# Technical Report Overview

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**Report:** Koocanusa Reservoir Monitoring Report, 2014 to 2016

**Overview:** This report presents the results of a three-year monitoring study undertaken in the Canadian portion of the Koocanusa Reservoir, from 2014 to 2016. The study was implemented to characterize and compare chemical and biological conditions downstream from the Elk River compared to upstream.

This report was prepared for Teck by Minnow Environmental Inc.

**For More Information**

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Future studies will be made available at **teck.com/elkvalley**

# Koocanusa Reservoir Monitoring Report, 2014 to 2016

Prepared for:
**Teck Coal Limited**
Sparwood, British Columbia

Prepared by:
**Minnow Environmental Inc.**
Georgetown, Ontario

January 2018

# Koocanusa Reservoir Monitoring Report, 2014 to 2016

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# EXECUTIVE SUMMARY

## Background

Teck Resources Limited (Teck) owns and operates five metallurgical coal mines within the Elk River watershed in southeastern British Columbia (BC). Mine discharges report to the Elk River which flows into Koocanusa Reservoir. Koocanusa Reservoir was created when the Libby Dam (Montana) was constructed in 1972, and is operated by the United States Army Corps of Engineers to provide flood control, hydroelectric power, and recreational opportunities. The reservoir straddles the border between Canada and United States, and lies within the traditional territory of the Ktunaxa First Nation. At full pool, about 68 km of the total 155 km length of the reservoir is in BC. Three Canadian rivers, the Kootenay (62% of mean annual inflow), Elk (26%), and Bull (11%), supply most of the reservoir's inflow. Water levels are managed at the Libby Dam, and are generally lowest in late winter or early spring and highest in summer/early fall. Normal annual pool fluctuation is about 35 m. At maximum drawdown, the reservoir volume is reduced by up to 85%, mean depth by 51%, surface area by 69%, and total length by 53%, with the largest relative changes occurring in the Canadian portion of the reservoir. Mean residence time is 0.55 years.

Discharges from Teck's metallurgical coal mines to the Elk River watershed are authorized by the BC Ministry of Environment (MOE) through permits that are issued under provisions of the *Environmental Management Act.* Permit 107517, which specifies the terms and conditions associated with those discharges, was issued November 19, 2015 and was recently amended on June 5, 2017, which included requirements for monitoring in Koocanusa Reservoir. A three-year study was implemented from 2014 to 2016 to characterize and compare chemical and biological conditions in the reservoir downstream from the Elk River compared to upstream. This report presents results of the monitoring completed within the Canadian portion of the reservoir.

## Water Quality

*In situ* profiles taken in February, April, and/or August showed only limited temperature, oxygen, pH, and conductivity gradients with depth. Most of the water column was oxygenated with slightly alkaline pH. A previous study concluded that waters in the Canadian portion of the reservoir remain relatively well-mixed, even during periods of maximum water elevation (May-November), as a result of basin morphometry, continual movement of water from river inputs and reservoir operations, and exposure to strong prevailing winds.

As the purpose of this study was to identify potential influences on Koocanusa Reservoir related to metallurgical coal mining inputs to the Elk River, the evaluation of water quality focused on substances associated with metallurgical coal mining: nitrate, selenium, and sulphate. Statistical tests showed that concentrations of these substances were similar in water samples collected at middle and bottom depths at all downstream sample locations, but differed from concentrations measured in samples collected at the surface. At the stations in the reservoir downstream from the Elk River, nitrate, selenium, and sulphate concentrations were typically lower at surface sampling depths. Differences between upstream and downstream concentrations were greater in 2016 than 2015 for both nitrate and selenium, but mean concentrations at the downstream areas in 2016 were similar to or less than those observed in 2015. Sulphate concentrations did not differ significantly between Koocanusa Reservoir stations located downstream versus upstream of the Elk River in any years.

With the exception of aluminum (one sample at RG_DSELK in 2015), iron (one sample at RG_GRASMERE in 2015 and one sample at RG_DSELK in 2016), and mercury (5 samples at RG_DSELK in 2016), water quality guidelines were not exceeded in water samples collected at stations throughout the reservoir as part of Teck's routine water quality monitoring program. Site performance objectives for nitrate, selenium, sulphate, and dissolved cadmium were consistently met at the station downstream from the Elk River.

### Sediment Quality

Sediment samples collected in the reservoir both downstream and upstream from the Elk River were mostly silt (≥60%), with sand and clay comprising smaller fractions. Sediments collected along a transect upstream from the Elk River (T2/TN) were significantly sandier (annual means of 2-10%) with less clay (means of 17-19%) than those collected at a downstream transect (T4; means of <1% for sand and 26-30% for clay). This may be related to the shallower depths and more fluvial nature of the reservoir at T2/TN (i.e., greater seasonal scour resulting in finer particles accumulating in sediments farther downstream). Total organic carbon content was consistent at both areas, ranging from 0.9 to 1.7%.

Concentrations of most metals and polycyclic aromatic hydrocarbons (PAHs) in sediment were higher in sediments collected downstream from the Elk River compared to upstream, but did not increase over the three year study. Concentrations of some metals (upstream and downstream) and PAHs (downstream only) in sediments were above the lower provincial sediment quality guidelines, but none exceeded the higher guidelines. The general pattern of higher concentrations in sediment downstream from the Elk River compared to upstream may be related to a greater proportion of fine sediment particles in the downstream area, providing more surface area for adsorption than larger particles.

## Plankton and Productivity

The reservoir is considered to be phosphorus limited. Low concentrations of phosphorus and chlorophyll-a, along with low seston and zooplankton biomass, all indicated that the reservoir is oligotrophic. Phytoplankton communities in the reservoir were numerically dominated by diatoms (algae with cell walls of hydrated silica), and to a lesser extent with Chrysophytes (golden algae). There were no significant differences in overall phytoplankton density, biomass, or richness between downstream and upstream areas over the three years. Community structure was similar between upstream and downstream areas, except for greater Cyanophyte (blue-green algae) biomass at the downstream area, which was considered to have low ecological significance because this group represented <1% of the community. Large year-to-year variation in the percent composition of major algal groups was reported in a previous study based on data collected from 1975 to 1988. Previous study authors concluded that the dominant influence on primary production in Koocanusa Reservoir was light quantity, which is influenced by: a) thermal structure which allows phytoplankton to be circulated out of the euphotic zone, b) turbidity in the inflows during spring runoff (freshet), and c) seasonal and meteorological variations in incident solar radiation.

The zooplankton community in Koocanusa Reservoir was numerically dominated by rotifers and copepods, with relatively low numbers of cladocerans. No consistent differences were observed between downstream and upstream areas in overall zooplankton density, biomass, or richness, or in absolute or relative density or biomass of copepods or rotifers, over the three year study. Abundance and biomass of cladocerans tended to be lower downstream from the Elk River compared to upstream. However, the smaller size of rotifers resulted in a considerably lower relative biomass compared to copepods and cladocerans. Overall community structure, indicated no consistent differences downstream compared to upstream from the Elk River over the three years. Selenium concentrations in zooplankton were similar between downstream and upstream areas in all three years.

## Benthic Invertebrates

Benthic invertebrate communities sampled in Koocanusa Reservoir upstream (T2/TN) and downstream (T4) from the Elk River were primarily composed of oligochaetes (mostly immature Tubificinae), insects (various species of chironomids), and ostracods in all three sample years. Total community density ranged from 984 to 3,533 organisms/m$^2$, which may be low compared to some reservoirs, but comparable to results reported in previous studies for Koocanusa Reservoir. Overall community density and richness did not differ significantly between upstream and downstream areas in any of the three study years. However, community structure differed between areas, particularly with respect to ostracods, which had higher average density at the downstream area (means ranging from 849 to 1,686 per m$^2$) compared to the upstream area (means of 38 to 333 per m$^2$) over the three years of study. Densities of oligochaetes were also significantly higher at the downstream area (range of 1,194 to 1,449 per m$^2$) compared to the upstream area (range of 418 to 1,194 per m$^2$). Greater abundance of these organisms downstream from the Elk River compared to upstream may be associated with preference for greater depths and finer sediment texture, and/or avoidance of coarser, compacted sediments in the upstream area that dry out during low pool.

Mean benthic invertebrate tissue selenium concentrations were significantly higher at the downstream area (6.9 µg/g dw) than the upstream area (5.0 µg/g dw), and were greater than the BC interim chronic dietary guideline of 4 µg/g dw, but were consistently less than the Level 1 benchmarks (based on <10% effect) developed in the Elk Valley Water Quality Plan for growth and reproductive effects to benthic invertebrates (13 mg/kg dw) and for dietary effects to fish (11 mg/kg dw).

**Fish**

Largescale sucker, northern pikeminnow, peamouth chub, redside shiner, and yellow perch were consistently captured in highest numbers at all three study areas (i.e., Sand Creek, Elk River, and Gold Creek) in Koocanusa Reservoir in 2014 to 2016. Other species that were captured included bull trout, burbot, kokanee, longnose sucker, mountain whitefish, pumpkinseed, rainbow trout, slimy sculpin, and westslope cutthroat trout.

Following technical guidance developed by Environment Canada, fish surveys were conducted in April of each study year at three areas (two downstream from the Elk River [Elk River and Gold Creek] and one upstream from the Elk River [Sand Creek]) to assess endpoints indicative of fish survival (mean age), growth (body size-at-age), reproduction (relative gonad weight) and energy storage (relative liver weight and overall condition). Peamouth chub were targeted in 2014 but additional species (northern pikeminnow, redside shiner, yellow perch, and largescale sucker) were also evaluated in subsequent years. Results were statistically compared between the downstream areas and the upstream area. No consistent patterns were observed among fish species, sexes, or sampling years that were indicative of influence from the Elk River.

Tissue samples were collected for analysis of metals from fish species captured in the April surveys, as well as fish collected in February and/or August of each year. Some fish had muscle or whole body concentrations of selenium greater than the BC tissue guidelines of 4 µg/g dw for both tissue types. All muscle and whole body samples were less than the United States Environmental Protection Agency (USEPA) criterion of 11.3 µg/g dw in muscle and 8.5 µg/g dw in whole bodies, except for a single yellow perch with a muscle selenium concentration of 15.0 µg/g dw. Similarly, ovary selenium concentrations were frequently greater than the BC chronic guideline of 11 µg/g dw (particularly in peamouth chub, redside shiner, and northern pikeminnow). All species except redside shiner and northern pikeminnow had mean ovary selenium concentrations less than the Level 1 benchmark for reproductive effects to fish (18 mg/kg dw), and the 2016 USEPA guideline of 15.1 µg/g dw. Northern pikeminnow had mean ovary selenium concentrations above the Level 1 benchmark at the Elk River area in only one of the three years they were sampled (2014), when ovaries were relatively undeveloped. Mean redside shiner ovary concentrations were above the Level 1 benchmark at both the Elk River and the Sand Creek areas in both years sampled. Exceedances of tissue selenium benchmarks or guidelines does not necessarily mean that effects will occur as fish species show a range of sensitivities to selenium.

### Next Steps

These data will be used as the basis for future study design development for a long-term monitoring program.

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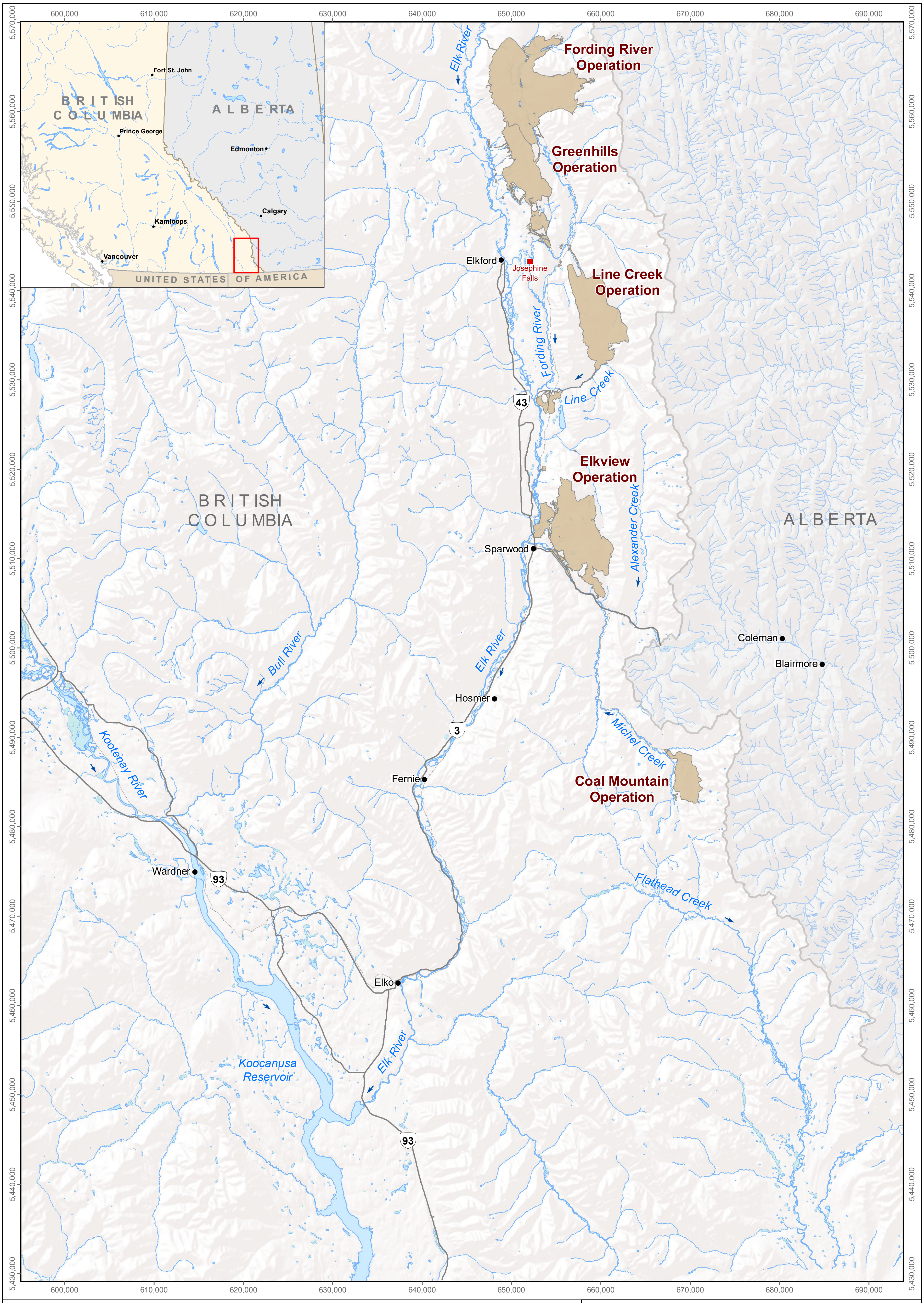
# 1 INTRODUCTION

## 1.1 Background

Teck Resources Limited (Teck) owns and operates five metallurgical coal mines within the Elk River watershed in southeastern British Columbia (BC; Figure 1.1). Mine discharges report to the Elk River which flows into Koocanusa Reservoir.

Koocanusa Reservoir was created when the Libby Dam (Montana) was constructed in 1972 to provide flood protection, hydroelectric power, and recreation benefits (Storm et al. 1982). The reservoir is operated by the United States Army Corps of Engineers (USACE) and reached full pool in June 1974 (Storm et al. 1982). At full pool, the reservoir is 155 km in length and straddles the border between Canada (about 68 km in length) and United States (87 km in length; Hamilton et al. 1990). The reservoir (at full pool) has a volume of 7.2 km$^3$, average surface area of 188 km$^2$, mean depth of 38 m, and maximum depth of 107 m (which occurs in Montana; the maximum depth at the border is about 46 m). Drawdown to minimum operational pool reduces the total length of the reservoir to 68 km, the volume to 1.1 km$^3$, and surface area to 59 km$^2$ (Woods and Falter 1982). At maximum drawdown, this equates to a reduction in reservoir volume of up to 85%, mean depth by 51%, surface area by 69% and total length by 53%, with the largest relative changes occurring in the Canadian portion of the reservoir (Hamilton et al. 1990). Three Canadian rivers, the Kootenay (62% of mean annual inflow), Elk (26%), and Bull (11%), supply most of the reservoir's inflow and, therefore, exert a major influence on the limnology of Koocanusa Reservoir (Woods 1982; Hamilton et al. 1990). Water levels within Koocanusa Reservoir are generally lowest in February through April and highest in summer/early fall (Figure 1.2). Normal annual pool fluctuation is about 35 m and mean residence time is 0.55 years (range 0.14 to 0.73 years) (Storm et al. 1982; Woods and Falter 1982; Hamilton et al. 1990). Since 2008, the USACE have adopted a variable flood control procedure, which improved the chance of refill and provided more normative flow, by drawing the reservoir down less in the winter and releasing more water out in the spring (USACE 2016).

The Ktunaxa First Nation has occupied lands adjacent to, and including, the Kootenay and Columbia Rivers and the Arrow Lakes of BC for more than 10,000 years (KNC 2005). Rivers and streams of the region provide culturally important sources of fish and plants. The Ktunaxa Territory is divided into traditional land districts historically associated with key actors in the Ktunaxa creation story, but also with specific key resources and with specific Ktunaxa individuals or lineages that held particular authority and responsibility for stewardship of resources in those areas (Robertson 2010).



**LEGEND**

▨ Teck Coal Mine Operation

## Location of Teck's Coal Mine Operations Relative to the Elk River Watershed and Koocanusa Reservoir

0 5 10 20
km

N E S W

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**Figure 1.1**

Document Path: S:\Projects\167202\167202.0049 - Teck Koocanusa 2016\GIS Mapping\2014-2016Report\16-49 Fig 1.1 Teck Coal Limited Operation.mxd

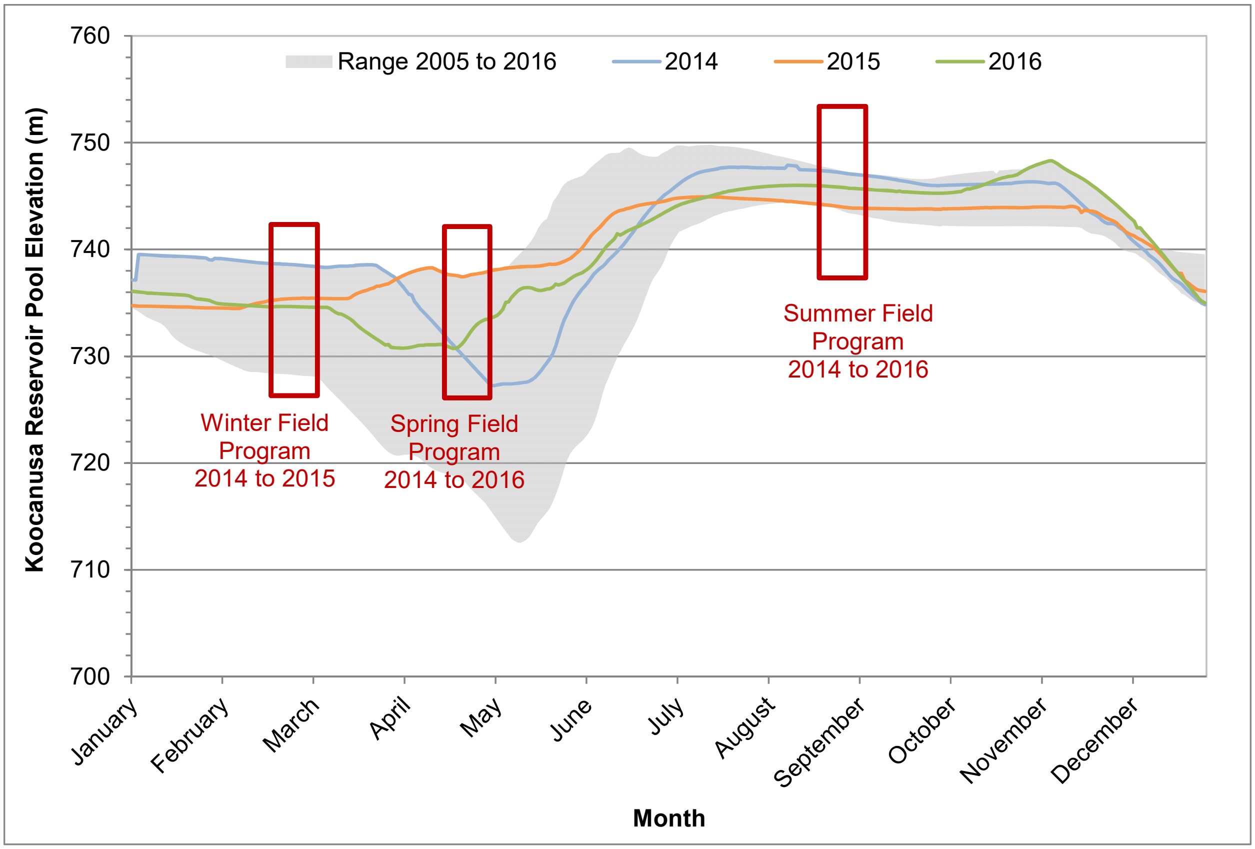

**Figure 1.2:** **Koocanusa Reservoir Water Surface (Pool) Elevation, 2014 to 2016**

Note: Shaded area is the historical daily range of water levels from 2005 to 2016. Data from United States Army Corps of Engineers (USACE 2017).

Based on concerns about rising mine-related concentrations of selenium and other constituents of interest within the Elk River basin, Teck initiated monitoring of chemical and biological conditions in the Koocanusa Reservoir in 2013[1]. In the same year (April 2013), the British Columbia (BC) Minister of Environment (MOE) issued a Ministerial Order (Number M113) requiring Teck to develop a plan for the Designated Area[2] to achieve the following outcomes:

- protection of aquatic ecosystem health;

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[1] For purposes of this study, Koocanusa Reservoir refers to lands and waters wholly contained within Canada. The first study in the reservoir undertaken by Teck was an evaluation of sediment quality (Minnow 2014a) and water quality.

[2] The Designated Area as defined by Ministerial Order M113 and Permit 107517 is: “a portion of southeastern British Columbia that contains the Elk Valley Watershed and the portion of Lake Koocanusa within Canada. References to the Elk Valley are references to the Designated Area.”

- management of bioaccumulation of contaminants in the receiving environment (including fish tissue);
- protection of human health; and
- protection of groundwater.

In response, Teck developed the Elk Valley Water Quality Plan (EVWQP), with input from the public, First Nations, governments, technical experts, and other stakeholders, to guide efforts to ensure the health of the watershed, while allowing for mining to continue (Teck 2014). The EVWQP was approved by the BC Minister of Environment on November 18, 2014.

Discharges from Teck's coal mines to the Elk River watershed are authorized by the BC Ministry of Environment (MOE) through permits that are issued under provisions of the *Environmental Management Act.* Permit 107517, which specifies the terms and conditions associated with those discharges, was issued November 19, 2015 following completion of the EVWQP, and was recently amended on June 5, 2017. The relevant permit requirement for this report is:

> (Section 10.8) ***"****The Permittee must prepare on an annual basis a report summarizing activities and monitoring results. The report must be submitted to the Lake Koocanusa Monitoring and Research Working Group (Lake Koocanusa Working Group)*[3] *and the EMC by June 30 of each year."*

A three-year monitoring program was initiated in 2014 to characterize and compare chemical and biological conditions in the reservoir downstream from the Elk River compared to upstream. Results of monitoring completed in 2014 and 2015 were reported by Minnow (2015b, 2016a). This report presents the 2016 monitoring results in accordance with the annual reporting requirement as per Section 10.8 of the permit, along with the combined results of all three years of study completed (2014 to 2016), a summary of water monitoring results, results from the burbot study (Minnow 2015a), and results from the initial sediment quality study completed in 2013 (Minnow 2014a, mentioned in footnote #2, above).

## 1.2 Objectives

The overall objective of the Koocanusa Reservoir (Canadian portion) monitoring program conducted in 2014 to 2016 was to assess conditions in the reservoir near and downstream from

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[3] The Permit specifies that the Working Group will be established under the BC & Montana government to government Memorandum of Understanding. The Permittee (Teck) is required to participate fully in the Koocanusa Reservoir Monitoring and Research Working Group.

the Elk River compared to upstream, to identify differences that may be attributable to influences from the Elk River. The types of data that were collected included:

- Water, sediment, and tissues of zooplankton, benthic invertebrates, and fish for chemical analysis;
- Phytoplankton, zooplankton, and benthic invertebrates for analysis of community structure;
- Fish measurements related to survival, growth, reproduction, and energy storage as indicators of fish health and population status; and
- Chlorophyll-a in water and seston biomass for analysis of productivity.

Measurement endpoints specific to each sample type were statistically evaluated to identify differences downstream compared to upstream from the Elk River, and for endpoints that differed among areas to determine if they were consistent among years or suggested an increasing or decreasing pattern.

The fluctuations of water levels within the reservoir (Figure 1.2) result in large seasonal and annual variation in water volume (Photo 1.1) and flow characteristics, as well as annual dewatering of large littoral (shallow shoreline) areas. These hydraulic factors are anticipated to influence chemical and biological characteristics within the reservoir and must be considered in the evaluation of potential influences from the Elk River.

### 1.3 Linkage to the Adaptive Management Plan

As required in Permit 107517 Section 11, Teck has developed an Adaptive Management Plan (AMP; Teck 2016a) to support implementation of the EVWQP, to achieve water quality and calcite targets, ensure that human health and the environment are protected, and where necessary, restored, and to facilitate continual improvement of water quality management in the Elk Valley. The AMP was submitted to the Environmental Monitoring Committee (EMC)[4] and MOE Director July 31, 2016 as required by the Permit. Study designs for many programs were established before the AMP was submitted. The AMP is currently under review, and Teck is working to incorporate input received from the EMC. Teck will work to embed elements of the AMP within each program through reviews of monitoring programs at the study design and

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[4] EMC refers to the Environmental Monitoring Committee, which Teck was required to form as a requirement of Permit 107517. The EMC consists of representatives from the MOE, the Ministry of Energy and Mines, Environment Canada, the Ktunaxa Nation, Interior Health Authority, and the Permittee. The EMC reviews submissions and provides technical advice to Teck and the MOE Director regarding monitoring programs.

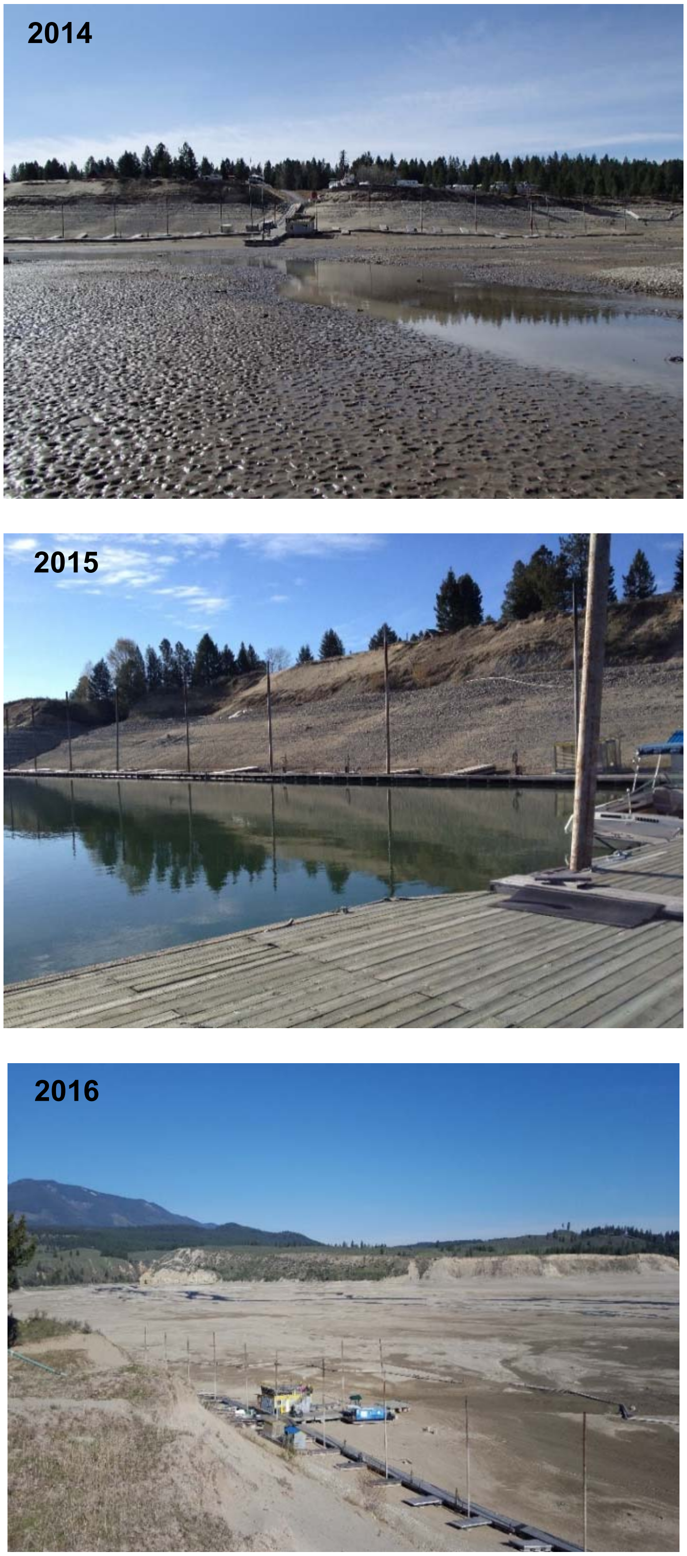


**Photo 1.1:** **Photos Showing Sunshine Houseboats & Marina Docks within Gold Bay of Koocanusa Reservoir, in April of 2014, 2015, and 2016**

report stages through implementation of the AMP. Data from the aquatic monitoring programs will feed into the adaptive management process to specifically address Big Questions #5 (Does monitoring for mine-related effects indicate that the aquatic ecosystem is healthy?) and #2 (Will aquatic ecosystem health be protected by meeting the long-term site performance objectives?). Following an adaptive management framework, evaluation of data collected in the Canadian portion of Koocanusa Reservoir will be used to inform adjustments to the future monitoring design within the reservoir.

# 2 METHODS

## 2.1 Overview

Annual study designs for the sampling conducted in the Canadian portion of the Koocanusa Reservoir in 2014 to 2016 were reviewed by the EMC and advice from the EMC was considered in updates to the study designs prior to implementation of field sampling (Minnow 2014b, Minnow 2015c, Minnow 2016b). Data analysis and presentation of results also reflects input provided by the EMC.

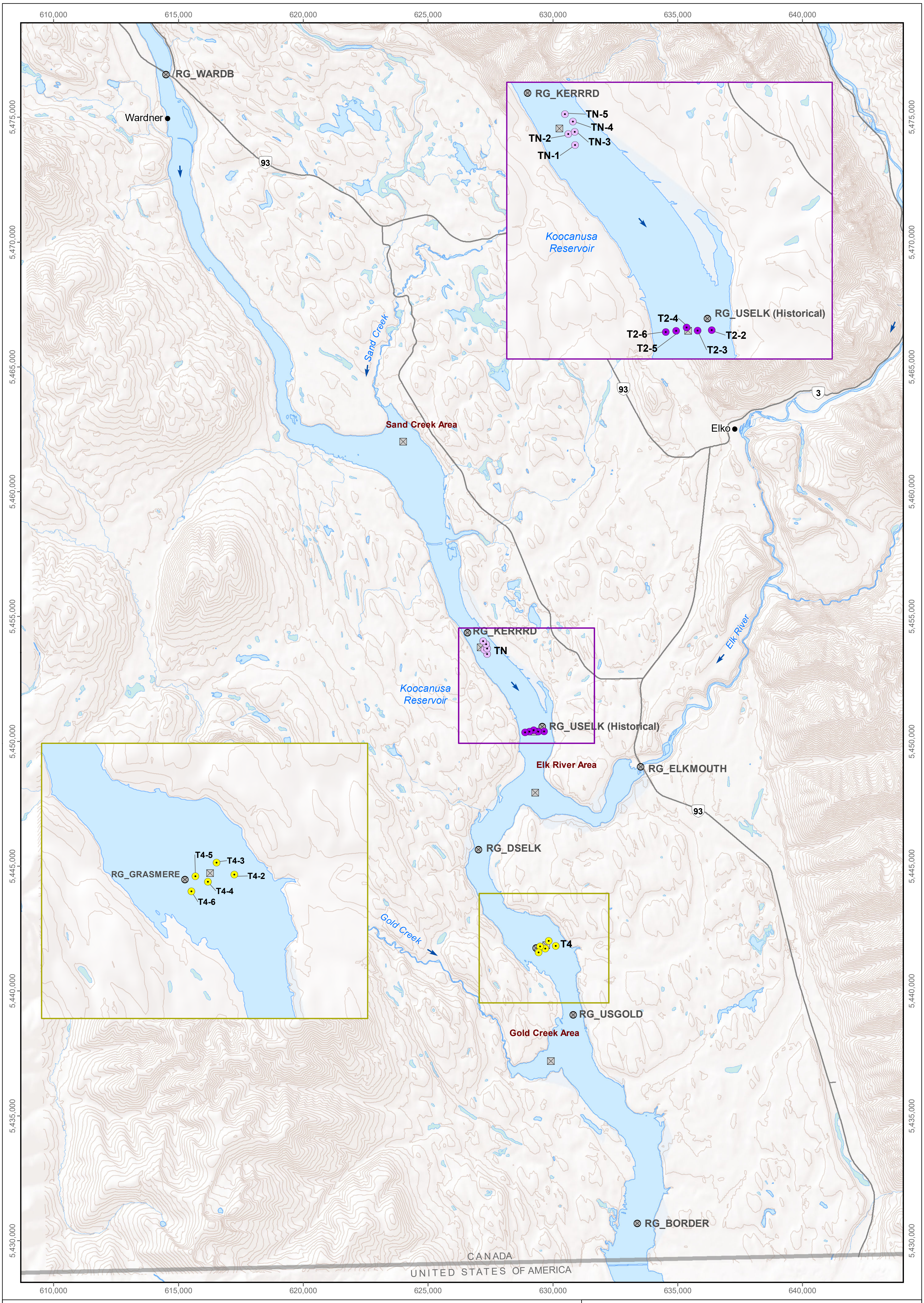
Two areas were sampled for sediment, plankton, and benthic invertebrates in Koocanusa Reservoir (upstream and downstream from the Elk River; Figure 2.1). The downstream area was maintained in the same location for all study years (i.e., Area T4), whereas the upstream area (Area T2) was moved 3.5 kilometres (km) further upstream in 2015 (relative to 2014). The area was moved as a result of the EMC's recommendation to relocate Teck's upstream water sampling station (RG_KERRRD, previously RG_USELK), to ensure that it was sufficiently distant from any potential influence of the Elk River (Figure 2.1). The new area was referred to as TN. Areas in the vicinity of the mouths of Sand Creek, Elk River, and Gold Creek were sampled for fish in all three years (Figure 2.2).

In February 2014 and 2015 (sampling was not conducted in February 2016), the following samples/measures were collected at the fish sampling areas identified on Figure 2.2 (with the exception of near the mouth of Gold Creek in 2015, where thin ice conditions presented a safety hazard) (Table 2.1):

- *In situ* water quality profiles (one per fishing area); and
- Fish tissue samples (target included 10 female burbot [*Lota lota*] and rainbow trout [*Oncorhynchus mykiss*], others such as bull trout [*Salvelinus confluentus*] were sampled opportunistically).

In April of 2014, 2015 and 2016, the following samples/measures were collected from the areas identified on Figures 2.1 and 2.2 (Table 2.1):

- *In situ* water quality profiles (one in the middle of each benthic invertebrate tissue sampling area [T2/TN and T4], and one in each fish sampling area);
- Benthic invertebrate tissue samples (one composite sample at each of the areas upstream and downstream from the Elk River [T2/TN and T4]);
- Fish tissue samples (up to 10 each of the following species: burbot, largescale sucker [*Catostomus macrocheilus*], peamouth chub [*Mylocheilus caurinus*], northern



**LEGEND**

- ⊙ Benthic Invertebrate Tissue Sampling Area (August 2015 and April/August 2016) and Sediment, Benthic Invertebrate and Plankton Sampling Location (August 2015 and 2016)
- ● Benthic Invertebrate Tissue Sampling Area (April/August 2014 and April 2015) and Sediment, Benthic Invertebrate and Plankton Sampling Location (August 2014)
- ⊙ Sediment, Benthic Invertebrate (both Community and Tissue) and Plankton Sampling Location (April/August 2014, 2015 and 2016)
- ⊗ Water Quality Station
- ☒ *In Situ* Water Quality Station

**Water Quality, Sediment, Benthic Invertebrate and Plankton Sampling Stations in Koocanusa Reservoir, 2014 to 2016**

0 2.5 5 10
km

N W E S

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**Figure 2.1**

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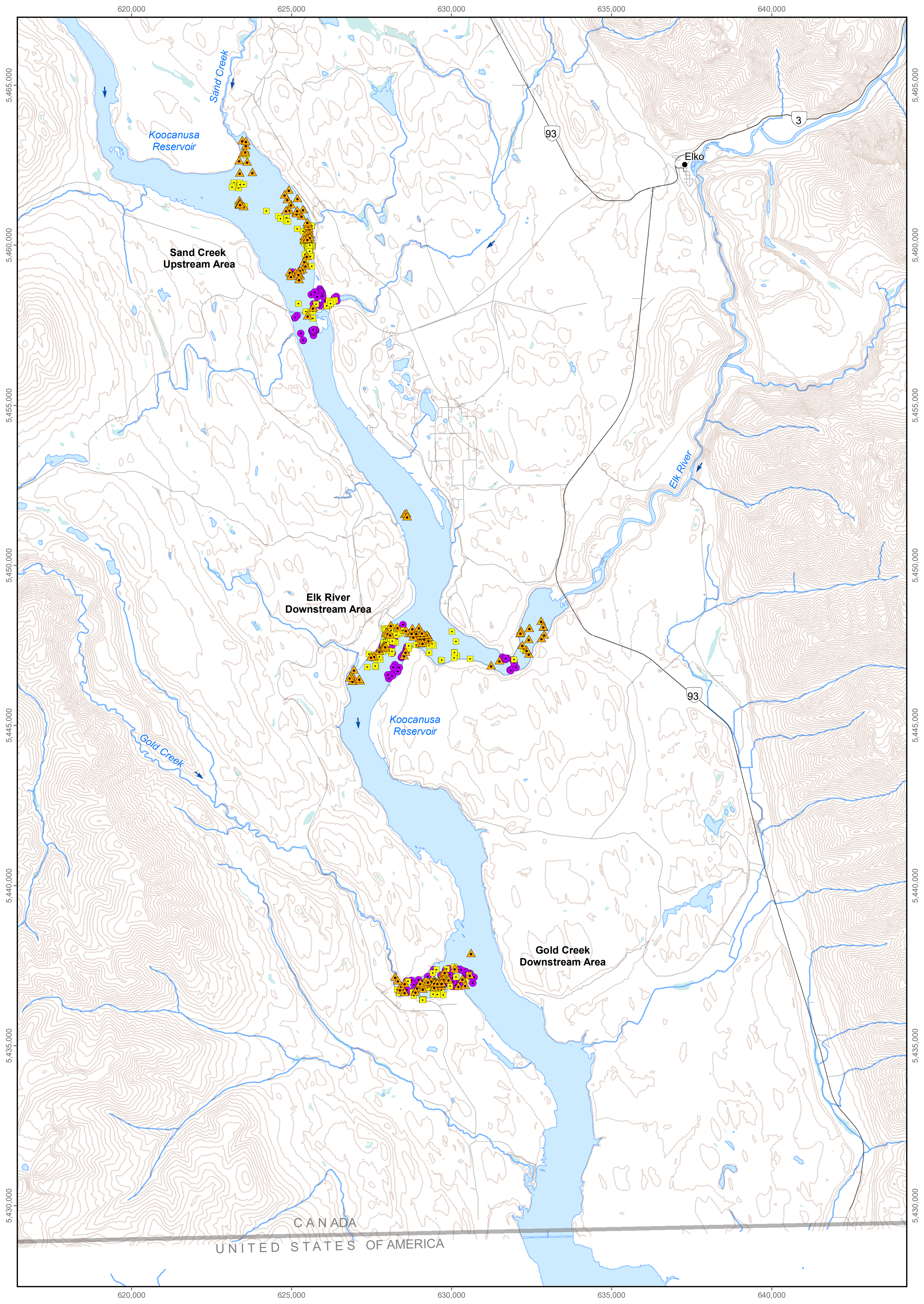

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- ▲ Fish Sampling Location 2014
- ■ Fish Sampling Location 2015
- ● Fish Sampling Location 2016

## Fish Sampling Locations in Koocanusa Reservoir, 2014 to 2016

0 1.75 3.5 7
km

N
W E
S

Map Projection: UTM Zone 11 NAD 1983
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**Figure 2.2**

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**Table 2.1: Samples Collected During Field Programs on Koocanusa Reservoir, 2014 to 2016**

| Year | Month | Sample Collected | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *In Situ* Water Quality | Sediment Chemistry | Plankton | | | Benthic Invertebrate | | Fish | |
| | | | | Phytoplankton Community | Zooplankton Community | Zooplankton Tissue | Community | Tissue | Fish Health and Population | Tissue Metals Analysis |
| 2014 | February | ✓<br>(in fishing areas[a]) | - | - | - | - | - | - | - | ✓[d] |
| | April | ✓<br>(in fishing areas[a] and in the middle of each transect, T2 and T4[b]) | - | - | - | - | - | ✓<br>(in the middle of each transect, T2 and T4[b]) | ✓<br>(peamouth chub) | ✓[d] |
| | August | ✓<br>(in fishing areas[a] and at each station of transect, T2 and T4[b]) | ✓<br>(at each station of transect, T2 and T4[b]) | ✓<br>(at each station of transect, T2 and T4[b]) | ✓<br>(at each station of transect, T2 and T4[b]) | ✓<br>(at each station of transect, T2 and T4[b]) | ✓<br>(at each station of transect, T2 and T4[b]) | ✓<br>(at each station of transect, T2 and T4[b]) | - | ✓[d] |
| 2015 | February | ✓<br>(in fishing areas[a,c]) | - | - | - | - | - | - | - | ✓[c,d] |
| | April | ✓<br>(in fishing areas[a] and in the middle of each transect, T2 and T4[b]) | - | - | - | - | - | ✓<br>(in the middle of each transect, T2 and T4[b]) | ✓<br>(largescale sucker, northern pikeminnow, peamouth chub, and yellow perch) | ✓[d] |
| | August | ✓<br>(in fishing areas[a] and at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | - | ✓[d] |
| 2016 | April | ✓<br>(in fishing areas[a] and in the middle of each transect, TN and T4[b]) | - | - | - | - | - | ✓<br>(in the middle of each transect, TN and T4[b]) | ✓<br>(largescale sucker, northern pikeminnow, peamouth chub, redside shiner, and yellow perch) | ✓[d] |
| | August | ✓<br>(in fishing areas[a] and at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | ✓<br>(at each station of transect, TN and T4[b]) | - | ✓[d] |

[a] Sand Creek fishing area is upstream of the Elk River confluence, while the Elk River and Gold Creek fishing areas are downstream of the Elk River.

[b] T2/TN were located upstream of the Elk River confluence, while T4 was downstream of the Elk River. The upstream location, T2, was relocated further upstream from the mouth of the Elk River for the August 2015 and subsequent field programs.

[c] Gold Creek area was not sampled in February 2015 where thin ice conditions presented a safety hazard.

[d] Species sampled included one or more of the following: bull trout, burbot, kokanee, largescale sucker, mountain whitefish, northern pikeminnow, peamouth chub, rainbow trout, redside shiner, westslope cutthroat trout, yellow perch.

pikeminnow [*Ptychocheilus oregonensis*], redside shiner [*Richardsonius balteatus*], yellow perch [*Perca flavescens*], bull trout, rainbow trout, westslope cutthroat trout [*O. clarki lewisi*], and mountain whitefish [*Prosopium williamsoni*]; and

- Peamouth chub (2014, 2015 and 2016), northern pikeminnow, yellow perch, largescale sucker, and redside shiner (2015 and 2016) for the fish health assessment (e.g., 20 males and 20 females per fish sampling area).

In August of 2014, 2015, and 2016, the following samples/measures were collected from the areas identified on Figure 2.1 (Table 2.1):

- *In situ* water quality profiles (one at each benthic invertebrate/plankton sampling station [n = 5 per area], and one at each fish sampling area);
- Sediment chemistry, phytoplankton community, zooplankton community, zooplankton tissue, benthic invertebrate community, chlorophyll-a, and seston biomass (five samples each, at each upstream and downstream area);
- Benthic invertebrate tissue samples (one composite sample from each of the areas upstream and downstream from the Elk River); and
- Fish tissue samples (target species included up to 10 rainbow trout [in 2014], 10 northern pikeminnow [in 2015 and 2016], 10 kokanee [*O. nerka*; 2014, 2015 and 2016], and any sport fish collected opportunistically in 2016).

An assessment of the quality of analytical data collected during the three-year sampling program is provided in Appendix A. Details related to sampling activities described above are provided in the sections that follow.

## 2.2 Water Quality

### 2.2.1 *In Situ* Water Quality

In association with biological sampling for the current study, *in situ* measurements of water quality were completed in February, April, and/or August, 2014 to 2016. *In situ* water temperature, dissolved oxygen (DO), pH, and specific conductance (i.e., temperature-standardized measurement of conductivity) were measured as vertical profiles at one meter intervals starting just below the water surface. The *in situ* water quality measurements were taken using a calibrated YSI 556 MDS (Multiparameter Display System) meter equipped with a YSI 6820 Sonde (YSI Inc., Yellow Springs, OH), or similar portable multi-parameter unit. Additional water quality information collected to support the interpretation of biological data included Secchi depth, and observations of water colour and clarity (Appendix B).

### 2.2.2 Routine Water Quality

Routine water quality monitoring was conducted in accordance with Teck's Regional Water Monitoring Plan (Teck 2016b, 2017). Permit 107517 requires the collection of water samples at five stations that are located within the Canadian portion of the reservoir (Figure 2.1). Four of the stations are referred to as receiving water sampling sites (RG_KERRRD, RG_DSELK, RG_GRASMERE, RG_USGOLD), while the fifth station (RG_DSELK) is an Order station, mandated by the MOE, for which site performance objectives (SPOs) have been established. The SPOs for RG_DSELK are 2 µg/L for total selenium (equivalent to the BC water quality guideline), 3 mg/L for nitrate-nitrogen (equivalent to the BC water quality guideline; hereafter referred to as nitrate), 308 mg/L for sulphate (consistent with the BC water quality guideline of 309 mg/L for moderately soft/hard to hard waters [i.e., 76 – 180 mg/L hardness]), and hardness based for dissolved cadmium[5] (functionally equivalent to the long-term BC water quality guideline).

In addition to the five water quality monitoring locations described above, water quality was also assessed on the lower Kootenay River at Wardner Bridge (RG_ WARDB), and the lower Elk River (RG_ELKMOUTH). Flow data from Environment Canada's (2017) closest hydrometric stations (i.e., Kootenay River in Fort Steele [station no. 08NG065] and Elk River in Fernie [station no. 08NK002]) on each river were also downloaded to determine an approximate ratio of flow from the Elk River compared to the Kootenay River into Koocanusa Reservoir. The respective watershed areas between the location where the hydrometric station was situated and Teck's river monitoring stations were also considered when determining the approximate ratio of flow from the Elk River compared to the Kootenay River.

The surface water monitoring program for Koocanusa Reservoir (Canadian portion) and the two river monitoring stations included the collection and/or analysis of multiple parameters on a monthly basis, except from April 1st to July 15th, when samples were collected weekly. Initially at the water quality stations on Koocanusa Reservoir, a profile of the water was conducted and if there was a thermocline (change of 1°C over 1 m change in depth), the water column was considered stratified. If stratified, a composite sample formed from three evenly spaced grab samples was collected throughout the epilimnion, and another composite from the hypolimnion. If the water was not stratified, a sample was collected at 3 m from the surface, 3 m from the substrate, and at the mid-point of the water column. Field parameters for the reservoir and river stations included water temperature, DO, specific conductance, pH, and Secchi depth (in

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[5] Dissolved cadmium SPO is hardness dependent based on the following formula:

Dissolved cadmium (in µg/L) = $10^{\ 0.83\log10(\text{hardness})-2.53}$ where hardness is in mg/L of $CaCO_3$

reservoir only). Conventional parameters included specific conductance, total dissolved solids (TDS), total suspended solids (TSS), hardness, alkalinity, dissolved organic carbon (DOC), total organic carbon (TOC), and turbidity. Major ions included bromide, fluoride, calcium, chloride, magnesium, potassium, sodium, and sulphate. Nutrients included ammonia, nitrate, nitrite, total Kjeldahl nitrogen (TKN), orthophosphate, and total phosphorous. Total and dissolved metals analysis included aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, and zinc (Teck 2016b, 2017). Chlorophyll-a samples were also collected within the reservoir for laboratory analysis starting in April 2015.

### 2.2.3 Data Analysis

Vertical water quality profiles that were completed in conjunction with biological sampling were plotted to determine if any stratification or gradients in temperature, DO, pH, and/or conductivity were occurring in any of the sampling areas. Data collected from areas downstream from the Elk River were also compared to data collected upstream.

Statistical analysis of water quality data focused on monthly mean concentrations for the Order constituents (i.e., nitrate, selenium, and sulphate; cadmium was excluded as most samples [90%] were less than the method detection limits [<0.00001 mg/L in 2014 and <0.000005 in 2015 and 2016] at areas both upstream and downstream of the Elk River. Samples were generally collected at the surface, middle, and bottom depths during each sampling event (i.e., as conditions in the reservoir were unstratified). Pairwise statistical comparisons of monthly mean concentrations between depths (surface vs. middle, surface vs. bottom, and middle vs. bottom) were conducted by station (RG_KERRRD, RG_USELK, RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER) using a paired t-test. When the assumption of normality (Shapiro-Wilks' test with significance level [α] = 0.05) was not met, the non-parametric Wilcoxon signed rank test was used. A Bonferroni-adjusted α of 0.1/3 = 0.033 was used for paired t-test and Wilcoxon signed rank tests to control the Type I error rate for the n = 3 pairwise comparisons for each station. Results of these analyses were used to determine whether the depths should be analyzed separately or pooled in the analyses described below.

Statistical comparisons of nitrate, selenium, and sulphate concentrations between downstream stations (i.e., RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER) and upstream stations (RG_USELK in 2014 and RG_KERRRD in 2015 and 2016) were conducted to assess differences among years and between stations. The statistical comparisons were conducted on the differences (downstream of the Elk River – upstream of the Elk River) in monthly mean concentrations to remove the influence of season using a method analogous to a two-way

ANOVA with factors *Area* and *Year*. The differences in monthly mean concentrations between areas were tested using ANOVA (or the Kruskal-Wallis test when assumptions of normality and homogeneity of variances were not met) with factor *Year* (equivalent to testing the *Area*×*Year* interaction in a two-way ANOVA) according to the following hypothesis:

$$H_{01}: \mu_{d\_2014} = \mu_{d\_2015} = \mu_{d\_2016}$$

where $\mu_{d\_2014}$ represents the mean of the differences in monthly mean concentrations between upstream and downstream stations.

When a difference was detected, pairwise comparisons among years were conducted using Tukey's Honestly Significant Differences method or the Mann-Whitney test ($\alpha = 0.1$). The upstream and downstream station comparisons were conducted by testing whether differences in monthly mean concentrations between stations were different from zero using a one-sample t-test (or Wilcoxon signed rank test when assumptions of normality were not met) by testing the hypothesis:

$$H_{02}: \mu_d = 0$$

The tests for $H_{02}$ were conducted by pooling all years of data when the differences in monthly mean concentrations between stations were not significantly different among years (i.e., $H_{01}$ was not rejected) and were conducted by year when the differences in monthly mean concentrations between stations were significantly different among years (i.e., $H_{01}$ was rejected). An example table showing the results of the analyses is provided in Table 2.2.

The magnitude of difference (MOD) between stations was calculated when a significant difference was detected between stations as:

$$\text{MOD} = \frac{(MCT_{DS} - MCT_{US})}{MCT_{US}} \times 100\%$$

where $MCT_{DS}$ and $MCT_{US}$ are the measure of central tendency for the downstream and upstream stations, respectfully (i.e., mean or median depending on whether the statistical comparison was conducted using a parametric or non-parametric method, respectively). The statistical analyses were conducted using R statistical software (R Core Team 2015).

## 2.3 Sediment Quality

### 2.3.1 Sample Collection

Sampling of sediment in the three-year (2014 to 2016) Koocanusa Reservoir monitoring program focused on two transects (i.e., T2/TN and T4). As noted in Section 2.1, the upstream transect (T2) was re-located 3.5 km farther upstream in 2015 (TN) to avoid potential influence

**Table 2.2:** Description of Two-way ANOVA Statistical Approach Applied to the Evaluation of Spatial and Temporal Differences in Aqueous Parameter Concentrations in Koocanusa Reservoir at Stations Downstream from the Elk River Relative to Upstream Station(s) Using Data Collected in 2014 to 2016

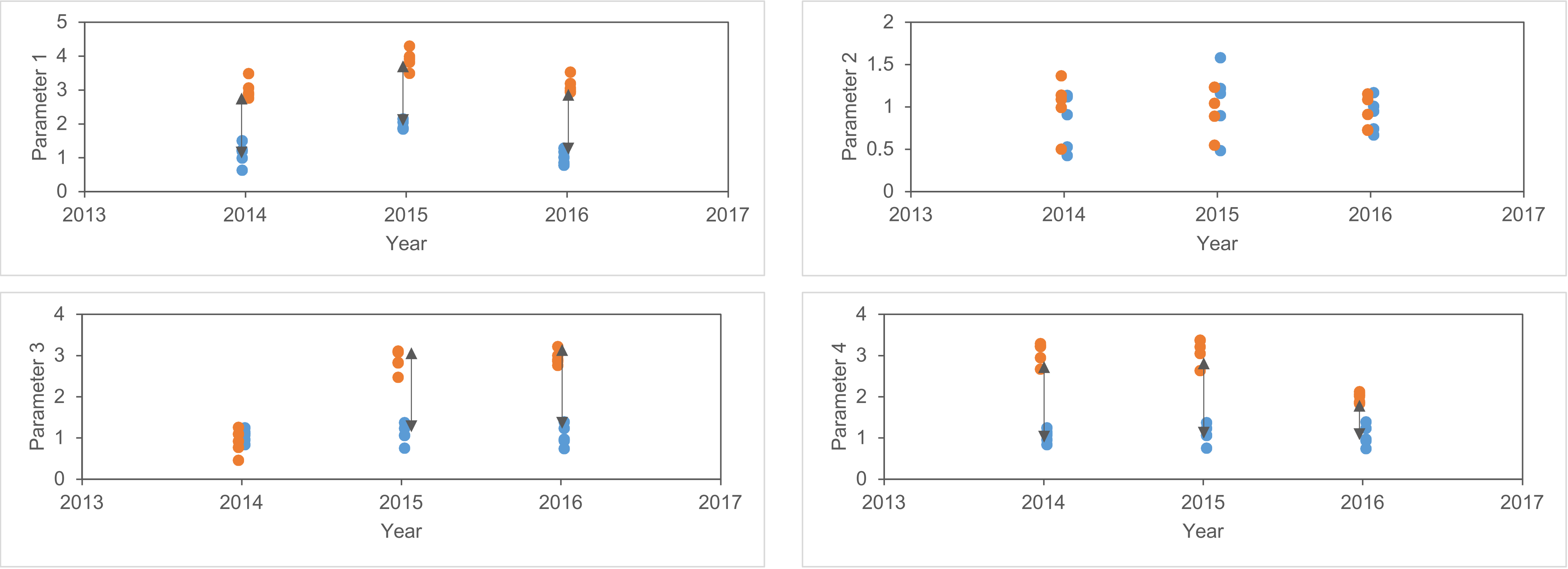
Mean concentrations are reported by station and year. The mean reported here represents the mean of monthly mean concentrations by station.

The test here is for whether the relative difference between downstream of Elk River and upstream of Elk River is the same in each year (i.e., are the lengths of the arrows between station means the same in each year in the figure below?). If there is a significant difference among years, then pairwise comparisons are conducted between years to determine which year(s) is(are) different (Tukey's Honestly Significant Differences or Mann-Whitney tests; α=0.1).

The test here is whether there is a difference downstream of Elk River compared to upstream of Elk River. The hypothesis is tested by comparing the mean relative difference between downstream of Elk River and upstream of Elk River to zero (i.e. are the two stations significantly different from each other?). When the relative difference between stations is similar among years (overall p-value from $H_{01}$>0.1) then the downstream of Elk River vs upstream of Elk River comparison is conducted by pooling data from all years (and not separated by year).

| Parameter | Mean Concentration (mass/volume) | | | | | | $H_{01}$: Is the difference between the downstream concentration and upstream concentration equal in all years? Test for Relative Difference Between Areas (Downstream of Elk River - Upstream of Elk River) Among Years | | | | | $H_{02}$: Is the downstream concentration equal to the upstream concentration? Test for Relative Difference Between Areas (Downstream of Elk River - Upstream of Elk River) = 0 | | | | | Magnitude of Difference (Downstream of Elk River - Upstream of Elk River) / Upstream of Elk River (mean or median) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2014 | | 2015 | | 2016 | | Test | P-value | | | | Test | P-value | | | | % | | |
| | | | | | | | | All years | Year | | | | All years | Year | | | Year | | |
| | Downstream of Elk River | Upstream of Elk River | Downstream of Elk River | Upstream of Elk River | Downstream of Elk River | Upstream of Elk River | | | 2015-2014 | 2016-2014 | 2016-2015 | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Parameter 1 | 3.0 | 1.1 | 3.9 | 2.0 | 3.1 | 1.0 | ANOVA | >0.1 | - | | | ANOVA | <0.1 | - | | | 200% | | |
| Parameter 2 | 1.0 | 0.82 | 1.0 | 1.1 | 0.92 | 0.91 | ANOVA | >0.1 | - | | | ANOVA | >0.1 | - | | | - | | |
| Parameter 3 | 0.90 | 1.1 | 2.9 | 1.1 | 2.9 | 1.1 | ANOVA | <0.1 | <0.1 | <0.1 | >0.1 | ANOVA | - | >0.1 | <0.1 | <0.1 | - | 200% | 200% |
| Parameter 4 | 3.1 | 1.0 | 3.1 | 1.0 | 2.0 | 0.94 | ANOVA | <0.1 | >0.1 | <0.1 | <0.1 | ANOVA | - | <0.1 | <0.1 | <0.1 | 200% | 200% | 90% |

▨ = p-value < 0.1



from the Elk River (Figure 2.1). Sediment samples were collected in August in each of the three years from five stations along each transect (Figure 2.1).

Sediment samples for physical and chemical characterization were collected using a stainless steel Petite Ponar (0.023 $m^2$ sampling area). At each transect (T2 and T4 in 2014, TN and T4 in 2015 and 2016; Figure 2.1), three grabs were collected at each of the five stations to create a composite sediment sample consisting of the top three centimetres (cm) of sediment [i.e., the sediment fraction in which most benthic fauna generally reside (Kirchner 1975)]. Following retrieval of each sediment grab, the ponar was gently opened and lifted to release the collected sediment into a clean plastic tub. If the grab was not complete to each edge of the ponar, or lacked an intact sediment-water surface layer, it was discarded and a new grab was collected. If the grab was acceptable, the top 3 cm were removed and placed into a separate plastic tub. The procedure was repeated until three acceptable grabs were obtained, after which the sample was homogenized using a stainless steel spoon. The homogenized sediment was then transferred to a glass jar [for analysis of polycyclic aromatic hydrocarbons (PAHs)] and a large labelled Ziploc® bag (for all other analyses described in the paragraph below). Sediments were not collected for PAH analysis in 2014 (i.e., only in 2015 and 2016). Samples were subsequently placed in a cooler with ice and transferred to a refrigerator later in the day.

At each sediment sampling station, supporting information was recorded on field sheets, including average Ponar fullness, station depth (m), the presence of algae or macrophytes in samples, sediment texture, and Universal Transverse Mercator (UTM) coordinates (Appendix C).

### 2.3.2 Laboratory Analysis

Sediment samples (whole sample not sieved) were sent to ALS Environmental in Calgary, Alberta for analysis of PAHs, moisture content, particle size, TOC, and metals/metalloids (hereafter collectively referred to as metals) in the <1 mm fraction (sieved in the lab). For the metals analysis, the <1 mm fraction was representative of whole sediments because samples were collected from depositional areas dominated by fine-grained sediments (i.e., results of particle size analysis indicated that grain size of whole sediment was <1 mm at all sampling locations during the 2014 to 2016 study). This approach is also consistent with previous sampling methodology. Screening at <1 mm ensured that the small sub-sample analyzed by the laboratory did not contain any large grains of sand or gravel that would not be considered representative of the sample as a whole and could bias chemical concentrations expressed relative to sample mass. Sediment sampling quality assurance/quality control (QA/QC) included the collection and analysis of one field duplicate split sample in each sampling event, as well as assessment of laboratory duplicates, method blanks, and recovery of certified reference materials.

### 2.3.3 Data Analysis

Sediment particle size distribution and TOC were plotted to aid in the interpretation of the sediment chemistry results. Sediment chemistry data were compared to applicable BC Working Sediment Quality Guidelines (WSQGs) and parameters that exceeded the lowest effect level WSQG (and selenium) were plotted. The lower sediment quality guidelines (i.e., lowest effect level/threshold effect level – LEL/TEL) represent concentrations below which adverse biological effects would not be expected to occur (BCMOE 2017b). In contrast, the highest sediment quality guidelines (i.e., probable effect level/severe effect level – PEL/SEL) represent concentrations above which effects may be observed (BCMOE 2017b).

A two-way ANOVA with factors *Area* and *Year* were used to compare areas located downstream versus upstream of the Elk River over three study years (2014 to 2016; Table 2.3). When the interaction between *Area* and *Year* was significant ($\alpha = 0.1$), the conclusion was that there was a difference between areas, but the difference depended on the year. Comparisons were then conducted between areas separately by year using the contrasts package (Kuhn et al. 2016) in R (R Core Team 2015). When the interaction between *Area* and *Year* was not significant, the significance of the *Area* term in the two-way ANOVA model was assessed and the conclusion was that the differences between areas were similar in each year. An example results table for the two-way ANOVA is provided in Table 2.3. Assumptions of normality and homogeneity of variances were tested on the residuals of the two-way ANOVA using the Shapiro-Wilks' and Levene's tests, respectfully. Data were $\log_{10}$-transformed as required to meet assumptions. When the assumptions could not be met, a rank transformation was used. A more liberal $\alpha$ of 0.01 was used for testing the assumptions, to limit the use of the rank transformation to those instances where assumptions were violated.

At the request of the EMC, the magnitude of difference was calculated in two ways. First, a magnitude of difference was reported for the comparisons between areas (either pooled across years or separately by year) as a standardized difference in terms of the number of within-area/year standard deviations as:

$$\text{MOD} = \frac{(\bar{X}_{DS} - \bar{X}_{US})}{S_r}$$

where $\bar{X}_{DS}$ is the mean for the downstream area, $\bar{X}_{US}$ is the mean for the upstream area, and $S_r$ is the pooled standard deviation of the residuals (i.e., the within-area/year standard deviation) of the two-way ANOVA model.

**Table 2.3: Example of Two-way ANOVA Statistical Approach with Factors Area and Year used for Comparisons between Koocanusa Reservoir Areas Located Downstream versus Upstream of the Elk River from 2014 to 2016**

Data transformation to meet assumption of normality (S-W test α=0.01) and homogeneity of variance (Levene's test α=0.01). If assumptions could not be met using a log [or log(x+1) when zeros were present] transformation, then the ANOVA was conducted on ranked data. A 0.1 instead of 0.5 significance level was used for testing assumptions to limit the use of the rank transformation to extreme deviation of normality or heterogeneity of variances.

The measure of central tendency was reported to support the statistical comparison. The mean is reported for no transformation, the back-transformed mean on the log scale (i.e. geometric mean) when a log transformation was used, and the median when the rank transformation was used.

P-values for the two-way ANOVA. When there was an interaction between Area and Year, it was interpreted as a difference between areas, but the difference depended on which years were compared. When there was an interaction, the Area and Year p-values were not shown and contrasts were conducted to compare the areas separately by year.

ANOVA contrasts (p-values) were conducted only when there was an interaction between Area and Year.

The magnitude of difference (MOD) was calculated as (downstream of Elk River-Upstream of Elk River)/Upstream of Elk River*100 and was reported when the difference was significant. The MOD was reported by year when there was an interaction between Area and Year, and reported for all years when there was no interaction between Area and Year.

The MOD was also reported in terms of the number of standard deviations (this is the pooled standard deviation from the ANOVA table).

| Endpoint | Trans-formation | Measure of Central Tendency (Mean, Geometric Mean, or Median)[a] | | | | | | Model P-values | | | P-values for Contrasts Area×Year | | | Significant Differences and Magnitudes of Difference (%) | | | Significant Differences and Magnitudes of Difference (number of SD) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2014 | | 2015 | | 2016 | | Area×Year | Area | Year | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | |
| | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Endpoint A | none | 2,631 | 3,224 | 3,533 | 984 | 3,295 | 2,547 | 0.170 | 0.184 | 0.641 | - | - | - | - | | | - | | |
| Endpoint B | log | 1,394 | 947 | 1,194 | 418 | 1,449 | 1,034 | 0.633 | 0.092 | 0.360 | - | - | - | * (81%) | | | * (0.64 SD) | | |
| Endpoint C | log(X+1) | 0.51 | 4.7 | 0.42 | 1.6 | 0.33 | 0.29 | 0.086 | - | - | 0.004 | 0.161 | 0.955 | * (-89%) | - | - | * (-3.4 SD) | - | - |

▨ p-value < 0.1

* indicates a significant difference between the two areas at an α of 0.1.

[a] The measure of central tendency reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for $\log_{10}$-transformation; and, median for rank-transformation.

Second, a magnitude of difference was also reported for the comparisons between areas (either pooled across years or separately by year) as a percentage difference in the measure of central tendency between areas relative to the upstream area as:

$$\text{MOD} = \frac{(MCT_{DS} - MCT_{US})}{MCT_{US}} \times 100\%$$

where $MCT_{DS}$ and $MCT_{US}$ are the measures of central tendency for the downstream and upstream areas. The measures of central tendency were reported in the original data units as:

- means when no transformation was used;
- geometric means when a $\log_{10}$-transfomation was used; and
- medians when a rank transformation was used.

The two-way ANOVA with a rank transformation actually compares mean ranks (and not medians). A percent difference between two mean ranks does not provide an estimate of the magnitude of difference between two areas. A percent difference between two medians does provide an estimate of the magnitude of difference; however it is possible to detect a significant difference between mean ranks when the area medians are equal.

## 2.4 Plankton

### 2.4.1 Productivity

#### 2.4.1.1 Sample Collection

Productivity was measured based on data collected during Teck's routine water quality monitoring (i.e., for nitrate, phosphorus, orthophosphate, chlorophyll-a, and Secchi depth, as described in Section 2.2.2) and data collected during biological sampling (described below).

Chlorophyll-a samples associated with biological monitoring were collected as depth-integrated samples through the top 10 m of the water column at each of five stations upstream and downstream from the Elk River (i.e., transects T2/TN and T4; Figure 2.1) in August of each sample year. Depth-integrated water samples were collected by lowering a 1 cm inside-diameter plastic tube, equipped with a weight, to a depth of 10 m and, after crimping the tube to ensure no water loss upon retrieval, the tube was pulled to the surface and the water inside the tube was emptied directly into a clean pail. A total of three grabs were composited to form the sample, which was then mixed and split for analysis of chlorophyll-a and phytoplankton community (see Section 2.4.2.1, below). Composite water samples were filtered in the field through a 0.45 µm sterile cellulose acetate membrane filter assisted by a vacuum pump. Following filtration of one litre of water, the membrane filter was removed from the filter apparatus, folded within a piece of aluminum foil, and placed into a pre-labelled polyethylene (Whirl-Pak™) bag. Samples were stored frozen until shipped to ALS Environmental for analysis.

Chlorophyll-a was also measured *in situ* in 2015 to investigate variability in concentrations at 1 m depth intervals and to test the accuracy of the method by comparing average *in situ* concentrations over the top 10 m to those reported by the laboratory for the 10-m depth-integrated samples. The 2015 *in situ* chlorophyll-a concentrations were measured using a YSI multi-parameter field meter. The meter was fitted with a total algae sensor, which provides separate measurements for both chlorophyll-a and blue-green algae. Measurements were conducted at one meter intervals starting just below the water surface. Collection of chlorophyll-a data using the traditional field filtering and laboratory analysis methods showed that *in situ* measurements underestimated chlorophyll-a concentrations; therefore, *in situ* chlorophyll-a measurements were not collected in 2016.

Seston biomass samples were also collected as a measure of productivity during biological sampling. Samples were collected at the same time and from the same locations as the field filtered chlorophyll-a samples described above. Samples were collected by hauling a 60 µm plankton net through the top 10 m of the water column at each station five times. Samples were transferred to plastic collection jars and preserved with 5% formalin solution. Samples were later filtered and residual material dried and weighed as described by Wetzel and Likens (2000) to provide an estimate of total seston productivity (i.e., total seston weight per unit volume of water).

### 2.4.2 Community Composition

#### 2.4.2.1 Sample Collection

Samples for analysis of phytoplankton community structure were collected as depth-integrated samples through the top 10 m of the water column from five stations in each transect (T2 and T4 in 2014, TN and T4 in 2015 and 2016; Figure 2.1), as described in Section 2.4.1.1. Immediately following collection of the 100 mL sample, Lugol's solution was added to the sample for preservation (enough volume to darken the solution to a weak tea colour). The sample was mixed with the Lugol's solution by gently tipping the jar twice. Samples were maintained at room temperature until shipment to the laboratory (Plankton R Us, Winnipeg, Manitoba).

Samples for analysis of zooplankton community composition were collected using a 19 cm diameter, fine mesh (i.e., 60 µm) plankton net, vertically hauled through the top 10 m of the water column at each sampling station, based on methods described by BCMWLAP (2003). A total of three vertical hauls were collected and composited to form a single community sample at each of the sampling stations (T2 and T4 in 2014, TN and T4 in 2015 and 2016; Figure 2.1). Each sample was carefully transferred into a pre-labelled plastic sampling jar, and preserved to a level of 10% buffered formalin. Samples were maintained at room temperature until shipment to Plankton R Us. At each plankton sampling station, supporting information was recorded on field sheets, including weather conditions, Secchi depth, and UTM coordinates (Appendix D).

#### 2.4.2.2 Laboratory Analysis

Phytoplankton and zooplankton samples collected for community analysis were sent to Plankton R Us Inc. (Winnipeg, MB) for taxonomic identification.

For phytoplankton samples, 10 mL aliquots of preserved sample were gravity settled for 24 hours. Cell counts were then performed using the Ütermohl technique as modified by Nauwerck (1963), using an inverted microscope at magnifications of 125X, 400X, and 1200X with phase contrast illumination. Specimens were identified to the lowest taxonomic level possible. Cell counts were converted to wet weight biomass by approximating cell volume. Estimates of cell volume for each species were obtained by measuring up to 50 cells of an individual species and applying the geometric formula best fitted to the shape of the cell (Vollenweider 1968; Rott 1981). A specific gravity of 1 was assumed for cellular mass.

Zooplankton samples were brought to a standard volume by settling the sample for 24 hours and then decanting the upper liquid. The decanted liquid was microscopically viewed to ensure no animals were lost. For cladocerans and copepods, sub-sampling was performed (using an automatic pipette) on samples that contained large numbers of specimens. All samples were sub-sampled (using an automatic pipette) for rotifer enumeration. One millilitre sub-samples (to a maximum of ¼ of the sample) were allowed to settle in a Sedgwick-Rafter counting chamber. Rotifers were enumerated by counting the entire counting chamber (9.6 cm$^2$). All enumerations and identifications were conducted using a Zeiss compound research microscope equipped with a phase-contrast condenser at magnifications ranging from 98X to 250X. Specimens were identified to the lowest taxonomic level possible. Once numbers of organisms within each sample were established, these values were converted to densities per litre. This was accomplished by dividing the number of organisms per volume of sample by the total volume of lake water filtered in the field (i.e., net mouth area × depth of haul × number of hauls).

The biomass of major taxonomic groups within each zooplankton sample was also determined. To calculate biomass, literature values from published length-weight regression equations were applied (list of references provided at the end of Appendix D). Biomass for each taxonomic group was calculated by multiplying the number enumerated for that sample by the mean individual weight.

For both phytoplankton and zooplankton community samples, sub-sampling accuracy was assessed by performing replicate counts on 10% of samples (in this case, one sample each year). Replicate samples were chosen at random and processed at different times from the original sample to reduce bias.

### 2.4.3 Tissue Chemistry

Zooplankton were collected for analysis of tissue chemistry using an 80 µm mesh net (30 cm diameter) vertically hauled through the top 10 m of the water column. A slightly larger mesh size was used for tissue collection to ensure the sample mostly consisted of zooplankton (and was not confounded by the presence of phytoplankton). A total of 10 vertical hauls were collected at each station, composited and filtered through the net a second time (to remove as much water as possible) to ensure sufficient sample weight for analysis. Samples were then transferred to sterile cryovials and frozen, pending shipment to the University of Missouri Research Reactor Center (MURR) for freeze-drying and analysis of metals (including mercury) using high-resolution Inductively Coupled Plasma Mass Spectrometry (ICP-MS).

### 2.4.4 Data Analysis

Based on input from the EMC, further understanding of the trophic status of the lake was requested so a literature search was conducted to find criteria for determining the trophic status in lakes and reservoirs. Representative criteria were chosen based on their relevance, as well as to give a representation of jurisdictional differences in criteria. Criteria were then grouped together by variable (total phosphorus, chlorophyll-a, Secchi depth and total nitrogen) into six trophic classifications, where possible (Table 2.4). These classifications are Ultra-oligotrophic, Oligotrophic, Mesotrophic, Meso-Eutrophic, Eutrophic and Hyper-Eutrophic. The trophic classification used in British Columbia (Nordin 1985) was selected for screening against monthly averages for total phosphorus, chlorophyll-a, and Secchi depth from the reservoir station upstream of the Elk River (RG_KERRRD) and the four stations downstream of the Elk River (RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER).

Phytoplankton and zooplankton communities were evaluated between areas and over time using primary metrics of mean taxonomic richness [as identified to lowest practical level (LPL)], mean organism density (average number of cells or organisms per litre), and mean biomass (mass of cells or organisms per litre). Comparisons were made based on absolute and relative density as well as absolute and relative biomass. Relative density and relative biomass were calculated as the density or biomass of each respective taxa and group relative to the total number of cells or organisms in the sample for dominant taxa and groups. Dominant taxa were defined as taxa representing at least 5% of the total cell or organism density at one or more

## Table 2.4: Available Criteria for Trophic Status Classification

| Variable | Source | Ultra-Oligotrophic | Oligotrophic | Mesotrophic | Meso-Eutrophic | Eutrophic | Hyper-Eutrophic |
|---|---|---|---|---|---|---|---|
| **Total Phosphorus (µg/L)** | OECD[a,h] | <4 | <10 | 10 - 35 | - | 35 -1 00 | >100 |
| | Environment Canada[b] | <4 | 4 - 10 | 10 - 20 | 20 - 35 | 35 - 100 | >100 |
| | Quebec[a] | - | 4 - 10 | 10 - 30 | - | 30 - 100 | - |
| | Sweden[a] | - | <15 | 15 - 25 | - | 25 - 100 | >100 |
| | Carlson TSI[c,d] | <6 | 6 - 12 | 12 - 24 | - | 24 - 96 | >96 |
| | Nordin (BC Criteria)[e] | - | 1 - 10 | 10 - 30 | - | >30 | - |
| | Nürnberg[a,f] | - | <10 | 10 - 30 | - | 31 - 100 | <100 |
| | Vollenweider and Karekes[g] | - | 3 - 18 | 11 - 96 | - | 16 - 390 | - |
| **Chlorophyll-a (µg/L)** | OECD | <1 | <2.5 | 2.5 - 8 | - | 8 - 25 | >25 |
| | Environment Canada | <1 | <2.5 | 2.5 - 8 | - | 8 - 25 | >25 |
| | Quebec | - | 1 - 3 | 3 - 8 | - | 8 - 25 | - |
| | Sweden | - | >3 | 3 - 7 | - | 7 - 40 | >40 |
| | Carlson TSI | <0.95 | 0.95 - 2.6 | 2.6 - 7.3 | - | 7.3 - 56 | >56 |
| | Nordin (BC Criteria) | - | 0 - 2 | 2 - 7 | - | >7 | - |
| | Nürnberg | - | <3.5 | 3.5 - 9 | - | 9.1 - 25 | >25 |
| | Vollenweider and Karekes | - | 0.3 - 4.5 | 3 - 11 | - | 2.7 - 78 | - |
| **Secchi Depth (m)** | OECD | >12 | >6 | 3 - 6 | - | 1.5 - 3 | <1.5 |
| | Environment Canada | >12 | >6 | 3 - 6 | - | 1.5 - 3 | <1.5 |
| | Quebec | - | 5 - 12 | 2.5 - 5 | - | 1 - 2.5 | - |
| | Sweden | - | >3.96 | 2.43 - 3.96 | - | 0.91-2.43 | <0.91 |
| | Carlson TSI | >8 | 4 - 8 | 2 - 4 | - | 0.5 - 2 | <0.25 |
| | Nordin (BC Criteria) | - | >6 | 3 - 6 | - | <3 | - |
| | Nürnberg | - | - | - | - | - | - |
| | Vollenweider and Karekes | - | 5.4 - 28 | 1.5 - 8.1 | - | 0.8 - 7 | - |
| **Total Nitrogen (µg/L)** | OECD | - | - | - | - | - | - |
| | Environment Canada | - | - | - | - | - | - |
| | Quebec | - | - | - | - | - | - |
| | Sweden | - | <400 | 400 - 600 | - | 600 - 1,500 | >1,500 |
| | Carlson TSI | - | - | - | - | - | - |
| | Nordin (BC Criteria) | - | <100 | 100 - 500 | - | 500 - 1000 | - |
| | Nürnberg | - | <350 | 350 - 650 | - | 651 - 1,200 | >1,200 |
| | Vollenweider and Karekes | - | 310 - 1,600 | 360 - 1,400 | - | 390 - 6,100 | - |

[a] Summarized in Galvez-Cloutier and Sanchez 2007

[b] Environment Canada 2004

[c] Carlson 1977

[d] Values converted from Trophic Status Index (TSI) for comparison to other classifications

[e] Nordin 1985, Criteria used in British Columbia

[f] Nürnberg 2001

[g] Vollenweider and Kerekes 1980

[h] Organisation for Economic Co-operation and Development

stations. For zooplankton, males and females belonging to the same taxa were combined for analysis. Zooplankton eggs were omitted from analyses (viability was not determined). All community endpoints were summarized by reporting the minimum, maximum, mean, median, standard deviation (SD), and sample size for each sampling area and year. Statistical comparisons were based on differences in major taxonomic groups. A two-way ANOVA was used to assess spatial and temporal differences in plankton community endpoints in the area downstream from the Elk River (T4) compared to the upstream area (T2/TN) in 2014 to 2016, as described in Section 2.3.3.

Non-metric multi-dimensional scaling (NMDS) was used to separately reduce the phytoplankton and zooplankton taxonomic data matrices to fewer dimensions. NMDS is a method to visualize the level of similarity of samples based on the rank of the similarities (Clarke 1993). The NMDS takes the N-dimensional (here N = number of taxa) coordinates of each sample (i.e., station in a given area/year) and defines a set of new n-dimensional coordinates that reflect the locations (rank distances) among samples. The n = 2 dimension is frequently used because the sample stations can be plotted on a 2-dimensional scatterplot.

The Bray-Curtis distance was used as the measure of relative community similarity or dissimilarity using PC-ORD© (McCune and Mefford 2011). Taxa occurring in two or fewer of the 30 samples were removed from the dataset as their exclusion from multivariate analyses reduces ‘noise’ (Bailey et al. 2004). The ‘slow and through’ option, which uses the following settings, was applied: maximum iterations = 400, instability criterion = 0.00001, number of real runs = 40, and number of randomized runs = 50 (McCune and Grace 2002). All NMDS ordinations were evaluated for solution stability, final stress <0.2, and Monte Carlo randomized determination of interpretable axes of $p < 0.05$ (McCune and Grace 2002).

NMDS of non-transformed data often results in “shallow interpretation in which only the pattern of a few, very common species is represented” (Clarke 1993). Thus, a suite of transformations was applied ($\log_{10}$, square root, 4th root, power 2, and power 4) which assigned different weights to the rarer taxa, relative to abundant taxa (Clarke 1993). All transformations were evaluated because it was not known *a priori* which transformation would best explain the differences in community structure (i.e., the appropriate weight to assign to rare taxa relative to abundant taxa). Results were reported for the transformation that had mean skew and kurtosis values closest to zero. The NMDS analyses were conducted using absolute abundance taxa data matrices at LPL. The 2- or 3-dimensional ordination was selected based on PC-ORD© decision criteria (final stress less than 0.2, randomization test with $p < 0.05$, and a reduction of at least 5 points of stress with each additional axis). The NMDS Axis 1 scores were used to describe the community matrix because it explained most of the variability in the community matrix.

Selenium concentrations in zooplankton were plotted and compared statistically between the downstream area (T4) and the upstream area (T2/TN) from 2014 to 2016 using a two-way ANOVA as described in Section 2.3.3. Data were compared to the interim BC guideline for benthic invertebrate tissue (4 µg/g dw), EVWQP Level 1 benchmarks for effects to benthic invertebrates (13 µg/g dw), and dietary effects to juvenile fish (11 µg/g dw).

## 2.5 Benthic Invertebrates

### 2.5.1 Community

#### 2.5.1.1 Sample Collection

Benthic invertebrate community sampling was completed at each of five stations upstream and downstream from the Elk River (i.e., transects T2/TN and T4; Figure 2.1) in August of each sampling year (2014 to 2016), when water levels are most stable and benthic invertebrate communities are at peak biomass and diversity (BCMOE 2006). Benthic invertebrate community samples were collected using a stainless steel petite-Ponar sampler. A single sample, consisting of a composite of five petite-Ponar grabs (i.e., 0.116 $m^2$ total sampling area) was collected at each station. Care was taken to ensure that each grab captured the surface material and was full to each edge of the ponar sampler, with any incomplete grabs discarded. Each acceptable grab was field-sieved using 500 µm mesh, with the retained material carefully transferred to a plastic jar containing both external and internal station identification labels. Samples were preserved to a level of 10% buffered formalin in ambient water. At each benthic invertebrate sampling station, supporting information was recorded, including substrate description, sampler fullness, sampling depth, Secchi depth, and UTM coordinates (Appendix E).

#### 2.5.1.2 Laboratory Analysis

Benthic invertebrate community samples were submitted to ZEAS Inc. (Nobleton, ON) for analysis following standard sorting methods which incorporated recommended Environment Canada QA/QC procedures for assessing sub-sampling error and sorting recovery checks (i.e., Environment Canada 2012). Upon arrival at the laboratory, a biological stain was added to each benthic invertebrate community sample to facilitate sorting accuracy. Samples were washed free of formalin in a 500 µm sieve and the remaining sample material examined under a stereomicroscope at a magnification of at least ten times. Benthic invertebrates were removed from the sample debris and placed into vials containing a 70% ethanol solution according to major taxonomic groups (e.g., phyla, orders). A senior taxonomist enumerated and identified benthic organisms to LPL (typically to genus or species) using the most current taxonomic keys (Appendix Table E.1). Following identification, representative specimens of each taxa were preserved in a 75% ethanol-3% glycerol solution in separately labelled vials to create a voucher collection.

### 2.5.2 Tissue Chemistry

#### 2.5.2.1 Sample Collection

Composite benthic invertebrate tissue samples were collected upstream and downstream from the Elk River in both April and August in 2014, 2015, and 2016 (Figure 2.1). A total of 20 petite-Ponar grabs (four from each of the five sampling stations identified on Figure 2.1) were collected to obtain a single sample from each area during each sampling event. Each full grab was placed into a 500 µm mesh sieve bag and sieved free of material less than 500 µm in size. The remaining material was then transferred to a white enamel tray for removal of benthic organisms using tweezers. All visible organisms were removed from the debris/sediment, rinsed clean using ambient water, and placed into a sterile cryovial.

#### 2.5.2.2 Laboratory Analysis

Samples were stored frozen, pending shipment to MURR for determination of moisture content (by freeze drying) and analysis of metals (including mercury) using high-resolution ICP-MS.

### 2.5.3 Data Analysis

Benthic invertebrate communities were evaluated between areas and over time similar to plankton communities (Section 2.4.4). Primary metrics of mean taxonomic richness (as identified to LPL) and mean organism density (average number of organisms per m$^2$) were calculated. Absolute and relative density (calculated as the density of each respective taxa and group relative to the total number of organisms in the sample) for dominant taxa and groups were also calculated. Dominant taxa were defined as those species representing at least 5% of the total organism density at one or more stations. Immature Tubificinae (with and without hair chaetae) were combined for analysis. All community endpoints were summarized by reporting the mean, median, minimum, maximum, SD, and sample size for each sampling area and year.

A two-way ANOVA was used to assess spatial and temporal differences in benthic invertebrate community endpoints using methods described in Section 2.3.3. Benthic invertebrate communities were also assessed using NMDS as described in Section 2.4.4.

Selenium concentrations in benthic invertebrates were compared between the downstream areas (T4) and the upstream area (T2/TN) from 2014 to 2016 using a two-way ANOVA as described in Section 2.3.3. Selenium concentrations in benthic invertebrates were also plotted and compared to the BCMOE interim guideline of 4 µg/g dw and the Level 1 benchmarks (Teck 2014) for the EVWQP (i.e., 13 and 11 µg/g dw for effects on benthic invertebrate reproduction and for dietary effects to fish, respectively).

## 2.6 Fish

### 2.6.1 Sample Collection

Fish for the health assessment and evaluation of tissue chemistry were targeted in three study areas in Koocanusa Reservoir – two downstream from the Elk River (Elk River and Gold Creek), and one upstream from the Elk River (Sand Creek) (Figure 2.2). Fish sampling employed a number of standard techniques, including angling, burbot traps, gill nets, hoop nets, minnow traps, and/or seining, which varied according to study year based on provincial fish collection permit conditions.

Angling was used to catch fish in February 2014 and 2015, April 2014, 2015 and 2016, and April 2016. In February 2014, angling was conducted through a hole bored in the ice using a baited (e.g., worms, squid, or salted salmon row) hook. Angling in April (2014 to 2016) and August (2015) was conducted from a boat using a single hook baited with salted salmon roe or worms. In August 2014, when rainbow trout were specifically targeted for tissue sampling, downrigging was conducted from a trolling boat. Downrigging was largely unsuccessful and was discontinued in subsequent monitoring years (i.e., 2015 and 2016).

Burbot traps were used to target burbot in February and April of 2015. Traps were set and retrieved by boat. Bait (i.e., salmon roe) was placed into bait bags in each trap, and the traps were slowly lowered to the bottom of the reservoir, ensuring that there was enough rope to allow the buoy to float at the surface. Burbot traps were left overnight and checked the following day (approximately 24 hour period).

Three foot-diameter hoop nets were used to collect fish in February, April, and August 2014, April and August 2015, and in April 2016. Leads were attached to the opening of each net, and the nets were typically set perpendicular to shore. In strong flow areas, the mouth of the net was directed downstream to minimize clogging from debris. The lead and net were secured with anchors, and floats were attached to the net to mark its location on the water surface. Hoop nets were left to fish overnight (i.e., approximately 24 hours).

Gill nets were used as the main method to capture fish in April and August of 2016. Nets of varying lengths (i.e., 75’ to 150’) and mesh sizes (1”, 1.5”, 2”, 2.5”, 3”, 4”, and 5”) were deployed. Gill nets were typically set for a maximum of 2 hours (often less) to minimize bycatch mortalities.

Minnow traps were used during the April 2015 sampling program to target redside shiner. Traps were baited with cat food, which was placed in a screened (<1 mm mesh) 250 mL container, to ensure that fish did not have access to the food. Minnow traps were set on the reservoir bottom in shallow areas, or suspended at various depths in the water column from docks or woody debris near the shore. After approximately 24 hours, traps were checked and re-set, as necessary.

Seining (using a 15 m by 0.9 m net with a 0.3 cm mesh size) was also used to characterize the small-bodied fish community in each of the study areas in August 2014.

Angling, burbot trapping, hoop netting, gill netting, minnow trapping, and seining locations were marked using a handheld Global Positioning System (GPS) with coordinates recorded in UTMs. The date and time of deployment and the date and time of retrieval, were recorded on field sheets. All fish captured were identified and enumerated, and released at the point of capture or sampled as described below (Appendix F).

### 2.6.2 Field Processing

Fish retained for the assessment of health endpoints were transported to a dedicated field laboratory for processing as soon as possible following capture (i.e., within hours). If not already dead, fish were sacrificed by a decisive blow to the head. Fork and total lengths were measured to the nearest millimeter using a standard measuring board. Weights were measured using appropriately-sized spring scales (e.g., 50 g, 100 g, 300 g). Each fish was opened and the sex and/or sexual maturity recorded. Whole gonads and livers were removed from each sexually mature fish and weighed to the nearest milligram (0.001 g) using an analytical balance with a surrounding draft shield. Whole ovaries from each sexually mature female were then placed in a labelled polyethylene (Whirl-Pak®) bag. A skinless, boneless muscle fillet sample was collected from each female fish and placed into a separate Whirl-Pak® bag. Following these measures, age structures (i.e., otoliths, dorso-lateral scales, and/or dorsal spines) were removed from all fish. Each age structure was wrapped separately in waxed paper and placed inside a labelled envelope. Whole bodies of male fish (i.e., carcasses and all associated internal organs previously removed for weighing) were placed into a Whirl-Pak® bag. Any internal or external parasites, deformities, erosions (fin and gill), lesions, or tumours observed during processing (i.e., DELT survey; Sanders et al. 1999) were recorded on field sheets.

Fish retained for lethal tissue sampling were similarly transported to a dedicated field laboratory for processing as soon as possible following capture. Each fish was weighed using an analytical balance (0.001 g) or appropriately-sized spring scale (e.g., 50 - 2000 g) and fork and total lengths were measured using a measuring board equipped with a metre stick (± 1 mm). Each fish was then opened and the sex and/or sexual maturity recorded (if obvious). Ovaries were removed from mature female fish and placed in a labelled Whirl-Pak® bag. A skinless, boneless muscle fillet (minimum of 25 g) was also collected from each fish and placed into a separate Whirl-Pak® bag. Age structures (i.e., otoliths and dorso-lateral scales) were removed from each fish, wrapped separately in waxed paper, and placed inside a labelled envelope. Any internal or external parasites, deformities, erosions (fin and gill), lesions, or tumours observed during processing (i.e., DELT survey; Sanders et al. 1999) were recorded on field sheets.

Fish collected for non-lethal tissue sampling or body measurements were processed in the field. Weights and lengths were measured using spring scales and a measuring board, respectively. External fish condition, including the presence of any parasites, deformities, lesions, or parasites, was documented. A muscle sample was collected from each fish using a biopsy punch (4 mm acu-punch). Following extraction of the biopsy sample, skin was removed from the sample using a scalpel and the remaining muscle placed into a sterile Nalgene cryovial. Samples were kept in a cooler on ice until transfer to a freezer later in the day. The fish was then released near its capture location.

All samples collected (i.e., eggs, ovaries, muscle, age structures, and whole bodies) were stored frozen pending shipment to the respective laboratory for analysis immediately following completion of field sampling.

### 2.6.3 Laboratory Analysis

Fish tissues collected for age analysis (i.e., otoliths, scales, and/or dorsal spines) were submitted to North Shore Environmental Services in Thunder Bay, Ontario. Otoliths were prepared using a “crack and burn” method which involves cracking the otoliths in half and then lightly burning the otolith to make the annuli visible. Dorsal spines were cleaned, embedded in epoxy resin and, after the epoxy hardened, sectioned using a low-speed isomet diamond saw. Each otolith, dorsal spine, or scale sample was then mounted on a glass slide using a mounting medium and examined under a compound microscope using transmitted light to determine fish age. For each structure, the age and edge condition was recorded along with a confidence rating for the age determination.

Tissue samples for chemical analysis were submitted to MURR. Samples were first freeze-dried for determination of moisture content and then analyzed for metals (including mercury) using high-resolution ICP-MS. Results were reported on a dry weight (dw) basis, along with moisture content (based on the difference between wet and freeze-dried sample weights) to allow conversion to wet-weight values, as required.

### 2.6.4 Data Analysis

#### 2.6.4.1 Fish Health Assessment

Fish health endpoints representing five response categories including survival (mean age), energy use - growth (weight-at-age and length-at-age), energy use - reproduction (relative gonad weight), and energy storage (condition and relative liver weight) were plotted and evaluated separately for male and female fish (Table 2.5). These endpoints are recognized as indicators of fish health by Environment Canada, and are consistent with those required for fish health monitoring under the national Environmental Effects Monitoring (EEM) program for mines (Environment Canada 2012). Statistical analyses of fish health endpoints were consistent with procedures outlined in the EEM technical guidance document (Environment Canada 2012), but adapted to accommodate multiple years of data using two-way analyses of variance and two-way analyses of covariance (Table 2.6).

**Table 2.5: Effect Indicators and Endpoints for the Fish Population Health Study (Environment Canada 2012)**

| Effect Indicators[a] | Effect Endpoints |
|---|---|
| Survival | Age |
| Growth (energy use) | Size-at-age (body weight relative to age) |
| | Size-at-age (length relative to age)[b] |
| Reproduction (energy use) | Relative gonad size (gonad weight against body weight) |
| Energy storage | Condition (body weight against length) |
| | Relative liver size (liver weight against body weight) |

[a] Endpoints to be used for determining "effects" as designated by statistically significant differences between exposed and reference areas (Environment Canada 2012).

[b] This analysis is for informational purposes only, and significant differences between exposed and reference areas are not necessarily used to designate an effect (Environment Canada 2012).

Analyses of the fish health endpoints were conducted separately by sex. Fish with a gonadosomatic index (GSI = gonad weight/body weight × 100%) less than 1% (i.e., non-developed fish) were removed from the analysis of the reproduction endpoint (i.e., relative gonad weight), with one exception. If the majority of fish captured were non-developed, the developed fish and non-developed fish were analyzed separately. Fish that had tapeworms in the body cavity were similarly removed from the evaluation of the reproductive endpoint

## Table 2.6: Description of Two-way ANCOVA Statistical Approach Applied to the Evaluation of Changes in Fish Health Endpoints in Koocanusa Reservoir Downstream (Elk River and Gold Creek) Study Areas Relative to Changes at the Upstream (Sand Creek) Study Area Over Time using Data Collected in 2014 to 2016

A two-way ANCOVA was used to compare endpoints between Elk River and Sand Creek study areas, and between Gold Creek and Sand Creek study areas. The model varied depending on data set properties and null hypotheses (H), as follows:

$Y=\beta0 + \beta1Cov + \beta2Area + \beta3Year + \beta4Area\times Year + \beta5Cov\times Area + \beta6Cov\times Year + \beta7Cov\times Area\times Year + \varepsilon$

H1: $\beta7=0$ (regression slopes are not dependent on area and year)
If $\beta7\neq0$ then regression slopes are dependent on area and year so ANCOVA conducted separately by year
If $\beta7=0$ then the Cov×Area×Year term was removed from the model and fit again.

$Y=\beta0 + \beta1Cov + \beta2Area + \beta3Year + \beta4Area\times Year + \beta5Cov\times Area + \beta6Cov\times Year+ \varepsilon$

H2a: $\beta6=0$ (regression slopes are not dependent on year)
H2b: $\beta5=0$ (regression slopes are not dependent on area)
If $\beta5\neq0$ or $\beta6\neq0$ then regression slopes are dependent on area or year so ANCOVA conducted separately by year
If $\beta5=0$ and $\beta6=0$ then the Cov×Area and Cov×Year terms were removed from the model and fit again.

$Y=\beta0 + \beta1Cov + \beta2Area + \beta3Year + \beta4Area\times Year + \varepsilon$ (parallel slope model with Area×Year interaction)

H3: $\beta4=0$ (differences between areas in the covariate adjusted response are not dependent on year)
If $\beta4\neq0$ ANCOVA conducted separately by year
If $\beta4=0$ then Area×Year term was removed from the model and fit again.

$Y=\beta0 + \beta1Cov + \beta2Area + \beta3Year + \varepsilon$ (parallel slope model with no interaction)

H4: $\beta2=0$ (no difference between areas in the covariate adjusted response)
If $\beta2\neq0$ significant difference between areas (consistent difference among years)
If $\beta2=0$ no significant difference between areas (consistent difference among years)

ANCOVA conducted separately by year:

$Y=\theta0 + \theta1Cov + \theta2Area + \theta3Cov\times Area + \varepsilon$

H1: $\theta3=0$ (regression slopes are not dependent on year)
If $\theta3\neq0$ then regression slopes are dependent on area. Magnitude of difference reported for the minimum and maximum values of the overlap of covariate values
If $\theta3=0$ then Cov×Area term was removed from the model and fit again.

$Y=\theta0 + \theta1Cov + \theta2Area + \varepsilon$
H4: $\theta2=0$ (no difference between areas in the covariate adjusted response)

When a significant interaction was detected in the two-way ANCOVA model, then a one-way ANCOVA was conducted by year.

A significant Cov×Area×Year term implies that the regression slopes are dependent on area and year.

A significant Cov×Area term implies that the regression slopes are dependent on area.

A significant Cov×Year term implies that the regression slopes are dependent on year.

A significant Area×Year term implies that the difference between areas in the covariate adjusted response is dependent on year.

When none of these interaction terms are significant then the two-way ANCOVA can proceed and the area p-value is reported from the parallel slope model with no interaction.

* = significantly different at α = 0.1
Magnitude of difference calculated as (downstream area-upstream area)/upstream area*100%

Results here are reported for all years together when there were no significant interactions.

Results are reported by year when there was a significant interaction.

When results were reported by year and regression slopes were significantly different between areas, results were reported as significant (*) and the magnitude of difference was estimated from predicted values of the regression at the minimum and maximum values of the range of overlap between areas.

| Species | Sex | Response | Covariate | Significant Interactions[a] | | Area P-value (Parallel Slope Model with No Interaction) | Elk River vs Sand Creek Area Comparisons[b] | | | | | | Significant Interactions[a] | | Area P-value (Parallel Slope Model with No Interaction) | Gold Creek vs Sand Creek Area Comparisons[b] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Term | P-value | | 2014 | | 2015 | | 2016 | | Term | P-value | | 2014 | | 2015 | | 2016 | |
| | | | | | | | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] | | | | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] |
| Peamouth Chub | M | $\log_{10}$(Adjusted Body Weight) | $\log_{10}$(Age) | Cov×Area×Year | 0.047 | - | * (19%) | | * (-34%) | * (4.3%) | - | | Cov×Year | 0.012 | - | * (30%) | | - | | * (-23%) | |
| Northern Pikeminnow | M | $\log_{10}$(Gonad Weight) | $\log_{10}$(Adjusted Body Weight) | Cov×Area,Cov×Year | <0.001,<0.001 | - | N/A | | * (-5.1%) | * (13%) | - | | Cov×Area×Year | <0.001 | - | N/A | | - | | - | |
| Peamouth Chub | F | $\log_{10}$(Gonad Weight) | $\log_{10}$(Adjusted Body Weight) | Cov×Area | 0.003 | - | * (78%) | * (-14%) | - | | - | | Cov×Area×Year | 0.029 | - | * (26%) | | - | | - | |
| Peamouth Chub | M | $\log_{10}$(Gonad Weight) | $\log_{10}$(Adjusted Body Weight) | Cov×Year | 0.008 | - | - | | - | | * (17%) | | Cov×Year | 0.027 | - | * (15%) | * (-2.2%) | - | | * (42%) | * (-14%) |
| Peamouth Chub | F | $\log_{10}$(Fork Length) | $\log_{10}$(Age) | Area×Year | 0.040 | - | * (3.6%) | | * (0.43%) | | * (-1.9%) | | Cov×Area×Year | <0.001 | - | * (3.4%) | | - | | * (-2.9%) | |
| Peamouth Chub | F | $\log_{10}$(Adjusted Body Weight) | $\log_{10}$(Fork Length) | - | - | 0.748 | - | | | | | | Area | - | 0.006 | * (-3.2%) | | | | | |

[a] Significance of interaction terms assessed using α = 0.05.

[b] Significance of Area comparisons assessed using α = 0.1.

[c] Comparison of magnitude of difference conducted at the minimum and maximum values of the range of overvap of covariate values between areas when the regression slopes between areas within a year were not parallel.

* = significant difference (α=0.1) between areas (or a significant difference in regression slopes when a magnitude of difference is reported for the Min Cov and Max Cov)

N/A = no data

because the presence of worms has been shown to influence gonad development (Carter et al. 2005).

Data used to calculate fish health endpoints were plotted using scatterplots of the response variable versus the covariate, and using boxplots of the summary endpoints listed in Table 2.5. Statistical comparisons of fish health endpoints were conducted using a two-way ANOVA (as described in Section 2.2.3) for age, and using a two-way ANCOVA for the other endpoints.

The two-way ANCOVA was conducted with factors *Area* and *Year* when data were available for at least two years. For simplicity, comparisons were conducted separately for the Elk River downstream area relative to the Sand Creek upstream area, and for the Gold Creek downstream area relative to Sand Creek. The ANCOVA model varied depending on the comparisons of regression slopes between areas and among years. The ANCOVA analyses were conducted as described below.

A full interaction model was fit:

$$Y=\beta_0 + \beta_1 X + \beta_2 Area + \beta_3 Year + \beta_4 Area\times Year + \beta_5 X\times Area + \beta_6 X\times Year + \beta_7 X\times Area\times Year + \varepsilon$$

where $Y$ is the response variable, $X$ is the covariate, *Area* is a categorical variable for area, *Year* is a categorical variable for year, $\varepsilon$ is the error term, and $\beta_1$ is the regression coefficient. The first hypothesis to test was whether the regression slopes were dependent on area and year:

$H_{01}$: $\beta_7=0$ (regression slopes were not dependent on area and year)

If the hypothesis $H_{01}$ was rejected (i.e. $\beta_7 \neq 0$), then the regression slopes were dependent on area and year and the ANCOVA was conducted separately by year using a one-way ANCOVA. If the hypothesis $H_{01}$ was not rejected (i.e. $\beta_7=0$) then the $X\times Area\times Year$ term was removed from the model and fit again:

$$Y=\beta_0 + \beta_1 X + \beta_2 Area + \beta_3 Year + \beta_4 Area\times Year + \beta_5 X\times Area + \beta_6 X\times Year + \varepsilon$$

The next hypotheses tested were whether regression slopes were dependent on area or dependent on year:

$H_{02a}$: $\beta_6=0$ (regression slopes were not dependent on year)
$H_{02b}$: $\beta_5=0$ (regression slopes were not dependent on area)

If hypothesis $H_{02a}$ was rejected (i.e. $\beta_6 \neq 0$) then regression slopes were dependent on year and the ANCOVA was conducted separately by year using a one-way ANCOVA. If hypothesis $H_{02b}$ was rejected (i.e. $\beta_5 \neq 0$) then regression slopes were dependent on area. With no differences between year, the interaction between the covariate and area could be evaluated by pooling years; however, for simplicity, the ANCOVA was conducted separately by year using a one-way ANCOVA when $H_{02b}$ was rejected.

If hypotheses $H_{02a}$ and $H_{02b}$ were not rejected (i.e. $\beta_5=0$ and $\beta_6=0$) then the $X \times Area$ and $X \times Year$ terms were removed from the model and fit again:

$$Y = \beta_0 + \beta_1 X + \beta_2 Area + \beta_3 Year + \beta_4 Area \times Year + \varepsilon$$

The next hypothesis tested was whether differences between areas (in the covariate-adjusted response) were dependent on year:

$H_{03}$: $\beta_4=0$ (differences between areas in the covariate adjusted response were not dependent on year)

If hypothesis $H_{03}$ was rejected (i.e. $\beta_4 \neq 0$), then differences in the covariate-adjusted response between areas was dependent on year, and the ANCOVA was conducted separately by year using a one-way ANCOVA. If hypothesis $H_{03}$ was rejected (i.e. $\beta_4 \neq 0$) then the $Area \times Year$ term was removed from the model and fit again:

$$Y = \beta_0 + \beta_1 X + \beta_2 Area + \beta_3 Year + \varepsilon$$

The next hypothesis tested was whether there were differences between areas (in the covariate-adjusted response):

$H_{04}$: $\beta_2=0$ (no difference between areas in the covariate-adjusted response)

If hypothesis $H_{04}$ was rejected (i.e. $\beta_2 \neq 0$), then differences in the covariate-adjusted response between areas was significantly different (and the magnitude consistent among years).

Two-way ANCOVAs were conducted using R (R Core Team 2015). When only a single year of data was available, analyses were conducted using ANOVA (for age) or ANCOVA with all three areas using Minitab 17 (Minitab 2015). When the overall ANOVA/ANCOVA was significant, comparisons of each downstream area to the upstream area were conducted using Dunnett's method.

All response variables and covariates were $\log_{10}$-transformed prior to conducting analyses. Outliers (i.e., observations with Studentized residuals with magnitude 4 or greater) were removed from analyses. Influential points (evaluated using the Cook's distance statistic) were removed from ANCOVA analyses when they caused significant interactions (Environment Canada 2012). Outliers and influential points are plotted in the scatterplots (Appendix F) as open symbols with an '×' through them. When a significant interaction was detected between the covariate and the *Area* term, but the coefficient of determination $R^2$ value of both the parallel regression model (interaction term) and full regression model were greater than 0.8 and within 0.02 units in value (Environment Canada 2012), slopes were considered practically parallel and the ANCOVA proceeded.

The magnitude of difference for the fish health endpoints was calculated as:

$$\text{MOD} = \frac{(\bar{X}_{DS}-\bar{X}_{US})}{\bar{X}_{US}} \times 100\%$$

where the $\bar{X}_{DS}$ and $\bar{X}_{US}$ are the means of the downstream area and upstream area, respectfully. The means used in the calculation for ANCOVA were least squares means from the ANCOVA model, back transformed (i.e. anti-logged) to the original data units. When a significant interaction between the covariate and the *Area* term was detected (i.e., the regression slopes between areas were different), the magnitude of difference was calculated for small fish and big fish (at the minimum and maximum values of the overlap of the range of covariate values between areas). Means used in the calculation of the magnitude of difference were the predicted values of the response variable at the minimum and the maximum values of the covariate overlap based on the regression lines for each area (Environment Canada 2012).

#### 2.6.4.2 Tissue Chemistry

Metal toxicity is usually assessed on the basis of measured waterborne exposure concentrations, sometimes by also taking into account environmental factors that affect metal interaction with biological tissues (e.g., biotic ligand models; DiToro et al. 2001), or by assessment of effects in direct or simulated exposure scenarios (e.g., *in situ* or laboratory bioassays, field studies) (Chapman et al. 1998; Environment Canada 2012). With few exceptions (e.g., mercury, selenium), the potential for toxicity to biota related to metal exposure in aquatic environments is not well predicted by concentrations measured in their tissues (Chapman and Wang 2000, McGeer et al. 2003, Deforest et al. 2007, Meador et al. 2010, Adams et al. 2011). Therefore, for most metals, concentrations in tissues are of limited utility in evaluating effects on the biota from which the tissues are collected. Results of a recent screening-level risk assessment also concluded that from the nine constituents evaluated, selenium was the only known mine-related substance of potential concern with respect to the Elk River watershed (Windward 2015). For these reasons, the tissue chemistry assessment focuses on selenium. Evaluation of differences in mercury concentrations in fish tissues among sampling areas was also included. The remainder of tissue metals data are provided in Appendix G, but are not discussed within this report.

Selenium concentrations in fish tissues were statistically compared between the downstream areas (Elk River and Gold Creek) and the upstream area (Sand Creek) from 2014 to 2016. Selenium concentration data were combined for muscle collected from a species within a given year, while whole body and ovary selenium concentrations were only collected in April. Selenium concentrations in fish tissues were also plotted and compared to the BCMOE guidelines (for muscle, ovary, and whole body), the 2016 United States Environmental Protection Agency (USEPA) guidelines (for muscle, ovary, and whole body), and the EVWQP

Level 1 benchmark for reproductive effects (ovary tissues only). Mercury concentrations in fish muscle relative to length were tested using linear regression (data from all study areas and years combined for each species) and compared to the BC tissue residue guideline for the protection of wildlife (BCMOE 2017a).

# 3 WATER QUALITY

## 3.1 Overview

In accordance with Permit 107517, water quality is monitored weekly (March 15th to July 15th) or monthly (remainder of the time when reservoir access is not restricted by safety concerns related to ice cover and flowing water) by Teck at five stations within the reservoir, including one situated upstream from the Elk River (initially at RG_USELK and then moved farther upstream to RG_KERRRD in April 2015) and four downstream from the Elk River (RG_DSELK, RG_GRASMERE, RG_USGOLD, RG_BORDER; Figure 2.1). At each station, water temperature, DO, pH, specific conductance, and Secchi depth are measured *in situ*, and samples are collected for laboratory analysis of nutrients, major ions, metals, TSS, turbidity, and other conventional parameters. Depth permitting, three samples (surface, mid-column and bottom) were collected under un-stratified conditions[6], one at 3 m from the surface, one 3 m from the substrate, and one at the mid-point of the water column. If the water was too shallow to allow for the collection of three samples, a single surface sample, or both a surface and bottom sample were collected. Data are reported annually (e.g., Teck 2016b, 2017). Station RG_DSELK is an Order station, at which SPO for cadmium, nitrate, selenium, and sulphate apply.

In association with biological sampling for the current study, *in situ* measurements of water quality were completed in February, April, and August, 2014 to 2016. Measurements were made at two transects, one each located upstream versus downstream of the Elk River where sediment, plankton, and benthic invertebrate samples were collected (T2/TN[7] and T4, respectively, five stations per transect sampled in August), and at three areas where fish were collected (near Sand Creek, Elk River and Gold Creek, sampled in February, April, and August).

## 3.2 *In Situ* Water Quality Profiles

Within-year water temperature profiles in August (i.e., maximum annual water depths) were similar between the areas downstream versus upstream of the Elk River (Figure 3.1). Greater variation was observed among years, but a decreasing gradient in water temperature was observed at depths below 6-10 m from the surface in all years. Profiles completed in February and April, when water levels were lower (Figure 1.2), showed very little change in temperature

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[6] Under stratified conditions, different sampling instructions would apply but the associated condition was not encountered.

[7] As noted in Section 2.1, transect T2 was moved farther upstream to TN in August 2015 to correspond with the relocation of water station RG_USELK to RG_KERRRD, thereby avoiding influence from the Elk River.

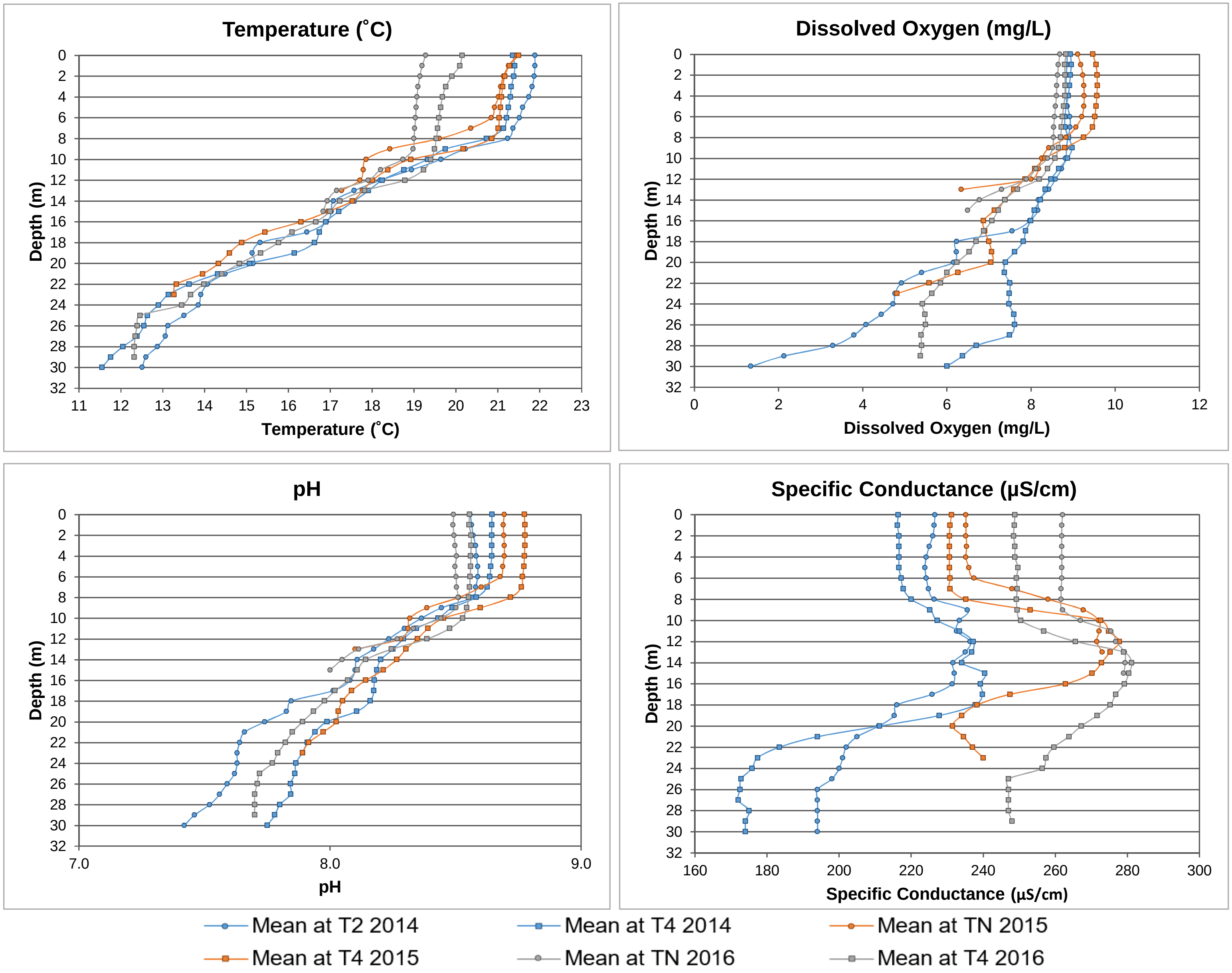

**Figure 3.1:** **Mean (n=5 Stations per Area)** ***In Situ*** **Water Quality Profiles Measured at Stations Downstream (T4) and Upstream (T2/TN) of the Elk River in Koocanusa Reservoir, August 2014, 2015, 2016**

with depth (Appendix Figures B.1 to B.3 and Tables B.1 to B.3). Surface water temperatures were higher at all stations in April 2015 compared to April 2014 and 2016 (Appendix Figure B.2).

A decreasing concentration gradient with depth, beginning 8-10 m below the surface, was also observed for DO, with similar profiles in August between the upstream and downstream areas, except in 2014. In August 2014, the DO concentrations were lower at the upstream transect (e.g., 4.1 mg/L at 26 m [at station T2-2]) compared to downstream (mean 7.6 mg/L at 26 m) (Figure 3.1). Therefore, although some values were less than the BC long-term water quality guideline for protection of aquatic life (8.0 mg/L) and some were also less than the instantaneous minimum value (5.0 mg/L), this did not occur as a result of influence from the Elk River. February and April profiles indicated DO concentrations of 10 mg/L or more at all areas, except at the deepest part (i.e., 10 to 12 m below surface) of the upstream Sand Creek area in February 2014, where concentrations as low as 4.5 mg/L were observed (Appendix Figures B.1 and B.2).

Aqueous pH was slightly alkaline (range of 7.2 to 8.8) in all sampling areas and at all depths (Figure 3.1; Appendix Figures B.1 to B.3 and Tables B.1 to B.3). As observed for temperature, a gradient of decreasing pH was evident in August at depths of more than 8 to 10 m below the surface and varied little among areas or years (Figure 3.1). Aqueous pH was consistently within the BC water quality guideline range of 6.5 to 9.0 (Appendix Tables B.1 to B.3).

Specific conductivity (i.e., conductivity standardized to a temperature of 25°C) varied among depths, sampling areas, and years (Figures 3.1; Appendix Figures B.1 to B.3 and Tables B.1 to B.3). August profiles taken at transects both upstream (T2/TN) and downstream (T4) of the Elk River showed increasing conductivity mid-water-column (e.g., 6-16 m) and then decreasing values at greater depths (Figure 3.1). At reservoir areas closer to Sand Creek, Elk River, and Gold Creek mouths (i.e., fish collection areas), the August profiles indicated an increase with depth (Appendix Figure B.3). Within years, specific conductivity in August was consistently lower downstream compared to upstream in the upper part of the water column, but values overlapped in deeper waters (>10 m). Profiles in February and April showed little change in specific conductance with depth, except for lower values within the top 1 m in February (Appendix Figure B.2). Elk River has greater specific conductivity (annual mean of 342 µS/cm at RG_ELKMOUTH) than the lower Kootenay River (annual mean of 264 µS/cm at RG_WARDB) (Appendix Tables B.10 and B.11). Previous studies have reported that inflow temperatures from the Elk and Kootenay River correspond best with temperatures at mid to bottom depths of the reservoir, so this is where densities would be most similar and river inflows would thus be expected to occur during most of the year (Hamilton et al. 1990). The same authors reported that the Canadian portion of the reservoir remains mixed even during full pool, as a result of basin morphometry, continual movement of water from dam operations and exposure to strong prevailing winds. More recent water sampling at Teck's five stations within the reservoir showed no instances of stratification in 2016, some stratification (i.e., one time at RG_BORDER and RG_USGOLD) in August 2015, and multiple times from June 25th to September 3rd in 2014 (i.e., four times at RG_GRASMERE, three times at RG_USELK, RG_DSELK, and RG_EASTARM, and two times at RG_BORDER).

## 3.3 Water Quality Based on Laboratory Sample Analyses

### 3.3.1 Statistical Evaluations

Plots of Order constituents nitrate, selenium, and sulphate suggested that aqueous concentrations may differ between surface, middle, and bottom layers sampled in the latter half of the year when reservoir water levels are highest (Appendix Figures B.4 to B.6). Dissolved cadmium (also an Order constituent) was omitted from the analysis, as most concentrations were less than the method detection limits as discussed in Section 2.2.3 (Appendix Tables B.4 to B.9).

Statistical tests identified significant differences in aqueous concentrations of nitrate, selenium, and/or sulphate between samples collected at the surface compared to lower depths at most stations (Table 3.1). However, concentrations were not significantly different between samples collected at the middle versus bottom depths at any stations, except for a small difference (2.5%) for sulphate at the upstream RG_KERRRD station. At stations downstream from the Elk River, nitrate, selenium, and sulphate concentrations were typically lower at the surface, but there was some variation in patterns among years (Table 3.1 and Figures 3.2 to 3.4).

Based on the results of Table 3.1, data for middle and bottom samples were averaged within months, and annual means were statistically compared among areas for middle-bottom samples separately from surface samples. Nitrate concentrations at both surface and middle-bottom depths of the water column were significantly higher at stations downstream from the Elk River compared to upstream in 2015 and 2016 (Table 3.2). Results were less consistent in 2014 when the upstream station was situated closer to the Elk River. The difference between upstream and downstream concentrations was greater in 2016 than 2015 for both nitrate and selenium, but mean concentrations at downstream areas in 2016 were similar to or less than those observed in 2015 (Table 3.2). Sulphate concentrations did not differ significantly between Koocanusa Reservoir stations located downstream versus upstream of the Elk River in any years (Table 3.2).

**Table 3.1:** **Statistical Summary of Differences in Nitrate-Nitrogen, Total Selenium and Sulphate Concentrations between Surface and Middle, Surface and Bottom, and Middle and Bottom Depths in the Water Column at Individual Koocanusa Reservoir Stations Based on Routine Water Quality Monitoring Samples Collected in 2014 to 2016 (all years combined)**

| Station | | Nitrate-N | | | Total Selenium | | | Sulphate | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface versus Middle | Surface versus Bottom | Middle versus Bottom | Surface versus Middle | Surface versus Bottom | Middle versus Bottom | Surface versus Middle | Surface versus Bottom | Middle versus Bottom |
| Upstream of Elk River | RG_KERRRD | * (7.3%) | - | - | * (33%) | - | - | * (-0.42%) | * (-7.1%) | * (-2.5%) |
| | RG_USELK | - | - | - | - | - | - | - | - | - |
| Downstream of Elk River | RG_DSELK | - | * (-34%) | - | - | - | - | * (-5.1%) | * (-13%) | - |
| | RG_GRASMERE | * (-18%) | * (-37%) | - | * (-5.8%) | * (-8.1%) | - | * (-1.3%) | * (-6.4%) | - |
| | RG_USGOLD | * (-4.1%) | * (-37%) | - | - | * (-11%) | - | - | * (-11%) | - |
| | RG_BORDER | * (-13%) | * (-19%) | - | - | - | - | - | * (-7%) | - |

* indicates a significant difference between the two areas at a Bonferroni adjusted α = 0.1/3 = 0.033 (for the 3 pairwise comparisons)

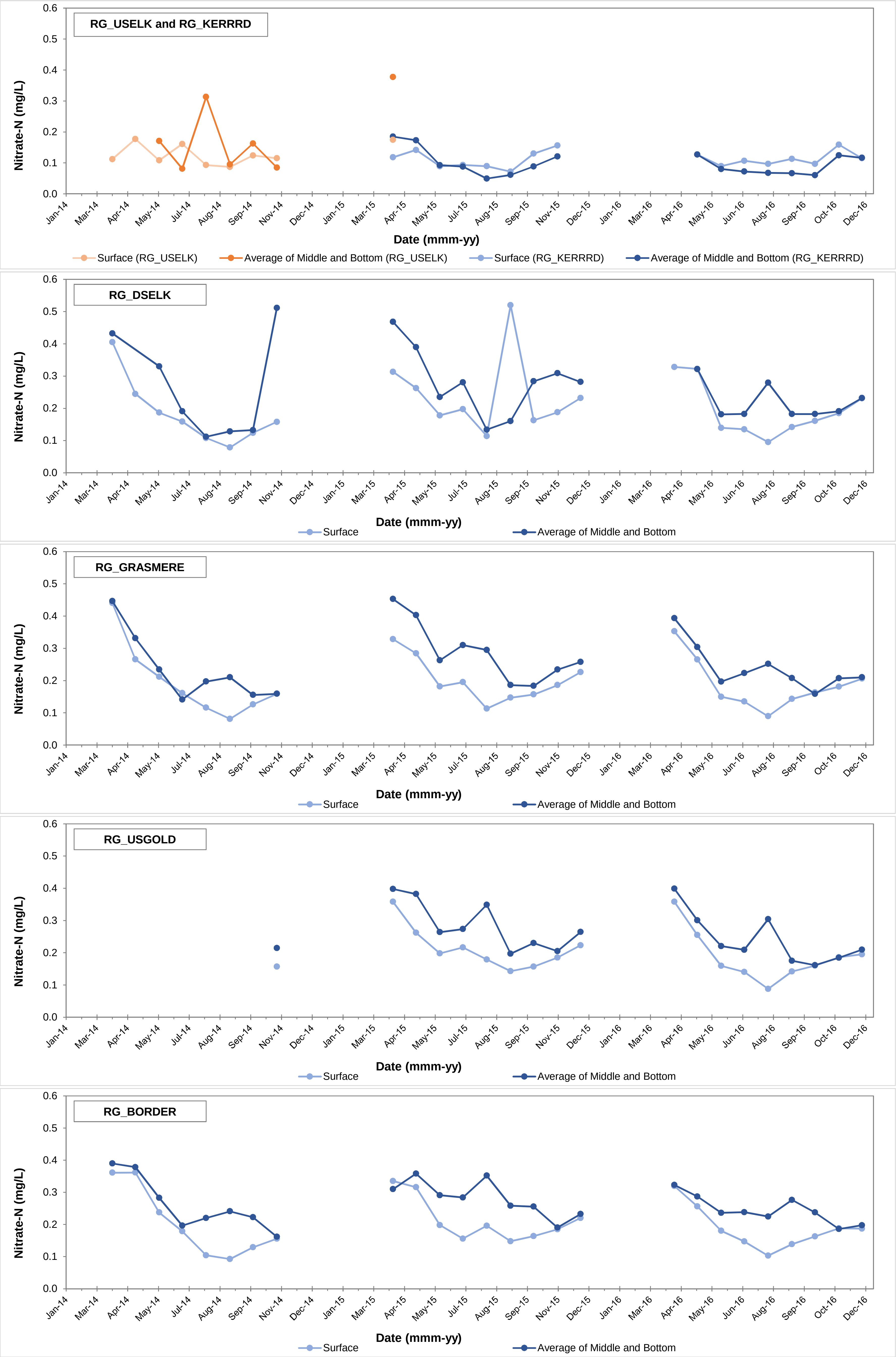

**Figure 3.2:** **Mean Monthly Aqueous Nitrate-Nitrogen Concentrations in Koocanusa Reservoir, 2014 to 2016**

Notes: Stations RG_USELK and RG_KERRRD are located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream. RG_USELK was only sampled in 2014, as the station was moved further upstream for the 2015 sampling program to RG_KERRRD.

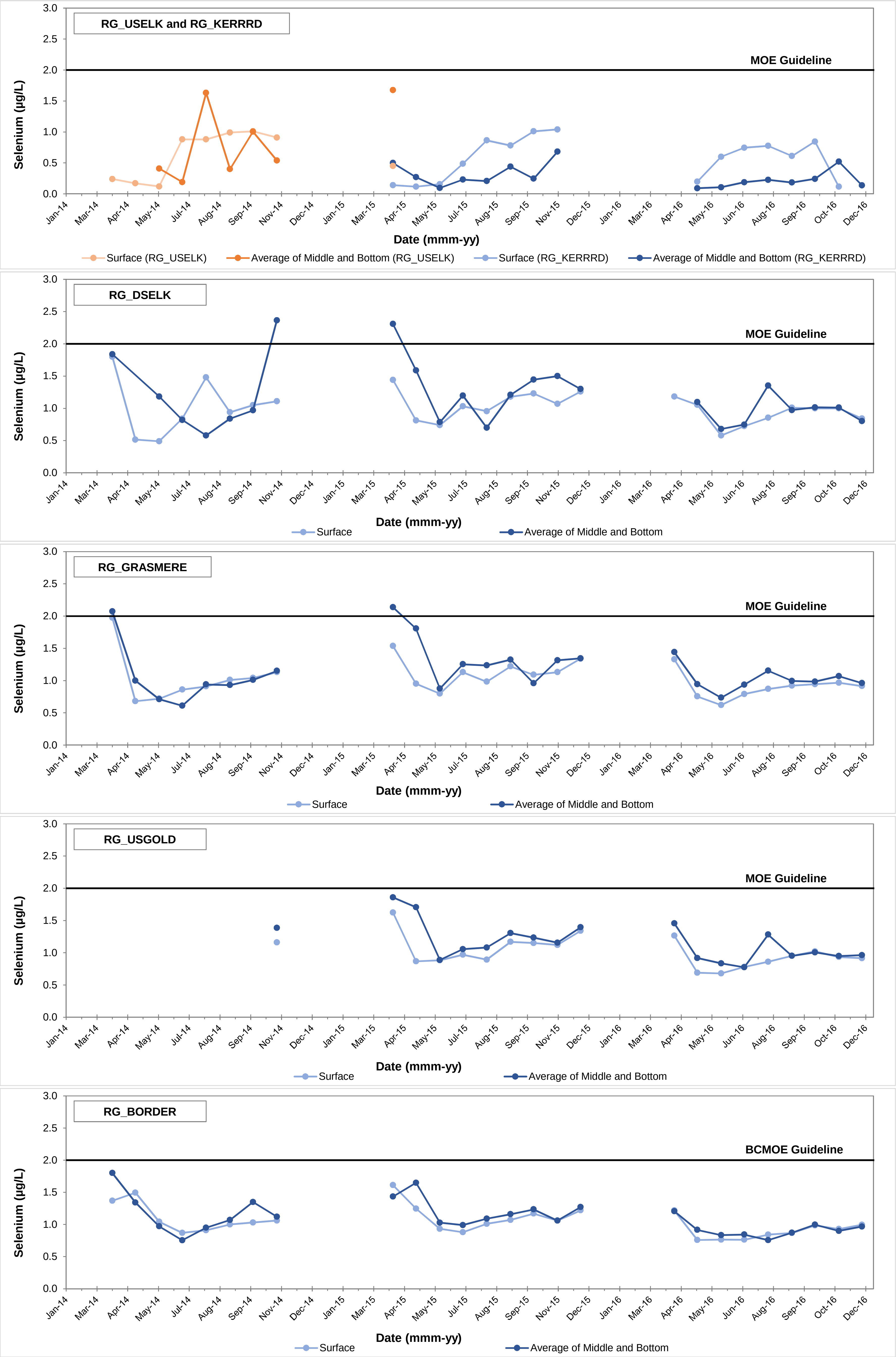

**Figure 3.3:** **Mean Monthly Aqueous Selenium Concentrations in Koocanusa Reservoir, 2014 to 2016**

Notes: Stations RG_USELK and RG_KERRRD are located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream. RG_USELK was only sampled in 2014, as the station was moved further upstream for the 2015 sampling program to RG_KERRRD.

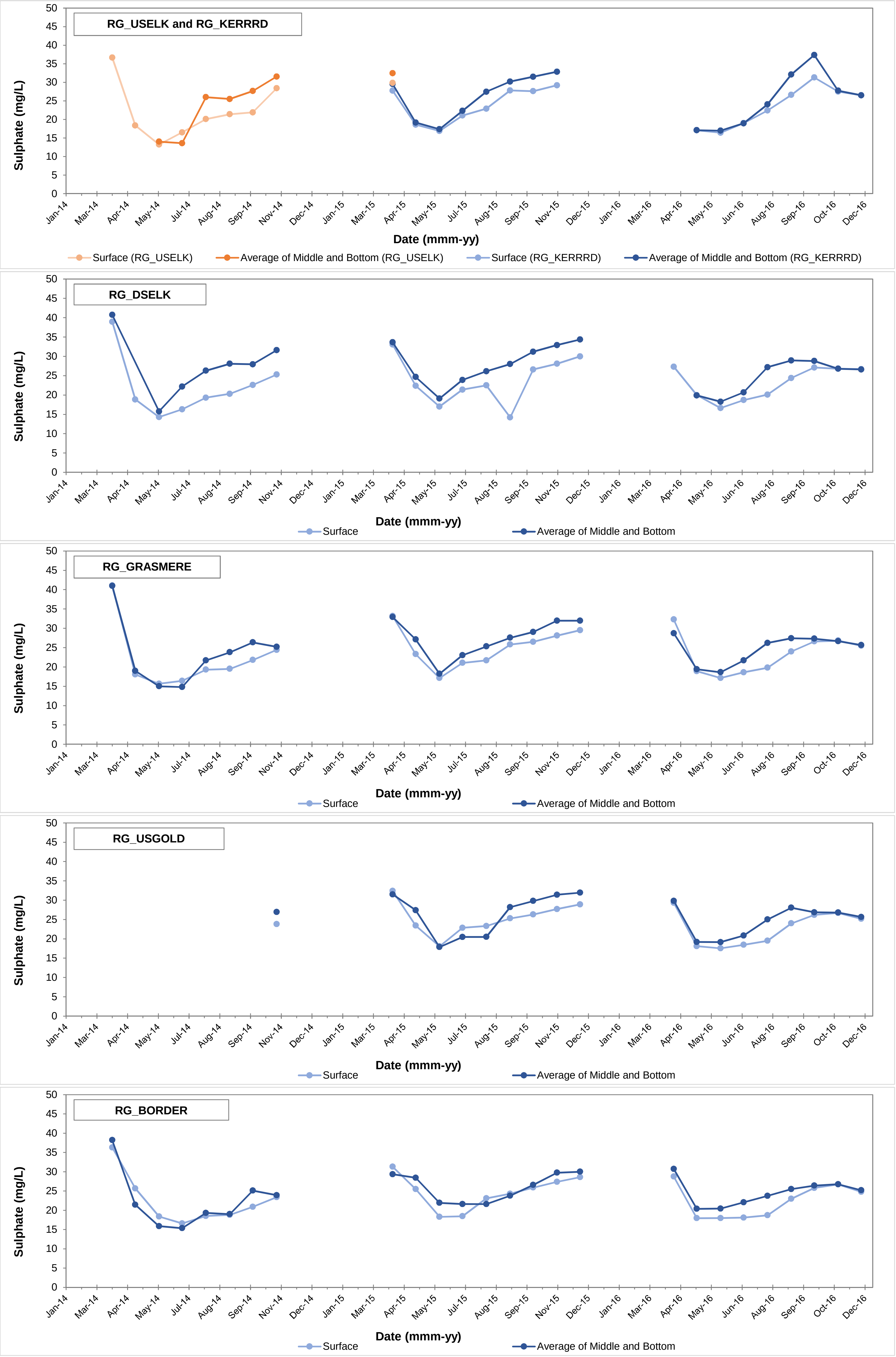

**Figure 3.4:** **Mean Monthly Aqueous Sulphate Concentrations in Koocanusa Reservoir, 2014 to 2016**

Notes: Stations RG_USELK and RG_KERRRD are located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream. RG_USELK was only sampled in 2014, as the station was moved further upstream for the 2015 sampling program to RG_KERRRD. MOE guideline is 309 mg/L based on a conservative water hardness between 76 and 180 mg/L for Koocanusa Reservoir.

**Table 3.2:** **Statistical Comparisons of Aqueous Nitrate, Total Selenium, and Sulphate Concentrations between Stations Located in Koocanusa Reservoir Downstream from the Elk River (RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BPRDER) versus Upstream (USELK in 2014 and KERRRD in 2015 and 2016), 2014 to 2016**

| Parameter | Depth | Station Down-stream of Elk River | Mean or Median$^a$ Concentration (mg/L or μg/L$^b$) | | | | | | $H_{01}$: Is the difference between the downstream concentration and upstream concentration equal in all years? | | | | | $H_{02}$: Is the downstream concentration equal to the upstream concentration? | | | | | Magnitude of Difference (Downstream of Elk River-Upstream of Elk River / Upstream of Elk River) (mean or median) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Test for Relative Difference Between Areas (Downstream of Elk River-Upstream of Elk River) Among Years | | | | | Test for Relative Difference Between Areas (Downstream of Elk River-Upstream of Elk River) = 0 | | | | | | | |
| | | | 2014 | | 2015 | | 2016 | | Test | P-value | | | | Test | P-value | | | | % | | |
| | | | | | | | | | | All years | Year | | | | All years | Year | | | Year | | |
| | | | Downstream of Elk River | Upstream of Elk River | Downstream of Elk River | Upstream of Elk River | Downstream of Elk River | Upstream of Elk River | | | 2015-2014 | 2016-2014 | 2016-2015 | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Nitrate | Surface | RG_DSELK | 0.16 | 0.11 | 0.20 | 0.12 | 0.14 | 0.11 | K-W | 0.093 | 0.003 | 0.002 | <0.001 | WSRT | - | 0.076 | 0.009 | 0.026 | 40 | 99 | 56 |
| | | RG_GRASMERE | 0.16 | 0.11 | 0.19 | 0.12 | 0.15 | 0.11 | K-W | 0.311 | - | | | M-W | <0.001 | - | | | 45 | | |
| | | RG_USGOLD | NA | 0.12 | 0.23 | 0.12 | 0.17 | 0.11 | ANOVA | 0.141 | NA | | - | t-test | <0.001 | NA | - | | NA | 62 | |
| | | RG_BORDER | 0.20 | 0.12 | 0.23 | 0.12 | 0.17 | 0.11 | ANOVA | 0.415 | - | | | t-test | <0.001 | - | | | 66 | | |
| | Combined Middle and Bottom | RG_DSELK | 0.17 | 0.15 | 0.31 | 0.13 | 0.22 | 0.09 | ANOVA | 0.002 | 0.001 | 0.020 | 0.303 | t-test | - | 0.668 | <0.001 | <0.001 | - | 128 | 146 |
| | | RG_GRASMERE | 0.18 | 0.15 | 0.32 | 0.13 | 0.22 | 0.09 | ANOVA | <0.001 | <0.001 | 0.019 | 0.127 | t-test | - | 0.375 | <0.001 | <0.001 | - | 135 | 146 |
| | | RG_USGOLD | NA | 0.15 | 0.29 | 0.13 | 0.22 | 0.09 | ANOVA | 0.312 | NA | | - | t-test | <0.001 | NA | - | | NA | 108 | |
| | | RG_BORDER | 0.22 | 0.15 | 0.29 | 0.13 | 0.24 | 0.09 | ANOVA | 0.047 | 0.052 | 0.107 | 0.843 | t-test | - | 0.099 | <0.001 | <0.001 | 47 | 113 | 165 |
| Total Selenium | Surface | RG_DSELK | 1.0 | 0.65 | 1.0 | 0.52 | 0.88 | 0.50 | ANOVA | 0.712 | - | | | t-test | <0.001 | - | | | 75 | | |
| | | RG_GRASMERE | 1.1 | 0.65 | 1.1 | 0.52 | 0.85 | 0.50 | ANOVA | 0.541 | - | | | WSRT | <0.001 | - | | | 78 | | |
| | | RG_USGOLD | NA | 0.65 | 1.1 | 0.52 | 0.85 | 0.50 | ANOVA | 0.443 | NA | | - | t-test | <0.001 | NA | - | | NA | 71 | |
| | | RG_BORDER | 1.1 | 0.65 | 1.1 | 0.52 | 0.86 | 0.50 | ANOVA | 0.566 | - | | | WSRT | <0.001 | - | | | 62 | | |
| | Combined Middle and Bottom | RG_DSELK | 0.80 | 0.73 | 1.4 | 0.44 | 0.97 | 0.21 | ANOVA | 0.001 | 0.001 | 0.013 | 0.352 | t-test | - | 0.738 | 0.002 | <0.001 | - | 220 | 357 |
| | | RG_GRASMERE | 0.90 | 0.73 | 1.5 | 0.44 | 0.97 | 0.21 | ANOVA | <0.001 | - | | | t-test | - | 0.421 | 0.001 | <0.001 | - | 230 | 359 |
| | | RG_USGOLD | NA | 0.73 | 1.3 | 0.44 | 0.96 | 0.21 | ANOVA | 0.346 | NA | | - | t-test | <0.001 | NA | - | | NA | 157 | |
| | | RG_BORDER | 1.0 | 0.73 | 1.2 | 0.44 | 0.89 | 0.21 | ANOVA | 0.034 | 0.030 | 0.153 | 0.549 | WSRT | - | 0.438 | 0.001 | <0.001 | - | 177 | 318 |
| Sulphate | Surface | RG_DSELK | 22 | 22 | 24 | 23 | 23 | 23 | ANOVA | 0.775 | - | | | t-test | 0.648 | - | | | - | | |
| | | RG_GRASMERE | 22 | 22 | 25 | 23 | 22 | 23 | ANOVA | 0.234 | - | | | t-test | 0.919 | - | | | - | | |
| | | RG_USGOLD | NA | 22 | 25 | 23 | 22 | 23 | ANOVA | 0.040 | NA | | 0.095 | t-test | - | NA | 0.219 | 0.104 | NA | - | - |
| | | RG_BORDER | 22 | 22 | 24 | 23 | 22 | 23 | ANOVA | 0.345 | - | | | t-test | 0.691 | - | | | - | | |
| | Combined Middle and Bottom | RG_DSELK | 22 | 23 | 27 | 26 | 25 | 25 | ANOVA | 0.351 | - | | | t-test | 0.791 | - | | | - | | |
| | | RG_GRASMERE | 21 | 23 | 27 | 26 | 24 | 25 | ANOVA | 0.259 | - | | | t-test | 0.618 | - | | | - | | |
| | | RG_USGOLD | NA | 23 | 26 | 26 | 24 | 25 | ANOVA | 0.488 | NA | | - | t-test | 0.544 | NA | - | | NA | - | |
| | | RG_BORDER | 20 | 23 | 26 | 26 | 24 | 25 | ANOVA | 0.456 | - | | | t-test | 0.220 | - | | | - | | |

▨ = p-value < 0.1

[a] means reported when the test for $H_{01}$ was ANOVA and median reported when the test for $H_{01}$ was the K-W test

[b] units for nitrate and sulphate concentrations are mg/L; units for selenium concentrations are μg/L

K-W = Kruskal-Wallis test; WSRT = Wilcoxon signed rank test; t-test = one sample t-test; M-W = Mann Whitney test; ANOVA = Analysis of Variance.

NA= not applicable (no data for RG_USGOLD in 2014)

### 3.3.2 Comparisons to Guidelines and SPOs

Annual water quality results for samples collected in Koocanusa Reservoir in 2015 and 2016[8] identified very few exceedances of the MOE guidelines for protection of aquatic life (Teck 2016b, 2017). Guideline exceedances were reported for aluminum (one sample at RG_DSELK in 2015), iron (one sample at RG_GRASMERE in 2015 and one sample at RG_DSELK in 2016), and mercury[9] (5 samples at RG_DSELK in 2016). Concentrations of nitrate, selenium, sulphate, and dissolved cadmium were consistently below SPOs at RG_DSELK in both years (Figure 3.5).

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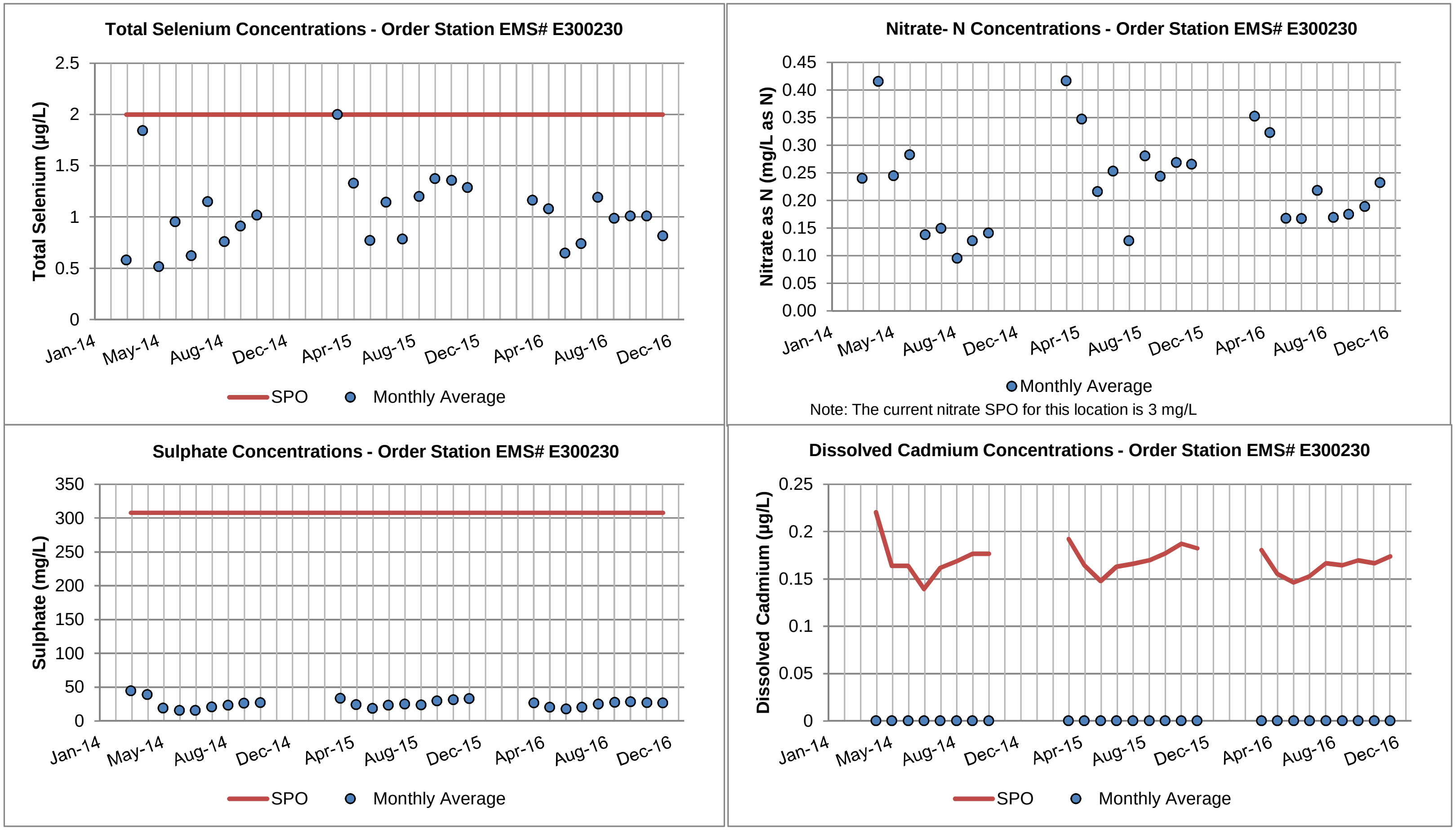
[8] No annual report was provided for 2014 because Permit 107517 was not in effect until late November 2015. As such, water quality reporting was completed under previous mine operational permits.

[9] The BC water quality guideline for mercury is based on the percent of methyl mercury present and, in the absence of methyl mercury data for all stations, Teck has applied the most stringent mercury guideline (which assumes that a large proportion of total mercury is present as methyl mercury). Teck recently began sampling for methyl mercury, and 48 methyl mercury samples collected in 2016 throughout the Elk Valley had methyl mercury concentrations less than the method detection limit of < 0.000050 µg/L. Assuming continued monitoring corroborates these results, it is expected that future water quality evaluations will confirm no mine-related exceedances of the appropriate mercury guideline, and metallurgical coal mining is not a source of mercury to the receiving environment.


Total Selenium Concentrations - Order Station EMS# E300230

Nitrate- N Concentrations - Order Station EMS# E300230

Note: The current nitrate SPO for this location is 3 mg/L

Sulphate Concentrations - Order Station EMS# E300230

Dissolved Cadmium Concentrations - Order Station EMS# E300230

**Figure 3.5:** Monthly Average Concentrations of Order Constituents Relative to Site Performance Objectives Recorded at Order Station RG_DSELK, Koocanusa Reservoir, 2014 to 2016

# 4 SEDIMENT QUALITY

## 4.1 Overview

Sediment samples were initially collected in Koocanusa Reservoir in April 2013, when seven transects were sampled across the Canadian portion of the reservoir, two upstream and five downstream of the Elk River confluence (Minnow 2014a). In August 2013, following record flooding in the Elk River watershed in June 2013, Transects T2 and T4 were re-sampled to further characterize sediment quality. Subsequent sampling of sediment, plankton, and benthic invertebrates in the three-year (2014 to 2016) Koocanusa Reservoir monitoring program (described herein) focused on two transects (i.e., T2 and T4). As noted in Section 3.1, the upstream transect (T2) was re-located 3.5 km farther upstream in August 2015 (TN) to avoid influence from the Elk River (Figure 2.1). Sediment samples were collected in August of all three years from five stations along each transect (Appendix Tables C.1 to C.3).

## 4.2 Results

Sediment samples collected in the reservoir downstream and upstream from the Elk River were mostly silt (60-82%), with sand and clay comprising smaller fractions (Figure 4.1; Appendix Tables C.4 to C.6). Sediments collected along the transect upstream from the Elk River (T2/TN) were consistently significantly sandier (annual means of 2-10%) with less clay (means of 17-19%), than those collected downstream at transect T4 (means of <1% for sand and 26-30% for clay), which may be related to the shallower depths and more fluvial nature of the reservoir at T2/TN (i.e., greater seasonal scour resulting in finer particles accumulating in sediments farther downstream) (Table 4.1). TOC content ranged from 0.9 to 1.7%, comparable to a mean TOC of 1.1% reported for Koocanusa Reservoir sediments by Iskandar and Shukla (1981), which was considered low and indicative of oligotrophy. A small difference in sediment TOC was observed between areas in 2015 (i.e., 1.6% versus 1.2% downstream compared to upstream) but TOC concentrations were not different between areas in 2014 or 2016 (Appendix Table C.7).

Concentrations of most metals and PAHs were significantly higher in sediments collected downstream from the Elk River compared to upstream (Table 4.1; Figure 4.2; Appendix Table C.7). Larger downstream-to-upstream differences in selenium and mercury concentrations were observed in 2016 compared to previous years, but only selenium showed a slight increase in concentrations over the three-year period. Downstream of the Elk River, all analytes other than selenium were found at similar or lower mean concentrations in 2016 compared to 2015. Even for selenium, the change in mean concentration over the three years was small (0.52, 0.66, and 0.68 mg/kg dw in 2014 to 2016 respectively), and mean

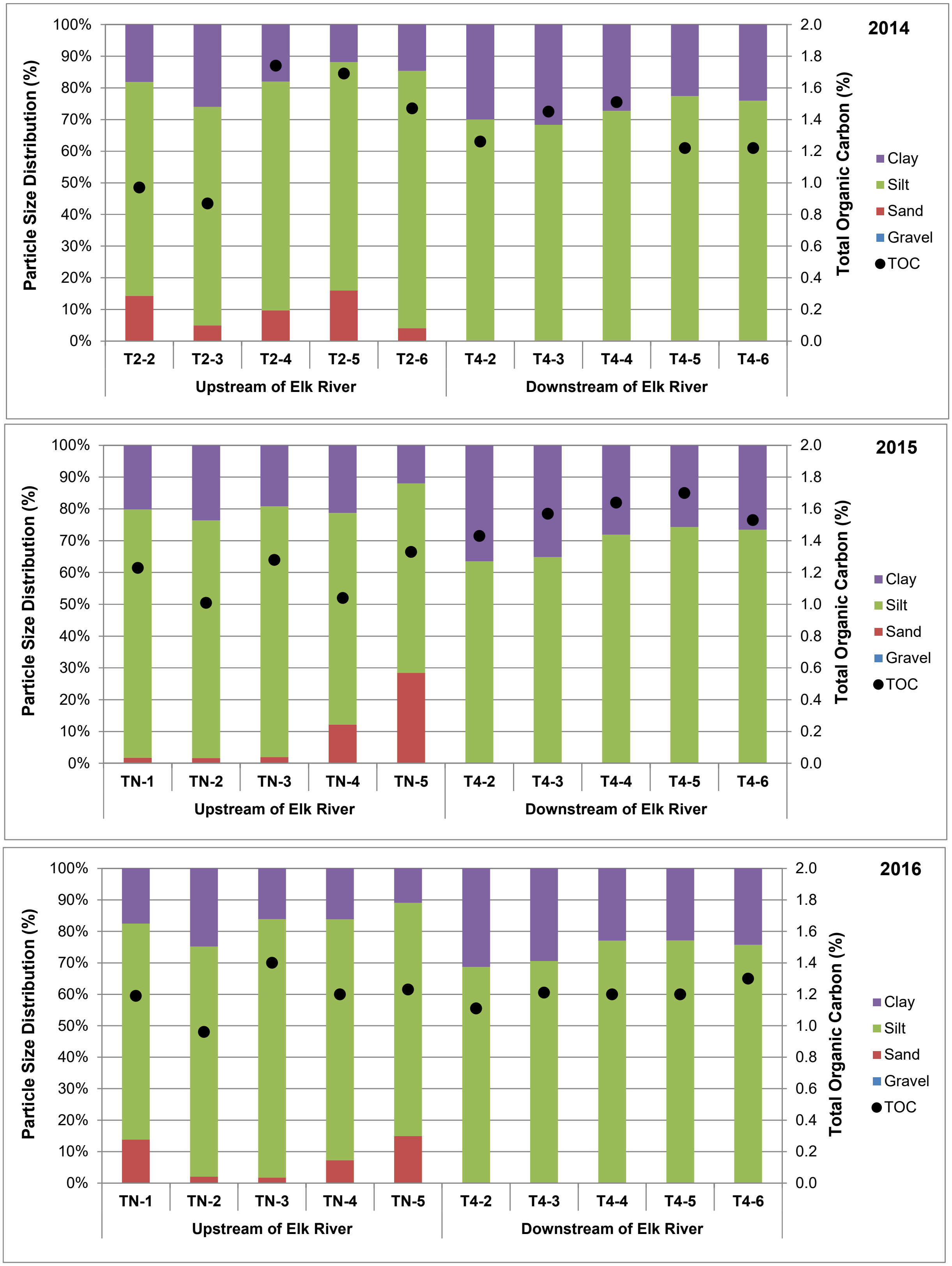


**Figure 4.1:** **Sediment Particle Size and Total Organic Carbon (TOC) Content at Stations in Koocanusa Reservoir, 2014 to 2016**

## Table 4.1: Statistical Summary of Spatial and Temporal Differences in Sediment Quality in Koocanusa Reservoir Downstream from the Elk River (T4) Compared to Upstream (T2/TN), 2014 to 2016

| Selected Analytes[a] | BC Sediment Quality Guidelines | Units | Transfor-mation | Measure of Central Tendency (Mean, Geometric Mean, or Median)[b,c] | | | | | | Model P-values | | | Downstream of Elk River (T4) vs Upstream of Elk River (TN/T2) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Contrasts | | | Magnitudes of Significant Differences | | |
| | | | | 2014 | | 2015 | | 2016 | | Area x Year | Area | Year | Area × Year | | | % | | |
| | | | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| **Metals (< 1mm fraction)** | | | | | | | | | | | | | | | | | | |
| Arsenic (As) | 5.9/17 [d] | mg/kg dw | none | 5.9 | 5.6 | **7.3** | **6.5** | **6.3** | 5.4 | 0.089 | - | - | 0.209 | <0.001 | <0.001 | - | * (12) | * (16) |
| Cadmium (Cd) | 0.6/3.5 [d] | mg/kg dw | none | 0.53 | 0.22 | 0.58 | 0.19 | 0.55 | 0.19 | 0.302 | <0.001 | 0.827 | - | - | - | * (182) | | |
| Iron (Fe) | 21,200/43,766 [e] | mg/kg dw | none | 20,200 | 20,760 | **22,970** | **22,600** | 20,240 | 19,980 | 0.393 | 0.938 | <0.001 | - | - | - | - | | |
| Manganese (Mn) | 460/1,100 [e] | mg/kg dw | none | **521** | 429 | **605** | **464** | **544** | 399 | 0.177 | <0.001 | <0.001 | - | - | - | * (29) | | |
| Nickel (Ni) | 16/75 [e] | mg/kg dw | none | **22** | **20** | **25** | **21** | **22** | **19** | 0.185 | <0.001 | <0.001 | - | - | - | * (13) | | |
| Selenium (Se) | 2 | mg/kg dw | log | 0.52 | 0.23 | 0.66 | 0.22 | 0.68 | 0.20 | <0.001 | - | - | <0.001 | <0.001 | <0.001 | * (128) | * (203) | * (241) |
| **Polycyclic Aromatic Hydrocarbons** | | | | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | 0.0202/0.201 [d] | mg/kg dw | rank | - | - | **0.059** | 0.010 | **0.054** | 0.010 | 0.770 | <0.001 | 0.770 | - | - | - | NA | * (465) | |
| Phenanthrene | 0.0419/0.515 [d] | mg/kg dw | rank | - | - | **0.060** | 0.010 | **0.046** | 0.010 | 0.487 | <0.001 | 0.487 | - | - | - | NA | * (405) | |

* indicates a significant difference between the two areas at an α of 0.1.

[a] Data are summarized for analytes that had mean concentration greater than the low BC Sediment Quality Guideline in at least one area and year (plus selenium). See Appendix Table C.7 for results for all other analytes.

[b] The measure of central tendency reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for log $_{10}$-transformation; and, median for rank-transformation.

[c] The bolded values are above BC Sediment Quality Guidelines lowest effect level.

[d] Interim Sediment Quality Guideline (ISQG; or Threshold Effect Level [LEL])/ Probable Effect Level (PEL)

[e] Lowest Effect Level (LEL)/ Severe Effect Level (SEL).

▨ p-value < 0.1.

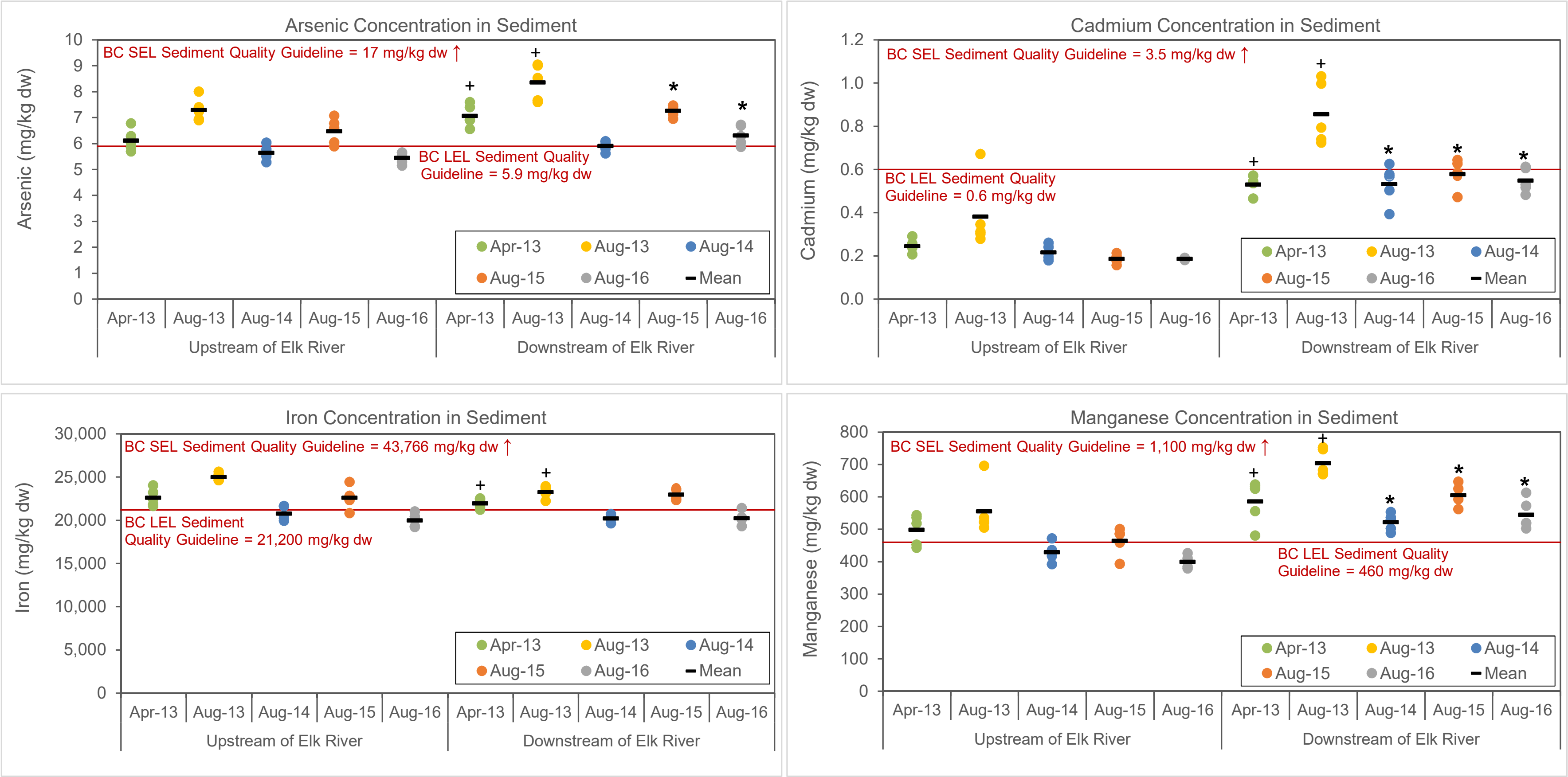


**Figure 4.2:** **Concentrations of Selected Parameters in Sediment Samples from Koocanusa Reservoir, 2013 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016. Concentrations below the MDL are plotted as open symbols (associated number indicates number of samples with parameter concentrations below MDL) at the MDL concentration.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.
' + ' indicates that no statistical analysis was not completed with these data (i.e., sediment collected in 2013).

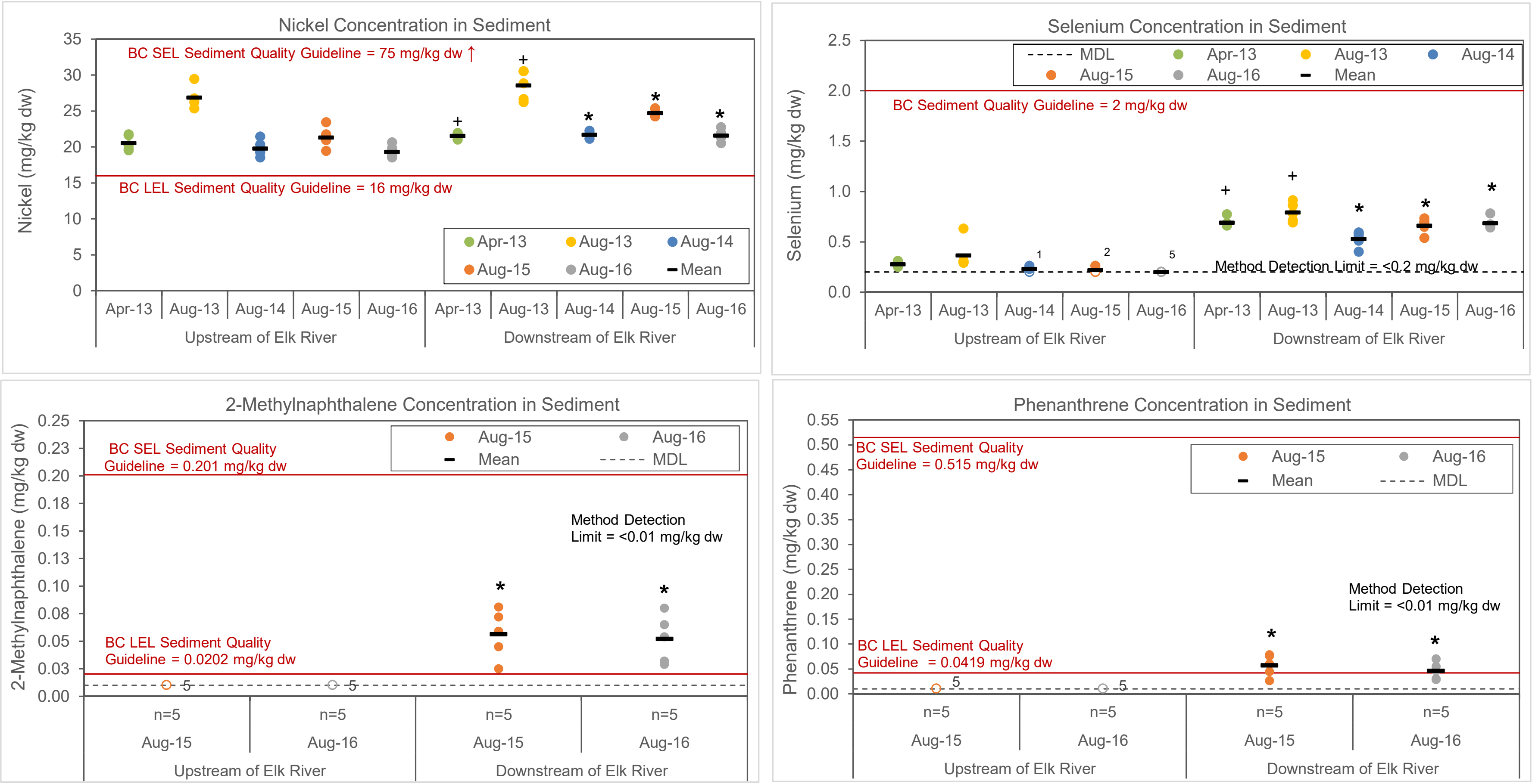


**Figure 4.2:** **Concentrations of Selected Parameters in Sediment Samples from Koocanusa Reservoir, 2013 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016. Concentrations below the MDL are plotted as open symbols (associated number indicates number of samples with parameter concentrations below MDL) at the MDL concentration.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.
' + ' indicates that no statistical analysis was not completed with these data (i.e., sediment collected in 2013).

concentrations observed at the downstream area in 2014 to 2016 were less than those measured in 2013 (Figure 4.2). Concentrations of some metals and PAHs in sediments were above the corresponding low sediment quality guideline, but none exceeded the high guideline (Appendix Tables C.4 to C.7). Concentrations of all PAHs in sediment were less than the method detection limit at stations in the upstream (TN) sampling area (Appendix Tables C.5 to C.6). Average concentrations of 2-methylnaphthalene and phenanthrene were greater than the low sediment guideline downstream of the Elk River, but were well below the high sediment quality guidelines (Figure 4.2). In addition, mean concentrations of Order constituents[10] cadmium and selenium were less than the sediment quality guidelines (Table 4.1; Figure 4.2).

Mean concentrations of arsenic, iron, manganese, and nickel in sediment were also above the low, but not high, sediment quality guidelines in at least one of the three monitoring years, including the upstream area (Table 4.1; Figure 4.2). The general pattern observed of higher concentrations of metals in sediment downstream of the Elk River in comparison to upstream may be related to the greater proportion of fine sediment particles in the downstream area. This point is also supported by data for samples collected in August 2013, when the percentage of fine particles and also the concentrations of many metals increased downstream from the Elk River relative to samples collected in April of that year as a result of sediment transport and deposition during record storm in June 2013 (Figure 4.2; Minnow 2014a). Fine particles provide more surface area relative to volume than larger particles, so sediments having finer particles are more likely to have elevated concentrations of chemicals that adsorb to particle surfaces than areas with larger particles (Horowitz and Elrick 1987; Blanton et al. 1995).

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[10] See section 1.2 for explanation of the Provincial Order and associated constituents of concern.

# 5 PLANKTON AND PRODUCTIVITY

## 5.1 Overview

Nitrogen species (nitrate, nitrite, ammonia), phosphorus species (total phosphorus, ortho-phosphate), chlorophyll-a, and Secchi depth are measured as part of Teck's routine water quality monitoring at stations in Koocanusa Reservoir based on grab samples collected at surface, middle, and bottom depths (Section 2.2.1). The data were summarized to evaluate trophic status (productivity).

Chlorophyll-a concentrations were also measured along the same transects where sediment samples were collected, along with seston biomass (another indicator of plankton productivity) in August of each of the three study years. These were based on depth-integrated samples collected from the top 10 m of the water column to provide an average value for each station along each transect (n=5 samples per transect). Chlorophyll-a was also measured *in situ* in 2015 to investigate variability in concentrations at 1 m depth intervals and to test the accuracy of the method by comparing average *in situ* concentrations over the top 10 m to those reported by the laboratory for the 10 m depth-integrated samples.

Phytoplankton and zooplankton community structure, and zooplankton tissue selenium concentrations, were also assessed based on samples collected from the same areas in August of each year.

## 5.2 Productivity

### 5.2.1 This Study

Ratios of total nitrogen to total phosphorus concentrations (N:P) greater than 15 indicate that phosphorus is the limiting nutrient based on categories defined by McDowell et al. (2009) for mass concentrations:

- N:P < 7 Nitrogen-limited
- 7 < N:P < 15 Co-limited (nitrogen and phosphorus)
- N:P > 15 Phosphorus-limited.

Based on concentrations measured in Koocanusa Reservoir as part of Teck's water quality monitoring program, median ratios were found to be 15 or more (Figure 5.1), which suggests that phosphorus is limiting, especially at stations downstream from the Elk River. Phosphorus was also concluded to be the limiting nutrient in previous studies of the reservoir (Hamilton et al. 1990; Richards 1997).

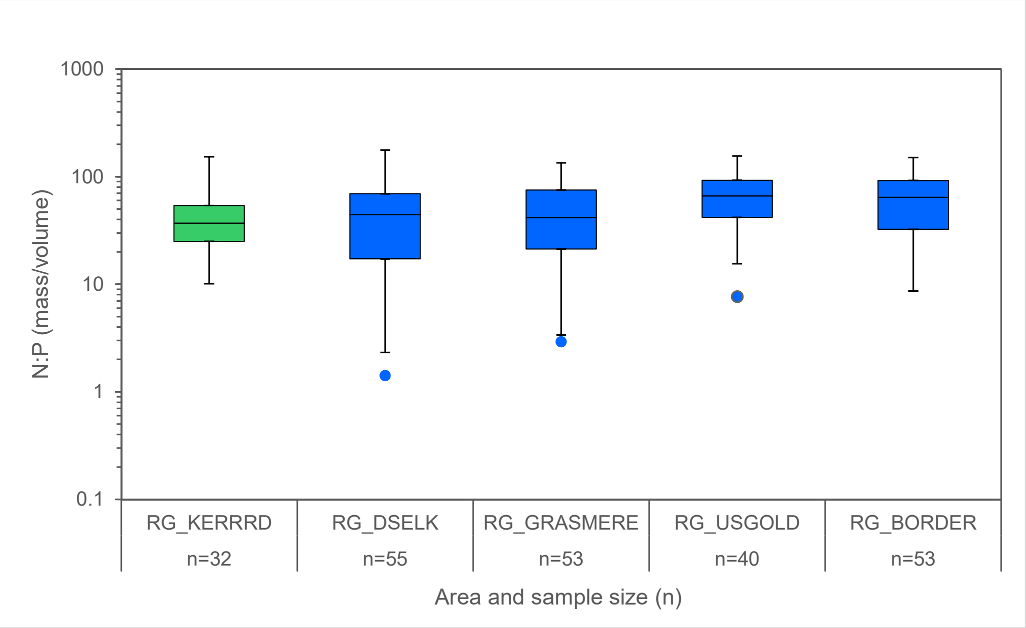

**Figure 5.1:** **Boxplot of Ratios of Nitrate to Total Phosphorus Mass Concentrations for Samples Collected in Koocanusa Reservoir, 2014 to 2016**

Note: The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set.

Phosphorus concentrations measured in the lower Elk River (RG_ELKMOUTH) were similar to those measured in the lower Kootenay River (RG_WARDB) (Appendix Tables B.10 and B.11), as was reported by Hamilton et al. (1990). However, flows in the Kootenay River are about three times higher, on average, than those in the Elk River (Appendix Figures B.13 and Table B.12; Hamilton et al. 1990).

Concentrations of total phosphorus and ortho-phosphate were highest in early spring and generally decreased through the remainder of the year, with ortho-phosphate concentrations usually undetectable (<0.0010 mg/L) in the latter part of the year (Appendix Figures B.7 and B.8). Secchi depths generally increased during the ice-free period (Appendix Figure B.9), which is contrary to the expected relationship of decreasing Secchi depth with increasing biological productivity in warmer months (Tilzer 1988). Low spring Secchi depths were likely related to high concentrations of TSS associated with freshet (Appendix Figure B.11) causing reduced water transparency (Tilzer 1988; Wetzel 2001). Concentrations of chlorophyll-a varied seasonally, with minima typically occurring in April or early May, consistent with low water levels, cooler temperatures, and high turbidity/TSS. This was followed by an increase in chlorophyll-a through the summer months. Secchi depths increased as water level rose and

TSS concentrations declined, but sometimes dipped again in July or August (Appendix Figure B.9), likely corresponding with peak primary productivity (Tilzer 1988). Finally, Secchi depth increased again toward November as both water temperatures and productivity decreased. As would be expected, chlorophyll-a concentrations were typically higher in samples collected at the surface compared to deeper samples (Appendix Figure B.10).

Chlorophyll-a concentrations measured *in situ* in August 2015 varied little with depth, except near Gold Creek where maxima were observed at 7-8 m in both April and August, and near Sand Creek in August only (maximum concentration at 4 m; Appendix Figure D.1). Profiles confirmed that depth-integrated water samples collected over the top 10 m captured most of the variation in chlorophyll-a concentrations among areas. However, *in situ* measurements of chlorophyll-a were consistently lower than concentrations reported by the laboratory (Appendix Figure D.2), so *in situ* measurements were not continued in 2016.

Chlorophyll-a concentrations reported by the laboratory for depth-integrated samples were significantly higher downstream from the Elk River than upstream in all three years, and the magnitude of difference increased slightly each year (Table 5.1, Figure 5.2, Appendix Table D.1 and Figure D.2). However, mean chlorophyll-a concentrations in depth-integrated samples were consistently low (see categories in Table 2.5), ranging between 1.7 and 3.0 µg/L among areas and years (Table 5.1). Chlorophyll-a concentrations measured in surface and middle-bottom samples as part of Teck's routine water quality monitoring were similarly low (i.e., usually < 3 µg/L; Appendix Figure B.10 and Tables B.5 to B.9).

Total seston biomass in depth-integrated samples collected in August of each year was significantly higher (35%) downstream (T4) of the Elk River compared to upstream (TN) in 2016, but did not differ significantly between areas in either 2014 or 2015 (Table 5.1; Appendix Table D.1). Mean seston biomass was lowest at both areas in 2015 (Figure 5.2).

### 5.2.2 Comparison to Previous Studies

Previous studies of limnological processes in Koocanusa Reservoir reported a weak thermal structure leading to a hypothesis that phytoplankton was circulated out of the euphotic zone. Such circulation was verified by a study of chlorophyll-a distribution, which revealed that more than one-half of the reservoir's phytoplankton was located beneath the euphotic zone (Woods 1982).

The post-impoundment primary productivity levels have been characterized as ultra-oligotrophic to mesotrophic as a result of the impoundment as well as channelization, diking, and pollution abatement measures in the watershed (Woods 1982, Woods and Falter 1982, Richards 1997). The low chlorophyll-a concentrations and seston biomass observed in this study were

**Table 5.1: Statistical Summary of Spatial and Temporal Differences in Seston Biomass and Chlorophyll-a Concentrations in Koocanusa Reservoir in the Area Downstream from the Elk River (T4) Compared to the Upstream Area (T2/TN), 2014 to 2016**

| Parameter | Trans-formation | Measure of Central Tendency (Mean, Geometric Mean, or Median)[a] | | | | | | Model P-values | | | Contrasts | | | Significant Differences and Magnitudes of Difference (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Area × Year | | | | | |
| | | 2014 | | 2015 | | 2016 | | Area × Year | Area | Year | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | |
| | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Chlorophyll-a (µg/L) | none | 2.2 | 1.9 | 3.0 | 2.5 | 2.4 | 1.7 | 0.046 | - | - | <0.001 | <0.001 | <0.001 | * (18) | * (20) | * (37) |
| Seston Biomass (mg/L dw) | none | 0.035 | 0.034 | 0.0022 | 0.0093 | 0.033 | 0.025 | 0.058 | - | - | 0.802 | 0.122 | 0.059 | - | - | * (35) |

▨ p-value < 0.1.

* indicates a significant difference between the two areas at an α of 0.1.

[a] The measure of central tendancy reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for $\log_{10}$-transformation; and, median for rank-transformation.

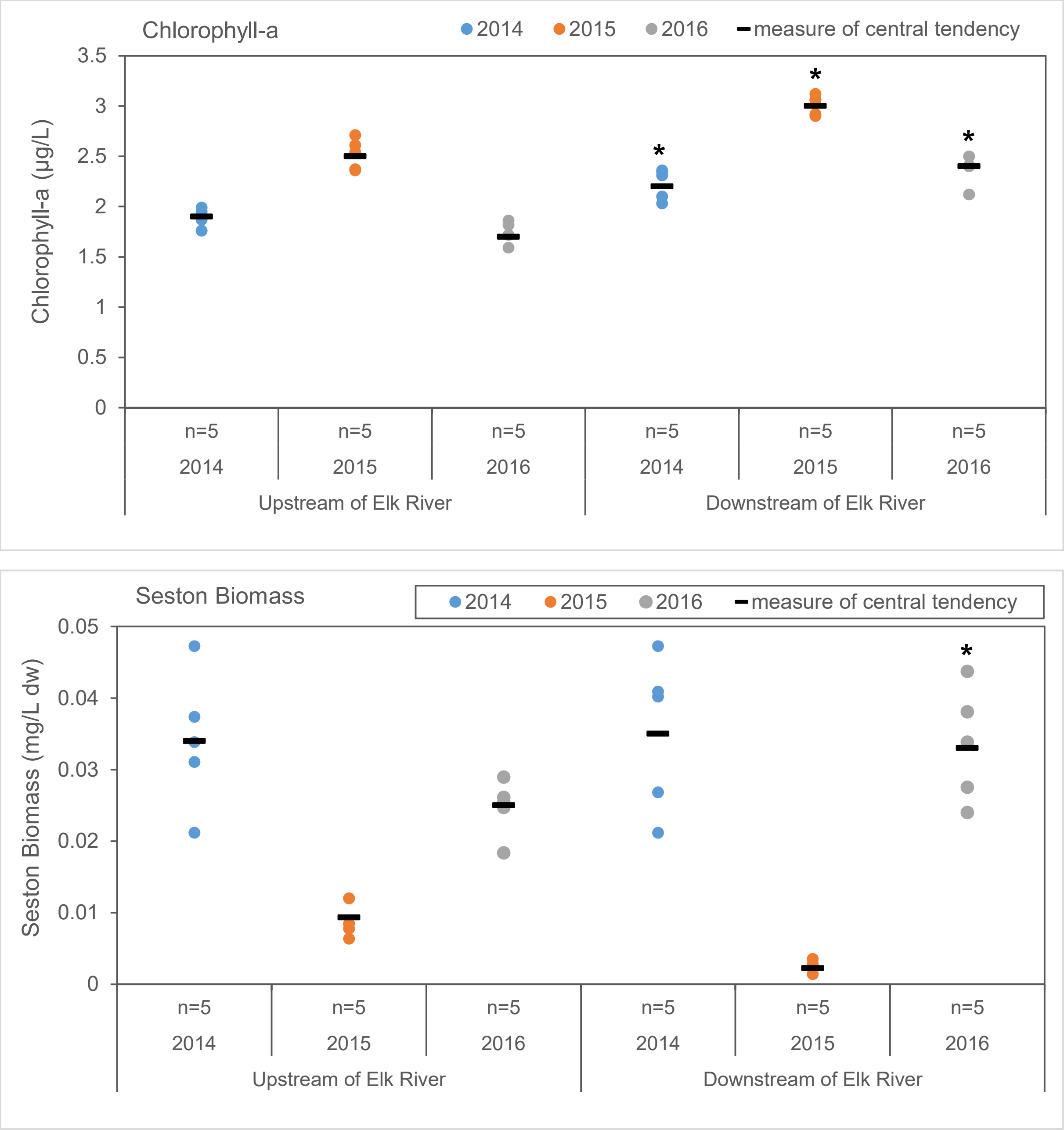

**Figure 5.2: Seston Chlorophyll-a (µg/L) and Seston Biomass (mg/L dw) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.

' * ' indicates the downstream area was significantly different from the upstream area in the same year.

consistent with observations from the 1980s (1.0-2.0 µg/L for chlorophyll-a and < 0.1 mg/L for biomass; Hamilton et al. 1990). Although shallow Secchi depths observed in recent monitoring suggested a higher trophic classification, phosphorus and chlorophyll-a concentrations support an oligotrophic classification (Table 5.2), consistent with the conclusions of Woods (1982) and Richards (1997). As noted above, the pattern of lowest Secchi depths in spring months is attributable to greater concentrations of TSS during freshet (Appendix Figure B.11), rather than elevated biological productivity. Highest biological productivity in the reservoir occurs in July and August when surface water is warmest and the euphotic zone is maximal (Hamilton et al. 1990, Richards 1997). Woods (1979) concluded that the dominant influence on primary production in Koocanusa Reservoir was light quantity, which is controlled by at least three factors: thermal structure which allows phytoplankton to be circulated out of the euphotic zone, elevated turbidity during spring runoff (freshet), and seasonal and meteorological variations in incident solar radiation.

### 5.3 Phytoplankton Community Structure

Phytoplankton communities in Koocanusa Reservoir both upstream (T2/TN) and downstream (T4) of the Elk River were numerically dominated by diatoms (algae with cell walls of hydrated silica) in all study years, with chrysophytes (golden algae) also being relatively abundant at both areas in 2014 and 2016 (Table 5.3, Figure 5.3; Appendix Tables D.2 to D.28 and Figures D.3 to D.6). Density and biomass of all other groups were variable, typically comprising 0-5% of the community (Table 5.3).

At the species level, the centric diatom *Cyclotella pseudostelligera* dominated the phytoplankton communities both upstream and downstream of the Elk River in all three years in terms of absolute and relative density and biomass (Figure 5.4; Appendix Tables D.1 to D.25). The predominance of *C. pseudostelligera* in Koocanusa Reservoir in August potentially reflects flow from the tributaries near each sampling area, which may provide the upwelling necessary to prevent individual organisms from sinking out of the photic zone and supplying the silica/silicon/silicates for frustule formation (H. Larratt, pers. comm. 2016). In addition, the relatively low nutrient concentrations within Koocanusa Reservoir (Section 5.2) may prevent *C. pseudostelligera* from being outcompeted by other organisms such as blue-green algae, which prefer higher concentrations of nitrogen and phosphorus (i.e., more eutrophic conditions; H. Larratt, pers. comm. 2016).

No significant differences in overall phytoplankton density, biomass, or richness were indicated between downstream and upstream areas over the three years (Table 5.3; Figure 5.5). In addition, there were no consistent downstream-to-upstream differences in abundance or relative biomass of major phytoplankton groups (i.e., Chlorophyte, Chrysophyte, Diatom, Cryptophyte, Dinoflagellate) among years. The exception was Cyanophyte biomass which was consistently higher at the downstream area compared to the upstream area in all three years. This group represented a very small proportion of the community (<1%; Table 5.3) suggesting low

**Table 5.2:** **Monthly Means for Total Phosphorus, Chlorophyll-a, and Secchi Depth in Koocanusa Reservoir, Compared to Trophic Status Criteria for British Columbia (Nordin 1985)**

| Month | Total Phosphorus (µg/L) | | | | | Chlorophyll-a (µg/L) | | | | | Secchi depth (m) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RG_KERRRD | RG_DSELK | RG_GRASMERE | RG_USGOLD | RG_BORDER | RG_KERRRD | RG_DSELK | RG_GRASMERE | RG_USGOLD | RG_BORDER | RG_KERRRD | RG_DSELK | RG_GRASMERE | RG_USGOLD | RG_BORDER |
| Jan-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Feb-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Mar-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Apr-15 | 9.5 | 7.5 | 7.2 | 6.6 | 5.6 | 0.19 | 0.46 | 0.47 | 1.0 | 0.85 | 0.70 | 1.0 | 1.3 | 1.5 | 2.8 |
| May-15 | 11 | 8.1 | 7.5 | 7.1 | 5.7 | 0.25 | 0.49 | 0.42 | 0.56 | 0.34 | 0.60 | 0.84 | 1.0 | 1.2 | 2.0 |
| Jun-15 | 7.6 | 5.0 | 5.6 | 4.0 | 3.6 | 0.50 | 1.1 | 1.3 | 1.4 | 1.3 | 1.2 | 2.4 | 2.7 | 2.6 | 2.5 |
| Jul-15 | 3.3 | 2.8 | 2.4 | 3.7 | 3.0 | 0.90 | 1.4 | 1.1 | 0.54 | 0.87 | 4.0 | 3.6 | 3.7 | 3.6 | 3.6 |
| Aug-15 | 4.5 | 2.4 | 2.1 | 3.5 | 6.8 | 1.5 | 1.7 | 1.4 | 1.7 | 1.4 | 1.9 | 2.0 | 2.4 | - | - |
| Sep-15 | 2.7 | 3.6 | 4.1 | 36 | 2.7 | 1.5 | 2.6 | 1.6 | 1.5 | 1.8 | 3.0 | 3.3 | - | 3.7 | 3.7 |
| Oct-15 | 2.3 | 3.0 | 2.6 | 2.2 | 2.4 | 1.3 | 1.2 | 1.6 | 1.6 | 1.6 | 6.3 | 4.6 | 4.7 | 4.0 | 3.9 |
| Nov-15 | 2.0 | 2.0 | 2.3 | 2.0 | 2.0 | 1.9 | 1.7 | 2.0 | 1.7 | 1.9 | 3.5 | 3.0 | 3.0 | 3.3 | 3.0 |
| Dec-15 | - | 8.0 | 3.8 | 2.9 | 3.3 | - | 0.82 | 1.9 | 1.3 | 0.90 | - | 4.0 | 4.0 | 4.0 | 4.0 |
| Jan-16 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Feb-16 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Mar-16 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Apr-16 | - | 31 | 22 | 19 | 12 | - | 0.98 | 1.2 | 2.0 | 2.0 | - | 0.36 | 0.59 | 0.81 | 1.2 |
| May-16 | 9.7 | 11 | 9.9 | 11 | 10 | 0.24 | 0.41 | 0.51 | 0.92 | 1.7 | 0.74 | 0.85 | 1.4 | 1.6 | 1.8 |
| Jun-16 | 8.4 | 8.2 | 8.5 | 6.1 | 6.4 | 0.94 | 3.1 | 3.2 | 3.5 | 3.9 | 2.3 | 2.6 | 2.9 | 2.5 | 2.5 |
| Jul-16 | 4.1 | 4.5 | 5.3 | 5.5 | 3.9 | 3.5 | 3.1 | 3.2 | 2.8 | 2.2 | 2.6 | 3.2 | 3.1 | 3.5 | 3.1 |
| Aug-16 | 3.9 | 4.8 | 3.1 | 2.8 | 2.0 | 1.4 | 2.2 | 1.8 | 2.2 | 1.7 | 1.3 | 2.5 | 2.8 | 2.3 | 2.6 |
| Sep-16 | 3.9 | 8.5 | 3.1 | 6.0 | 3.0 | 1.5 | 1.8 | 2.0 | 1.9 | 1.9 | 4.6 | 4.1 | 4.2 | 3.9 | 3.5 |
| Oct-16 | 4.1 | 4.0 | 5.8 | 2.9 | 2.5 | 1.1 | 1.4 | 1.6 | 1.4 | 1.2 | 5.3 | 5.8 | 4.9 | 5.1 | 3.2 |
| Nov-16 | 4.7 | 2.0 | 2.9 | 2.0 | 3.1 | 1.0 | 1.7 | 1.6 | 1.3 | 1.3 | 4.0 | 4.0 | 4.0 | 4.3 | 4.1 |
| Dec-16 | 3.8 | 3.8 | 3.8 | 2.8 | 2.2 | 0.77 | 0.56 | 2.1 | 2.0 | 0.18 | 3.5 | 4.1 | 4.0 | 4.0 | 4.0 |
| **Mean** | **5.3** | **15** | **9.3** | **6.7** | **6.0** | **1.2** | **1.5** | **1.6** | **1.6** | **1.5** | **2.9** | **2.9** | **3.0** | **3.0** | **3.0** |
| **Median** | **4.1** | **4.8** | **4.7** | **3.7** | **3.5** | **1.1** | **1.4** | **1.6** | **1.6** | **1.5** | **2.8** | **3.1** | **3.0** | **3.5** | **3.1** |
| **Minimum** | **2.0** | **2.0** | **2.1** | **2.0** | **2.0** | **0.19** | **0.41** | **0.42** | **0.54** | **0.18** | **0.60** | **0.36** | **0.59** | **0.81** | **1.2** |
| **Maximum** | **11** | **163** | **60** | **36** | **29** | **3.5** | **3.1** | **3.2** | **3.5** | **3.9** | **6.3** | **5.8** | **4.9** | **5.1** | **4.1** |
| **SD** | **2.8** | **32** | **13** | **8.1** | **5.9** | **0.81** | **0.85** | **0.77** | **0.72** | **0.83** | **1.7** | **1.5** | **1.3** | **1.2** | **0.84** |

🟩 Oligotrophic
🟦 Mesotrophic
🟥 Eutrophic

Note: Station RG_KERRRD is located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream.
SD = Standard Deviation

**Table 5.3: Statistical Summary of Spatial and Temporal Differences in Phytoplankton Community Endpoints in Koocanusa Reservoir in the Area Downstream from the Elk River (T4) Compared to the Upstream Area (T2/TN), 2014 to 2016**

| Endpoint | | Trans-formation | Measure of Central Tendency (Mean, Geometric Mean, or Median)[a] | | | | | | Model P-values | | | Contrasts | | | Significant Differences and Magnitudes of Difference (%) | | | Significant Differences and Magnitudes of Difference (number of SD) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2014 | | 2015 | | 2016 | | Area × Year | Area | Year | Area × Year<br>Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | |
| | | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Density (# cells/L) | | log | 4,403,235 | 4,246,195 | 14,877,257 | 12,544,803 | 2,329,525 | 3,319,527 | 0.381 | 0.757 | <0.001 | - | - | - | - | | | - | | |
| Biomass (µg/L dw) | | log | 946 | 904 | 4,259 | 3,117 | 463 | 627 | 0.265 | 0.905 | <0.001 | - | - | - | - | | | - | | |
| Richness | | none | 25 | 25 | 19 | 18 | 23 | 25 | 0.519 | 0.631 | <0.001 | - | - | - | - | | | - | | |
| Major Group Density (cells/L) | Cyanophyte | log(X+1) | 34 | 39 | 410 | 153 | 348 | 0 | 0.249 | 0.154 | 0.365 | - | - | - | - | | | - | | |
| | Chlorophyte | log | 46,957 | 73,083 | 253,756 | 195,201 | 31,152 | 90,544 | 0.224 | 0.185 | 0.001 | - | - | - | - | | | - | | |
| | Chrysophyte | rank | 592,088 | 683,280 | 396,830 | 317,664 | 387,936 | 581,904 | 0.003 | - | - | 0.579 | 0.094 | 0.001 | - | * (25%) | * (-33%) | - | * (0.079 SD) | * (-0.19 SD) |
| | Diatom | none | 3,787,276 | 3,549,904 | 13,529,517 | 11,876,080 | 2,123,555 | 2,433,347 | 0.431 | 0.408 | <0.001 | - | - | - | - | | | - | | |
| | Cryptophyte | none | 167,027 | 165,122 | 574,235 | 263,588 | 132,765 | 159,834 | 0.041 | - | - | 0.985 | 0.004 | 0.785 | - | * (118%) | - | - | * (2 SD) | - |
| | Dinoflagellate | log(X+1) | 2,740 | 2,848 | 16,788 | 3,232 | 447 | 1,672 | 0.235 | 0.890 | 0.058 | - | - | - | - | | | - | | |
| Major Groups Relative Density (%) | Cyanophyte | rank | 0 | 0 | 0.0014 | 0.0039 | 0.068 | 0 | 0.223 | 0.165 | 0.547 | - | - | - | - | | | - | | |
| | Chlorophyte | none | 1.2 | 1.8 | 2.3 | 1.9 | 1.5 | 3.1 | 0.212 | 0.183 | 0.349 | - | - | - | - | | | - | | |
| | Chrysophyte | none | 22 | 16 | 2.7 | 2.4 | 18 | 20 | 0.412 | 0.651 | <0.001 | - | - | - | - | | | - | | |
| | Diatom | none | 74 | 78 | 91 | 93 | 74 | 72 | 0.597 | 0.592 | <0.001 | - | - | - | - | | | - | | |
| | Cryptophyte | none | 3.1 | 3.7 | 3.8 | 2.1 | 5.7 | 4.7 | 0.327 | 0.284 | 0.015 | - | - | - | - | | | - | | |
| | Dinoflagellate | rank | 0.042 | 0.044 | 0.28 | 0.027 | 0.068 | 0.042 | 0.519 | 0.449 | 0.869 | - | - | - | - | | | - | | |
| Major Group Biomass (µg/L dw) | Cyanophyte | log(X+1) | 0.32 | 0.27 | 1.3 | 0.59 | 1.7 | 0 | 0.274 | 0.059 | 0.407 | - | - | - | * (283%) | | | * (2.1 SD) | | |
| | Chlorophyte | log | 2.3 | 4.4 | 10 | 7.4 | 2.2 | 5.4 | 0.327 | 0.243 | 0.045 | - | - | - | - | | | - | | |
| | Chrysophyte | rank | 63 | 43 | 38 | 45 | 28 | 44 | 0.071 | - | - | 0.155 | 0.836 | 0.060 | - | - | * (-36%) | - | - | * (-0.17 SD) |
| | Diatom | none | 889 | 835 | 4,099 | 3,049 | 457 | 517 | 0.016 | - | - | 0.845 | <0.001 | 0.831 | - | * (34%) | - | - | * (2.4 SD) | - |
| | Cryptophyte | rank | 16 | 17 | 111 | 37 | 33 | 39 | 0.076 | - | - | 0.780 | 0.024 | 0.355 | - | * (204%) | - | - | * (3.1 SD) | - |
| | Dinoflagellate | none | 31 | 34 | 22 | 18 | 21 | 28 | 0.820 | 0.735 | 0.335 | - | - | - | - | | | - | | |
| Major Groups Relative Biomass (%) | Cyanophyte | rank | 0 | 0 | 0.012 | 0.025 | 0.074 | 0 | 0.197 | 0.150 | 0.560 | - | - | - | - | | | - | | |
| | Chlorophyte | log | 0.24 | 0.48 | 0.24 | 0.24 | 0.47 | 0.86 | 0.653 | 0.205 | 0.062 | - | - | - | - | | | - | | |
| | Chrysophyte | log | 10 | 5.5 | 0.88 | 1.1 | 6.7 | 8.0 | 0.075 | - | - | 0.040 | 0.380 | 0.532 | * (83%) | - | - | * (1.4 SD) | - | - |
| | Diatom | rank | 82 | 88 | 96 | 97 | 79 | 81 | 0.297 | 0.252 | <0.001 | - | - | - | - | | | - | | |
| | Cryptophyte | rank | 2.1 | 2.2 | 2.2 | 1.3 | 8.2 | 5.9 | 0.075 | - | - | 0.604 | 0.026 | 0.534 | - | * (75%) | - | - | * (0.38 SD) | - |
| | Dinoflagellate | none | 4.4 | 3.6 | 0.49 | 0.55 | 5.2 | 4.7 | 0.954 | 0.735 | 0.014 | - | - | - | - | | | - | | |
| NMDS Axis 1[b] | | none | 0.93 | 0.81 | -0.90 | -0.70 | -0.20 | 0.061 | 0.374 | 0.349 | <0.001 | - | - | - | NA | | | - | | |

▨ p-value < 0.1.

* indicates a significant difference between the two areas at an α of 0.1.

[a] The measure of central tendency reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for $\log_{10}$-transformation; and, median for rank-transformation.

[b] NMDS conducted using $\log_{10}$-transformed LPL taxonomy abundance matrix.

NA indicates not applicable as the calculation of percent differences is not appropriate for variables with both positive and negative scores.

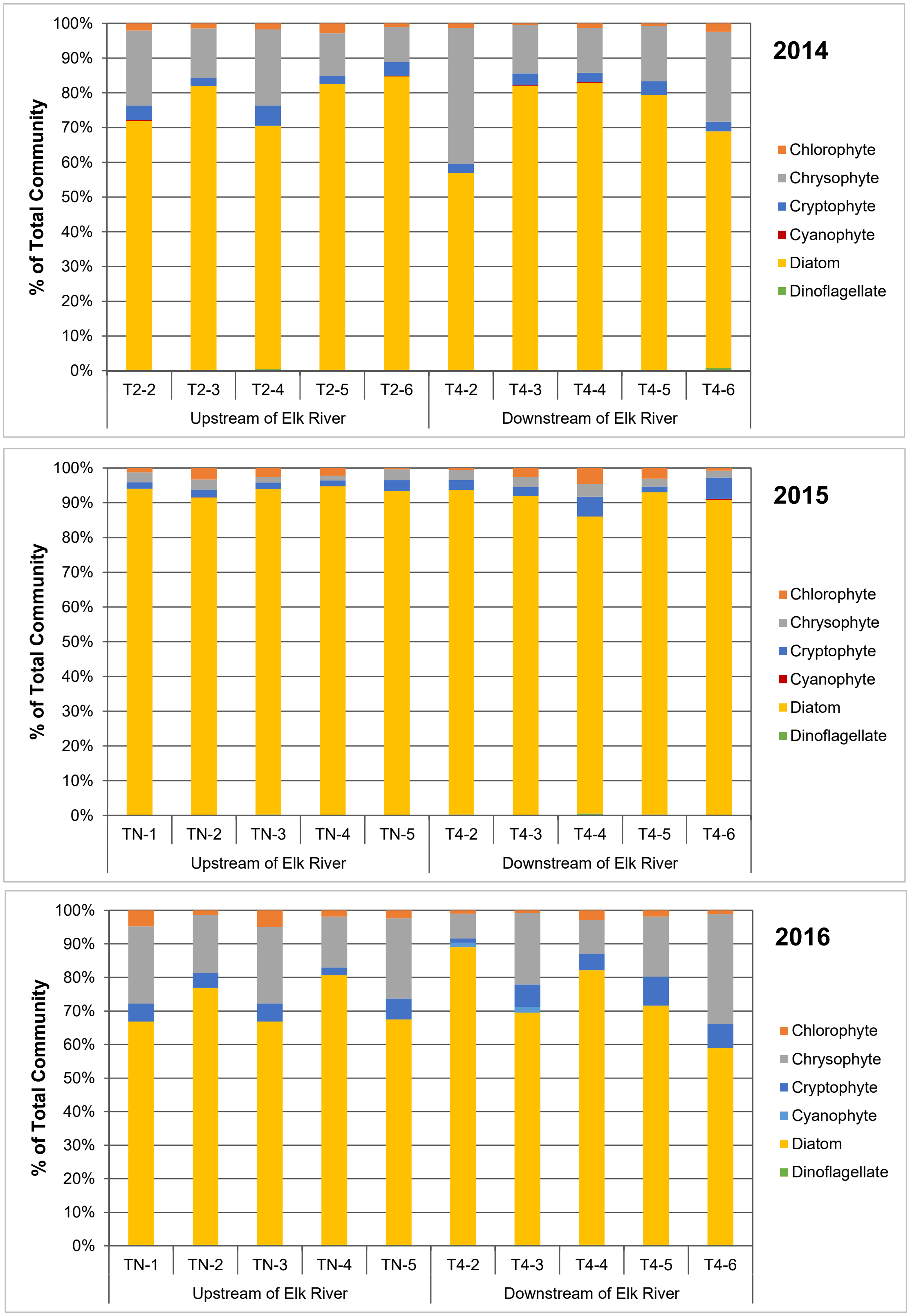

**Figure 5.3: Relative Density of Major Phytoplankton Groups in Koocanusa Reservoir, August 2014, 2015, and 2016**

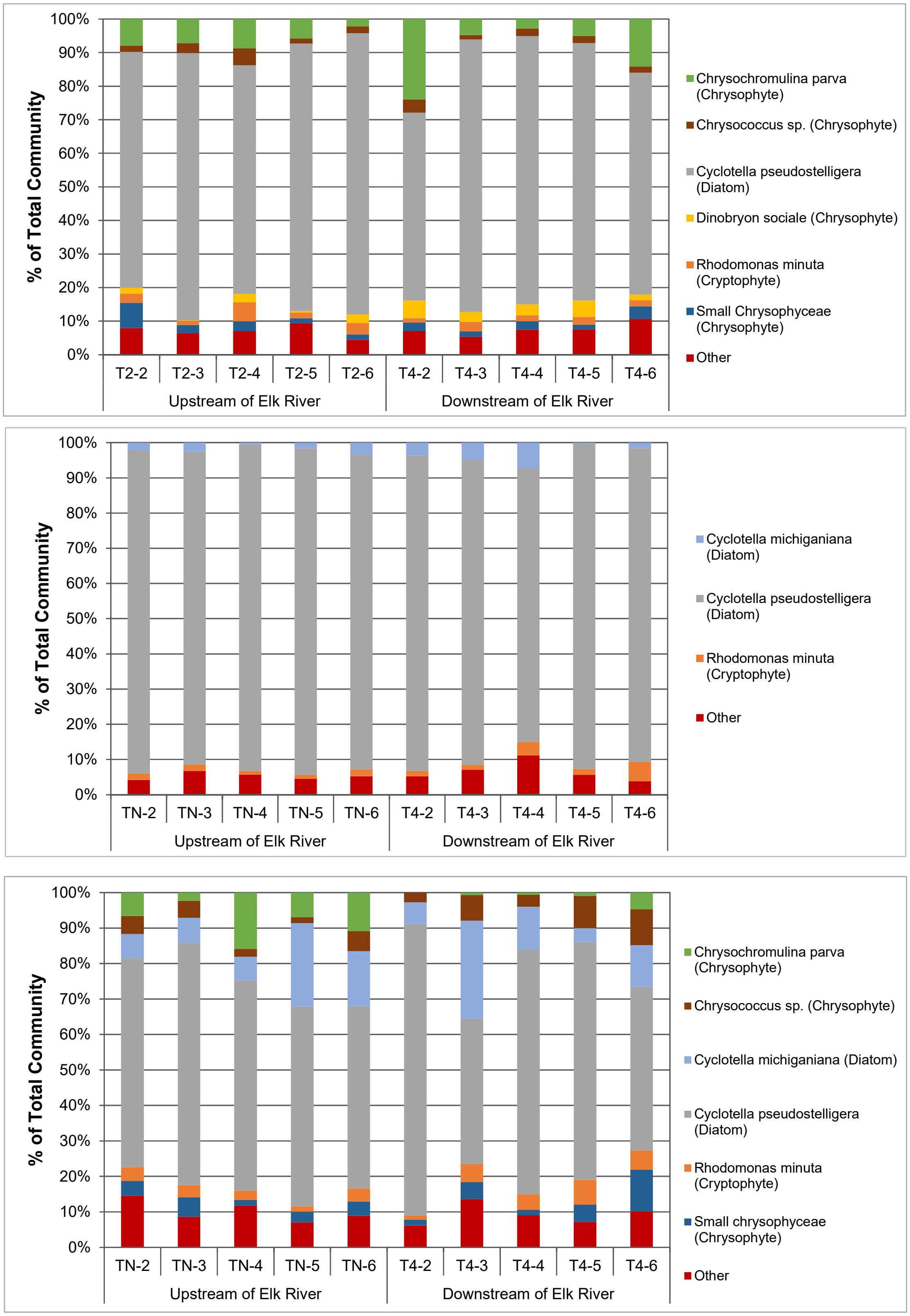

**Figure 5.4:** **Relative Density of Phytoplankton Taxa in Koocanusa Reservoir, August 2014, 2015, and 2016**

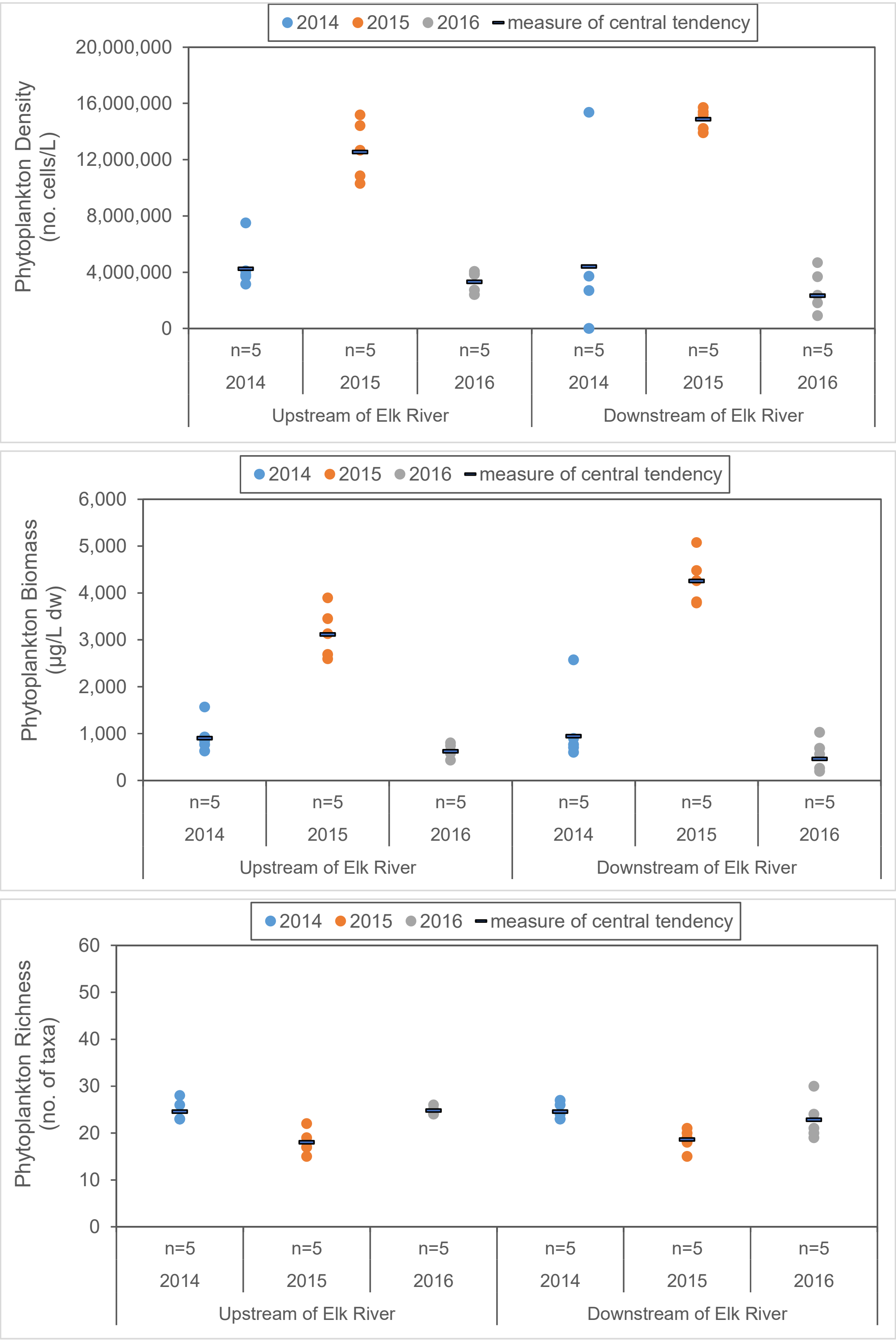

**Figure 5.5:** **Phytoplankton Density (no. cells/L), Biomass (µg/L dw), and Richness (no. of taxa) in Koocanusa Reservoir, August 2014, 2015, and 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016

' * ' indicates the downstream area was significantly different from the upstream area in the same year.

ecological relevance. Overall phytoplankton community composition, as summarized by NMDS, did not differ between upstream and downstream areas within each of the three years, but varied among years (Figure 5.6; Table 5.3, Appendix Tables D.26 to D.28. Large year-to-year variation in the percent composition of major algal groups was observed from 1975 to 1988 (Hamilton et al. 1990).

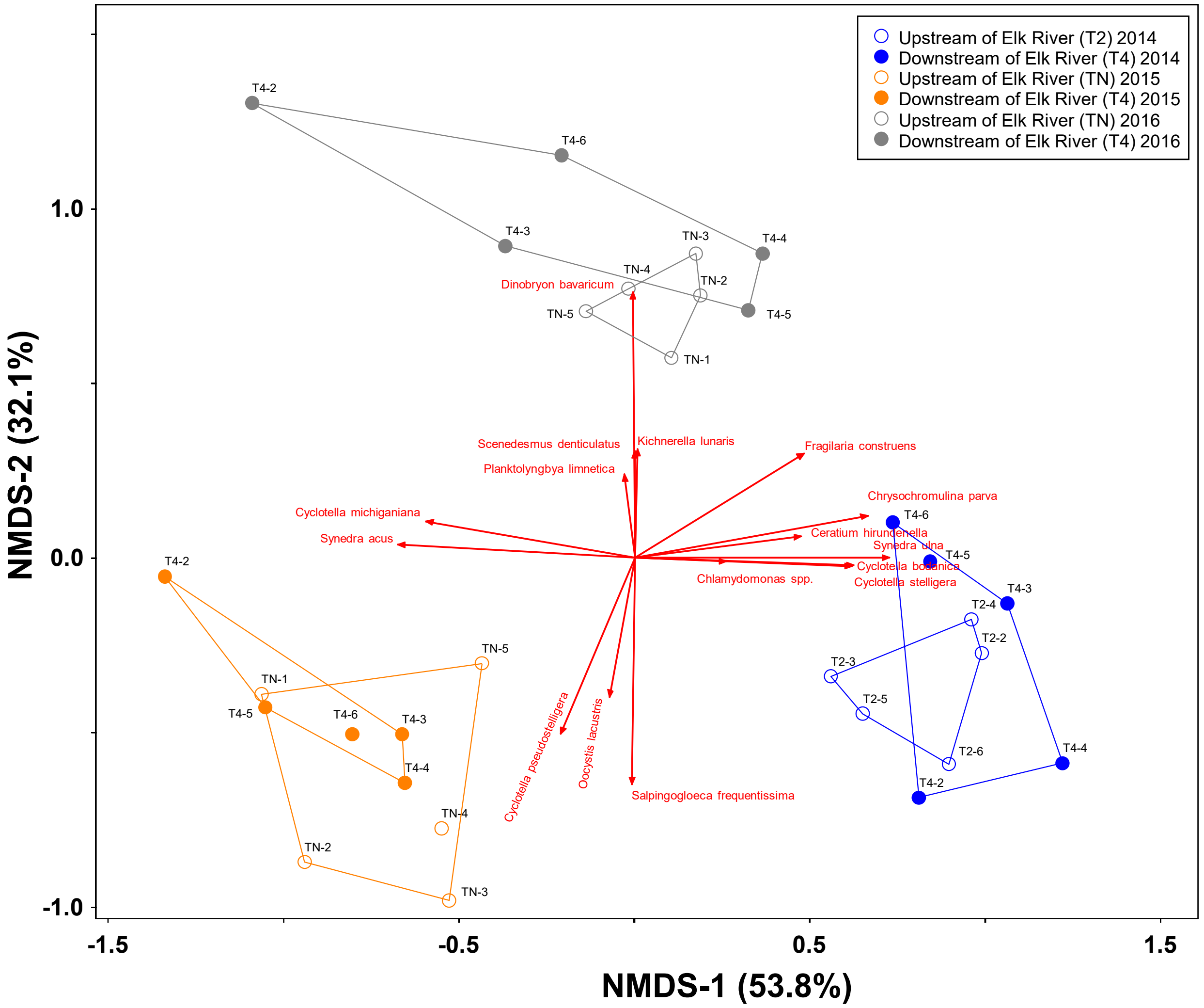

**Figure 5.6: Phytoplankton Community Structure (Lowest Practical Level of Taxonomy) in Koocanusa Reservoir as Summarized by NMDS, 2014 to 2016**

Notes: Data (n=5 per area and year) were assessed using $\log_{10}$ transformed absolute density and the Bray-Curtis distance measure. Displayed vectors reflect significant ($p < 0.05$) absolute Pearson correlation coefficients (r-value) greater than 0.5.

NMDS - Non-Metric Multidimensional Scaling.

## 5.4 Zooplankton

### 5.4.1 Community Structure

The zooplankton community in Koocanusa Reservoir was numerically dominated by rotifers and copepods, with relatively low numbers of cladocerans (Table 5.4, Figure 5.7; Appendix Tables D.29 to D.55 and Figures D.7 to D.10). However, the smaller size of rotifers resulted in a considerably lower relative biomass compared to copepods. Consequently, copepods dominated the zooplankton community biomass both upstream and downstream from the Elk River in all three years, except at the upstream area in 2016, when cladocera were dominant (Table 5.4). The numerically dominant taxa (i.e., those representing >5% of the community at one or more stations in each year) were similar between areas in each year, but varied among years (Figure 5.8). No consistent differences were observed between downstream and upstream areas in overall zooplankton density, biomass, or richness, or in absolute or relative density or biomass of copepods or rotifers, over the three years of study (Table 5.4; Figure 5.9). Absolute and relative cladoceran density and biomass were lower at the downstream area compared to upstream in all three years (absolute density and biomass), or in the latter two years (relative density and biomass). Some cladocerans are predacious, but most species are herbivorous and feed on phytoplankton, organic matter, and bacteria. As described in Sections 5.2 and 5.3, phytoplankton density and biomass were similar between downstream and upstream areas; and chlorophyll-a was higher downstream compared to upstream, suggesting that fewer cladocerans downstream of the Elk River was likely not due to food limitations.

Most variability in overall zooplankton community structure was captured on NMDS-Axis 1 (91.7%) and organisms contributing to the separation of areas along Axis-1 included a variety of copepods, cladocerans, and rotifers (Figure 5.10; Appendix Tables D.53 to D.55). Stations at the downstream area had more positive scores on NMDS-Axis 1 in 2014 and 2015 and more negative scores in 2016, compared to the upstream area, indicating that community differences between upstream and downstream areas were likely not associated with influence from the Elk River. The largest changes in community structure were associated with sampling year with no overlap in community structure between any of the three years on NMDS-Axis 1 (Figure 5.10). Differences between the downstream and upstream areas of the Elk River in 2015 and 2016 were significant; but in opposite directions, as noted above (Table 5.4; Figure 5.10).

Studies that examined zooplankton data collected from 1973 to 1988 reported that species composition was generally consistent among years (Hamilton et al. 1990; Richards 1997). The predominant genera of zooplankton collected were *Daphnia*, *Diaptomus*, and *Cyclops*. Total zooplankton biomass was considered low, consistent with an oligotrophic system

## Table 5.4: Statistical Summary of Spatial and Temporal Differences in Zooplankton Community Endpoints in Koocanusa Reservoir in the Area Downstream from the Elk River (T4) Compared to the Upstream Area (T2/TN), 2014 to 2016

| Endpoint | | Transformation | Measure of Central Tendency (Mean, Geometric Mean, or Median)$^{a}$ | | | | | | Model P-values | | | Contrasts Area × Year | | | Significant Differences and Magnitudes of Difference (%) | | | Significant Differences and Magnitudes of Difference (number of SD) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2014 | | 2015 | | 2016 | | Area×Year | Area | Year | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | |
| | | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Density (# organisms/L) | | none | 73 | 93 | 3.5 | 6.4 | 33 | 26 | 0.013 | - | - | 0.003 | 0.631 | 0.232 | * (-22%) | - | - | * (-2.1 SD) | - | - |
| Biomass (µg/L dw) | | none | 88 | 91 | 2.7 | 6.1 | 61 | 53 | 0.734 | 0.955 | <0.001 | - | - | - | - | | | - | | |
| Richness (# taxa) | | none | 20 | 21 | 14 | 17 | 17 | 17 | 0.064 | - | - | 0.670 | 0.001 | 0.397 | - | * (-20%) | - | - | * (-2.3 SD) | - |
| Major Group Density (organisms/L) | Copepod | none | 23 | 25 | 0.81 | 1.4 | 11 | 5.8 | 0.110 | 0.519 | <0.001 | - | - | - | - | | | - | | |
| | Cladocera | rank | 1.6 | 2.1 | 0.11 | 0.42 | 1.4 | 3.2 | 0.351 | 0.003 | <0.001 | - | - | - | * (-35%) | | | * (-0.87 SD) | | |
| | Rotifera | none | 49 | 66 | 2.6 | 4.5 | 20 | 16 | 0.005 | - | - | <0.001 | 0.663 | 0.379 | * (-27%) | - | - | * (-2.6 SD) | - | - |
| Major Group Relative Density (%) | Copepod | none | 31 | 26 | 23 | 23 | 32 | 23 | 0.064 | - | - | 0.092 | 0.993 | 0.002 | * (18%) | - | * (42%) | * (1.1 SD) | - | * (2.2 SD) |
| | Cladocera | none | 2.1 | 2.1 | 3.4 | 7.8 | 6.1 | 14 | 0.002 | - | - | 1.000 | 0.004 | <0.001 | - | * (-57%) | * (-56%) | - | * (-2 SD) | * (-3.5 SD) |
| | Rotifera | none | 67 | 71 | 73 | 69 | 62 | 64 | 0.136 | 0.722 | 0.002 | - | - | - | - | | | - | | |
| Major Group Biomass (µg/L dw) | Copepod | log | 66 | 70 | 2.2 | 4.1 | 37 | 16 | <0.001 | - | - | 0.832 | 0.011 | 0.001 | - | * (-47%) | * (130%) | - | * (-1.8 SD) | * (2.3 SD) |
| | Cladocera | rank | 13 | 16 | 0.16 | 1.3 | 14 | 33 | 0.413 | 0.005 | <0.001 | - | - | - | * (-20%) | | | * (-0.38 SD) | | |
| | Rotifera | log | 3.1 | 4.2 | 0.12 | 0.19 | 0.98 | 1.00 | 0.208 | 0.016 | <0.001 | - | - | - | * (-24%) | | | * (-0.95 SD) | | |
| Major Group Relative Biomass (%) | Copepod | log | 80 | 78 | 89 | 71 | 65 | 31 | <0.001 | - | - | 0.808 | 0.022 | <0.001 | - | * (25%) | * (113%) | - | * (1.5 SD) | * (5.2 SD) |
| | Cladocera | rank | 16 | 18 | 6.0 | 24 | 34 | 64 | 0.027 | - | - | 0.952 | <0.001 | 0.009 | - | * (-75%) | * (-47%) | - | * (-2.0 SD) | * (-3.4 SD) |
| | Rotifera | none | 3.8 | 4.7 | 5.1 | 3.4 | 1.8 | 2.0 | 0.046 | - | - | 0.215 | 0.026 | 0.850 | - | * (49%) | - | - | * (1.5 SD) | - |
| NMDS Axis 1$^{b}$ | | none | -0.81 | -0.98 | 1.5 | 0.79 | -0.36 | -0.15 | <0.001 | - | - | 0.151 | <0.001 | 0.083 | NA | NA | NA | - | * (3.9 SD) | * (-1.1 SD) |

▨ p-value < 0.1.

* indicates a significant difference between the two areas at an α of 0.1.

[a] The measure of central tendency reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for log$_{10}$-transformation; and, median for rank-transformation.

[b] NMDS conducted using fouth-root transformed LPL taxanomy abundance matrix.

NA indicates not applicable as the calculation of percent differences is not appropriate for variables with both positive and negative scores.

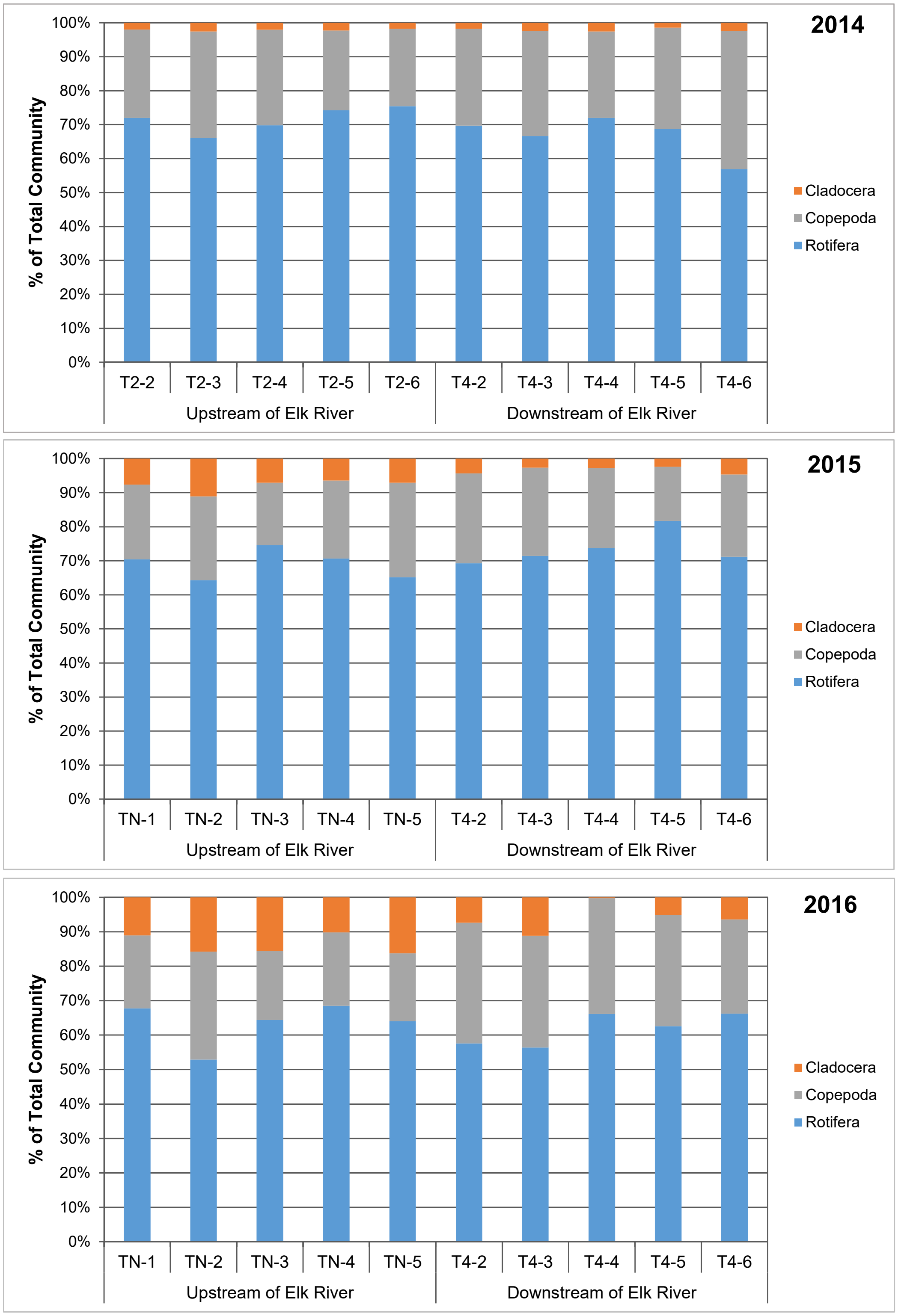

**Figure 5.7: Relative Density of Major Zooplankton Groups in Koocanusa Reservoir, August 2014, 2015, and 2016**

Note: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.

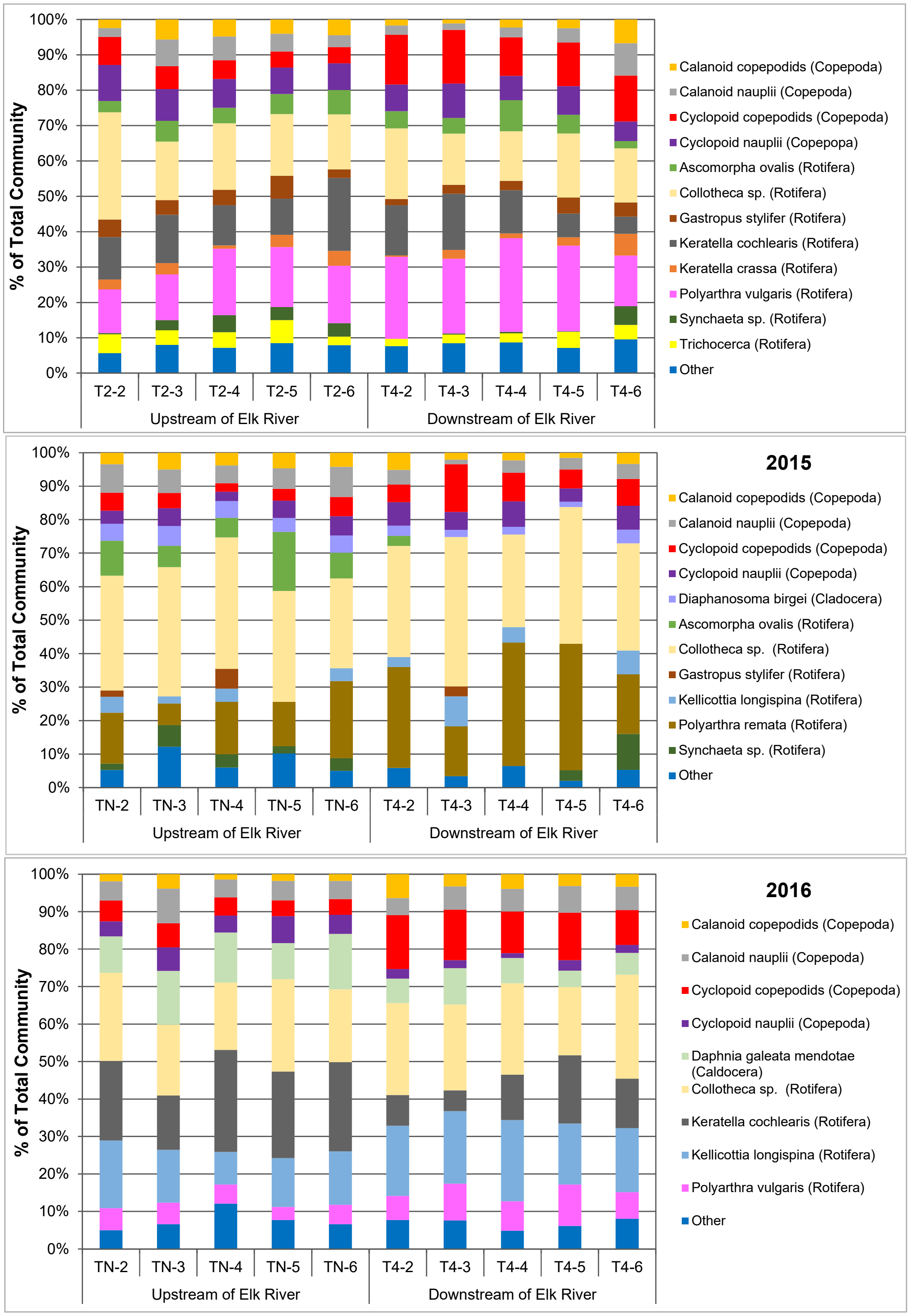

**Figure 5.8:** **Relative Density of Major Zooplankton Groups in Koocanusa Reservoir, August 2014, 2015, to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016. Only taxa comprising at least 5% of the total number of cells at one or more stations are depicted individually.

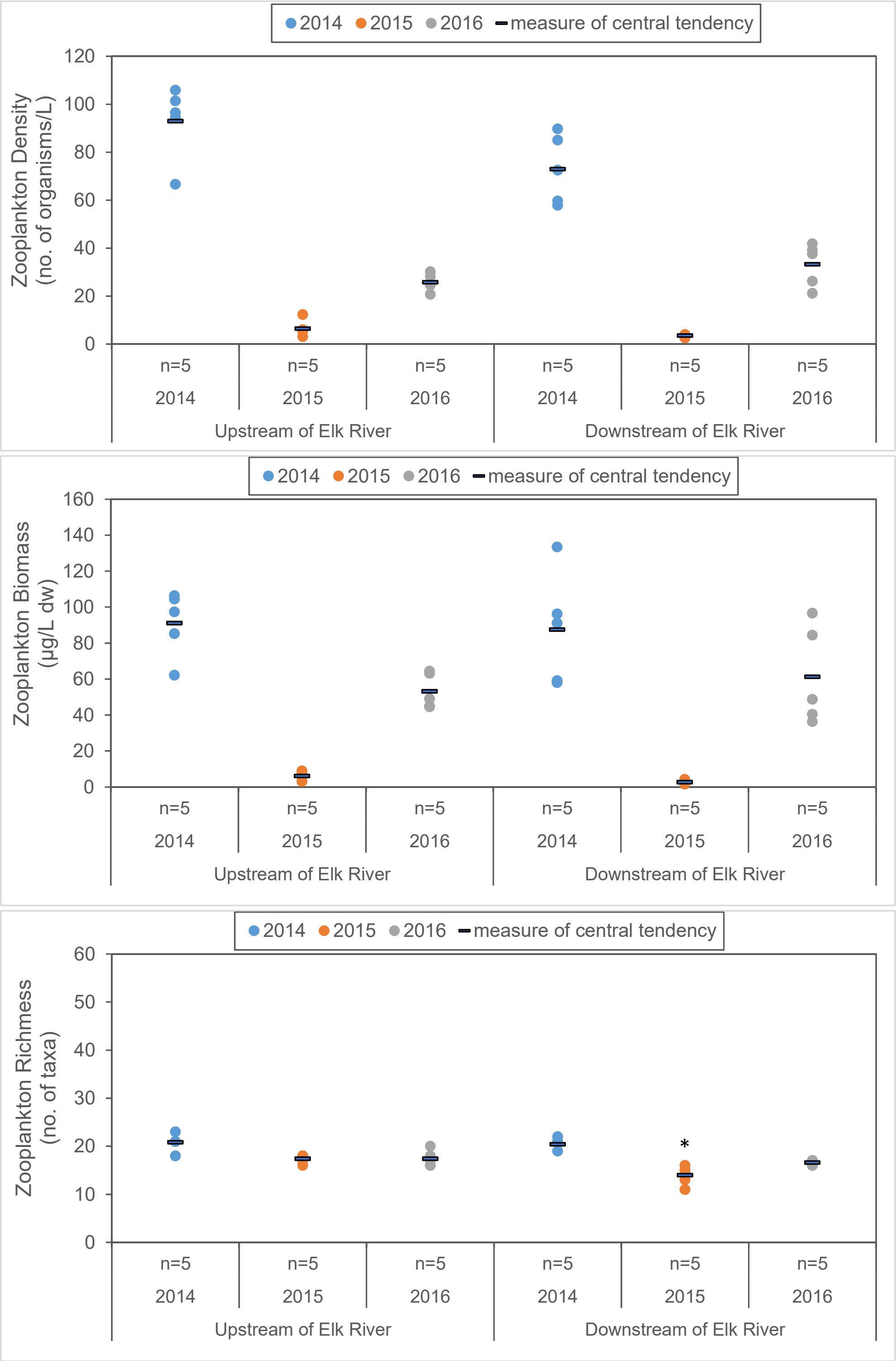

**Figure 5.9: Relative Density of Zooplankton Taxa in Koocanusa Reservoir, August 2014, 2015, to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.

' * ' indicates the downstream area was significantly different from the upstream area in the same year.

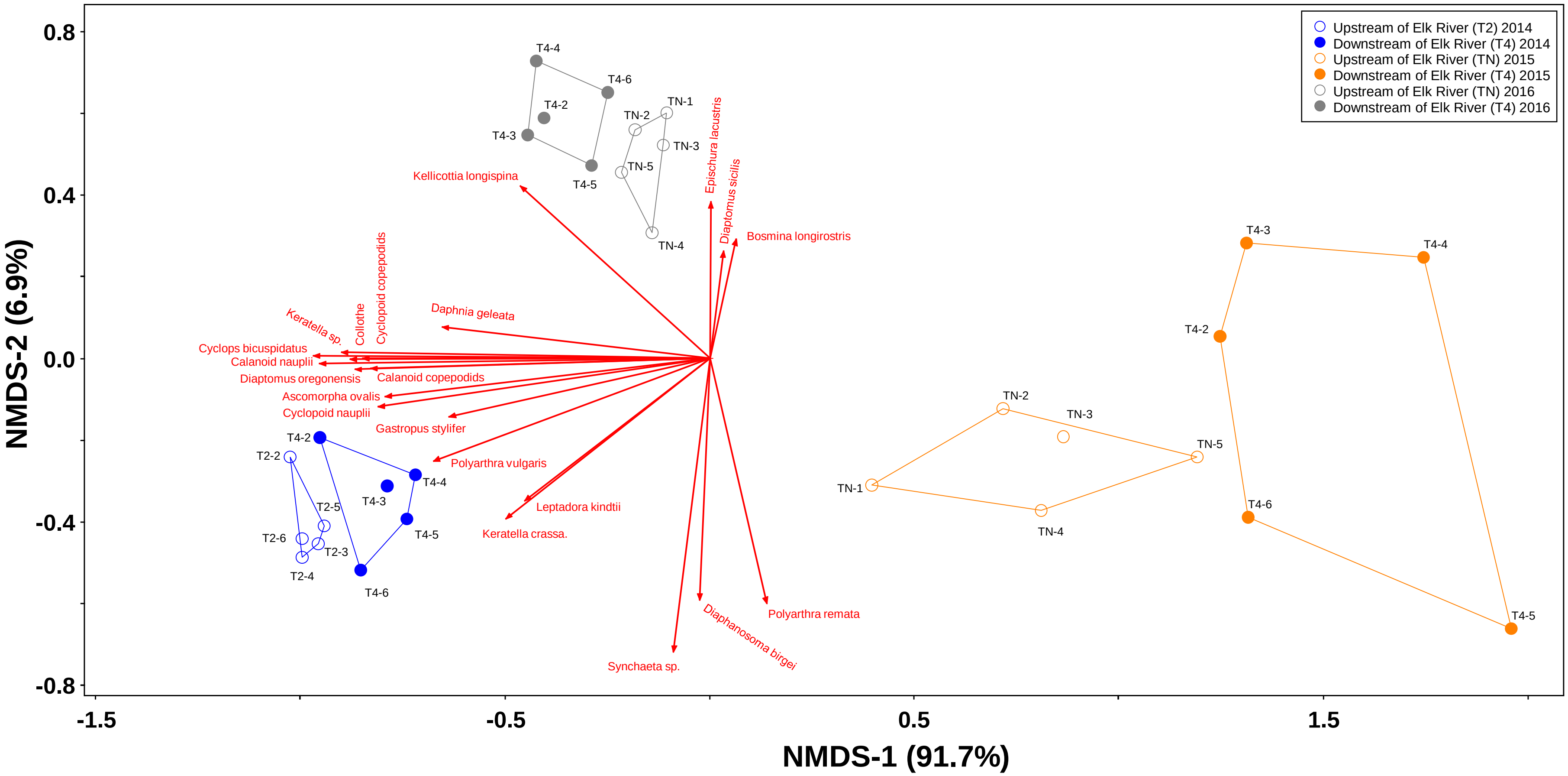

**Figure 5.10: Zooplankton Community Structure (Lowest Practical Level of Taxonomy) in Koocanusa Reservoir as Summarized by NMDS, 2014 to 2016**

Note: Data (n=5 per area and year) were assessed using fourth root transformed absolute density data and the Bray-Curtis distance measure. Displayed vectors reflect significant ($p < 0.05$) absolute Pearson correlation coefficients (r-value) greater than 0.5.
NMDS - Non-Metric Multidimensional Scaling.

(Hamilton et al. 1990). Inverse correlations between *Cyclops* and *Diaptomus* densities, and *Daphnia* and *Bosmina* densities, were considered potentially indicative of a cyclic kokanee population and size-selective fish predation in Koocanusa Reservoir (Dalbey et al. 1998).

### 5.4.2 Tissue Selenium Concentrations

Selenium concentrations in zooplankton in Koocanusa Reservoir did not differ significantly between downstream and upstream areas in any of the three sampling years (Figure 5.11; Table 5.5). The BC interim guideline for invertebrates (4 µg/g dw), EVWQP Level 1 benchmarks for potential effects to benthic invertebrates (13 µg/g dw) and for dietary effects to juvenile fish (11 µg/g dw) are presented as a basis of comparison. Mean selenium concentrations measured in zooplankton were above the BC interim guideline for invertebrates in 2015 only, and were below the Level 1 benchmarks in all study years both upstream and downstream from the Elk River (Figure 5.11; Appendix Table G.1).

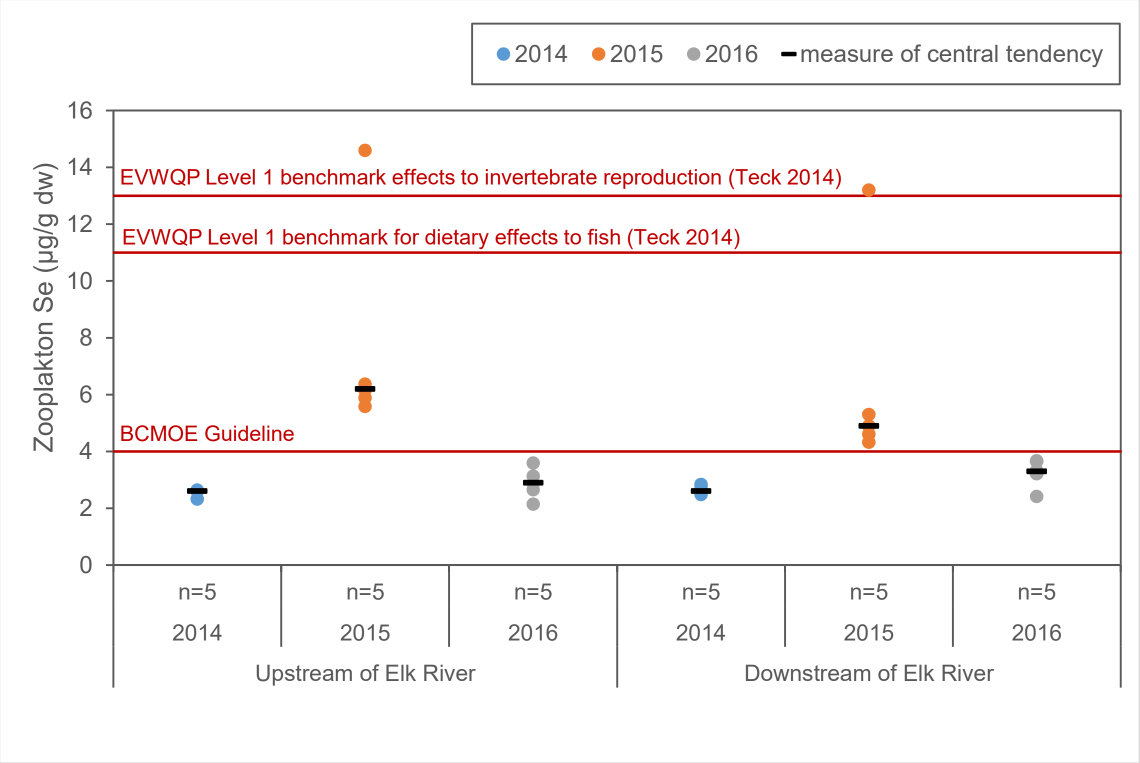

**Figure 5.11: Selenium Concentrations (µg/g dw) in Zooplankton in Koocanusa Reservoir, August 2014 to 2016**

Note: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.

' * ' indicates the downstream area was significantly different from the upstream area in the same year.

**Table 5.5:** Statistical Summary of Spatial and Temporal Differences in Zooplankton Selenium Concentrations in Koocanusa Reservoir in the Area Downstream from the Elk River (T4) Compared to the Upstream Area (T2/TN), 2014 to 2016

| Tissue | Trans-formation | Measure of Central Tendency (Median) | | | | | | Model P-values | | | Contrasts | | | Significant Differences and Magnitudes of Difference (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Area × Year | | | | | |
| | | 2014 | | 2015 | | 2016 | | Area×Year | Area | Year | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | |
| | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Zooplankton Selenium (µg/g dw) | rank | 2.6 | 2.6 | 4.9 | 6.2 | 3.3 | 2.9 | 0.188 | 0.549 | <0.001 | - | - | - | - | | |

▨ p-value < 0.1.

* indicates a significant difference between the two areas at an α of 0.1.

# 6 BENTHIC INVERTEBRATES

## 6.1 Overview

Benthic invertebrate community samples were collected in Koocanusa Reservoir in areas both upstream (T2/TN) and downstream (T4) from the Elk River in all three monitoring years (2014 to 2016) (Appendix Tables E.1 to E.16). Sampling occurred in August, when water levels are most stable (Figure 1.2) and benthic invertebrate communities are at or near maximum biomass and diversity (BCMOE 2006). Composite-taxa benthic invertebrate tissue samples were collected upstream (T2/TN) and downstream (T4) of the Elk River in both April and August for selenium and metals analysis.

## 6.2 Community Structure

Benthic invertebrate communities sampled in Koocanusa Reservoir upstream (T2/TN) and downstream (T4) of the Elk River were primarily composed of oligochaetes (mostly immature Tubificinae), insects (various species of chironomids), and ostracods in all three sample years (Figure 6.1; Appendix Tables E.1 to E.16). Total community density ranged from 984 to 3,533 organisms/m$^2$, which may be low compared to some reservoirs (e.g., Cowell and Hudson 1968), but brackets the value of 1,100 organisms/m$^2$ that Chisholm et al (1989) reported for samples collected in permanently wetted areas of Koocanusa Reservoir from 1983 to 1987.

Overall community density and richness did not differ significantly between upstream and downstream areas in any of the three study years (Table 6.1; Figure 6.2). However, community structure differed between areas, particularly with respect to ostracods, which were higher in density at the downstream area (range of 849 to 1,686 per m$^2$) compared to the upstream area (range of 38 to 333 per m$^2$) over the three years of study (Table 6.1). Absolute densities of oligochaetes were also significantly higher at the downstream area (range of 1,194 to 1,449 per m$^2$) compared to the upstream area (range of 418 to 1,194 per m$^2$; Table 6.1).

Beginning in 2015[11], ostracods were identified to species and *Cyntherissa lacustris* was found to be relatively abundant downstream and sparse upstream (Figure 6.3). *C. lacustris* is reputedly tolerant of a broad range in temperature (Danielopol et al. 1990; Külköylüoglu 2004), deep water (>40 m deep; Griffiths et al. 2002; Li et al. 2010), and DO concentrations as low as approximately 3 mg/L (Ruiz et al. 2013). The greater abundance of ostracods downstream of

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[11] Ostracods were only identified to order in 2014 based on the guidelines for sampling benthic invertebrates in BC streams (BCMOE 2006); however, after recognizing that they represented a large proportion of the community, ostracods were identified to species in 2015 and 2016.

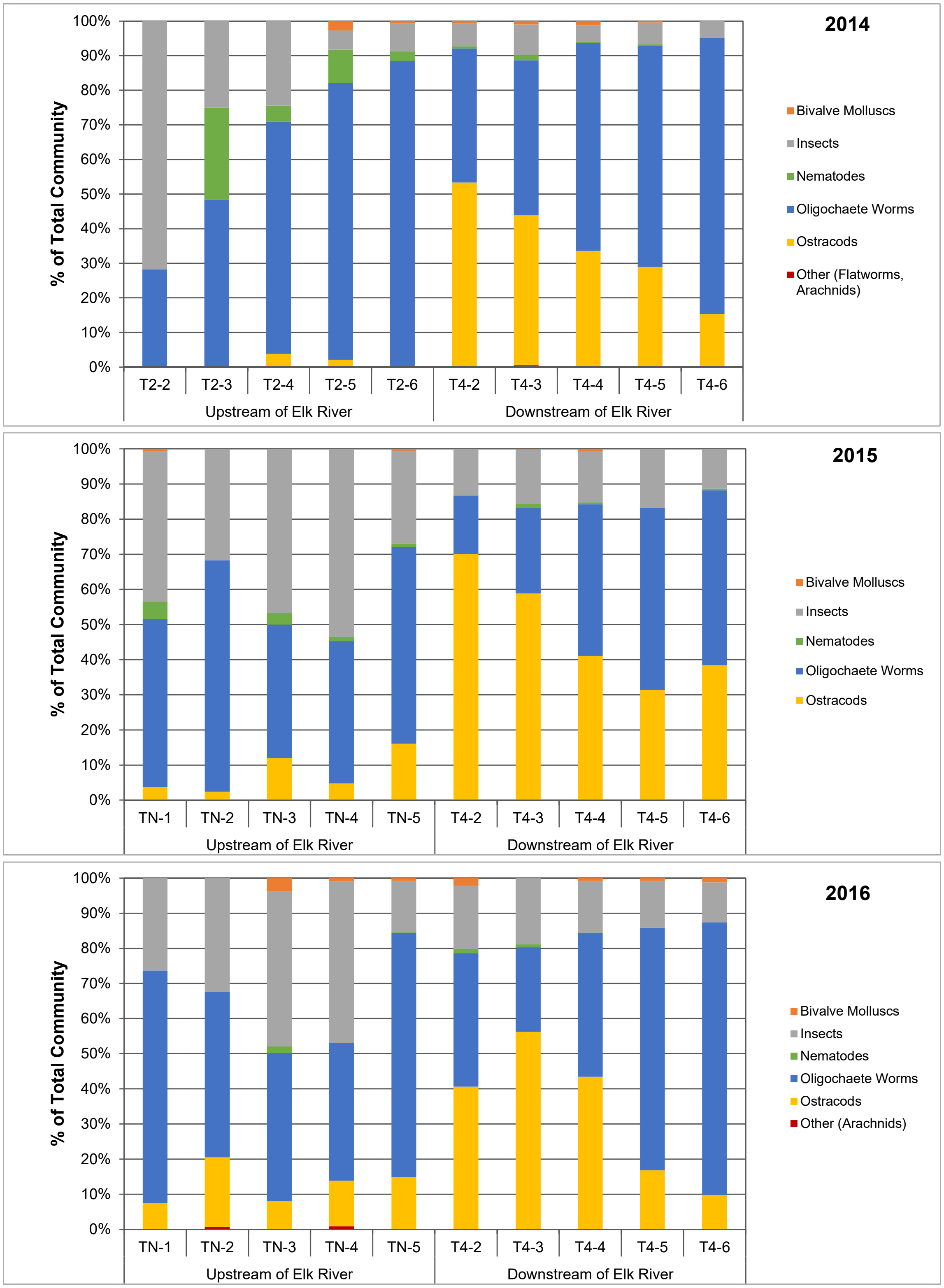

**Figure 6.1: Relative Density of Major Benthic Invertebrate Community Groups in Koocanusa Reservoir, August 2014 to 2016**

Note: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.

**Table 6.1: Statistical Summary of Spatial and Temporal Differences in Benthic Invertebrate Community Endpoints in Koocanusa Reservoir, 2014 to 2016**

| Endpoint | | Trans-formation | Measure of Central Tendency (Mean, Geometric Mean, or Median)[a] | | | | | | Model P-values | | | P-values for Contrasts | | | Magnitudes of Significant Differences | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Area×Year | | | % | | | Standard Deviations (SD) | | |
| | | | 2014 | | 2015 | | 2016 | | Area×Year | Area | Year | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | |
| | | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Density (no. of organisms/m²) | | none | 2,631 | 3,224 | 3,533 | 984 | 3,295 | 2,547 | 0.170 | 0.184 | 0.641 | - | - | - | - | | | - | | |
| Richness (no. of taxa) | | none | 10 | 10 | 10 | 11 | 13 | 13 | 0.859 | 0.536 | 0.024 | - | - | - | - | | | - | | |
| Major Group Density (no. of organisms/m²) | Nemata | log(X+1) | 7.6 | 62 | 10 | 12 | 3.4 | 2.8 | 0.386 | 0.320 | 0.121 | - | - | - | - | | | - | | |
| | Oligochaetes | log | 1,394 | 947 | 1,194 | 418 | 1,449 | 1,034 | 0.633 | 0.092 | 0.360 | - | - | - | * (81%) | | | * (0.64 SD) | | |
| | Ostracods | none | 849 | 38 | 1,686 | 91 | 1,241 | 333 | 0.152 | <0.001 | 0.110 | - | - | - | * (717%) | | | * (2.3 SD) | | |
| | Chironomids | none | 158 | 327 | 502 | 381 | 522 | 658 | 0.170 | 0.363 | 0.001 | - | - | - | - | | | - | | |
| | Bivalve Molluscs | log(X+1) | 8.8 | 5.2 | 2.0 | 1.5 | 16.2 | 7.6 | 0.956 | 0.500 | 0.188 | - | - | - | - | | | - | | |
| Major Group Relative Density (%) | Nemata | log(X+1) | 0.51 | 4.7 | 0.42 | 1.6 | 0.33 | 0.29 | 0.086 | - | - | 0.004 | 0.161 | 0.955 | * (-89%) | - | - | * (-3.4 SD) | - | - |
| | Oligochaetes | none | 57 | 62 | 37 | 50 | 50 | 53 | 0.822 | 0.313 | 0.142 | - | - | - | - | | | - | | |
| | Ostracods | none | 35 | 1.2 | 48 | 7.8 | 33 | 13 | 0.217 | <0.001 | 0.219 | - | - | - | * (437%) | | | * (2.6 SD) | | |
| | Chironomids | log | 6.1 | 18 | 14 | 39 | 15 | 30 | 0.661 | <0.001 | 0.002 | - | - | - | * (-61%) | | | * (-1.9 SD) | | |
| | Bivalve Molluscs | log(X+1) | 0.58 | 0.44 | 0.16 | 0.20 | 0.86 | 0.75 | 0.943 | 0.792 | 0.108 | - | - | - | - | | | - | | |
| NMDS Axis 1[b] | | - | 0.51 | -0.30 | -0.12 | -0.84 | 0.75 | -0.0044 | 0.972 | <0.001 | 0.001 | - | - | - | NA | | | * (1.6 SD) | | |

▨ = p-value < 0.1

* indicates a significant difference between the two areas at an α of 0.1.

[a] The measure of central tendency reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for $\log_{10}$-transformation; and, median for rank-transformation.

[b] NMDS conducted using $\log_{10}$-transformed LPL taxonomy abundance matrix.

NA indicates not applicable as the calculation of percent differences is not appropriate for variables with both positive and negative scores.

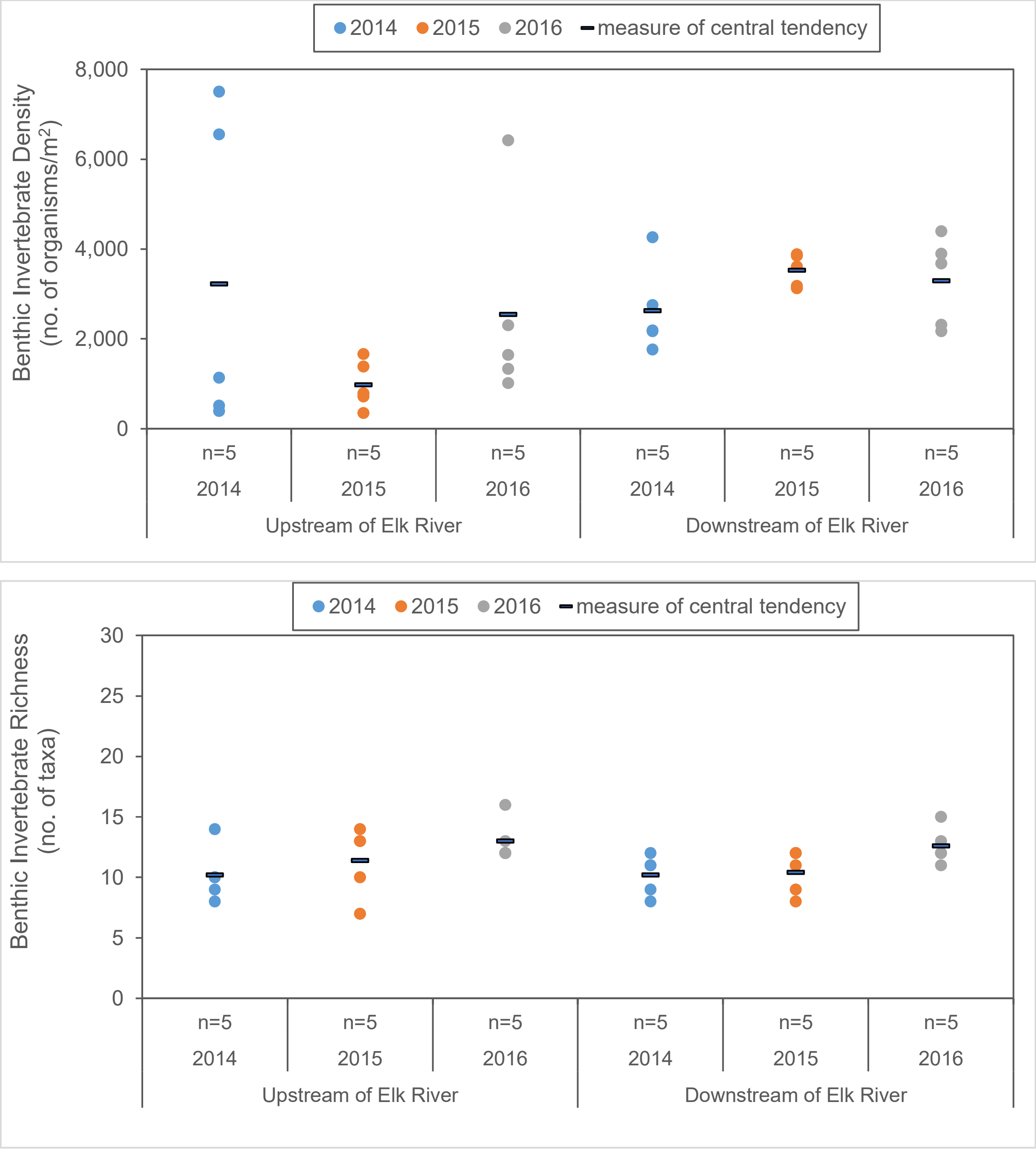

**Figure 6.2:** **Benthic Invertebrate Density (No. Organisms/m$^2$) and Richness (No. of Taxa) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016

' * ' indicates the downstream area was significantly different from the upstream area in the same year.

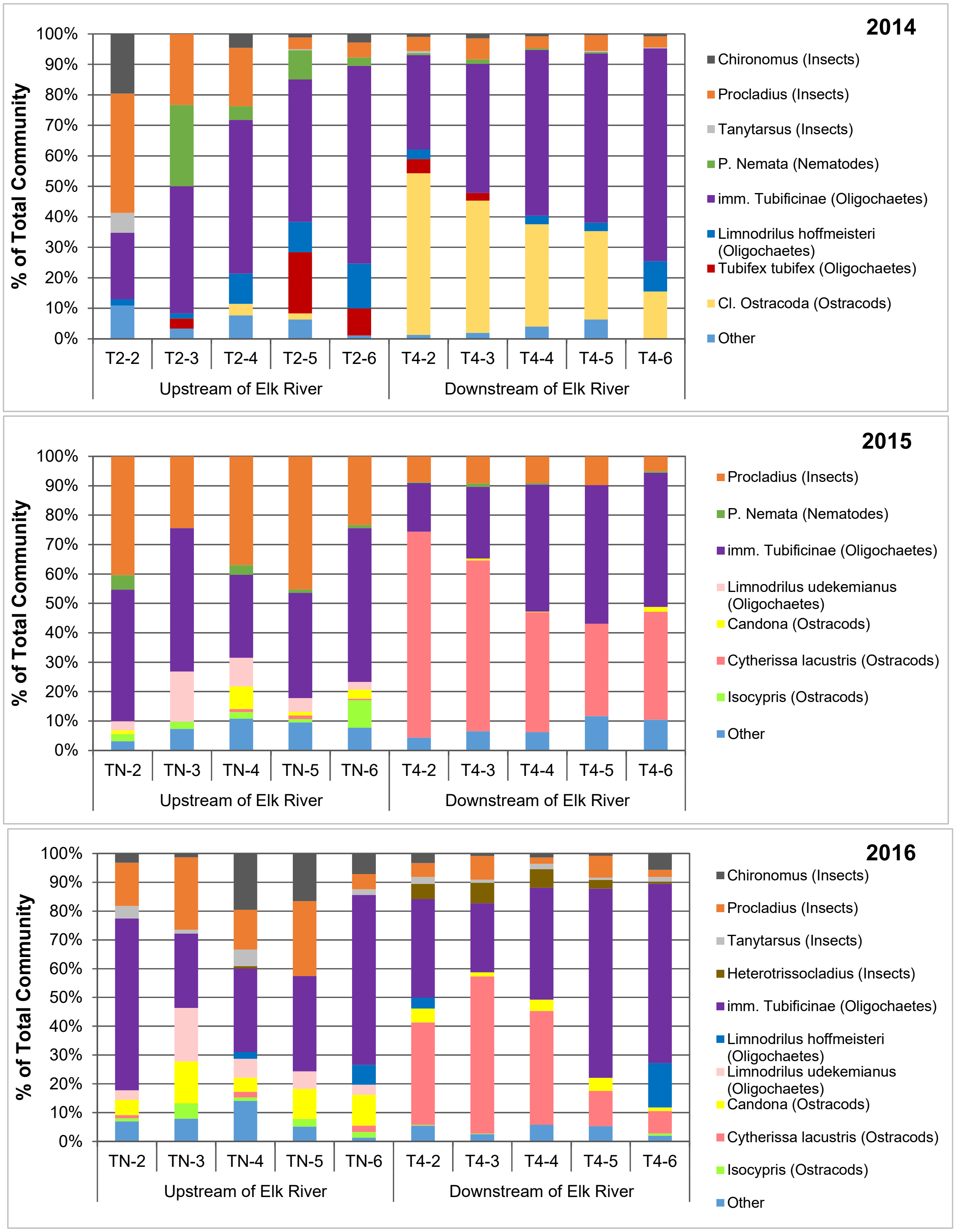

**Figure 6.3: Relative Density of Benthic Invertebrate Taxa in Koocanusa Reservoir, August 2014 to 2016**

Note: Only taxa comprising at least 5% of the total number of individuals at one or more stations are depicted individually.

the Elk River compared to upstream may be associated with greater depths (Appendix Tables B.1 to B.3), and/or lower bottom water velocities, which are favorable for the development of these microcrustaceans (Ruiz et al. 2013). Also, portions of the upper reservoir dry out during low pool, and Curry (2003) reported fewer ostracods in lakes that went dry.

Overall benthic invertebrate community structure, as summarized by NMDS-Axis 1 scores (explaining 53% of variability in community structure between areas), differed significantly between the downstream and the upstream study area, with a similar magnitude of difference among years (i.e., 1.6 SD; Table 6.1; Appendix Tables E.17 to E.19). In particular, the downstream area had higher Axis 1 scores in all three years with the difference mainly associated with a greater density of ostracods, and *Heterotrissocladius* and *Tanytarsus* midges (Figure 6.4), as identified in Table 6.1.

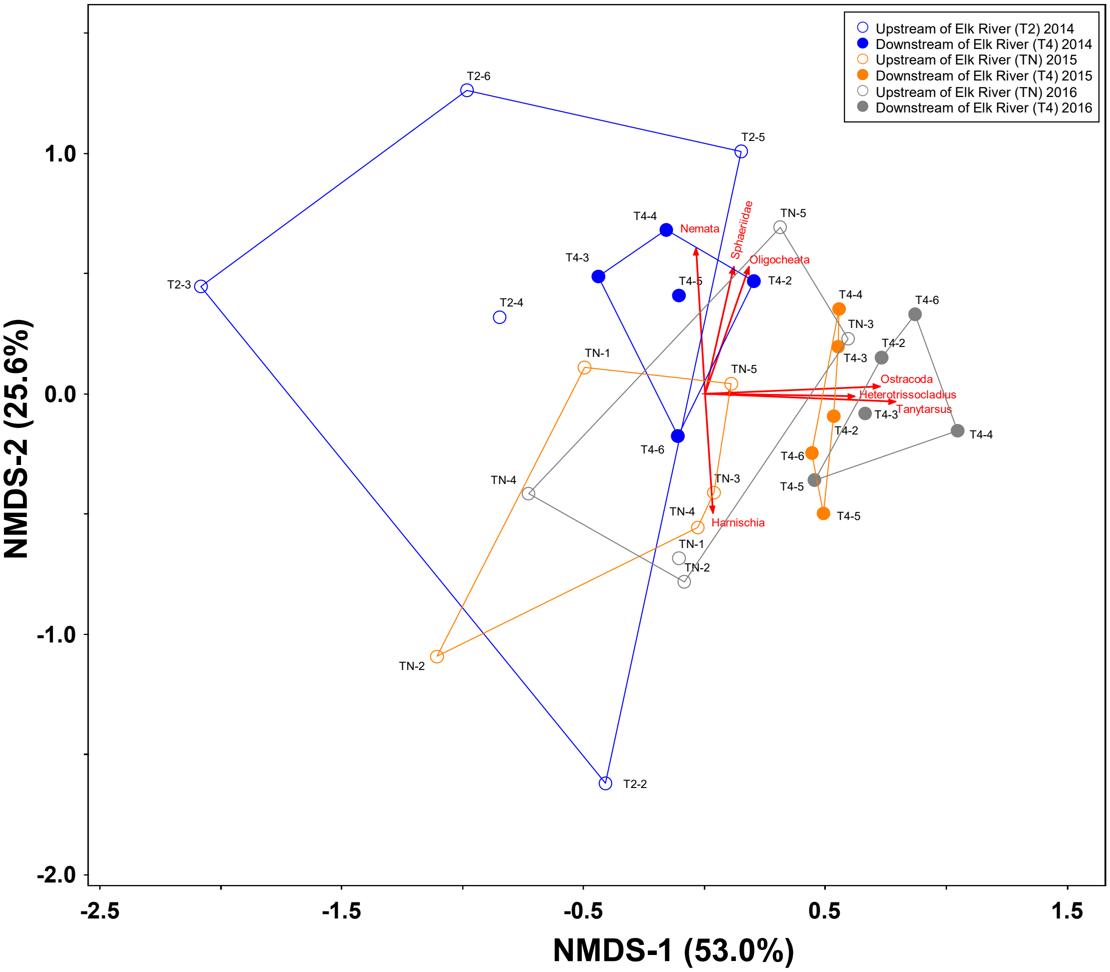

**Figure 6.4: Benthic Invertebrate Community Structure (Lowest Practical Level of Taxonomy) in Koocanusa Reservoir as Summarized by NMDS, 2014 to 2016**

Notes: Data (n=5 per area and year) were assessed using $\log_{10}$ transformed absolute density and the Bray-Curtis distance measure. Displayed vectors reflect significant ($p < 0.05$) absolute Pearson correlation coefficients (r-value) greater than 0.5. NMDS - Non-Metric Multidimensional Scaling.

## 6.3 Tissue Selenium Concentrations

Composite-taxa benthic invertebrate tissue samples collected in April and August consisted mainly of chironomids with some oligochaetes. Low densities resulted in very little tissue mass relative to the amount of area sampled at each location and time period (e.g., about 0.4 g wet weight in April 2015 from a total of 20 Petite Ponar grabs; Appendix Table G.1). Consequently, only a single tissue sample was obtained per area during each sampling event.

Benthic invertebrate selenium concentrations were 29% greater, on average, at the downstream area compared to the upstream area over the three years of study (Table 6.2). The difference in tissue concentrations between areas did not increase after the upstream station was moved farther upstream in early 2015, suggesting limited influence from the Elk River on tissue chemistry at the upstream station in 2014. Selenium concentrations at the downstream area ranged from 5.3 to 9.7 µg/g dw, compared to 2.0 to 7.8 µg/g dw at the upstream area over the three years of study (Figure 6.5; Appendix Table G.1;). Eleven of 12 samples collected between the two areas had tissue selenium concentrations above the interim BCMOE guideline of 4 µg/g dw (except the August sample for the upstream area in 2015). Concentrations in all samples were less than the EVWQP Level 1 benchmarks for potential effects to invertebrates (13 µg/g dw) and for dietary effects to fish (11 µg/g dw) (Figure 6.5).

## Table 6.2: Statistical Summary of Spatial and Temporal Differences in Benthic Invertebrate Tissue Selenium Concentrations in Koocanusa Reservoir, 2014 to 2016

| Tissue | Trans-formation | Measure of Central Tendency (Median)[a] | | | | | | Model P-values | | | Contrasts | | | Magnitudes of Significant Differences | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Area×Year | | | % | | |
| | | 2014 | | 2015 | | 2016 | | Area×Year | Area | Year | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | |
| | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Benthic Invertebrate Selenium (µg/g dw) | rank | 6.8 | 4.4 | 6.1 | 3.9 | 7.9 | 6.6 | 0.541 | ▨ 0.087 | 0.272 | - | - | - | * (29%) | | |

▨ p-value < 0.1.

* indicates a significant difference between the two areas at an α of 0.1.

[a] Each value only represents two sample results, so the median and the mean are equivalent.

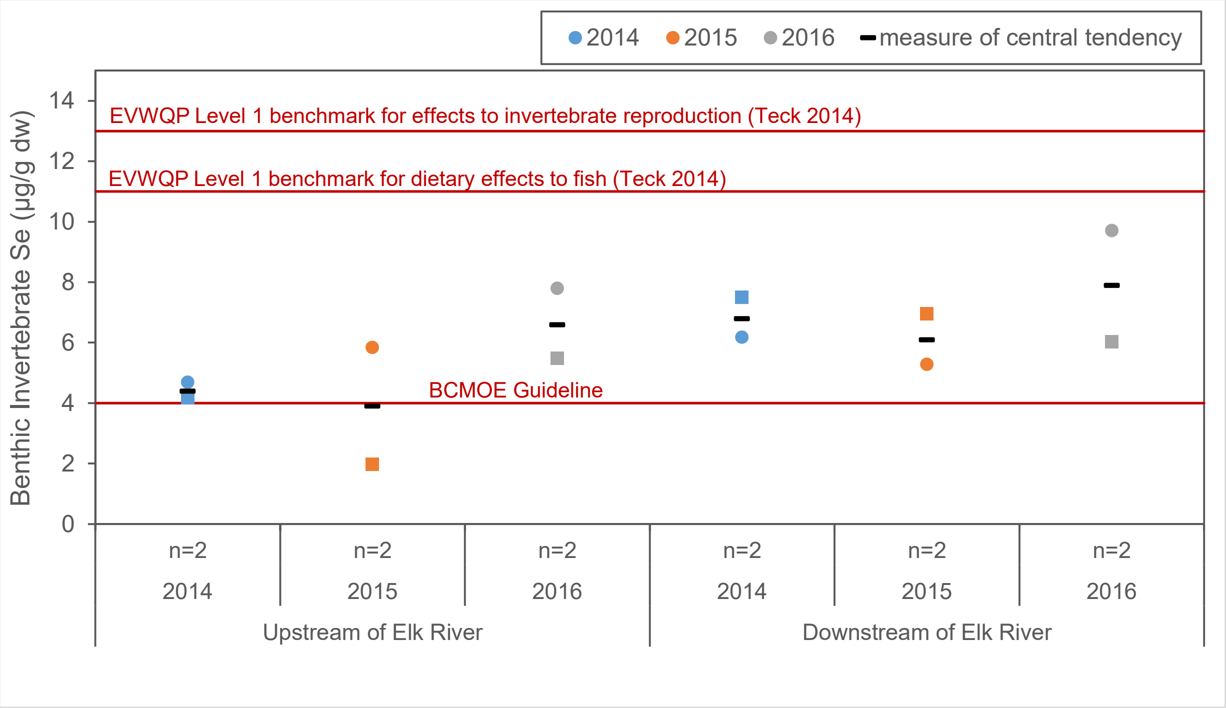

**Figure 6.5:** **Selenium Concentrations (µg/g dw) in Composite Benthic Invertebrate Tissue Samples Collected in Koocanusa Reservoir, April and August, 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.

' * ' indicates the downstream area was significantly different from the upstream area in the same year.

# 7 FISH

## 7.1 Overview

Fish were sampled in the Canadian portion of the Koocanusa Reservoir to evaluate endpoints indicative of individual and population health as well as tissue chemistry. Three areas were sampled in the reservoir, two downstream from the Elk River (Elk River and Gold Creek), and one upstream from the Elk River (Sand Creek) (Figure 2.2).

For the fish health surveys, peamouth chub were targeted in April of the first year of study (Minnow 2014b). Additional species were targeted in 2015 and/or 2016 based on ease of capture using the sampling gear permitted under the provincially issued scientific collection permit, and reproductive maturity observed during April sampling (northern pikeminnow, redside shiner, yellow perch, largescale sucker) (Minnow 2015c, 2016b). Endpoints associated with fish survival (mean age), growth (body size-at-age), reproduction (relative gonad weight) and energy storage (relative liver weight and overall condition) were statistically compared between the downstream areas and the upstream area. Magnitudes of difference were interpreted relative to commonly accepted Critical Effect Sizes (CES; Munkittrick et al. 2009; Environment Canada 2012).

Tissues were collected for analysis of selenium and mercury from species sampled for the fish health surveys (April each year), and from other species, including sport fish (February, April, August). Tissue concentrations were statistically compared between the downstream areas and the upstream area and were also compared to available provincial guidelines (BCMOE 2017a), US EPA criteria (USEPA 2016), and Level 1 benchmarks developed in the EVWQP (Teck 2014). Although a formal fish community evaluation was not an objective of the fish survey, the abundances of different species captured were summarized to provide indication of the fish community composition. Based on cultural importance to the Ktunaxa First Nation, a separate study of burbot was completed in 2014 to 2015 (Minnow 2015a) and results are also summarized in this report.

## 7.2 Fish Community

### 7.2.1 Previous Studies

Prior to construction of the Libby Dam, the sportfish fishery in the Kootenay River (which was later impounded to form the reservoir) consisted primarily of westslope cutthroat trout, rainbow trout, mountain whitefish, and burbot (Hamilton et al. 1990). Shortly following impoundment, an increase in nutrients due to the inundation of substrates was hypothesized to account for a substantial increase in total fish biomass, including several native species such as westslope cutthroat and rainbow trout, mountain whitefish, peamouth chub, northern pikeminnow, and sucker species (Hamilton et al. 1990; Richards 1997). Among game species, westslope cutthroat trout, bull trout, mountain whitefish, and burbot were initially most common, whereas longnose sucker and invasive yellow perch were initially the most common non-cyprinid, non-game species (Richards 1997). Kokanee were released into the reservoir from the Kootenay Trout Hatchery in BC in 1979, and yellow perch may have inadvertently colonized the reservoir through emigration from Murphy Lake in Montana (Huston et al. 1984; Hamilton et al. 1990).

Following the initial increase in total fish biomass within the reservoir, numbers of native westslope cutthroat trout and rainbow trout (i.e., *Oncorhynchus* spp.) declined, while kokanee numbers increased, potentially as a result of competition for available food, changes in available spawning and rearing habitat due to deep drawdown levels and flushing of nutrients from the reservoir (Dalbey et al. 1998). The numbers of native *Oncorhynchus* spp. captured in gill nets declined independent of number and size of hatchery fish stocked into the reservoir over time. Mountain whitefish and redside shiners captured in gill nets showed similar declining trends as shown for the *Oncorhynchus* spp., which was hypothesized to reflect a loss of spawning and rearing habitat, and competition with kokanee for plankton food resources (Dalbey et al. 1998).

### 7.2.2 Koocanusa Reservoir 2014 – 2016

Fish communities at the Sand Creek, Elk River, and Gold Creek study areas in 2014 to 2016 were represented by a total of 14, 12, and 13 species, respectively (Table 7.1). Largescale sucker, northern pikeminnow, peamouth chub, redside shiner, and yellow perch were consistently captured in highest numbers at all three study areas (Table 7.1). Variability in the diversity and abundance of fish captured among years was likely due to annual differences in collection gear and sampling effort (i.e., angling, burbot trapping, gill netting, hoop netting, minnow trapping and/or seine netting; Appendix Tables F.1 to F.44).

### 7.2.3 Burbot

Burbot are one of the few Canadian freshwater fish species that spawn in midwinter (Scott and Crossman 1998). In Canada, burbot spawning typically occurs under-ice from January to March in nearshore waters or shallow offshore shoals at depths of approximately 1 – 3 m (Ford et al. 1995; Scott and Crossman 1998; Spence 1999). Preferred spawning locations in lakes appear to be associated with tributary confluences or groundwater upwelling (Ford et al. 1995; Spence and Neufeld 2002). Burbot eggs hatch in about 30 days (at 6 °C), and larvae typically appear in late February to June (Scott and Crossman 1998). Once the eggs hatch, larvae spend several days resting on the bottom before becoming free-swimming and planktonic. Young-of-the-year burbot are frequently found in rocky shorelines and sometimes in

**Table 7.1: Summary of Fish Catches at the Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, 2014 to 2016**

| Year | Area | Total Caught of Each Fish Species | | | | | | | | | | | | | | Total Caught by Area | Total Number of Species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Bull Trout | Burbot | Kokanee | Largescale Sucker | Longnose Sucker | Mountain Whitefish | Northern Pikeminnow | Peamouth Chub | Pumpkinseed | Rainbow Trout | Redside Shiner | Slimy Sculpin | Westslope Cutthroat Trout | Yellow Perch | | |
| 2014[b] | Sand Creek[a] | 6 | 11 | 28 | 334 | 0 | 15 | 106 | 68 | 3 | 4 | 151 | 1 | 1 | 27 | **755** | **13** |
| | Elk River | 1 | 2 | 26 | 277 | 2 | 2 | 109 | 69 | 0 | 0 | 310 | 0 | 1 | 3 | **802** | **11** |
| | Gold Creek | 1 | 0 | 9 | 78 | 0 | 1 | 129 | 75 | 1 | 3 | 702 | 0 | 0 | 27 | **1,026** | **10** |
| | **Total** | **8** | **13** | **63** | **689** | **2** | **18** | **344** | **212** | **4** | **7** | **1,163** | **1** | **2** | **57** | **-** | **-** |
| 2015[c] | Sand Creek | 4 | 5 | 12 | 43 | 6 | 0 | 195 | 81 | 0 | 0 | 9 | 0 | 1 | 34 | **390** | **10** |
| | Elk River | 1 | 3 | 12 | 54 | 3 | 0 | 178 | 191 | 0 | 0 | 23 | 0 | 0 | 42 | **507** | **9** |
| | Gold Creek | 2 | 1 | 0 | 25 | 0 | 1 | 119 | 140 | 0 | 1 | 10 | 0 | 0 | 39 | **338** | **9** |
| | **Total** | **7** | **9** | **24** | **122** | **9** | **1** | **492** | **412** | **0** | **1** | **42** | **0** | **1** | **115** | **-** | **-** |
| 2016[d] | Sand Creek | 23 | 10 | 5 | 292 | 13 | 6 | 164 | 608 | 0 | 4 | 83 | 1 | 3 | 45 | **1,257** | **13** |
| | Elk River | 16 | 11 | 14 | 199 | 5 | 12 | 167 | 212 | 0 | 2 | 76 | 0 | 2 | 33 | **749** | **12** |
| | Gold Creek | 8 | 0 | 0 | 243 | 1 | 2 | 125 | 271 | 0 | 4 | 62 | 0 | 3 | 71 | **790** | **10** |
| | **Total** | **47** | **21** | **19** | **734** | **19** | **20** | **456** | **1,091** | **0** | **10** | **221** | **1** | **8** | **149** | **-** | **-** |

[a] Includes fish collected from Oestreich Road.

[b] Fish captured in 2014 by angling, hoop netting and/or seining.

[c] Fish captured in 2015 by angling, burbot trapping, hoop netting, and/or minnow trapping.

[d] Fish captured in 2016 by angling, gill netting, and/or hoop netting.

weedy areas of tributary streams (Scott and Crossman 1998). In contrast, adult burbot prefer deeper water and, after spawning, move to hypolimnic habitat (Scott and Crossman 1998). Burbot are voracious predators that commonly feed at night. Young burbot (<500 mm in length) feed mainly on aquatic insects, while burbot over 500 mm in length feed almost exclusively on fish, including kokanee, peamouth chub and northern pikeminnow, among others (Scott and Crossman 1998).

Historically, burbot supported a productive fishery in the lakes and streams of southeastern Kootenay region (Prince 2007). In recent years, however, the lower Kootenay burbot populations were designated as critically imperiled and red-listed, meaning potentially extirpated, endangered, or threatened (BCMOE 2015). Gill netting surveys completed by Montana Fish, Wildlife and Parks in the lower Koocanusa Reservoir, beginning in 1975, indicated that the relative abundance of burbot increased until the late 1980s, followed by continual decline to current low levels (Dunnigan 2015).

Limited information exists regarding the life history and spawning distribution of burbot within Koocanusa Reservoir (Dunnigan and Sinclair 2008). Recent investigation of the movement patterns of burbot in Koocanusa Reservoir suggested that burbot exhibited pre-spawning migratory behavior, with movement up to 64.3 km in a season, but movement was more limited in other seasons, similar to studies in other areas (Paragamian and Wakkinen 2008, Gardner and Stewart 1987). Burbot in the Koocanusa Reservoir demonstrated strong fidelity to a particular side, implying limited mixing of fish from opposite shorelines (Dunnigan and Sinclair 2008). In addition, burbot showed affinity for the former Kootenay River channel within the reservoir, presumably because it is the deepest and coolest portion of the reservoir. Overall, the mean 50%, 75%, and 90% home range sizes for burbot in the reservoir were estimated to be 14.6, 22.6, and 32.3 km$^2$, respectively, which is substantially larger than most fish species in lake environments (Minns 1995; Dunnigan and Sinclair 2008). Minns (1995) speculated that aside from ecological differences between species, fish residing in larger habitats with lower productivity would require larger home ranges to obtain food. In Koocanusa Reservoir, kokanee are a key prey item for burbot, and their pelagic and transient nature could in part explain the larger home range (Dunnigan and Sinclair 2008).

Based on concerns about burbot abundance, and the cultural importance of this fish species to the Ktunaxa First Nation, a study of burbot tissue selenium concentrations was undertaken in 2014 and 2015 (Minnow 2015a). The objective was to measure tissue selenium concentrations in pre-spawning females, if possible. Conditions in the fish collection permit required that samples be taken non-lethally (i.e., expressed eggs, if ripe females were caught, and muscle plugs). However, the combined catch of burbot in February of 2014 and 2015 totaled eight individuals, despite considerable effort (i.e., 148 angling hours and 122.6 hoop net days; Appendix Tables F.1, F.4, F.8 and F.13). Although burbot were not targeted in 2016, any individuals caught opportunistically were also sampled non-lethally for tissue selenium analysis in 2016. In total, 43 burbot were captured among the three study areas in Koocanusa Reservoir from 2014 to 2016 (Table 7.1; Figure 7.1) with the majority (31 burbot) collected through hoop netting[12] in the April field programs (Appendix Tables F.37 to F.44). The tissue selenium concentrations are presented and discussed in Section 7.4.

The suspected link between burbot productivity and reservoir operations has also made burbot a species of concern elsewhere, such as the Kinbasket Reservoir on the Columbia River (Warnock et al. 2014; Kang et al. 2015). Winter drawdown of the Kinbasket Reservoir (impounded by the Mica Dam in 1973) causes water elevations to vary typically by about 35 m, similar to Koocanusa Reservoir. This exposes large areas of littoral habitat which is suspected to cause dewatering of burbot eggs and/or larvae, with commensurate reduction of recruitment (Warnock et al 2014). A study was initiated by the Canadian Columbia River Inter-Tribal Fisheries Commission (CCRIFC) involving capture and surgical implantation of burbot in Kinbasket Reservoir with acoustic-radio transmitters to determine shallow reservoir and tributary habitat use during the spawning season (Warnock et al 2014). Given the comparable fluctuations in water elevations between the two reservoirs, it is possible similar effects could be expected on burbot in Koocanusa Reservoir.

## 7.3 Fish Health and Population Assessment

### 7.3.1 Largescale Sucker

#### 7.3.1.1 General Biology

Largescale suckers spawn in the spring over a variety of substrate types at lake inlets and outlets (McEvoy 1998). Although some individuals may migrate in excess of 100 km during the spawning period and return to within 0.2 km of their original home range following spawning, other individuals may not migrate far to spawn (McEvoy 1998). Largescale sucker eggs typically hatch within 14 days and fry generally remain closely associated with the substrate for the first few weeks until the yolk sac is absorbed and the mouth becomes terminal, at which point they become pelagic (Scott and Crossman 1998). Growth of fry is slow, and as fish grow larger, fry move toward the bottom and into deeper water. Adult largescale sucker inhabit large rivers and lakes, and are usually found at a depth of a few meters in weedy shore areas of

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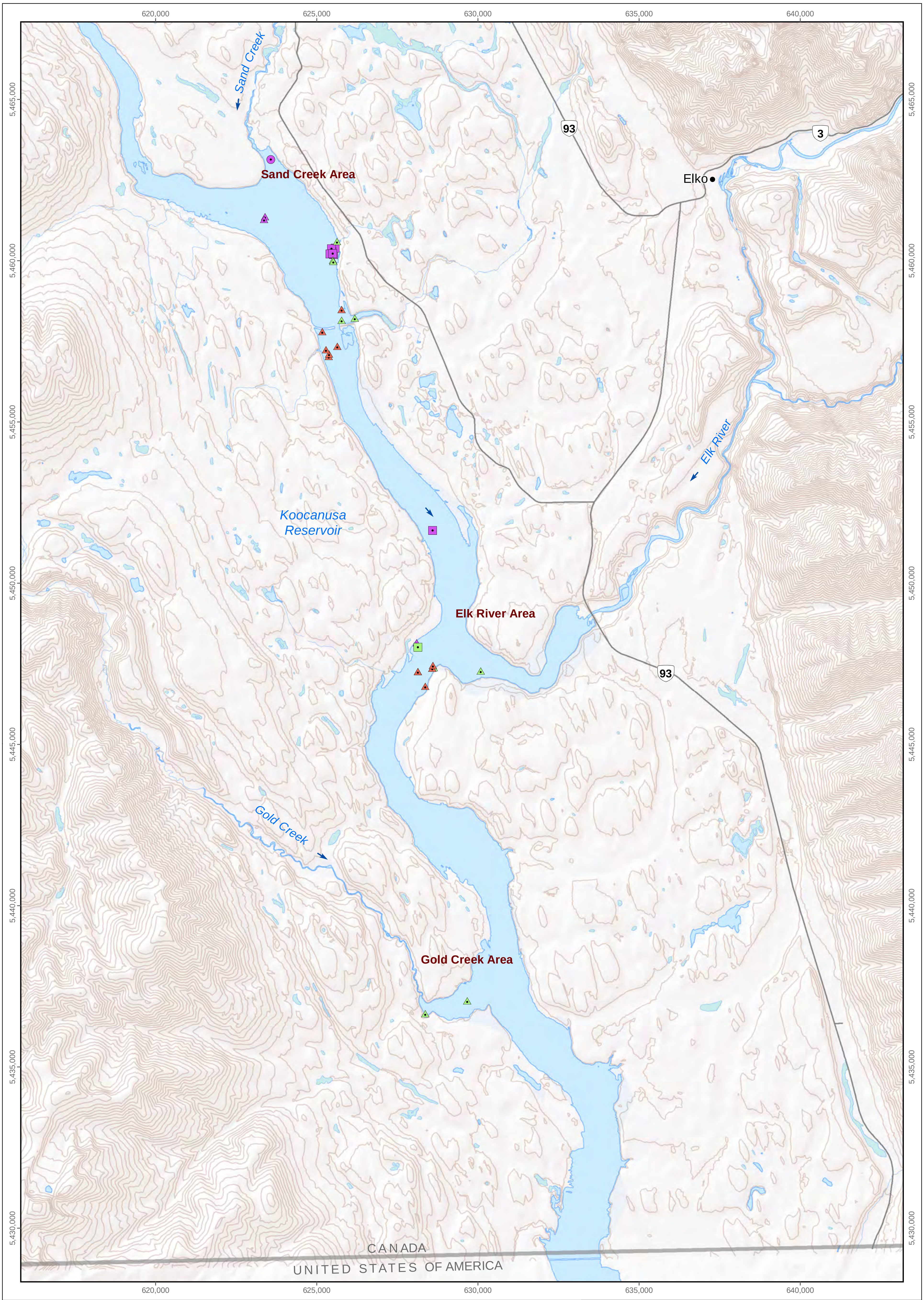
[12] Hoop netting with a lead could not be effectively used in February because the reservoir was frozen (as in 2014) or there were ice flows that entangled gear (as in 2015).



**Burbot**

- 🟪 Winter
- ▲ Spring
- ● Summer
- 🟩 Winter
- ▲ Spring
- ▲ Spring

## Seasonal Burbot Collection in Koocanusa Reservoir, 2014 to 2016

0 2 4 8
km

N
W E
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Projection: North American Datum 1983 UTM Zone 11
Reproduced under licence from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.

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minnow environmental inc.

Figure 7.1

Document Path: S:\Projects\167202\167202.0049 - Teck Koocanusa 2016\GIS Mapping\2014-2016Report\16-49 Fig 7.1 Burbot Collection.mxd lakes, in backwaters, and at stream mouths (Scott and Crossman 1998). Outside of spawning migration, largescale suckers do not move significantly during the summer, fall, or winter, and in river environments, often reside within one pool-riffle sequence with net upstream-downstream movement limited to 200 to 300 m (McEvoy 1998). Adult largescale sucker feed almost exclusively on benthic-dwelling invertebrates, including ostracods, copepods, amphipods, Trichoptera (caddisflies), Chironomidae (midges) and molluscs (Scott and Crossman 1998). Following the spawning of various salmonids, largescale sucker are also known to feed on fish eggs deposited on bottom substrates (Scott and Crossman 1998).

#### 7.3.1.2 Health Assessment

The largescale sucker health assessment was only conducted on females collected in 2015 and 2016 and males in 2016 (i.e., sample size for males in 2015 was too small [n = 1, 5, and 5 for Sand Creek, Elk River, and Gold Creek, respectively; Appendix Table F.23 and Figures F.1, F.2, and F.11]). Male and female largescale sucker captured among the three study areas ranged in age from 7 to 18 years (Figure 7.2 and 7.3). Mean age of female and male largescale sucker did not differ significantly between study areas located downstream versus upstream of the Elk River (Table 7.2). In addition, there were no consistent downstream to upstream differences between years or sexes for endpoints indicative of largescale sucker growth (size relative to age), energy storage (body weight relative to length, liver weight relative to body weight), or reproduction (gonad size relative to body size) (Table 7.3). Males sampled at both downstream areas in 2016 showed a similar pattern of reduced condition among small individuals and increased condition among larger individuals; but the magnitudes of difference at the Elk River area were less than the CES of 10%, and smaller than observed at the Gold Creek area. Internal body cavity tapeworms were the most common abnormality observed in all fish species during the fish health assessment (Table 7.4; Appendix Tables F.45 to F.47). No tapeworms were observed in largescale suckers captured at the Elk River study area, whereas approximately 8% and 3% of largescale suckers from the Gold Creek and Sand Creek study areas, respectively contained tapeworms (Table 7.4; Appendix Tables F.23 and F.24).

### 7.3.2 Northern Pikeminnow

#### 7.3.2.1 General Biology

Northern pikeminnow spawn from late May to early August, often congregating in large numbers to spawn on gravelly lake shallows either along the shoreline or near a tributary (Scott and Crossman 1998; Gadomski et al. 2001; Gray and Dauble 2001). They reach maturity between 4 (males) and 5 (females) years (around a 300 mm length), and exhibit multiple spawning episodes within the spawning season (Scott and Crossman 1998). Eggs hatch in approximately

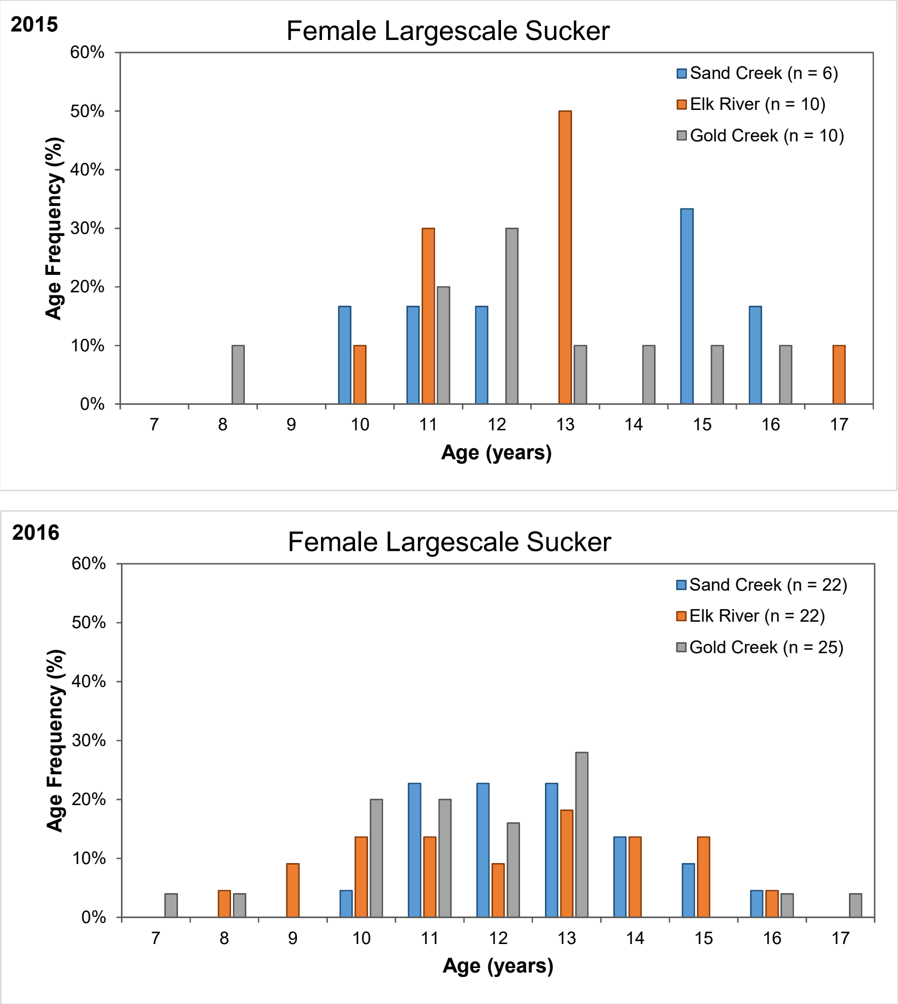

**Figure 7.2:** Relative Age Distribution of Female Largescale Sucker in Koocanusa Reservoir, April 2015, and 2016

**Figure 7.3:** Relative Age Distribution of Male Largescale Sucker in Koocanusa Reservoir, April 2016

7 days, with the young fish generally remaining inshore in the summer and moving offshore in the fall and winter. Larger individuals reside predominately in lakes and tend to remain offshore (Gray and Dauble 2001; Scott and Crossman 1998). Northern pikeminnow feed predominately on small fish (shiners, stickleback), terrestrial insects and plankton in the summer, and during fall and winter diet generally shifts to fish in the offshore areas (Scott and Crossman 1998). In Koocanusa Reservoir, northern pikeminnow appear to be opportunistic feeders, consuming a variety of organisms, but primarily relying upon fish (Lotic 2017). Seven different species of fish were consumed by northern pikeminnow in the reservoir, with kokanee and peamouth chub being most common (Lotic 2017).

#### 7.3.2.2 Health Assessment

Female northern pikeminnow captured in Koocanusa Reservoir ranged in age from 5 to 22 years and male northern pikeminnow generally ranged in age from 6 to 16 years (with two individuals documented at 25 and 26 years of age[13]; Figures 7.4 and 7.5; Appendix Figures F.3, F.4, F.12, and F.13 and Table F.26). The large range in northern pikeminnow ages likely reflected the wide variety of fish collection methods used between the two years. No differences were observed between the downstream and upstream areas that would be indicative of influence from the Elk River (Tables 7.2 and 7.3). For example, most significant differences were associated with pikeminnow collected at the Gold Creek area compared to Sand Creek. Very few abnormalities were observed in northern pikeminnow, and no tapeworms were observed in any individuals collected in 2015 (Appendix Tables F.45 to F.47). Only 2%, 3% and 8% of individuals collected at the Elk River, Gold Creek and Sand Creek study areas, respectively, had tapeworms in 2016 (Table 7.4).

### 7.3.3 Peamouth Chub

#### 7.3.3.1 General Biology

Peamouth chub spawn in large groups in late spring in the shallow shoreline habitat of lakes (Scott and Crossman 1998). Newly hatched young remain in schools along the shore and move into deeper water in late summer. Generally, peamouth chub inhabit the weedy shallows of lakes and rivers for most of the year where they tend to form schools (Scott and Crossman 1998), although adults appear to move offshore by mid-summer (Gray and Dauble 2001). Peamouth chub are mainly insectivorous, feeding on a wide variety of aquatic insects

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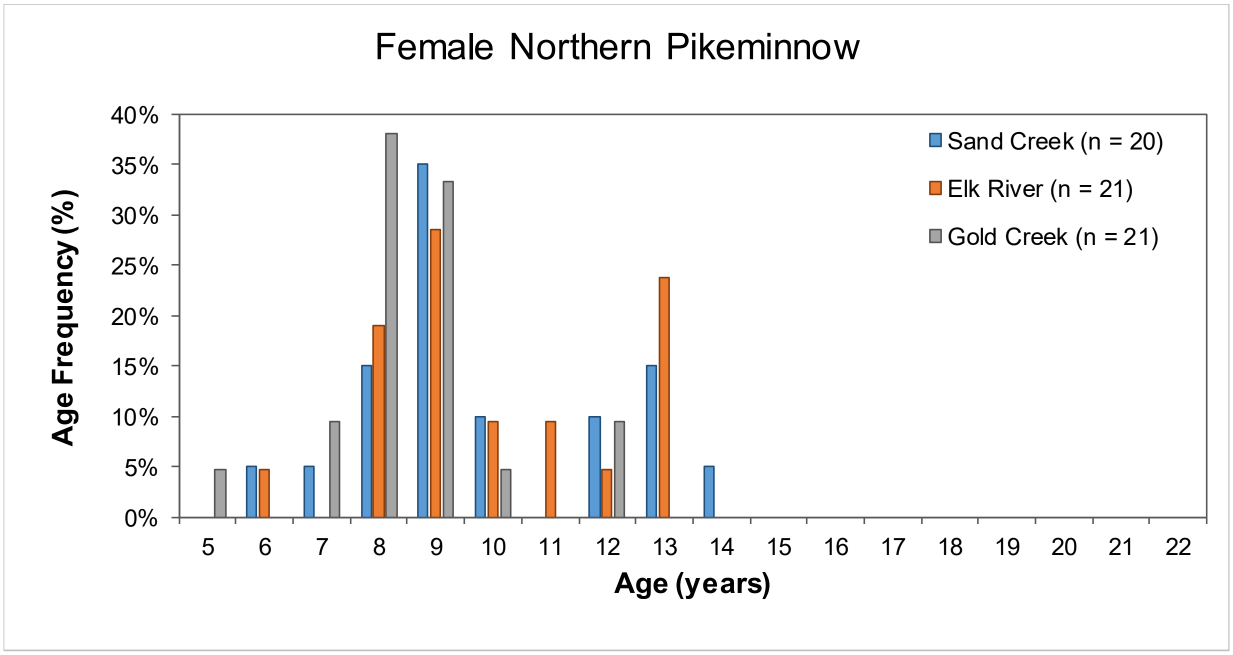
[13] Confidence around ages (using otoliths) decreased beyond 17-19 years (zones) and ages provided are best estimates (Appendix H).



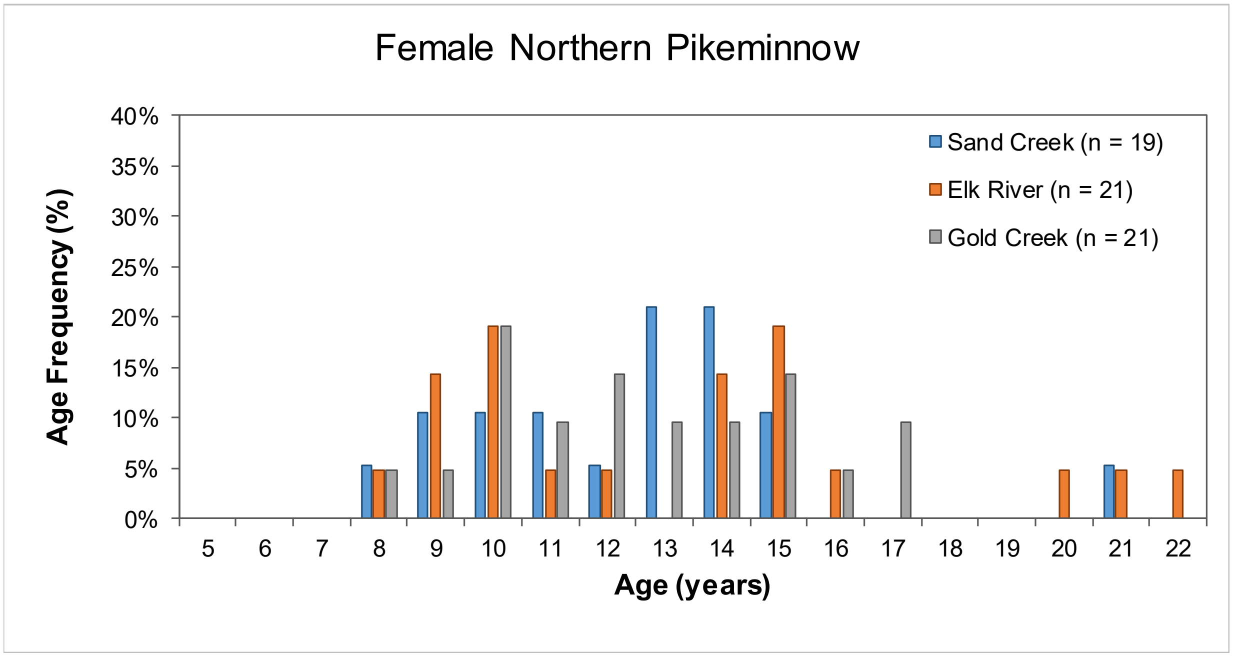
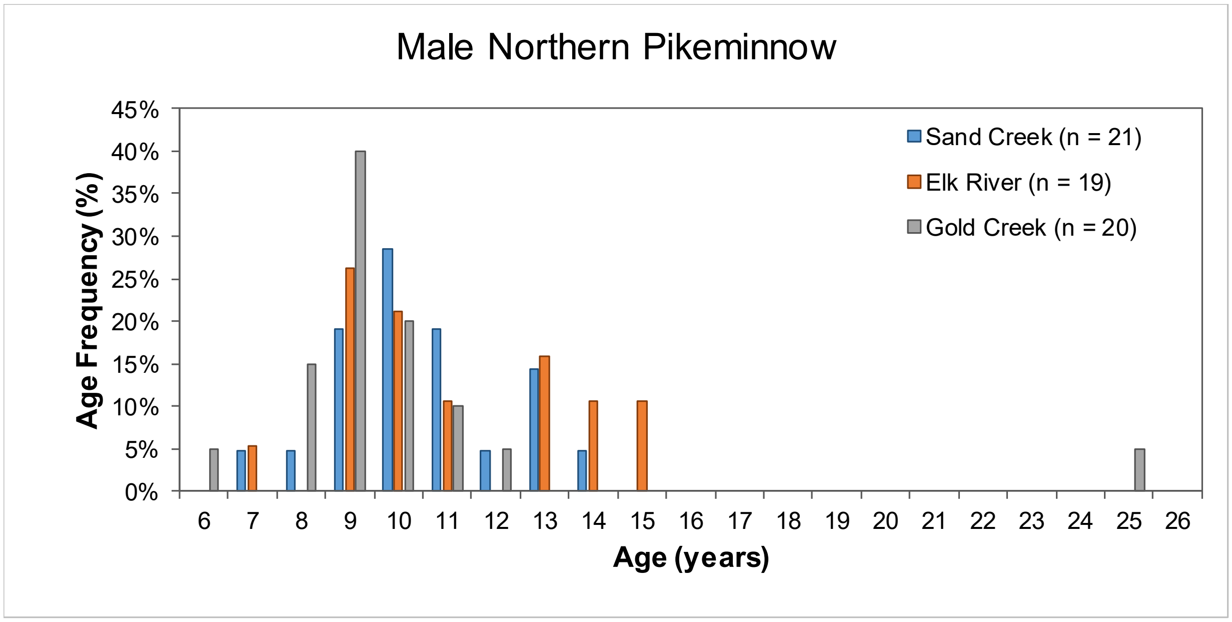


**Figure 7.4:** **Relative Age Distribution of Female Northern Pikeminnow in Koocanusa Reservoir, April 2015 and 2016**



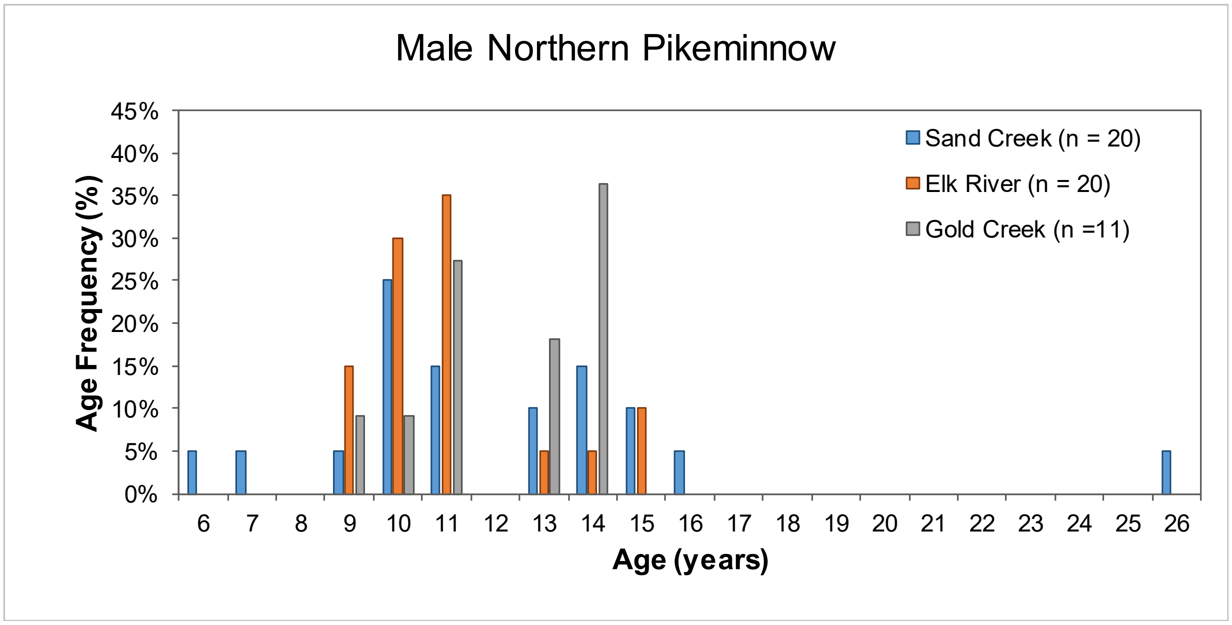


**Figure 7.5:** **Relative Age Distribution of Male Northern Pikeminnow in Koocanusa Reservoir, April 2015 and 2016**

**Table 7.2: Statistical Summary of Spatial and Temporal Differences in Fish Age at the Downstream Areas (Elk River and Gold Creek) Compared to the Upstream Area (Sand Creek) in Koocanusa Reservoir using a Two-way ANOVA (at Least Two Years of Data) or ANOVA/Kruskal-Wallis Test (One Year of Data), 2014, 2015 and/or 2016**

| Fish Species | Sex | Response | Trans-formation or Test[a] | Measure of Central Tendency (Mean, Geometric Mean, or Median)[b] | | | | | | | | | Model P-values | | | Contrasts | | | | | | | | Significant Differences and Magnitude of Differences (% Difference in Measure of Central Tendency Relative to Refererence) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2014 | | | 2015 | | | 2016 | | | Area×Year | Area | Year | Area | | Area×Year | | | | | | Area×Year | | | | | |
| | | | | | | | | | | | | | | | | Elk River vs Sand Creek | Gold Creek vs Sand Creek | Elk River vs Sand Creek | | | Gold Creek vs Sand Creek | | | Elk River vs Sand Creek | | | Gold Creek vs Sand Creek | | |
| | | | | Elk River | Gold Creek | Sand Creek | Elk River | Gold Creek | Sand Creek | Elk River | Gold Creek | Sand Creek | | | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Largescale Sucker | F | Age | none | NA | | | 12.5 | 12.4 | 13.2 | 12.2 | 12.0 | 12.6 | 0.983 | 0.478 | 0.404 | - | - | NA | - | | NA | - | | NA | - | | NA | - | |
| | M | Age | K-W | NA | | | NA | | | 11.0 | 12.5 | 12.5 | NA | 0.197 | NA | - | - | NA | | | | | | NA | | - | NA | | - |
| Northern Pikeminnow | F | Age | log | NA | | | 9.8 | 8.4 | 9.6 | 12.7 | 12.3 | 12.3 | 0.354 | 0.173 | <0.001 | - | - | NA | - | | NA | - | | NA | - | | NA | - | |
| | M | Age | rank | NA | | | 10 | 9 | 10 | 11 | 13 | 11 | 0.027 | - | - | - | - | NA | 0.459 | 0.437 | NA | 0.055 | 0.490 | NA | - | - | NA | * (-10%) | - |
| Peamouth Chub | F | Age | log | 13.7 | 8.6 | 9.6 | 13.3 | 12.4 | 11.8 | 7.9 | 6.3 | 9.5 | 0.002 | - | - | - | - | 0.003 | 0.364 | 0.364 | 0.369 | 0.701 | <0.001 | * (43%) | - | - | - | - | * (-34%) |
| | M | Age | log | 7.6 | 6.2 | 5.8 | 7.4 | 6.7 | 7.7 | 6.0 | 4.7 | 6.1 | 0.201 | 0.013 | <0.001 | 0.268 | 0.101 | - | | | - | | | - | | | - | | |
| Redside Shiner | F | Age | K-W | NA | | | NA | | | 3 | 3 | 3 | NA | 0.820 | NA | - | - | NA | | | | | | NA | | - | NA | | - |
| | M | Age | K-W | NA | | | NA | | | 3 | 3 | 3 | NA | 0.276 | NA | - | - | NA | | | | | | NA | | - | NA | | - |
| Yellow Perch | F | Age | rank | NA | | | 3 | 4 | 2.5 | 3 | 3 | 3 | 0.084 | - | - | - | - | NA | 0.006 | 0.546 | NA | 0.002 | 0.498 | NA | * (20%) | - | NA | * (60%) | - |
| | M | Age | rank | NA | | | 2 | 2 | 2 | 3 | 3 | 3 | 0.632 | 0.011 | <0.001 | 0.001 | 0.064 | NA | - | | NA | - | | NA | * (-33%) [c] | | NA | * (0%) [c] | |

▨ p-value < 0.1.

* indicates a significant difference between the two areas at an α of 0.1.

[a] Transformation reported for two-way ANOVA when more than one year of data were analyzed; Test (ANOVA or K-W = Kruskal-Wallis) reported for when one year of data was analyzed.

[b] The measure of central tendancy reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for $\log_{10}$-transformation; and, median for rank-transformation.

[c] The significant p-value is based on the average rank and the % difference is based on medians for the 2015 and 2016 population as a whole.

NA = not applicable as no data were collected for this species/sex in the given year.

**Table 7.3: Statistical Summary of Spatial and Temporal Differences in Fish Morphometric Endpoints at the Downstream Areas (Elk River and Gold Creek) Compared to the Upstream Area (Sand Creek) in Koocanusa Reservoir, 2014, 2015, and/or 2016**

| Fish Species | Sex | Response | Covariate (Cov) | Elk River Area in Comparison to Sand Creek Area | | | | | | | | | Gold Creek Area in Comparison to Sand Creek Area | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Significant Interactions[a] | | Area P-value (Parallel Slope Model with No Interaction) | Area Comparisons[b] | | | | | | Significant Interactions[a] | | Area P-value (Parallel Slope Model with No Interaction) | Area Comparisons[b] | | | | | |
| | | | | | | | 2014 | | 2015 | | 2016 | | | | | 2014 | | 2015 | | 2016 | |
| | | | | Term | P-value | | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] | Term | P-value | | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] | Min Cov[c] | Max Cov[c] |
| Largescale Sucker | F | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Area×Year | <0.001 | - | | | NA[f] | | | | Cov×Area×Year | <0.001 | - | | | NA[f] | | | |
| | F | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.550 | | | - | | | | Area×Year | <0.001 | - | | | * (-22%) | | * (49%) | |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | Area×Year | 0.040 | - | | | * (-4.5%) | | * (6%) | | Cov×Area | 0.023 | - | | | - | | * (12%) | |
| | F | log$_{10}$(Fork Length) | log$_{10}$(Age) | - | - | 0.653 | | | - | | | | - | - | 0.249 | | | - | | | |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Age) | - | - | 0.648 | | | - | | | | Area×Year | 0.018 | - | | | * (-6.8%) | | * (22%) | |
| | M | Gonad Weight | -[g] | - | - | 0.833 | | | | | - | | - | - | 0.706 | | | | | - | |
| | M | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.463 | | | | | - | | - | - | 0.463 | | | | | - | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | Cov×Area | 0.010 | - | | | | | * (-4.2%) | * (8.9%) | Cov×Area | 0.010 | - | | | | | * (-1.1%) | * (23%) |
| | M | log$_{10}$(Fork Length) | log$_{10}$(Age) | - | - | 0.464 | | | | | - | | - | - | 0.221 | | | | | - | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Age) | Cov×Area | 0.002 | - | | | | | * (-6.7%) | * (3.0%) | Cov×Area | 0.002 | - | | | | | * (4.4%) | * (38%) |
| Northern Pikeminnow | F | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Year | <0.001 | - | | | - | | - | | Cov×Year | <0.001 | - | | | - | | - | |
| | F | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Year | <0.001 | - | | | - | | - | | Cov×Area×Year | 0.007 | - | | | * (80%) | * (-52%) | - | |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | - | - | 0.165 | | | - | | | | - | - | 0.002 | | | * (-4.9%) | | | |
| | F | log$_{10}$(Fork Length) | log$_{10}$(Age) | Cov×Year | 0.020 | - | | | * (-6.9%) | | - | | Cov×Year | 0.010 | - | | | - | | * (8.7%) | |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Age) | Cov×Year | 0.011 | - | | | - | | - | | Cov×Year | 0.023 | - | | | - | | - | |
| | M | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Year | <0.001 | - | | | - | | - | | Cov×Area×Year | 0.001 | - | | | - | | - | |
| | M | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.608 | | | - | | | | - | - | <0.001 | | | * (-31%) | | | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | Cov×Area×Year | 0.040 | - | | | - | | - | | - | - | 0.064 | | | - | | | |
| | M | log$_{10}$(Fork Length) | log$_{10}$(Age) | Cov×Area×Year | 0.005 | - | | | - | | * (5.5%) | * (-6.9%) | - | - | 0.013 | | | * (4.8%) | | | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Age) | Cov×Year | 0.050 | - | | | - | | - | | - | - | 0.039 | | | * (13%) | | | |
| Peamouth Chub | F | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.965 | - | | | | | | Area×Year | 0.015 | - | * (17%) | | * (-17%) | | * (6.5%) | |
| | F | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Area | 0.042 | - | - | | - | | * (25%) | | Cov×Area | 0.022 | - | * (18%) | | * (-17%) | | * (34%) | |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | - | - | 0.748 | - | | | | | | - | - | 0.006 | * (-3.2%) | | | | | |
| | F | log$_{10}$(Fork Length) | log$_{10}$(Age) | Area×Year | 0.040 | - | * (3.6%) | | * (0.43%) | | * (-1.9%) | | Cov×Area×Year | <0.001 | - | - | | - | | * (-11%) | * (7.2%) |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Age) | - | - | 0.777 | - | | | | | | Cov×Area×Year | <0.001 | - | - | | - | | * (-32%) | * (20%) |
| | M | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Year | 0.045 | - | - | | - | | - | | Cov×Year | 0.009 | - | * (15%)[d] | * (-2.2%)[d] | - | | - | |
| | M | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Year | 0.023 | - | - | | - | | - | | - | - | 0.801 | - | | | | | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | Cov×Area | 0.038 | - | - | | - | | - | | - | - | 0.006 | * (-4.4%) | | | | | |
| | M | log$_{10}$(Fork Length) | log$_{10}$(Age) | Area×Year | 0.007 | - | * (9.3%) | | * (-4.7%) | | * (3.2%) | | Cov×Year | 0.001 | - | * (10%) | | - | | - | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Age) | Cov×Area×Year | 0.047 | - | - | | * (-34%) | * (4.3%) | - | | Cov×Year | 0.012 | - | * (30%) | | - | | * (-23%) | |
| Redside Shiner | F | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.515 | | | | | - | | - | - | 0.515 | | | | | - | |
| | F | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.001 | | | | | * (67%) | | - | - | 0.004 | | | | | * (35%) | |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | - | - | 0.572 | | | | | - | | - | - | 0.572 | | | | | - | |
| | F | Fork Length | -[h] | - | - | 0.240 | | | | | - | | - | - | 0.240 | | | | | - | |
| | F | Adjusted Body Weight | -[h] | - | - | 0.215 | | | | | - | | - | - | 0.215 | | | | | - | |
| | M | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.519 | | | | | - | | - | - | 0.519 | | | | | - | |
| | M | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.183 | | | | | - | | - | - | 0.049 | | | | | * (26%) | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | - | - | 0.031 | | | | | * (-5.7%) | | - | - | 0.998 | | | | | - | |
| | M | Fork Length | -[h] | - | - | 0.111 | | | | | - | | - | - | 0.111 | | | | | - | |
| | M | Adjusted Body Weight | -[h] | - | - | 0.310 | | | | | - | | - | - | 0.310 | | | | | - | |
| Yellow Perch | F | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | Area×Year | 0.046 | - | | | NA[e] | | * (3.4%) | | Cov×Year | 0.036 | - | | | NA[e] | | - | |
| | F | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.134 | | | - | | | | - | - | 0.007 | | | * (15%) | | | |
| | F | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | - | - | 0.268 | | | - | | | | - | - | 0.033 | | | * (-5.2%) | | | |
| | M | log$_{10}$(Gonad Weight) | log$_{10}$(Adjusted Body Weight) | - | - | 0.466[d] | | | - | | | | - | - | 0.919[d] | | | - | | | |
| | M | log$_{10}$(Liver Weight) | log$_{10}$(Adjusted Body Weight) | Cov×Area | 0.029 | -[d] | | | - | | - | | - | - | 0.357[d] | | | - | | | |
| | M | log$_{10}$(Adjusted Body Weight) | log$_{10}$(Fork Length) | - | - | 0.124[d] | | | - | | | | - | - | 0.702[d] | | | - | | | |

[a] Significance of interaction terms assessed using α = 0.05.

[b] Significance of Area comparisons assessed using α = 0.1.

[c] Comparison of magnitude of difference conducted at the minimum and maximum values of the range of overlap of covariate values between areas when the regression slopes between areas within a year were not parallel.

[d] There is little or no overlap in covariate values. Results should be interpreted with caution.

[e] NA = Not analyzed; insuffient sample size (n = 3 for Sand Creek).

[f] NA = Not analyzed; few fish had developping gonads (the majority of fish had GSI < 1%; see Figure F.8 in Appendix F).

[g] Conducted as a t-test because the covariate was not significant in the ANCOVA model.

[h] Conducted as an ANOVA on age 3 fish.

* Indicates significant difference (α=0.1) between areas (or a significant difference in regression slopes when a magnitude of difference is reported for the Min Cov and Max Cov).

▨ p-value < α

**Table 7.4:** **Summary of Body Cavity Tapeworms at Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, 2014 to 2016**

| Fish Species (Collection Month) | Study Area | Parasites (body cavity tapeworm) | | | |
|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | Mean Annual |
| **Largescale Sucker (April)** | Sand Creek | - | 0% | 6.3% | 3.1% |
| | Elk River | - | 0% | 0% | 0% |
| | Gold Creek | - | 0% | 16% | 8.0% |
| **Northern Pikeminnow (April)** | Sand Creek | - | 0% | 7.7% | 3.8% |
| | Elk River | - | 0% | 2.4% | 1.2% |
| | Gold Creek | - | 0% | 3.1% | 1.6% |
| **Peamouth Chub (April)** | Sand Creek | 19% | 10% | 38% | 22% |
| | Elk River | 9.1% | 1.9% | 23% | 11% |
| | Gold Creek | 35% | 5.3% | 23% | 21% |
| **Redside Shiner (April)** | Sand Creek | - | 11% | 30% | 21% |
| | Elk River | - | 46% | 38% | 42% |
| | Gold Creek | - | 83% | 37% | 60% |
| **Yellow Perch (April)** | Sand Creek | - | 0.038% | 2.9% | 1.5% |
| | Elk River | - | 3.0% | 20% | 12% |
| | Gold Creek | - | 2.9% | 7.1% | 5.0% |
| **All Other Fish Species (February, April, August)** | Sand Creek | 0% | 0% | 0% | 0% |
| | Elk River[a] | 0% | 0% | 0% | 0% |
| | Gold Creek[b] | 1.6% | 0% | 0% | 0.53% |

[a] Includes fish caught from the Oestreich Road sampling location in February 2014.

[b] Includes fish caught from the Englishman Creek sampling location in February 2014.

and larvae as well as terrestrial insects (Scott and Crossman 1998). In Koocanusa Reservoir, peamouth chub fed mainly on aquatic insects (i.e. Diptera larvae and pupae) and zooplankton (e.g., *Daphnia* spp.), with terrestrial insects constituting a smaller, but important, portion of prey items (Lotic 2017).

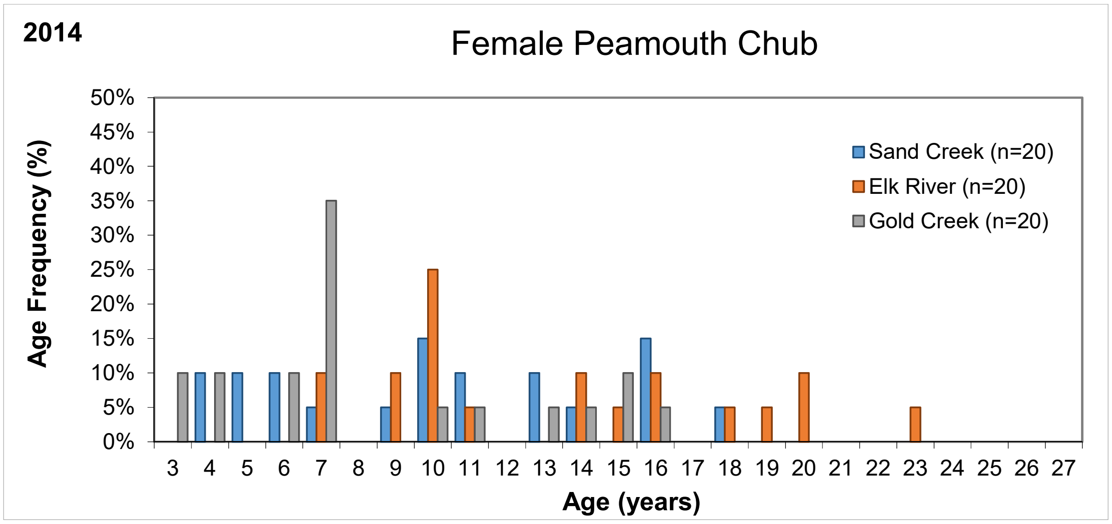
#### 7.3.3.2 Health Assessment

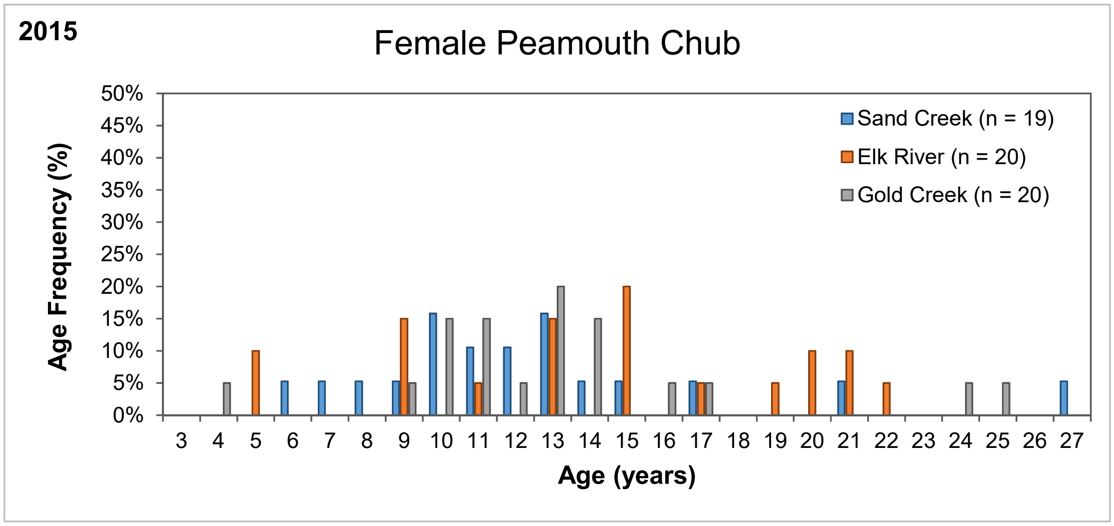
Female peamouth chub ranged in age from 3 to 27 years, whereas males ranged from 3 to 14 years over the 2014 to 2016 sampling program (Figures 7.6 and 7.7; Appendix Figures F.5, F.6, F.14, and F.15 and Table F.28). There were no differences in mean age (Table 7.2) or differences among the other endpoints (Table 7.3) that could be considered indicative of influence from the Elk River. For example, lower condition among females (3.2%) and males (4.4%) captured at Gold Creek compared to Sand Creek was not observed at the Elk River sampling area compared to Sand Creek. Peamouth chub showed a relatively high incidence of tapeworms at all study areas, ranging from 2% to 38% of individuals within a study area from 2014 to 2016 (Table 7.4). Peamouth chub gonad development appeared to be inhibited by the presence of tapeworms, which is consistent with typical responses of cyprinids shown in the literature (Carter et al. 2005).

### 7.3.4 Redside Shiner

#### 7.3.4.1 General Biology

Redside shiners generally spawn between May and July in groups of 30 to 40 fish, both in streams and in lakes when water temperatures reach approximately 10°C, and show a strong affinity for natal spawning grounds (Scott and Crossman 1998). Eggs tend to hatch 3 to 15 days post-spawning, depending on water temperature. Redside shiners usually reach sexual maturity by their third year. They occur in schools of thousands in large lakes, ponds, and moderately fast-moving streams, tolerating a wide variety of temperatures and trophic conditions. In lakes, smaller individuals tend to remain in the upper water column and/or close to shore. Other than during spawning migration, redside shiners exhibit very little directed movement aside from movements on and off shoals in lake environments related to changes in water temperature (Scott and Crossman 1998). Redside shiner fry feed mainly on plankton and demersal crustaceans while larger fish are mainly insectivorous, but feed on fish eggs opportunistically. Egg predation by redside shiners can have large influences on trout populations in cases where accidental releases have occurred to lakes previously utilized solely by trout (Scott and Crossman 1998).





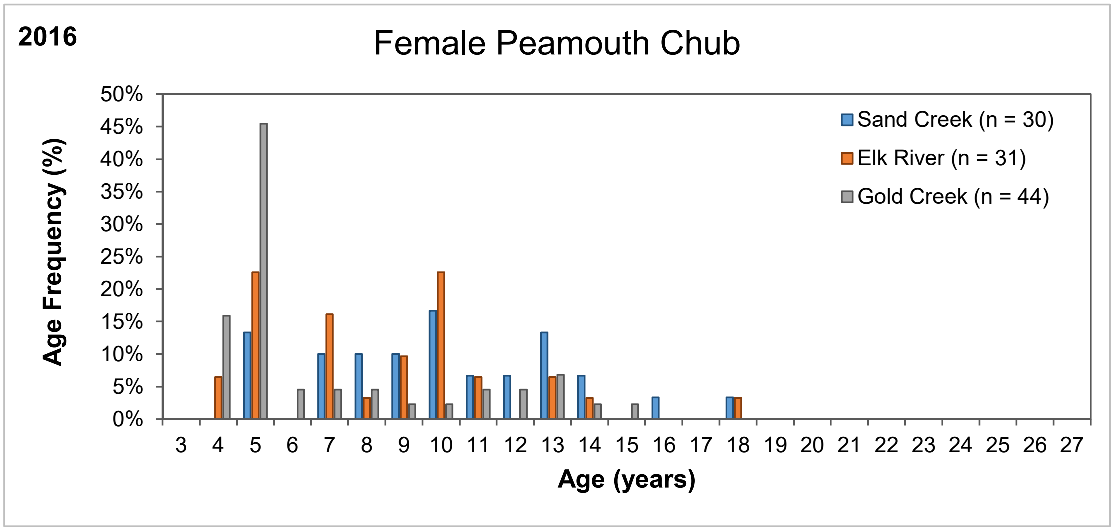
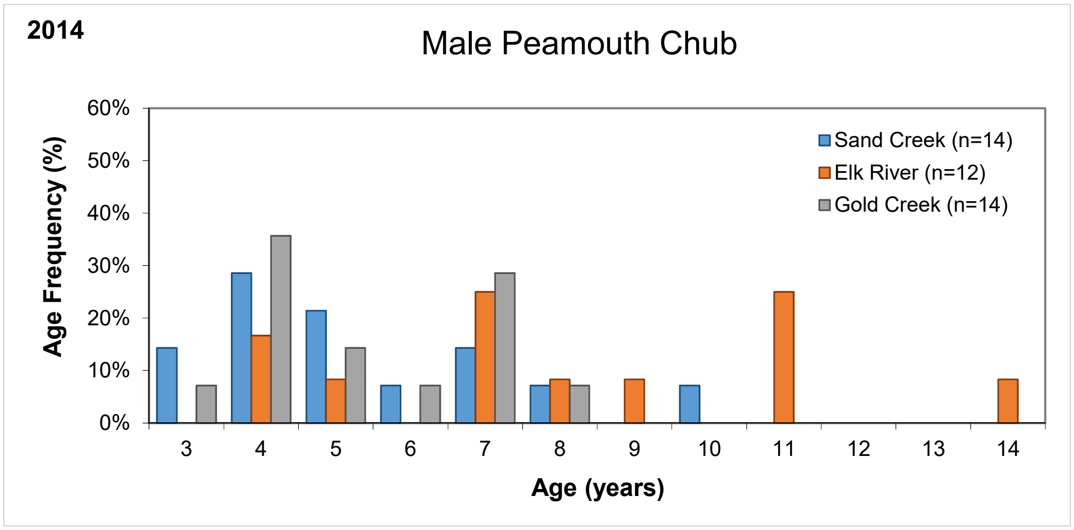
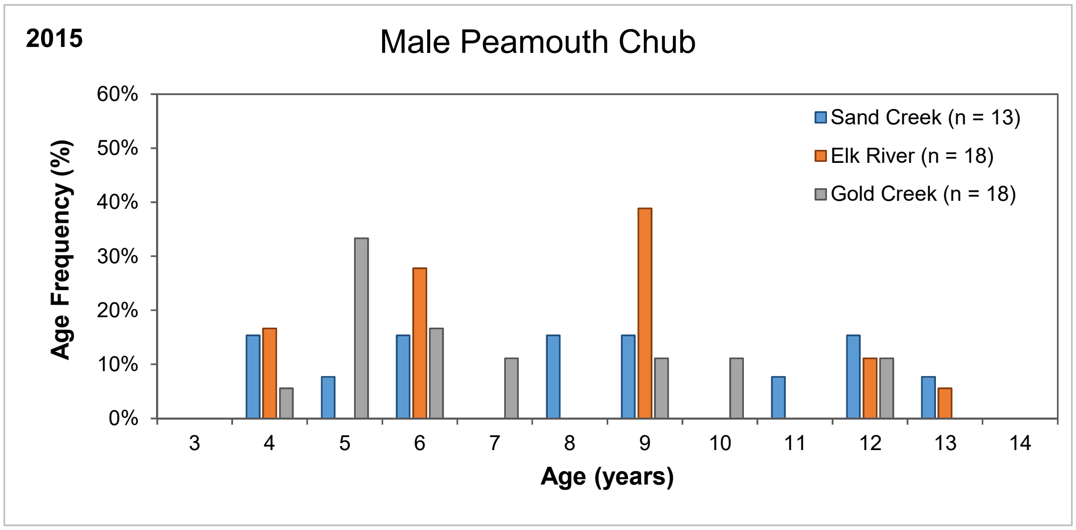


**Figure 7.6:** **Relative Age Distribution of Female Peamouth Chub in Koocanusa Reservoir, 2014 to 2016**





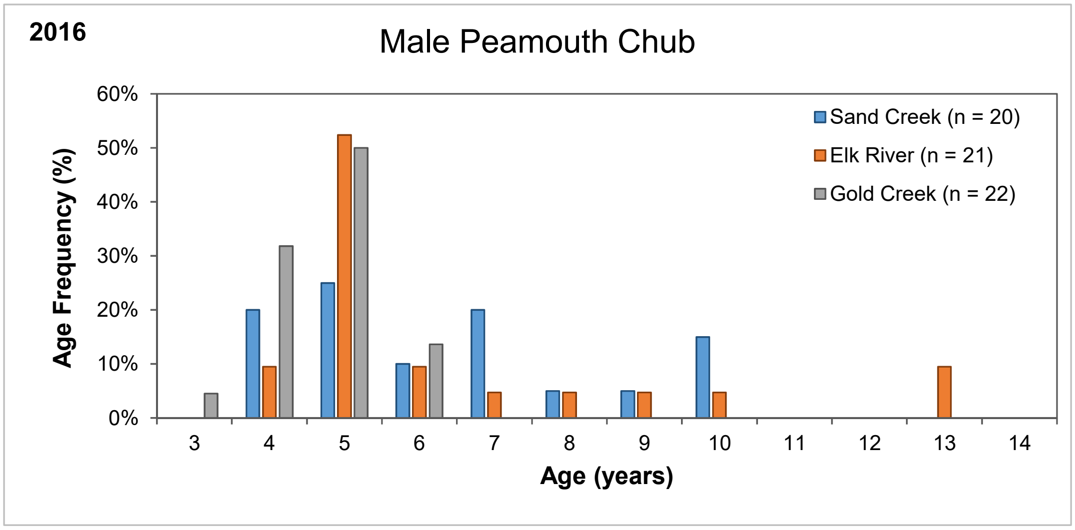


**Figure 7.7:** Relative Age Distribution of Male Peamouth Chub in Koocanusa Reservoir, 2014 to 2016

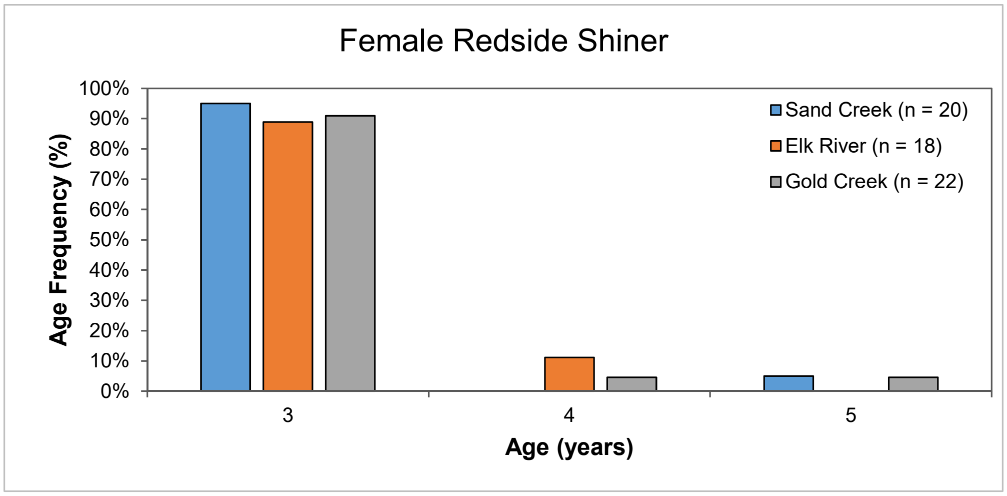
#### 7.3.4.2 Health Assessment

Redside shiner health were only assessed in 2016 due to limited sample sizes of fish with sufficient gonad development to determine sex in 2015 (Appendix Table F.31 and Figures F.7 and F.8). Overall catch yields were greater in 2016 when gill nets were permitted for use (Appendix Tables F.40 to F.44), but a large proportion of individuals in both years had unripe gonads (Appendix Table F.31). Lack of gonad development may have been related to the high proportion (21 to 60%) of tapeworms infections in this species, particularly at the downstream areas (42 to 60%; Table 7.4). The tapeworm *Ligula intestinalis* has been shown to inhibit gonad development in various cyprinid species (Carter et al. 2005). Female redside shiners ranged in age from 3 to 5 years, whereas males ranged from 2 to 4 years in 2016 (Figure 7.8). Liver sizes of female redside shiner were greater at both downstream areas than at Sand Creek, but males showed a difference in liver size only at the Gold Creek area (Table 7.3). Other than greater liver weight at the Gold Creek area compared to Sand Creek, no other differences in endpoints were observed for redside shiner between the downstream and upstream areas in 2016.

### 7.3.5 Yellow Perch

#### 7.3.5.1 General Biology

As a result of their commercial and recreational importance, a considerable amount of information is available regarding various aspects of the life history of the yellow perch (Scott and Crossman 1998). In lakes and large rivers, adult yellow perch migrate towards the shore, or into tributaries, to spawn. Spawning usually takes place at night and early morning, often near or on rooted vegetation and/or woody debris. Eggs usually hatch within 8 to 10 days of spawning, and juveniles grow relatively rapidly, with sexual maturity usually reached by age 3 in males and age 4 in females (Scott and Crossman 1998). Yellow perch exploit a wide variety of warm to cool water habitats from large lakes to ponds and quiet rivers, although they are typically most abundant in the open waters of lakes. Young-of-the-year yellow perch are often seen in large compact schools, while adults are often found moving in a loose aggregation of 50 to 500 individuals. They are considered shallow water fish, not typically found below 9 m, but exhibit a seasonal vertical movement in order to maintain a roughly 20°C isotherm (Scott and Crossman 1998). Studies in the Great Lakes have suggested that during the summer months, yellow perch movement is relatively limited, but that during cooler months, greater distances may be travelled (Glover et al. 2008). Although some studies suggest that yellow perch may travel from 13 km to over 100 km through the year, tagging studies generally indicate a high degree of site fidelity and most often travel is limited to the lower end of this range (Glover et al. 2008). Minns (1995) characterized the home range size for yellow perch to be



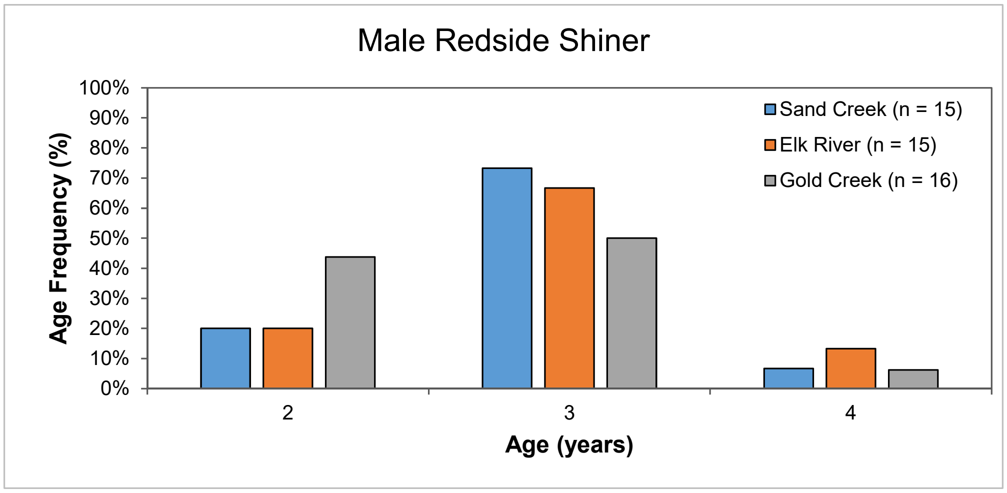
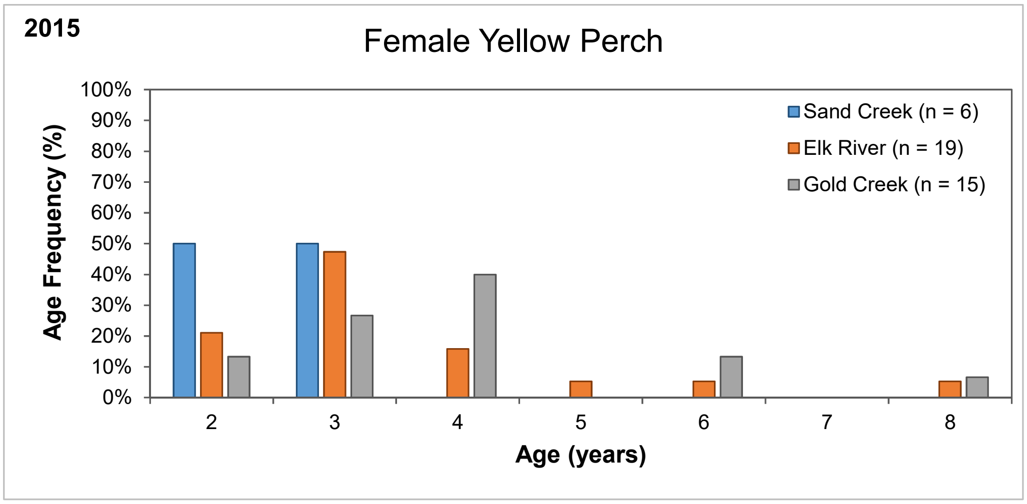


**Figure 7.8: Relative Age Distribution of Male and Female Redside Shiner in Koocanusa Reservoir, April 2016**

relatively small, from approximately 0.007 to 0.011 km$^2$. The diet of yellow perch largely consists of immature insects, larger invertebrates, and fishes taken from both the open water and the substrate. In Koocanusa Reservoir, yellow perch relied heavily on aquatic insects (mainly Diptera spp. larvae) with redside shiner comprising the remainder of the diet, although the sample size supporting these observations was small (six; Lotic 2017).

#### 7.3.5.2 Health Assessment

Female and male yellow perch ranged from 2 to 8 years of age in 2015 and 2016 (Figures 7.9 and 7.10; Appendix Figures F.9, F.10, F.16, and F.17 and Table F.35). No consistent significant differences were found between the downstream study areas and the Sand Creek study area to indicate influence from the Elk River (Tables 7.2 and 7.3). Yellow perch abnormalities, including



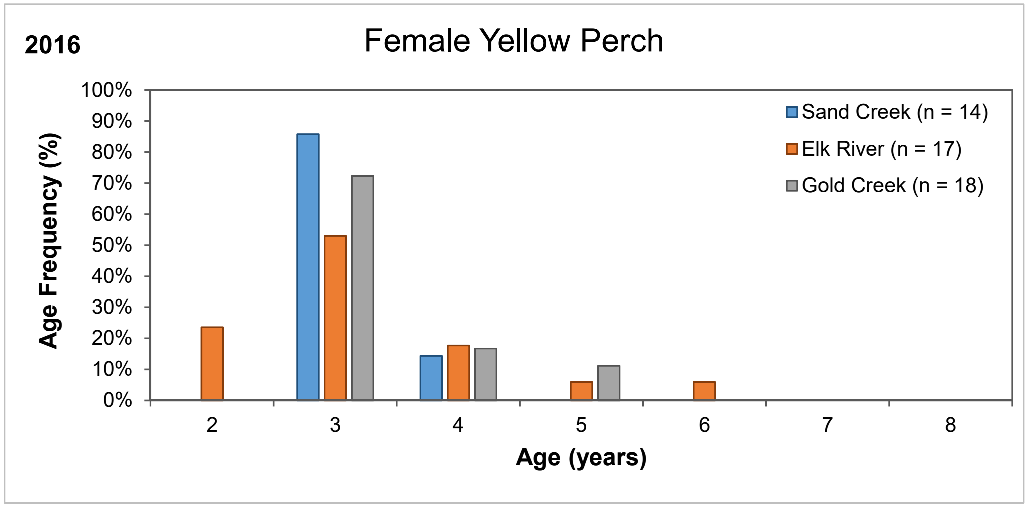


**Figure 7.9:** **Relative Age Distribution of Female Yellow Perch in Koocanusa Reservoir, April 2015 and 2016**

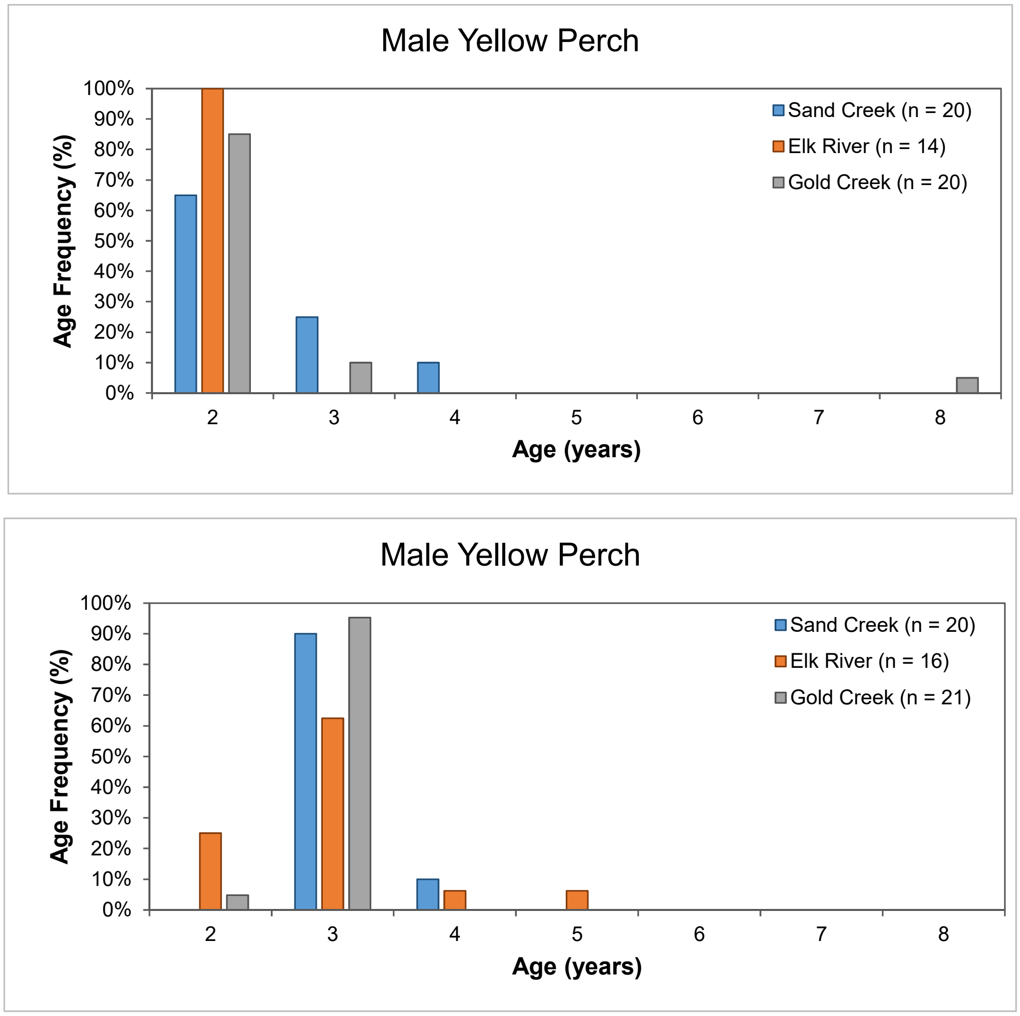


**Figure 7.10:** **Relative Age Distribution of Male Yellow Perch in Koocanusa Reservoir, April 2015 and 2016**

the incidence of internal tapeworms, were comparable among all three study areas in 2015 (i.e., ≤ 3%), but were more prevalent at the Elk River and Gold Creek study areas (20% and 7% of total individuals, respectively) in 2016 (Table 7.4 and Appendix Tables F.45 to F.47).

## 7.4 Tissue Selenium Concentrations

### 7.4.1 Muscle

Muscle selenium concentrations in largescale sucker, peamouth chub, yellow perch, and redside shiner from the Elk River downstream area were consistently greater than those in fish from the upstream Sand Creek area (Table 7.5; Appendix Figures F.18 to F.28). Selenium concentrations in northern pikeminnow muscle were also greater at the Elk River area compared to Sand Creek in 2014 and 2015, but were lower than at Sand Creek in 2016

**Table 7.5:** **Statistical Summary of Spatial and Temporal Differences in Fish Tissue Selenium Concentrations at the Downstream Areas (Elk River and Gold Creek) Compared to the Upstream Area (Sand Creek) in Koocanusa Reservoir using a Two-way ANOVA (at Least Two Years of Data) or ANOVA/Kruskal-Wallis Test (One Year of Data), 2014, 2015 and/or 2016**

| Fish Species | Tissue Type | Trans-formation | Measure of Central Tendency (Mean, Geometric Mean, or Median)[a] | | | | | | | | | Model P-values | | | Contrasts | | | | | | | | Significant Differences and Magnitude of Differences (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Area | | Area×Year | | | | | | Area×Year | | | | | |
| | | | 2014 | | | 2015 | | | 2016 | | | Area×Year | Area | Year | Elk River vs Sand Creek | Gold Creek vs Sand Creek | Elk River vs Sand Creek | | | Gold Creek vs Sand Creek | | | Elk River vs Sand Creek | | | Gold Creek vs Sand Creek | | |
| | | | Elk River | Gold Creek | Sand Creek | Elk River | Gold Creek | Sand Creek | Elk River | Gold Creek | Sand Creek | | | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Largescale Sucker | Muscle | none | 5.8 | 3.5 | 2.1 | 4.9 | 3.1 | 2.2 | 4.8 | 1.9 | 3.6 | 0.283 | <0.001 | 0.200 | <0.001 | 0.732 | - | - | - | - | - | - | * (139%) | | | - | | |
| Northern Pikeminnow | Muscle | rank | 5.0 | 2.2 | 1.7 | 2.8 | 2.3 | 2.4 | 1.6 | 1.8 | 1.8 | <0.001 | - | - | - | - | <0.001 | 0.001 | 0.001 | 0.015 | 0.946 | 0.356 | * (187%) | * (16%) | * (-9.2%) | * (27%) | - | - |
| | Ovary | log | 18 | 7.5 | 13 | 8.6 | 6.9 | 9.1 | 5.9 | 5.4 | 7.1 | 0.493 | 0.076 | 0.001 | 0.865 | 0.068 | - | - | - | - | - | - | - | | | * (-28%) | | |
| Peamouth Chub | Muscle | log | 2.9 | 2.4 | 1.7 | 3.6 | 2.4 | 2.5 | 3.8 | 3.7 | 2.6 | 0.380 | <0.001 | <0.001 | <0.001 | 0.022 | - | - | - | - | - | - | * (51%) | | | * (26%) | | |
| | Ovary | log | 7.0 | 7.3 | 5.7 | 13 | 10 | 12 | 13 | 11 | 13 | 0.298 | 0.468 | <0.001 | - | - | - | - | - | - | - | - | - | | | - | | |
| | Whole Body | none | 1.8 | 2.3 | 1.6 | 3.4 | 2.6 | 2.9 | 3.2 | 3.1 | 2.5 | 0.238 | 0.142 | <0.001 | - | - | - | - | - | - | - | - | - | | | - | | |
| Redside Shiner | Muscle | log | NA | | | 2.4 | 1.8 | 1.8 | 2.7 | 2.2 | 1.6 | 0.376 | 0.001 | 0.440 | <0.001 | 0.249 | NA | - | - | NA | - | - | NA | * (51%) | | NA | - | |
| | Ovary | log | NA | | | 17 | 10 | 20 | 20 | 15 | 21 | 0.598 | 0.014 | 0.098 | 0.480 | 0.003 | NA | - | - | NA | - | - | NA | - | | NA | * (-39%) | |
| | Whole Body | none | NA | | | NA | | | 4.1 | 3.7 | 3.1 | NA | 0.620 | NA | - | - | NA | | | | | | NA | | - | NA | | - |
| Yellow Perch | Muscle | rank | NA | NA | NA | 3.8 | 2.7 | 2.7 | 3.9 | 3.0 | 1.8 | 0.002 | - | - | - | - | NA | 0.005 | <0.001 | NA | 0.535 | <0.001 | NA | * (41%) | * (121%) | NA | - | * (71%) |
| | Ovary | rank | NA | NA | NA | 4.0 | 3.3 | 2.9 | 4.4 | 4.0 | 2.1 | 0.004 | - | - | - | - | NA | 0.002 | <0.001 | NA | 0.687 | <0.001 | NA | * (39%) | * (108%) | NA | - | * (90%) |

▨ p-value < 0.1.

* indicates a significant difference between the two areas at an α of 0.1.

[a] The measure of central tendency reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for $\log_{10}$-transformation; and, median for rank-transformation.

NA indicates not applicable as no data were collected for this species in the given year.

(Table 7.5). Selenium concentrations in the muscle of peamouth chub (all study years) and yellow perch (2016 only) from the Gold Creek study area were also higher than those from Sand Creek (Table 7.5).

Fish muscle selenium concentrations were below the USEPA (2016) criteria of 11.3 µg/g dw at all study areas, with the exception of one yellow perch collected at the Elk River downstream study area in April 2015 (Figure 7.11). Four of the eleven species sampled (largescale sucker, mountain whitefish, northern pikeminnow, and yellow perch) had mean muscle selenium concentrations greater than the BCMOE guideline (4 µg/g dw) at the downstream Elk River area (Figure 7.11). The single burbot and westslope cutthroat trout collected from the Elk River area in April 2015 and 2016, respectively, also had muscle selenium concentrations above the BCMOE guideline. The mean selenium concentration in mountain whitefish muscle was also above the BCMOE guideline at the upstream Sand Creek area (Figure 7.11). However, it should be noted that these comparisons of individual fish to the BCMOE guideline are potentially misleading, as the BCMOE guidelines for tissue concentrations are intended to be compared to the mean of at least 8 fish. As further data becomes available from future monitoring programs, muscle selenium concentrations comparisons to the BCMOE guidelines will be updated.

A temporal comparison (April versus August) of selenium concentrations in muscle of northern pikeminnow was completed using three-way ANOVA. There were no significant interactions between Month and Area or between Month and Year indicating that differences in selenium concentrations between months (April and August) did not depend on area (Sand Creek, Elk River, and Gold Creek) or year (2014 to 2016). Differences between months could therefore be evaluated after combining data among years and areas for each month. The mean muscle selenium concentration in northern pikeminnow was significantly greater (7.7%) in August compared to April (Figure 7.12).

### 7.4.2 Whole Body

No differences were found between whole body peamouth chub selenium concentrations from the downstream areas (Elk River and Gold Creek) relative to the upstream area (Sand Creek; Table 7.5). All whole body selenium concentrations for peamouth chub and redside shiner were less than the USEPA (2016) criteria of 8.5 µg/g dw and mean values were at or below the BCMOE guideline of 4 µg/g dw in all study areas in all three years (Figure 7.13).

### 7.4.3 Ovary

In contrast to results for muscle selenium concentrations which typically indicated higher concentrations downstream compared to upstream from the Elk River, yellow perch was the

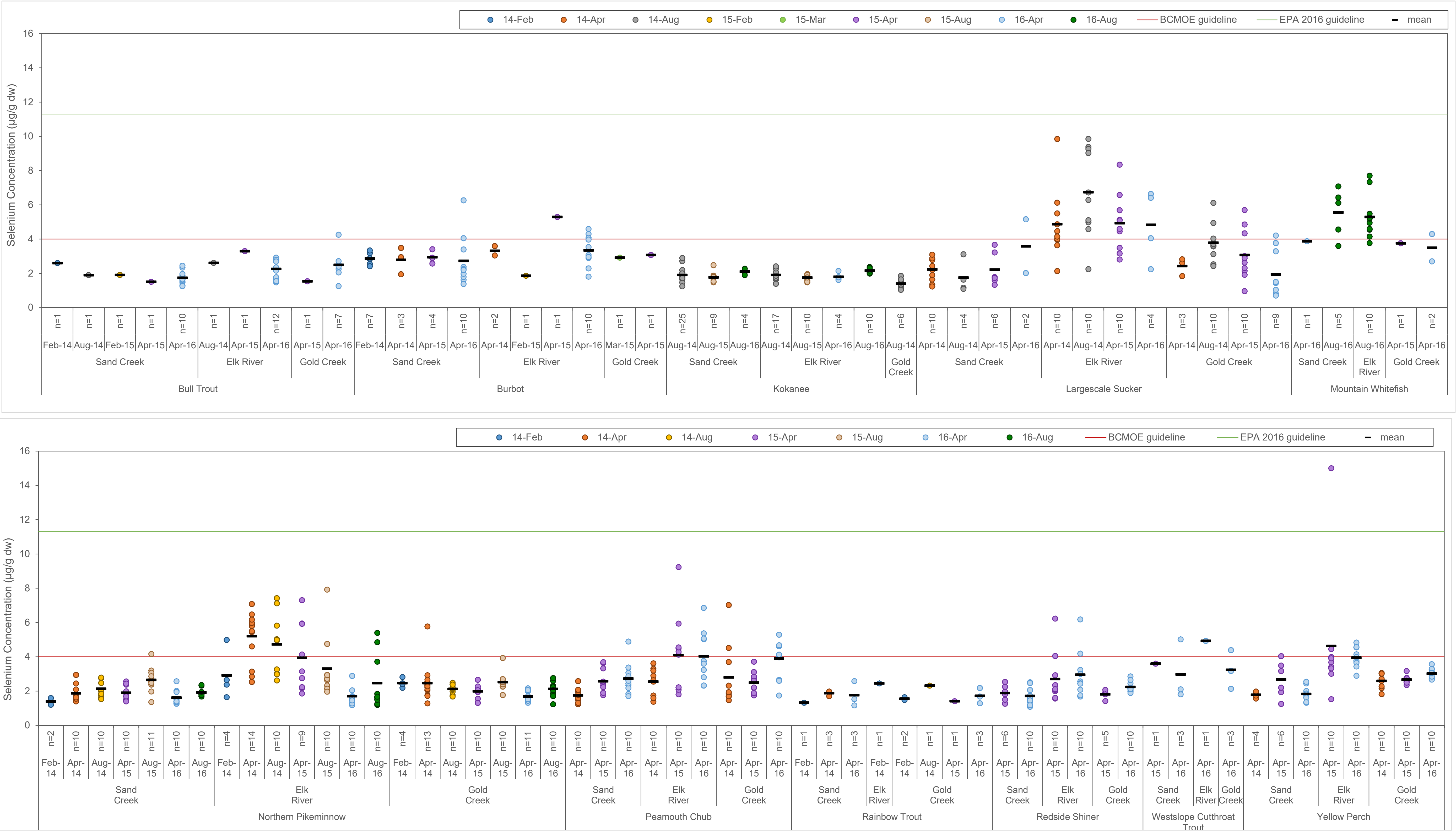


**Figure 7.11: Fish Muscle Selenium Concentrations (µg/g dw) in Koocanusa Reservoir, 2014 to 2016**

Note: Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River.

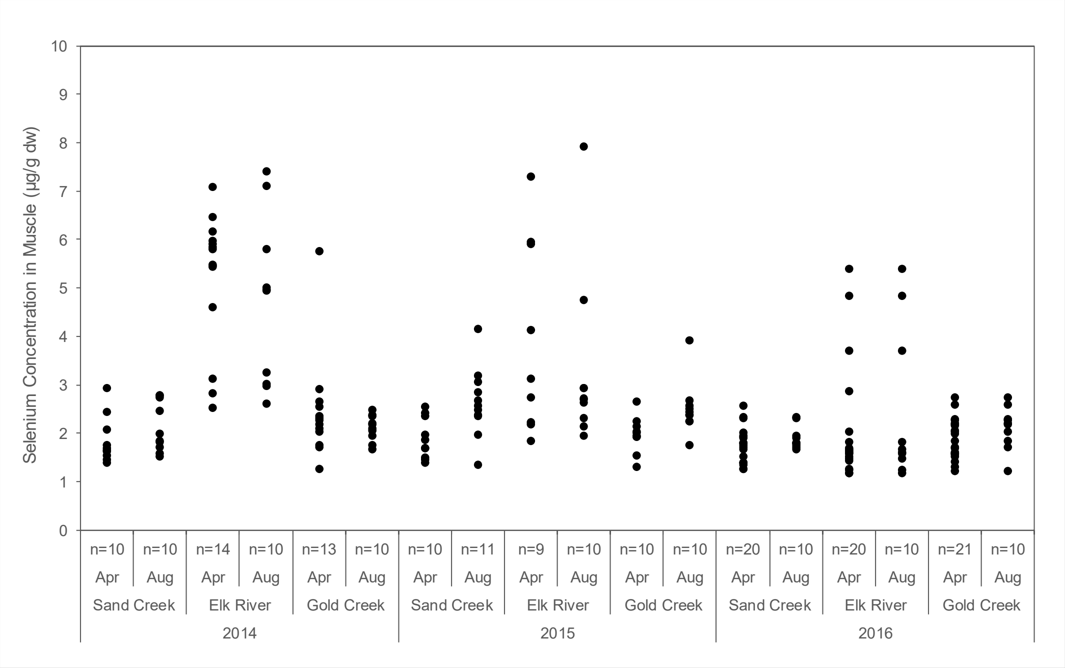


**Figure 7.12: Selenium Concentrations (µg/g dw) in Muscle of Northern Pikeminnow Collected in Koocanusa Reservoir, 2014 to 2016**

Note: Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River.

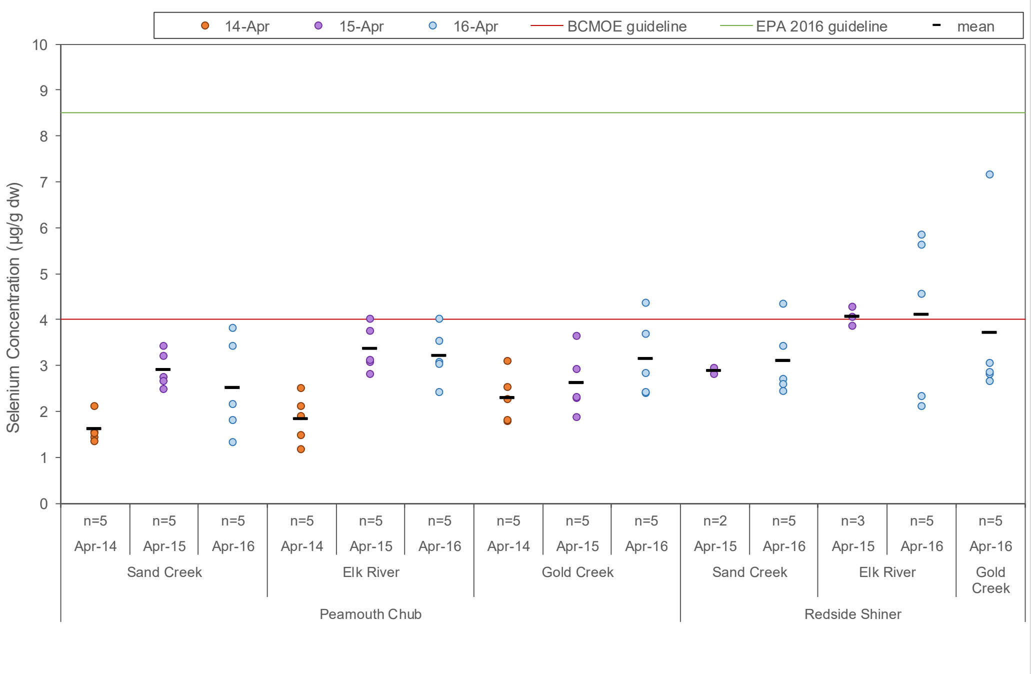


**Figure 7.13: Fish Whole Body Selenium Concentrations (µg/g dw) in Koocanusa Reservoir, 2014 to 2016**

Note: Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River.

only fish species that had higher ovary selenium concentrations at the Elk River study area compared to the upstream area (Table 7.5). Yellow perch from the Gold Creek study area also had higher ovary selenium concentrations than those at Sand Creek in 2016, but no difference was observed in 2015. No differences in ovary selenium concentration were evident between downstream and upstream areas for peamouth chub. Selenium concentrations in the ovaries of northern pikeminnow and redside shiners were significantly lower at the Gold Creek area than at the Sand Creek area, while no differences were observed for either of these species between the Elk River and Sand Creek areas (Table 7.5).

With the exception of redside shiner and northern pikeminnow all mean ovary selenium concentrations were below the EVWQP Level 1 benchmark for reproductive effects to fish (18 mg/kg dw) and the 2016 USEPA criteria of 15.1 µg/g dw (Figure 7.14). Redside shiner ovary concentrations were above the Level 1 benchmark at both the Elk River and Sand Creek areas in both years they were sampled. Northern pikeminnow had mean ovary selenium concentrations above the Level 1 benchmark only at the Elk River area in one of the three years they were sampled (2014), when ovaries were relatively undeveloped (Appendix Table F.27). Mean selenium concentrations in ovaries of peamouth chub from all areas, particularly in 2015 and 2016, also exceeded the BCMOE guideline of 11 µg/g dw (Figure 7.14). While the mean selenium concentration in ovaries of rainbow trout from Gold Creek in 2016 exceeded the BCMOE guideline, it was based on a sample size of only two, whereas the guideline is intended to be applied to a mean of eight or more samples. Exceedances of tissue selenium benchmarks or guidelines does not necessarily mean that effects will occur as fish species show a range of sensitivities to selenium (USEPA 2016).

### 7.4.4 Muscle to Ovary Selenium Concentration Ratio

Selenium concentrations were generally highest in ovaries, compared to muscle and whole body samples, which is a common inter-tissue selenium concentration pattern among fish species (i.e., fish ovary-to-muscle selenium concentrations typically range from 1:1 to 7:1 among species; Table 7.6; Appendix Figure F.29). Selenium concentrations in fish ovaries were compared to muscle selenium concentrations for seven species collected in Koocanusa Reservoir[14]. Redside shiners had the highest ovary to muscle selenium concentration ratio at 7.7, while yellow perch had the lowest (1.1; Table 7.6). Except for redside shiner, the ratios observed for species collected in Koocanusa Reservoir spanned the range of those previously documented for other fish species (Table 7.6; Appendix Figure F.29).

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[14] Based on only individuals with GSI > 1%, which is considered indicative of active reproductive investment development (Environment Canada 2012).

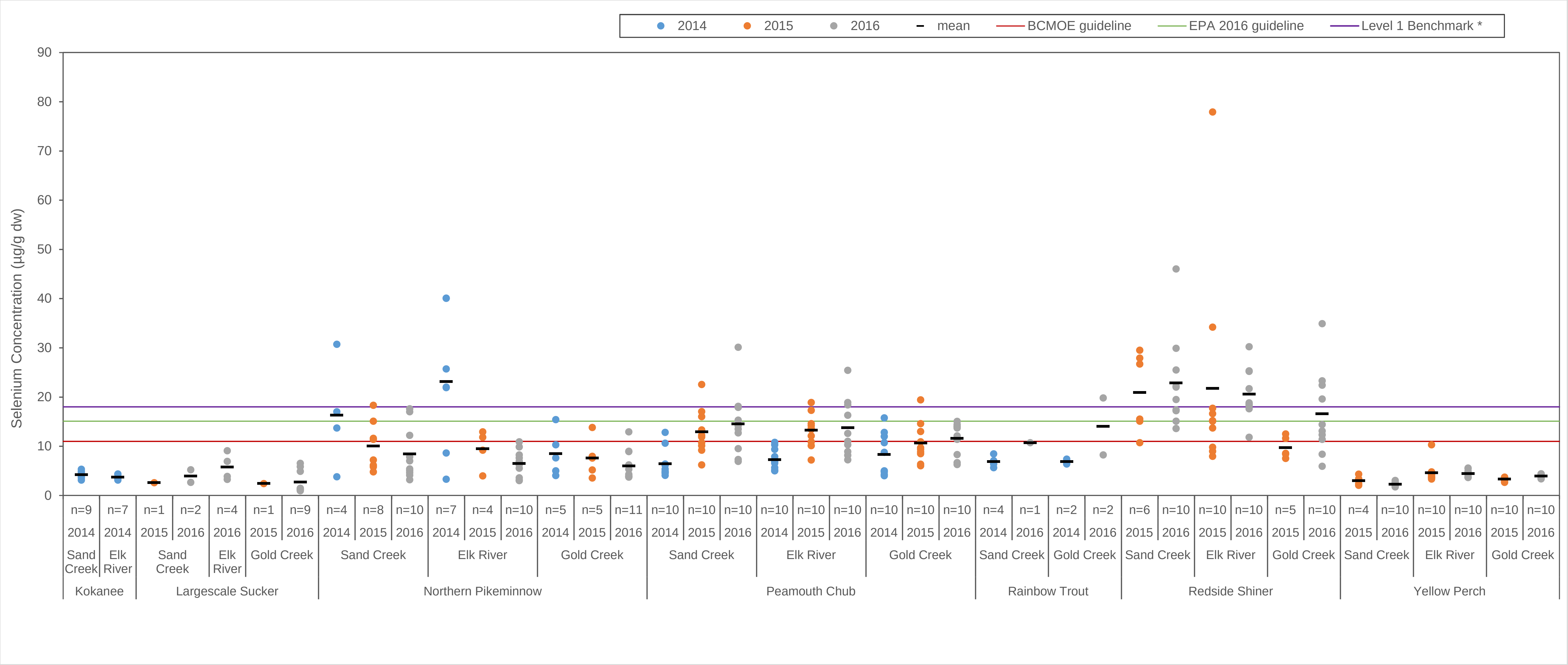

**Figure 7.14:** **Fish Ovary Selenium Concentrations (µg/g dw) in Koocanusa Reservoir, 2014 to 2016**

Note: Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River.
* Level 1 benchmark for effects to fish reproduction (Teck 2014)

## Table 7.6: Ovary to Muscle Selenium Relationships for Different Fish Species in the Elk Valley and Various Locations in the Literature

| Location | Source | Common Name | Scientific Name | Ovary to Muscle Concentration Ratios[a] | | | | Regression[b] | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | n | Min | Max | Median | p | $r^2$ |
| Elk Valley | Koocanusa Reservoir | Kokanee | *Oncorhynchus nerka* | 16 | 1.6 | 3.1 | 2.1 | 0.61 | - |
| | | Largescale Sucker | *Catostomus macrocheilus* | 17 | 0.78 | 2.5 | 1.4 | <0.001 | 0.89 |
| | | Northern Pikeminnow | *Ptychocheilus oregonensis* | 64 | 2.0 | 10 | 3.6 | <0.001 | 0.55 |
| | | Peamouth Chub | *Mylocheilus caurinus* | 90 | 1.1 | 7.8 | 3.3 | <0.001 | 0.43 |
| | | Rainbow Trout | *Oncorhynchus mykiss* | 9 | 3.2 | 12 | 4.3 | 0.81 | - |
| | | Redside Shiner | *Richardsonius balteatus* | 51 | 2.8 | 15 | 7.3 | <0.001 | 0.42 |
| | | Yellow Perch | *Perca flavescens* | 54 | 1.1 | 1.5 | 1.2 | <0.001 | 0.78 |
| | RAEMP, in prep | Longnose Sucker | *Catostomus catostomus* | 19 | 0.64 | 2.1 | 1.1 | <0.001 | 0.96 |
| | | Mountain Whitefish | *Prosopium williamsoni* | 106 | 1.8 | 16 | 6.5 | <0.001 | 0.52 |
| | Nautilus and IR (2011) | Westslope Cutthroat Trout | *Oncorhynchus clarki lewisi* | >100 | 0.5[c] | 6[c] | 2[c] | <0.001 | 0.82 |
| Various | USEPA (2016) | Black Bullhead | *Ameiurus melas* | 10 | 3.4 | 19 | 6.8 | 0.25 | - |
| | | Bluegill | *Lepomis macrochirus* | 29 | 0.14 | 2.4 | 1.4 | <0.001 | 0.65 |
| | | Bluehead Sucker | *Catostomus discobolus* | 7 | 0.94 | 1.8 | 1.5 | <0.001 | 0.91 |
| | | Brook Trout | *Salvelinus fontinalis* | 17 | 0.54 | 2.3 | 1.1 | <0.001 | 0.91 |
| | | Brown Trout | *Salmo trutta* | 4 | 0.38 | 11 | 7.0 | 0.71 | - |
| | | Channel Catfish | *Ictaluris punctatus* | 4 | 3.7 | 8.7 | 5.8 | 0.67 | - |
| | | Common Carp | *Cyprinus carpio* | 6 | 0.39 | 1.5 | 1.1 | 0.007 | 0.84 |
| | | Cutthroat Trout | *Oncorhynchus clarkii* | 69 | 1.0 | 11 | 1.8 | <0.001 | 0.82 |
| | | Dolly Varden | *Salvelinus malma* | 17 | 0.71 | 3.6 | 1.3 | <0.001 | 0.90 |
| | | Flannelmouth Sucker | *Catostomus latipinnis* | 7 | 0.85 | 1.4 | 1.1 | 0.036 | 0.58 |
| | | Green Sunfish | *Lepomis cyanellus* | 38 | 0.79 | 1.8 | 1.2 | <0.001 | 0.89 |
| | | Largemouth Bass | *Micropterus salmoides* | 13 | 0.77 | 1.8 | 1.1 | 0.22 | - |
| | | Mountain Whitefish | *Prosopium williamsoni* | 27 | 3.5 | 8.2 | 5.8 | <0.001 | 0.33 |
| | | Northern Pike | *Esox lucius* | 14 | 1.0 | 3.9 | 1.9 | <0.001 | 0.83 |
| | | Rainbow Trout | *Oncorhynchus mykiss* | 47 | 0.040 | 4.4 | 1.9 | <0.001 | 0.96 |
| | | Razorback Sucker | *Xyrauchen texanus* | 34 | 1.1 | 5.2 | 2.3 | <0.001 | 0.80 |
| | | Roundtail Chub | *Gila robusta* | 7 | 1.5 | 2.5 | 2.0 | 0.026 | 0.62 |
| | | Smallmouth Bass | *Micropterus dolomieu* | 6 | 0.94 | 1.6 | 1.2 | 0.006 | 0.85 |
| | | White Sturgeon | *Acipenser transmontanus* | 6 | 1.6 | 21 | 1.3 | 0.006 | 0.86 |
| | | White Sucker | *Catostomus commersonii* | 40 | 0.47 | 2.1 | 1.0 | <0.001 | 0.59 |

[a] Ratio of ovary to muscle for individual fish as listed by USEPA (2016)

[b] $r^2$ presented for significant relationships ($p<0.05$)

[c] Estimated from a figure in Nautilus (2011)

### 7.5 Mercury Concentrations in Muscle

Elevated mercury concentrations are often observed in predatory fish species in northern lakes due to naturally high mercury levels, atmospheric deposition of mercury, and biogeochemical conditions that favour mercury methylation (Evers et al. 2011). Methylated mercury is bioaccumulated and biomagnified through the food chain resulting in elevated concentrations in larger, older, and more predatory fish (such as burbot and bull trout). Consistent with mercury's known ability to bioaccumulate, concentrations in the muscle of fish from Koocanusa Reservoir were typically higher in larger fish (Appendix Figures F.30 to F.40). Muscle mercury concentrations were consistently higher than the BCMOE guideline for the protection of wildlife (0.033 µg/g ww), assuming all mercury is present as methylmercury (CCME 2000). The only exception was mountain whitefish, where muscle mercury concentrations in most individuals were below the guideline (Appendix Figure F.34). As indicated in the footnote of Section 3.3.2, the metallurgical coal mines in the Elk River watershed are not considered to be a source of mercury.

# 8 SUMMARY

A three-year study characterizing and comparing chemical and biological conditions in the Canadian portion of Koocanusa Reservoir downstream from the Elk River compared to upstream was completed over the 2014 to 2016 period.

Water quality profiles conducted during biological sampling indicated that the water column was oxygenated with slightly alkaline pH. Concentrations of nitrate, selenium, and sulphate were similar in water samples collected at middle and bottom depths at all downstream sample locations, but were typically lower in samples collected at the surface. Differences between upstream and downstream concentrations were greater in 2016 than 2015 for both nitrate and selenium, but mean concentrations at the downstream areas in 2016 were similar to or less than those observed in 2015. Sulphate concentrations did not differ significantly downstream versus upstream of the Elk River in any years. SPOs for nitrate, selenium, sulphate, and dissolved cadmium were consistently met at the Order station downstream from the Elk River.

Sediment samples collected in the reservoir both downstream and upstream from the Elk River were mostly silt (≥60%), with sand and clay comprising smaller fractions, and TOC concentrations ranging from 0.9 to 1.7%. Concentrations of most metals and PAHs in sediment were higher downstream from the Elk River compared to upstream, but did not increase over the three year study. Concentrations of some metals (upstream and downstream) and PAHs (downstream only) in sediments were also above the lower provincial sediment quality guidelines (i.e., thresholds, below which, aquatic life is protected from adverse effects), but none exceeded the higher guidelines (i.e., thresholds, above which, severe effects to aquatic life are likely to occur).

Low concentrations of phosphorus and chlorophyll-a, along with low seston and zooplankton biomass, all indicated that the reservoir is oligotrophic. Phytoplankton communities in the reservoir were numerically dominated by diatoms, and to a lesser extent, Chrysophytes. There were no significant differences in overall phytoplankton density, biomass, or richness between downstream and upstream areas over the three years. The only difference in community structure was greater Cyanophyte biomass at the downstream area, which was considered to have low ecological significance because this group represented <1% of the community.

The zooplankton community was numerically dominated by rotifers and copepods, with relatively low numbers of cladocerans. No consistent differences were observed between downstream and upstream areas in overall zooplankton density, biomass, richness, or in absolute or relative density or biomass of copepods or rotifers, over the three year study.

Abundance and biomass of cladocerans tended to be lower downstream from the Elk River compared to upstream.

Benthic invertebrate communities were primarily composed of oligochaetes (mostly immature Tubificinae), insects (various species of chironomids), and ostracods in all three sample years. Overall community density and richness did not differ significantly between upstream and downstream areas in any of the three study years. However, community structure differed between areas, particularly with respect to ostracods, which had higher average density at the downstream area (means ranging from 849 to 1,686 per m$^2$) compared to the upstream area (means of 38 to 333 per m$^2$) over the three years of study. Densities of oligochaetes were also significantly higher at the downstream area (range of 1,194 to 1,449 per m$^2$) compared to the upstream area (range of 418 to 1,194 per m$^2$). Greater abundance of these organisms downstream from the Elk River compared to upstream may be associated with preference for greater depths and finer sediment texture, and/or avoidance of coarser, compacted sediments in the upstream area that dry out during low pool.

Largescale sucker, northern pikeminnow, peamouth chub, redside shiner, and yellow perch were the most commonly captured species all three study areas (i.e., Sand Creek, Elk River, and Gold Creek), with other less-commonly captured species including bull trout, burbot, kokanee, longnose sucker, mountain whitefish, pumpkinseed, rainbow trout, slimy sculpin, and westslope cutthroat trout. Fish health surveys, which focused on endpoints indicative of fish survival (mean age), growth (body size-at-age), reproduction (relative gonad weight) and energy storage (relative liver weight and overall condition), showed no consistent patterns among fish species, sexes, or sampling years that were indicative of influence from the Elk River.

Selenium concentrations in zooplankton were similar between downstream and upstream areas in all three years. In contrast, mean benthic invertebrate tissue selenium concentrations were significantly higher at the downstream area than the upstream area. Concentrations were also greater than the BC interim chronic dietary guideline of 4 µg/g dw, but lower than the Level 1 benchmarks for effects to benthic invertebrates (13 mg/kg dw) and for dietary effects to fish (11 mg/kg dw). Some fish had muscle or whole body concentrations of selenium greater than the BC guideline of 4 µg/g dw, but all were less than the USEPA criterion of 11.3 µg/g dw in muscle and 8.5 µg/g dw in whole bodies (except for a single yellow perch with a muscle selenium concentration of 15.0 µg/g dw). Ovary selenium concentrations were frequently greater than the BC chronic guideline of 11 µg/g dw, but all species except redside shiner and northern pikeminnow had mean ovary selenium concentrations less than the Level 1 benchmark for reproductive effects to fish (18 mg/kg dw), and the 2016 USEPA criterion of 15.1 µg/g dw. Northern pikeminnow had mean ovary selenium concentrations above the Level 1 benchmark at the Elk River area in only one of the three years they were sampled (2014), when ovaries were relatively undeveloped.  Mean redside shiner ovary concentrations were above the Level 1 benchmark at both the Elk River and the Sand Creek areas in both years sampled.

Overall, the data collected during this study will be used as the basis for future study design development for a long-term monitoring program.

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# APPENDIX A

# DATA QUALITY ASSESSMENT

# APPENDIX A DATA QUALITY ASSESSMENT

# A1 INTRODUCTION

A Data Quality Assessment (DQA) was conducted on data collected for the Koocanusa Reservoir 2014 to 2016 monitoring program. The objective of the DQA is to define the overall quality of the data presented in the report, and, by extension, the confidence with which the data can be used to derive conclusions.

## A1.1 Background

A variety of factors can influence the chemical and biological measurements made in an environmental study and thus affect the accuracy and/or precision of the data. Inconsistencies in sampling or laboratory methods, use of instruments that are inadequately calibrated or which cannot measure to the desired level of accuracy or precision, and contamination of samples in the field or laboratory are just some of the potential factors that can lead to the reporting of data that do not accurately reflect environmental conditions. Depending on the magnitude of the problem, inaccuracy or imprecision have the potential to affect the reliability of conclusions made from the data. Therefore, it is important to ensure that monitoring programs incorporate appropriate steps to control the non-natural sources of data variability (i.e., minimize the variability that does not reflect natural spatial and temporal variability in the environment) and thus assure the quality of the data.

Data quality as a concept is meaningful only when it relates to the intended use of the data. That is, one must know the context in which the data will be interpreted in order to establish a relevant basis for judging whether or not the data set is adequate. DQA involves comparison of actual field and laboratory measurement performance to data quality objectives (DQOs) established for a particular study, such as evaluation of method detection limits, blank sample data, data precision (based on field and laboratory duplicate samples), and data accuracy (based on matrix spike recoveries and/or analysis of standards or certified reference materials).

DQOs were established at the outset of the project that reflect reasonable and achievable performance expectations (Table A.1). Programs involving a large amount of samples and analytes usually have some results that exceed the DQOs. This is particularly so for multi-element scans (e.g., ICP scans for metals) since the analytical conditions are not necessarily optimal for every element included in the scan. Generally, scan results may be considered acceptable if no more than 20% of the analytes fail to meet the DQOs. Overall, the intent of comparing data to DQOs was not to reject any measurement that did not meet the DQO, but to ensure any questionable data received more scrutiny to determine what effect, if any, this had on interpretation of results within the context of this project.

## A1.2 Types of Quality Control Samples

Several types of quality control (QC) samples were assessed based on samples collected (or prepared) in the field and laboratory. These samples, and a description of each, include the following:

- **Blanks** are samples of de-ionized water and/or appropriate reagent(s) that are handled and analyzed the same way as regular samples. These samples will reflect any contamination of samples occurring in the field (in the case of field or trip blanks) or the laboratory (in the case of laboratory or method blanks). Concentrations of analytes should not be detectable, although a DQO of twice the method detection limit allows for slight “noise” around the detection limit.
- **Field Duplicates** are replicate samples split from a larger homogenized sample that was collected at a randomly selected field station. Data from split samples provides a measure of potential contamination or variability introduced after sampling through analysis.
- **Laboratory Duplicates** are replicate sub-samples created in the laboratory from randomly selected field samples which are sub-sampled and then analyzed independently using identical analytical methods. The laboratory duplicate sample results reflect any variability introduced during laboratory sample handling and analysis and thus provide a measure of laboratory precision.
- **Spike Recovery Samples** are created in the laboratory by adding a known amount/concentration of a given analyte (or mixture of analytes) to a randomly selected test sample previously divided to create two sub-samples. The spiked and regular sub-samples are then analyzed in an identical manner. The spike recovery represents the difference between the measured spike amounts (total amount in spiked sample minus amount in original sample) relative to the known spike amount (as a percentage). The analysis of spiked samples provides an indication of the accuracy of analytical results.
- **Certified Reference Materials** are samples containing known chemical concentrations that are processed and analyzed along with batches of environmental samples. The sample results are then compared to target results to provide a measure of analytical accuracy. The results are reported as the percent of the known amount that was recovered in the analysis.

Two additional types of QC, specific to benthic invertebrate or plankton community samples, include:

- **Organism Recovery Checks** for benthic invertebrate community samples. This involves the re-processing of previously sorted material from a randomly selected sample to determine the number of invertebrates that were not recovered during the original sample processing. The reprocessing is conducted by an analyst not involved during the original processing to reduce bias. This check allows the determination of accuracy through assessment of recovery efficiency.
- **Sub-Sampling Error** is assessed for studies in which benthic invertebrate or plankton community samples require sub-sampling (due to large sample volume and/or organism density). By comparing the numbers of organisms recovered between at least two sub-samples, this measure provides an estimate of laboratory precision. Therefore, sub-sampling error provides a measure of analytical accuracy and precision. The processing of an entire benthic invertebrate community sample in representative fractions also allows an evaluation of sub-sampling accuracy.

# A2 WATER SAMPLES

Water chemistry samples collected from 2014 to 2016 were taken in accordance with Teck's Annual Water Quality Monitoring Report (Teck 2016b, 2017). Associated QC measures were taken by the analytical laboratory and the field crew and the results from the DQA were included in the aforementioned reports.

# A3 SEDIMENT SAMPLES

Sediment chemistry samples collected from 2014 to 2016 were analyzed by ALS Environmental (Calgary, Alberta).

## A3.1 Method Detection Limits

MDLs achieved for sediment sample analyses were at or below the target concentrations, with few exceptions. In all three years (2014 to 2016), the MDL was above target concentrations for bismuth, magnesium, phosphorus, strontium, and tin (Table A.2). Additionally, with the analysis of polycyclic aromatic hydrocarbons in 2015 and 2016, targets MDLs were not achieved for acenaphthene, acenaphthylene, and diebnz(a,h)anthracene. However, MDLs for all analytes were below the corresponding guidelines for protection of aquatic health so the reported results can still be evaluated relative to guidelines.

### A3.1.1 Method Blanks

Laboratory blank samples were analyzed and reported along with sediment samples in all three samples years. Concentrations of all analytes were reported as being less than the MDL, indicating no inadvertent sample contamination (Table A.3).

## A3.2 Data Precision

### A3.2.1 Precision Associated with Field Duplicate (Split) Samples

One sediment sample was split in the field in each of the three years to create field duplicates. There was good agreement (<40% RPD) in analyte concentrations for each set of duplicate results (Table A.4). Exceptions were sodium and tin measurements made in 2014, but neither substance has a sediment quality guideline or is considered a mine-related constituent of concern. Overall, the data suggest that reported results were reasonably precise representations of conditions at the time of sampling.

### A3.2.2 Laboratory Precision

Close agreement was achieved between laboratory duplicate samples for all three years of analysis, providing further evidence that reported sample results were associated with good analytical precision (Table A.5).

## A3.3 Laboratory Accuracy

Recoveries of certified reference materials were all within the target ranges (Table A.6), indicating excellent analytical accuracy.

# A4 PLANKTON SAMPLES

Tissue chemistry of zooplankton samples was analyzed by the University of Missouri-Columbia Research Reactor Center (MURR; Columbia, Missouri). Phytoplankton and zooplankton community samples were analyzed by Plankton R Us (Winnipeg, Manitoba).

## A4.1 Method Detection Limits for Zooplankton Tissue Chemistry

Method detection limits for analytes measured in zooplankton tissue samples were variable over the three year study (2014 to 2016; Table A.7), but were sufficiently low to report quantifiable tissue concentrations of all analytes (Table G.1).

## A4.2 Laboratory Accuracy of Zooplankton Tissue Chemistry Analysis

Accuracy of tissue chemistry data was determined based on recoveries of analytes in liver samples analyzed concurrently with the zooplankton tissue samples (i.e., SRM 1577 bovine liver from National Institute of Standards and Technology, and CRM DOLT-4 and DOLT-5 dogfish liver from the National Research Council). The DQO was recovery of 70 – 130% of the certified value in each sample. Some elements listed on the certificates of analysis are lower-confidence values or unconfirmed results presented for informational purposes, rather than certified values (i.e., the target value may not be accurate). These values were also provided for comparison purposes, but were not used to judge acceptability of data.

Over the three year study, recoveries of metals from CRMs almost all metals met the DQO of 70 to 130% (Table A.8a to c). In particular, reported selenium concentrations were consistently within the certified range of concentrations. Selenium is the tissue constituent of greatest relevance to the project. The results indicated good analytical accuracy associated with analysis of zooplankton tissue samples.

## A4.3 Laboratory Precision for Zooplankton Tissue Chemistry Analysis

One set of laboratory duplicate samples was completed for zooplankton tissue analysis. All The DQO of RPD ≤30% was met for all analytes (Table A.9). As such, laboratory precision associated with analysis of zooplankton tissue samples was considered good.

## A4.4 Laboratory Precision for Plankton Community Analyses

One zooplankton sample collected during each of the August field programs in 2014, 2015 and 2016 was randomly selected by the laboratory for duplicate analysis of community structure (Plankton R Us). The relative percent difference between replicates was computed at the species and group level, and compared to the DQO (Tables A.10 and A.11). Results indicated fairly consistent findings at the lowest practical level (LPL) throughout the three year study, although RPDs for the densities of some organisms, particularly those present in low abundance, exceeded the DQO (Table A.10). Comparisons at group level showed good agreement between the duplicate samples, with the exception of the rotifers in 2015 (Table A.11). The results indicate adequate laboratory precision for the purposes of this project, because statistical comparisons among areas and years focused on major group densities.

One phytoplankton sample collected during each of the August field programs in 2014, 2015 and 2016 was randomly selected by the laboratory for duplicate analysis of community structure. The relative percent difference between duplicates was computed at the species and group level and compared to the DQO. Very few replicates met the DQO at the species level (Table A.12). At the major group level, the DQO was met for five of the seven groups in 2014 and 2016, while duplicate results for only three of seven groups met the DQO in 2015 (Table A.13). Poor agreement between duplicate results indicates relatively large sub-sampling error, especially at more detailed levels of taxonomy. This may be due to incomplete homogenization of the sample prior to subsampling, and/or because only a very small portion of a collected sample is assessed (e.g., 10 mL aliquots), so between-sub-sample differences in counts (especially for rarer taxa) become exaggerated once multiplied up to a per-litre density basis. Similar QC issues were recently reported for laboratory analyses of periphyton samples (Minnow and Larratt 2016).

# A5 BENTHIC INVERTEBRATE SAMPLES

Benthic invertebrate tissue chemistry samples were analyzed by MURR (Columbia, Missouri). Benthic invertebrate community samples were analyzed by ZEAS Inc. (Bolton, Ontario).

## A5.1 Method Detection Limits for Benthic invertebrate Tissue Chemistry Analysis

Method detection limits for analytes measured in benthic invertebrate tissue samples were variable over the three year study (2014 to 2016) (Table A.14), but were sufficiently low to quantify concentrations of all analytes (Table G.1).

## A5.2 Laboratory Precision and Accuracy for Benthic Invertebrate Tissue Chemistry Analysis

Benthic invertebrate tissue samples were analyzed at the same time as the fish tissue samples, so the QA/QC results reported in Sections A5.2 and A.5.3 apply to benthic invertebrate samples.

## A5.3 Laboratory Precision and Accuracy for Benthic Invertebrate Community Analyses

Percent recovery of organisms was excellent in all three study years, ranging from 95% to 100% among samples, and all values were well above the corresponding DQO of ≥ 90% (Table A.15a).

Sub-sampling error was not estimated in 2014 or 2015 because all samples were sorted and enumerated in their entirety. In 2016, subsampling error was estimated for 1 of the 10 samples. Subsample precision and accuracy were excellent based on good agreement between the two sub-samples for organism abundance (Table A.15b).

# A6 FISH SAMPLES

Metal concentrations were analyzed in fish tissues (i.e., bull trout [BT], burbot [BB], kokanee [KO], largescale sucker [CSU], mountain whitefish [MW], northern pikeminnow [NSC], peamouth chub [PCC], rainbow trout [RT], redside shiner [RSC], westslope cutthroat trout [WCT], yellow perch [YP]) were analyzed in 2014, 2015 and/or 2016 by MURR (Columbia, MO). The benthic invertebrate tissue were analyzed at the same time, so the QA/QC applies, as well. Resulting QA/QC is discussed collectively in the following sections.

## A6.1 Method Detection Limits

MDLs for elements measured in fish tissue samples were variable, but were typically very low (Table A.16). Selenium, which was the main tissue constituent of interest for this project, had sufficiently low MDLs to results in quantifiable concentrations in fish tissue samples and allow for comparison to tissue guidelines and site-specific benchmarks (Tables G.2 to G.11).

## A6.2 Laboratory Precision

Replicate digestions of several fish muscle, ovary, and whole body samples were prepared for analysis in all three study years (2014 to 2016; Table 17a,b,c, Table 18a,b,c and Table 19). Fish muscle and ovary samples were homogenized within their freeze drying vessels using a combination of pre-cleaned plastic lab spatulas and glass stir rods. This homogenization technique may not have been entirely adequate for the fish muscle samples as small flakes of connective tissue were still visible in the muscle powder. This is most likely the cause of some inconsistency of the replicate results for a few elements in fish muscle (Table A.17a,b,c). However, duplicate results for were comparable for most analytes, and showed consistently good agreement for selenium concentrations (Tables A.17a,b,c and A.18a,b,c). Therefore, the precision of tissue chemistry results for fish and benthic invertebrates was considered acceptable.

Replicate digestions of nine whole body fish samples were prepared from 2014 to 2016. Whole-bodied fish samples were homogenized using a cryogenic mixer mill, which effectively pulverized the samples into a fine, frozen powder. This resulted in very homogenous samples, which is reflected in the fact that very few substances exceeded the DQO by only a minor amount in replicate analyses (Table A.19). There was good agreement in selenium concentrations between duplicate samples. Overall, the results of replicate analyses indicated acceptable precision of analyses.

### A6.3 Laboratory Accuracy

Accuracy of tissue chemistry data was determined based on recoveries of analytes in liver samples analyzed concurrently with the fish tissue samples (i.e., SRM 1577 bovine liver from National Institute of Standards and Technology, and CRM DOLT-4 and DOLT-5 dogfish liver from the National Research Council). The DQO was recovery of 70 – 130% of the certified value in each sample. Some elements listed on the certificates of analysis are lower-confidence values or unconfirmed results presented for informational purposes, rather than certified values (i.e., the target value may not be accurate). These values were also provided for comparison purposes, but were not used to judge acceptability of data.

Matrix spikes using approximately 3 ppm of two multi-element solutions (together containing many, but not all, analytes) were also performed on muscle fillet, ovary and whole body samples, but could not be performed on muscle plug samples based on their small size.

Results for chromium and mercury in SRM 1577 exceeded the DQO in most instances compared to certified values in all three study years (Table A.20,a,b,c). However, results for chromium and mercury in DOLT-4 and DOLT-5 were within the acceptable range relative to certified or informational values (Table A.20,a,b,c). All other elements met the DQO for all analyses, with a few minor exceptions where recovery was just outside of the acceptable range. Selenium concentrations, which were of particular relevance in this project, met the DQO except for a small proportion of instances in which the reported concentrations slightly overestimated the actual sample amount. This means that, if anything, sample concentrations associated with the project may slightly overestimate actual tissue concentrations and the project results will be conservative in terms of estimating potential selenium-related risks to fish or their consumers.

Matrix spike recoveries almost always met the DQO of 70-130%, with the exception of zirconium where the recovery was often not completely recovered in all three years of the study (Table A.21a,b,c). Spike recovery results for some elements were omitted by MURR because the high or variable level of the element in the unspiked sample precluded accurate measurement of percent recovery (Table A.21a,b,c). Recoveries of selenium in matrix spikes were consistently good. Overall, the results for analysis of matrix spikes and certified reference materials indicated acceptable analytical accuracy for fish tissue samples.

# A7 DATA QUALITY STATEMENT

The quality of the data collected for this project was considered acceptable to serve the project objectives, except that phytoplankton community results should be interpreted with caution based on poor agreement on taxon densities between laboratory subsamples.

## Table A.1: Data Quality Objectives for Samples Collected in Koocanusa Reservoir, 2014 to 2016

| Quality Control Measure | Quality Control Sample Type | Study Component | | | |
|---|---|---|---|---|---|
| | | Sediment Quality | Phytoplankton and Zooplankton Community | Benthic Invertebrate Community | Tissue Chemistry |
| **Method Detection Limits (MDL)** | Comparison of actual MDL versus target MDL | MDL for each parameter should be at least as low as applicable guidelines, ideally ≤1/2 the LEL guideline value[a] | NA | NA | NA |
| **Blank Analysis** | Laboratory Blank | Within target range of ≤2x the MDL | NA | NA | NA |
| **Field Precision** | Field Duplicates (split samples) | ≤40% RPD[b] | NA | NA | NA |
| **Laboratory Precision** | Laboratory Duplicates | ≤35% RPD[b] | ≤30% RPD[b] | ≤20% RPD[b] | ≤30% RPD[b] |
| **Accuracy** | Recovery of Matrix Spikes | NA | NA | NA | 70-130% |
| | Recovery of Certified Reference Material, QC Standards | Within laboratory target range of 70-130%[c] | NA | NA | 70-130% |
| | Sub-Sampling Accuracy | NA | NA | Sub-sample estimate is within 80% to 120% of total sample abundance | NA |
| | Organism Recovery | NA | NA | ≥90% | NA |

[a] or should meet target MDLs provided by the laboratory, if a guideline does not exist for the substance.

[b] RPD - Relative Percent Difference

[c] some variations occur with the DQO, which are indicated on Appendix Table A.6.

NA - Not Applicable

**Table A.2:** **Laboratory Method Detection Limits (MDLs) for Sediment Samples Relative to Targets and Sediment Quality Guidelines**

| Analyte | | Units | BCSQG$^{a}$ | Method Detection Limit | | | |
|---|---|---|---|---|---|---|---|
| | | | | Target | Achieved (2014) | Achieved (2015) | Achieved (2016) |
| Non-metals | Moisture | % | - | 0.25 | 0.25 | 0.25 | 0.25 |
| | pH (1:2 soil:water) | pH | - | 0.1 | 0.1 | 0.1 | 0.1 |
| | % Gravel | % | - | 0.1 | 0.1 | 0.1 | 0.1 |
| | % Sand | % | - | 0.1 | 0.1 | 0.1 | 0.1 |
| | % Silt | % | - | 0.1 | 0.1 | 0.1 | 0.1 |
| | % Clay | % | - | 0.1 | 0.1 | 0.1 | 0.1 |
| | Total Organic Carbon | % | - | 0.1 | 0.1 | 0.1 | 1.0 |
| Total Metals | Aluminum (Al) | mg/kg dw | - | 50 | 50 | 50 | 50 |
| | Antimony (Sb) | mg/kg dw | - | 0.10 | 0.10 | 0.10 | 0.10 |
| | Arsenic (As) | mg/kg dw | 5.9/17 $^{b}$ | 2.95 | 0.05 | 0.100 | 0.10 |
| | Barium (Ba) | mg/kg dw | - | 0.50 | 0.50 | 0.50 | 0.50 |
| | Beryllium (Be) | mg/kg dw | - | 0.10 | 0.20 | 0.10 | 0.10 |
| | Bismuth (Bi) | mg/kg dw | - | 0.10 | 0.20 | 0.20 | 0.20 |
| | Boron (B) | mg/kg dw | - | - | - | 5.00 | 5.0 |
| | Cadmium (Cd) | mg/kg dw | 0.6/3.5 $^{b}$ | 0.30 | 0.05 | 0.02 | 0.02 |
| | Calcium (Ca) | mg/kg dw | - | 50 | 50 | 50 | 50 |
| | Chromium (Cr) | mg/kg dw | 37.3/90 $^{b}$ | 18.7 | 0.50 | 0.50 | 0.50 |
| | Cobalt (Co) | mg/kg dw | - | 0.10 | 0.10 | 0.10 | 0.10 |
| | Copper (Cu) | mg/kg dw | 35.7/197 $^{b}$ | 17.9 | 0.50 | 0.50 | 0.50 |
| | Iron (Fe) | mg/kg dw | 21,200/43,766 $^{c}$ | 10,600 | 50 | 50 | 50 |
| | Lead (Pb) | mg/kg dw | 35/91 $^{b}$ | 17.5 | 0.50 | 0.50 | 0.50 |
| | Lithium (Li) | mg/kg dw | - | 5.0 | 5.0 | 2.0 | 2.0 |
| | Magnesium (Mg) | mg/kg dw | - | 10 | 20 | 20 | 20 |
| | Manganese (Mn) | mg/kg dw | 460/1,100 $^{c}$ | 230 | 1 | 1 | 1 |
| | Mercury (Hg) | mg/kg dw | 0.170/0.486 $^{b}$ | 0.085 | 0.005 | 0.005 | 0.005 |
| | Molybdenum (Mo) | mg/kg dw | - | 0.10 | 0.50 | 0.10 | 0.10 |
| | Nickel (Ni) | mg/kg dw | 16/75 $^{c}$ | 8 | 0.50 | 0.50 | 0.50 |
| | Phosphorus (P) | mg/kg dw | - | 20 | 50 | 50 | 50 |
| | Potassium (K) | mg/kg dw | - | 100 | 100 | 100 | 100 |
| | Selenium (Se) | mg/kg dw | 2 | 1 | 0.2 | 0.2 | 0.2 |
| | Silver (Ag) | mg/kg dw | 0.5 | 0.25 | 0.10 | 0.10 | 0.10 |
| | Sodium (Na) | mg/kg dw | - | 100 | 100 | 50 | 50 |
| | Strontium (Sr) | mg/kg dw | - | 0.10 | 0.50 | 0.50 | 0.50 |
| | Thallium (Tl) | mg/kg dw | - | 0.050 | 0.050 | 0.050 | 0.050 |
| | Tin (Sn) | mg/kg dw | - | 0.20 | 2.00 | 2.00 | 2.00 |
| | Titanium (Ti) | mg/kg dw | - | 1.0 | 1.0 | 1.0 | 1.0 |
| | Uranium (U) | mg/kg dw | - | 0.050 | 0.050 | 0.050 | 0.050 |
| | Vanadium (V) | mg/kg dw | - | 0.20 | 0.20 | 0.20 | 0.20 |
| | Zinc (Zn) | mg/kg dw | 123/315 $^{b}$ | 61.5 | 1.0 | 2.0 | 2.0 |
| | Zirconium (Zr) | mg/kg dw | - | - | - | 1.0 | 1.0 |
| Polycyclic Aromatic Hydrocarbons | Acenaphthene | mg/kg dw | 0.00671/0.0889 $^{c}$ | 0.003 | - | 0.005 | 0.005 |
| | Acenaphthylene | mg/kg dw | 0.00587/0.128 $^{c}$ | 0.003 | - | 0.005 | 0.005 |
| | Anthracene | mg/kg dw | 0.0469/0.245 $^{c}$ | 0.023 | - | 0.004 | 0.004 |
| | Benz(a)anthracene | mg/kg dw | 0.0317/0.385 $^{c}$ | 0.016 | - | 0.01 | 0.01 |
| | Benzo(a)pyrene | mg/kg dw | 0.0319/0.782 $^{c}$ | 0.016 | - | 0.01 | 0.01 |
| | Benzo(b&j)fluoranthene | mg/kg dw | - | - | - | 0.01 | 0.01 |
| | Benzo(b+j+k)fluoranthene | mg/kg dw | - | - | - | 0.015 | 0.015 |
| | Benzo(g,h,i)perylene | mg/kg dw | 0.17/3.2 $^{c}$ | 0.09 | - | 0.01 | 0.01 |
| | Benzo(k)fluoranthene | mg/kg dw | 0.24/13.4 $^{c}$ | 0.12 | - | 0.01 | 0.01 |
| | Chrysene | mg/kg dw | 0.0571/0.862 $^{c}$ | 0.03 | - | 0.01 | 0.01 |
| | Dibenz(a,h)anthracene | mg/kg dw | 0.00622/0.135 $^{c}$ | 0.003 | - | 0.005 | 0.005 |
| | Fluoranthene | mg/kg dw | 0.111/2.355 $^{c}$ | 0.06 | - | 0.01 | 0.01 |
| | Fluorene | mg/kg dw | 0.021/0.144 $^{c}$ | 0.01 | - | 0.01 | 0.01 |
| | Indeno(1,2,3-c,d)pyrene | mg/kg dw | 0.2/3.2 $^{c}$ | 0.10 | - | 0.01 | 0.01 |
| | 2-Methylnaphthalene | mg/kg dw | 0.0202/0.201 $^{c}$ | 0.01 | - | 0.01 | 0.01 |
| | Naphthalene | mg/kg dw | 0.0346/0.391 $^{c}$ | 0.02 | - | 0.01 | 0.01 |
| | Phenanthrene | mg/kg dw | 0.0419/0.515 $^{c}$ | 0.02 | - | 0.01 | 0.01 |
| | Pyrene | mg/kg dw | 0.053/0.875 $^{c}$ | 0.03 | - | 0.01 | 0.01 |

Note: Highlighted values indicate when achieved MDLs exceeded target MDLs.

[a] Working guidelines for whole sediment (BCMOE 2006).

[b] Interim Sediment Quality Guideline (ISQG; or Threshold Effect Level [LEL]) / Probable Effect Level (PEL).

[c] Lowest Effect Level (LEL) / Severe Effect Level (SEL).

## Table A.3: Laboratory Blank Results Associated with Analysis of Sediment Samples

| Analyte | | Units | 2014 | | 2015 | | 2016 | |
|---|---|---|---|---|---|---|---|---|
| | | | MDL | Result | MDL | Result | MDL | Result |
| Physical Test | Moisture | % | 0.25 | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 |
| Organic Carbon | Total Organic Carbon | % | - | - | <0.10 | <0.10 | - | - |
| Total Metals | Aluminum (Al) | mg/kg | <50 | <50 | <50 | <50 | <50 | <50 |
| | Antimony (Sb) | mg/kg | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| | Arsenic (As) | mg/kg | <0.050 | <0.050 | <0.10 | <0.10 | <0.10 | <0.10 |
| | Barium (Ba) | mg/kg | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Beryllium (Be) | mg/kg | <0.20 | <0.20 | <0.10 | <0.10 | <0.10 | <0.10 |
| | Bismuth (Bi) | mg/kg | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| | Boron (B) | mg/kg | - | - | <5.0 | <5.0 | <5.0 | <5.0 |
| | Cadmium (Cd) | mg/kg | <0.050 | <0.050 | <0.020 | <0.020 | <0.020 | <0.020 |
| | Calcium (Ca) | mg/kg | <50 | <50 | <50 | <50 | - | - |
| | Chromium (Cr) | mg/kg | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Cobalt (Co) | mg/kg | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| | Copper (Cu) | mg/kg | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Iron (Fe) | mg/kg | <50 | <50 | <50 | <50 | <50 | <50 |
| | Lead (Pb) | mg/kg | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Lithium (Li) | mg/kg | <5.0 | <5.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| | Magnesium (Mg) | mg/kg | <20 | <20 | <20 | <20 | <20 | <20 |
| | Manganese (Mn) | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| | Mercury (Hg) | mg/kg | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| | Molybdenum (Mo) | mg/kg | <0.50 | <0.50 | <0.10 | <0.10 | <0.10 | <0.10 |
| | Nickel (Ni) | mg/kg | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Phosphorus (P) | mg/kg | <50 | <50 | <50 | <50 | <50 | <50 |
| | Potassium (K) | mg/kg | <100 | <100 | <100 | <100 | <100 | <100 |
| | Selenium (Se) | mg/kg | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| | Silver (Ag) | mg/kg | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| | Sodium (Na) | mg/kg | <100 | <100 | <50 | <50 | <50 | <50 |
| | Strontium (Sr) | mg/kg | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Thallium (Tl) | mg/kg | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| | Tin (Sn) | mg/kg | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| | Titanium (Ti) | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| | Uranium (U) | mg/kg | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| | Vanadium (V) | mg/kg | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| | Zinc (Zn) | mg/kg | <1.0 | <1.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| | Zirconium (Zr) | mg/kg | - | - | <1.0 | <1.0 | <1.0 | <1.0 |
| Polycyclic Aromatic Hydrocarbon | Acenaphthene | mg/kg | - | - | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| | Acenaphthylene | mg/kg | - | - | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| | Anthracene | mg/kg | - | - | <0.0040 | <0.0040 | <0.0040 | <0.0040 |
| | Benz(a)anthracene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Benzo(a)pyrene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Benzo(b&j)fluoranthene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Benzo(g,h,i)perylene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Benzo(k)fluoranthene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Chrysene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Dibenz(a,h)anthracene | mg/kg | - | - | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| | Fluoranthene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Fluorene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Indeno(1,2,3-c,d)pyrene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | 2-Methylnaphthalene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Naphthalene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Phenanthrene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |
| | Pyrene | mg/kg | - | - | <0.010 | <0.010 | <0.010 | <0.010 |

**Table A.4:** **Field Duplicate (Split Sample) Results**

| Analyte | | Units | T4-2 (2014) | | | T4-6 (2015) | | | TN-5 (2016) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | T4-2 | TX-D | RPD | T4-6 | T4-X | RPD | TN-5 | T-XSed | RPD |
| Physical Tests | Moisture | % | 38 | 43 | 11% | 45 | 42 | 7% | 38 | 38 | 2% |
| | pH (1:10 soil:water) | pH | 8.17 | 8.08 | 1% | 8.13 | 8 | 2% | 8.02 | 8.2 | 2% |
| Particle Size | % Gravel (>2mm) | % | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% |
| | % Sand (2.00mm - 1.00mm) | % | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% |
| | % Sand (1.00mm - 0.50mm) | % | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% | <0.10 | <0.13 | 26% |
| | % Sand (0.50mm - 0.25mm) | % | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% | <0.47 | <0.41 | 14% |
| | % Sand (0.25mm - 0.125mm) | % | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% | <4.49 | <4.88 | 8% |
| | % Sand (0.125mm - 0.063mm) | % | <0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% | <9.84 | <10.80 | 9% |
| | % Silt (0.063mm - 0.0312mm) | % | 8.33 | 8.61 | 3% | 9.92 | 10.40 | 5% | 27.00 | 25.50 | 6% |
| | % Silt (0.0312mm - 0.004mm) | % | 61.7 | 62.0 | 0% | 63.5 | 63.0 | 1% | 47.1 | 46.3 | 2% |
| | % Clay (<4um) | % | 30 | 29 | 2% | 27 | 27 | 0% | 11 | 12 | 10% |
| | Texture | - | Silt loam | Silt loam | - | Silt loam | Silt loam | - | Silt loam | Silt loam | - |
| Organic Carbon | Total Organic Carbon | % | 1.26 | 1.32 | 5% | 1.53 | 1.51 | 1% | 1.23 | 1.28 | 4% |
| Total Metals | Aluminum (Al) | mg/kg | 13,600 | 12,900 | 5% | 13,900 | 12,000 | 15% | 10,800 | 10,100 | 7% |
| | Antimony (Sb) | mg/kg | 0.44 | 0.45 | 2% | 0.46 | 0.43 | 7% | 0.26 | 0.26 | 0% |
| | Arsenic (As) | mg/kg | 6.08 | 5.99 | 1% | 7.37 | 6.51 | 12% | 5.28 | 5.05 | 4% |
| | Barium (Ba) | mg/kg | 155 | 155 | 0% | 151 | 136 | 10% | 061 | 060 | 2% |
| | Beryllium (Be) | mg/kg | 0.60 | 0.57 | 5% | 0.56 | 0.52 | 7% | 0.38 | 0.38 | 0% |
| | Bismuth (Bi) | mg/kg | 0.21 | 0.20 | 5% | 0.21 | <0.20 | 5% | <0.20 | <0.20 | 0% |
| | Boron (B) | mg/kg | - | - | - | 5.40 | <5.0 | 8% | <5.00 | <5.00 | 0% |
| | Cadmium (Cd) | mg/kg | 0.576 | 0.592 | 3% | 0.500 | 0.442 | 12% | 0.184 | 0.191 | 4% |
| | Calcium (Ca) | mg/kg | 100,000 | 100,000 | 0% | 120,000 | 110,000 | 9% | 102,000 | 101,000 | 1% |
| | Chromium (Cr) | mg/kg | 20.1 | 19.3 | 4% | 22.0 | 19.8 | 11% | 15.2 | 14.5 | 5% |
| | Cobalt (Co) | mg/kg | 8.20 | 8.11 | 1% | 10.10 | 8.83 | 13% | 7.67 | 7.57 | 1% |
| | Copper (Cu) | mg/kg | 15.1 | 15.4 | 2% | 18.6 | 16.6 | 11% | 17.9 | 14.8 | 19% |
| | Iron (Fe) | mg/kg | 20,400 | 20,400 | 0% | 24,800 | 22,300 | 11% | 19,200 | 19,200 | 0% |
| | Lead (Pb) | mg/kg | 14.7 | 17.3 | 16% | 15.1 | 13.3 | 13% | 13.7 | 14.5 | 6% |
| | Lithium (Li) | mg/kg | 23.6 | 23.3 | 1% | 26.3 | 23.9 | 10% | 23.9 | 24.1 | 1% |
| | Magnesium (Mg) | mg/kg | 19,100 | 19,100 | 0% | 24,600 | 22,000 | 11% | 20,500 | 20,000 | 2% |
| | Manganese (Mn) | mg/kg | 552 | 551 | 0% | 596 | 527 | 12% | 378 | 379 | 0% |
| | Mercury (Hg) | mg/kg | 0.0334 | 0.0349 | 4% | 0.0417 | 0.0380 | 9% | 0.0163 | 0.0223 | 31% |
| | Molybdenum (Mo) | mg/kg | 1.03 | 1.02 | 1% | 0.98 | 0.89 | 10% | 0.60 | 0.57 | 5% |
| | Nickel (Ni) | mg/kg | 22.2 | 22.4 | 1% | 25.7 | 22.8 | 12% | 18.7 | 17.7 | 5% |
| | Phosphorus (P) | mg/kg | 615 | 651 | 6% | 819 | 707 | 15% | 506 | 524 | 3% |
| | Potassium (K) | mg/kg | 2,220 | 1,950 | 13% | 1,810 | 1,510 | 18% | 740 | 610 | 19% |
| | Selenium (Se) | mg/kg | 0.59 | 0.53 | 11% | 0.58 | 0.49 | 17% | <0.20 | <0.20 | 0% |
| | Silver (Ag) | mg/kg | 0.12 | 0.12 | 0% | 0.10 | <0.10 | 0% | <0.10 | <0.10 | 0% |
| | Sodium (Na) | mg/kg | 190 | 120 | 45% | 124 | 110 | 12% | 083 | 073 | 13% |
| | Strontium (Sr) | mg/kg | 183 | 184 | 1% | 241 | 222 | 8% | 226 | 236 | 4% |
| | Thallium (Tl) | mg/kg | 0.203 | 0.184 | 10% | 0.155 | 0.140 | 10% | 0.077 | 0.077 | 0% |
| | Tin (Sn) | mg/kg | 2.2 | 4.0 | 58% | <2.0 | <2.0 | 0% | <2.0 | <2.0 | 0% |
| | Titanium (Ti) | mg/kg | 97.0 | 78.3 | 21% | 108 | 89 | 19% | 92 | 71 | 26% |
| | Uranium (U) | mg/kg | 0.926 | 0.896 | 3% | 0.842 | 0.762 | 10% | 0.633 | 0.702 | 10% |
| | Vanadium (V) | mg/kg | 24.5 | 23.2 | 5% | 23.3 | 20.3 | 14% | 12.3 | 11.1 | 10% |
| | Zinc (Zn) | mg/kg | 80.9 | 82.8 | 2% | 84.4 | 75.6 | 11% | 64.7 | 63.5 | 2% |
| | Zirconium (Zr) | mg/kg | - | - | - | 1.3 | 1.2 | 8% | 1.1 | 1.1 | 0% |
| Polycyclic Aromatic Hydrocarbons | Acenaphthene | mg/kg | - | - | - | <0.0050 | <0.0050 | 0% | <0.01 | <0.01 | 0% |
| | Acenaphthylene | mg/kg | - | - | - | <0.0050 | <0.0050 | 0% | <0.01 | <0.01 | 0% |
| | Anthracene | mg/kg | - | - | - | <0.0040 | <0.0040 | 0% | <0.00 | <0.00 | 0% |
| | Benz(a)anthracene | mg/kg | - | - | - | 0.01 | 0.011 | 10% | <0.01 | <0.01 | 0% |
| | Benzo(a)pyrene | mg/kg | - | - | - | <0.010 | <0.010 | 0% | <0.01 | <0.01 | 0% |
| | Benzo(b&j)fluoranthene | mg/kg | - | - | - | 0.017 | 0.017 | 0% | <0.01 | <0.01 | 0% |
| | Benzo(b+j+k)fluoranthene | mg/kg | - | - | - | 0.017 | 0.017 | 0% | <0.02 | <0.02 | 0% |
| | Benzo(g,h,i)perylene | mg/kg | - | - | - | <0.010 | <0.010 | 0% | <0.01 | <0.01 | 0% |
| | Benzo(k)fluoranthene | mg/kg | - | - | - | <0.010 | <0.010 | 0% | <0.01 | <0.01 | 0% |
| | Chrysene | mg/kg | - | - | - | 0.018 | 0.018 | 0% | <0.01 | <0.01 | 0% |
| | Dibenz(a,h)anthracene | mg/kg | - | - | - | <0.0050 | <0.0050 | 0% | <0.01 | <0.01 | 0% |
| | Fluoranthene | mg/kg | - | - | - | 0.014 | 0.014 | 0% | <0.01 | <0.01 | 0% |
| | Fluorene | mg/kg | - | - | - | <0.010 | <0.010 | 0% | <0.01 | <0.01 | 0% |
| | Indeno(1,2,3-c,d)pyrene | mg/kg | - | - | - | <0.010 | <0.010 | 0% | <0.01 | <0.01 | 0% |
| | 2-Methylnaphthalene | mg/kg | - | - | - | 0.05 | 0.04 | 22% | <0.01 | <0.01 | 0% |
| | Naphthalene | mg/kg | - | - | - | 0.025 | 0.019 | 27% | <0.01 | <0.01 | 0% |
| | Phenanthrene | mg/kg | - | - | - | 0.046 | 0.043 | 7% | <0.01 | <0.01 | 0% |
| | Pyrene | mg/kg | - | - | - | 0.013 | 0.012 | 8% | <0.01 | <0.01 | 0% |

Note: Highlighted values did not meet the data quality objective of ≤40% relative percent difference (RPD).

## **Table A.5:** Laboratory Duplicate Results for Sediment Sample Analyses

| Analyte | | Units | 2014 | | | 2015 | | | | | | | | | | | | | | | 2016 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Rep 1 | Rep 2 | RPD | T4-X Rep 1 | T4-X Rep 2 | RPD | T4-2 Rep 1 | T4-2 Rep 2 | RPD | T4-4 Rep 1 | T4-4 Rep 2 | RPD | T4-6 Rep 1 | T4-6 Rep 2 | RPD | TN-1 Rep 1 | TN-1 Rep 2 | RPD | TN-1 Rep 1 | TN-1 Rep 2 | RPD | T4-2 Rep 1 | T4-2 Rep 2 | RPD |
| Physical Tests | Moisture | % | 36.2 | 36.1 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 33.9 | 34.1 | 1% | - | - | - |
| | pH (1:10 soil:water) | pH | 8.04 | 8.22 | 2% | - | - | - | - | - | - | - | - | - | 8.13 | 8.08 | 1% | - | - | - | 8.28 | 8.24 | 0% | - | - | - |
| Particle Size | % Gravel (>2mm) | % | <0.10 | <0.10 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | <0.10 | <0.10 | 0% | - | - | - | <0.10 | <0.10 | 0% |
| | % Sand (2.00mm - 1.00mm) | % | <0.10 | <0.10 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | <0.10 | <0.10 | 0% | - | - | - | <0.10 | <0.10 | 0% |
| | % Sand (1.00mm - 0.50mm) | % | <0.10 | <0.10 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | <0.10 | <0.10 | 0% | - | - | - | <0.10 | <0.10 | 0% |
| | % Sand (0.50mm - 0.25mm) | % | <0.10 | 0.13 | 26% | - | - | - | - | - | - | - | - | - | - | - | - | <0.10 | <0.10 | 0% | - | - | - | <0.10 | <0.10 | 0% |
| | % Sand (0.25mm - 0.125mm) | % | 0.36 | 0.36 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | <0.1 | 0.1 | 10% | - | - | - | <0.10 | <0.10 | 0% |
| | % Sand (0.125mm - 0.063mm) | % | 3.64 | 3.62 | 1% | - | - | - | - | - | - | - | - | - | - | - | - | 1.6 | 2.1 | 30% | - | - | - | <0.10 | <0.10 | 0% |
| | % Silt (0.063mm - 0.0312mm) | % | 27.3 | 28.1 | 3% | - | - | - | - | - | - | - | - | - | - | - | - | 20.4 | 17.7 | 14% | - | - | - | 5.6 | 6.46 | 14% |
| | % Silt (0.0312mm - 0.004mm) | % | 54 | 54 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | 57.8 | 59.7 | 3% | - | - | - | 63.1 | 60 | 5% |
| | % Clay (<4µm) | % | 14.6 | 13.6 | 7% | - | - | - | - | - | - | - | - | - | - | - | - | 20.2 | 20.3 | 0% | - | - | - | 31.3 | 33.5 | 7% |
| Organic Carbon | Total Organic Carbon | mg/kg | 1.69 | 1.68 | 1% | - | - | - | 1.43 | 1.42 | 1% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total Metals | Aluminum (Al) | mg/kg | 11,800 | 11,500 | 3% | 12,000 | 13,000 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Antimony (Sb) | mg/kg | 0.34 | 0.33 | 3% | 0.43 | 0.44 | 2% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Arsenic (As) | mg/kg | 5.50 | 5.37 | 2% | 6.51 | 6.9 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Barium (Ba) | mg/kg | 91.9 | 89.2 | 3% | 136 | 142 | 4% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Beryllium (Be) | mg/kg | 0.40 | 0.40 | 0% | 0.52 | 0.56 | 7% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Bismuth (Bi) | mg/kg | <0.2 | <0.2 | 0% | <0.2 | <0.2 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Boron (B) | mg/kg | - | - | - | <5.0 | <5.0 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Cadmium (Cd) | mg/kg | 0.259 | 0.269 | 4% | 0.442 | 0.49 | 10% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Calcium (Ca) | mg/kg | 117,000 | 113,000 | 3% | 110,000 | 117,000 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Chromium (Cr) | mg/kg | 17.2 | 16.6 | 4% | 19.8 | 21 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Cobalt (Co) | mg/kg | 8.14 | 7.65 | 6% | 8.83 | 9.61 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Copper (Cu) | mg/kg | 13.3 | 12.8 | 4% | 16.6 | 17.7 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Iron (Fe) | mg/kg | 20,200 | 19,500 | 4% | 22,300 | 23,500 | 5% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Lead (Pb) | mg/kg | 14.4 | 14 | 3% | 13.3 | 13.9 | 4% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Lithium (Li) | mg/kg | 21.9 | 21.1 | 4% | 23.9 | 25.2 | 5% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Magnesium (Mg) | mg/kg | 21,500 | 20,800 | 3% | 22,000 | 23,900 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Manganese (Mn) | mg/kg | 435 | 413 | 5% | 527 | 571 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Mercury (Hg) | mg/kg | 0.0224 | 0.0215 | 4% | 0.038 | 0.0365 | 4% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Molybdenum (Mo) | mg/kg | 0.69 | 0.64 | 8% | 0.89 | 0.96 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Nickel (Ni) | mg/kg | 19.2 | 18.2 | 5% | 22.8 | 24.6 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Phosphorus (P) | mg/kg | 461 | 477 | 3% | 707 | 744 | 5% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Potassium (K) | mg/kg | 1350 | 1260 | 7% | 1,510 | 1,600 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Selenium (Se) | mg/kg | 0.26 | 0.26 | 0% | 0.49 | 0.48 | 2% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Silver (Ag) | mg/kg | <0.1 | <0.1 | 0% | <0.1 | <0.1 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Sodium (Na) | mg/kg | 120 | 170 | 34% | 110 | 120 | 9% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Strontium (Sr) | mg/kg | 246 | 237 | 4% | 222 | 236 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Thallium (Tl) | mg/kg | 0.129 | 0.127 | 2% | 0.14 | 0.152 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Tin (Sn) | mg/kg | <2.0 | <2.0 | 0% | <2.0 | <2.0 | 0% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Titanium (Ti) | mg/kg | 134 | 150 | 11% | 89 | 94.3 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Uranium (U) | mg/kg | 0.802 | 0.785 | 2% | 0.762 | 0.824 | 8% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Vanadium (V) | mg/kg | 16.9 | 16.3 | 4% | 20.3 | 21.5 | 6% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Zinc (Zn) | mg/kg | 70.9 | 67.3 | 5% | 75.6 | 81.2 | 7% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Zirconium (Zr) | mg/kg | - | - | - | 1.2 | 1 | 18% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Polycyclic Aromatic Hydrocarbons | Acenaphthene | mg/kg | - | - | - | - | - | - | - | - | - | <0.005 | <0.005 | 0% | - | - | - | - | - | - | <0.005 | <0.005 | 0% | - | - | - |
| | Acenaphthylene | mg/kg | - | - | - | - | - | - | - | - | - | <0.005 | <0.005 | 0% | - | - | - | - | - | - | <0.005 | <0.005 | 0% | - | - | - |
| | Anthracene | mg/kg | - | - | - | - | - | - | - | - | - | 0.004 | <0.004 | 0% | - | - | - | - | - | - | <0.004 | <0.004 | 0% | - | - | - |
| | Benz(a)anthracene | mg/kg | - | - | - | - | - | - | - | - | - | 0.016 | 0.014 | 13% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Benzo(a)pyrene | mg/kg | - | - | - | - | - | - | - | - | - | 0.011 | 0.012 | 9% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Benzo(b&j)fluoranthene | mg/kg | - | - | - | - | - | - | - | - | - | 0.025 | 0.023 | 8% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Benzo(g,h,i)perylene | mg/kg | - | - | - | - | - | - | - | - | - | <0.01 | <0.01 | 0% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Benzo(k)fluoranthene | mg/kg | - | - | - | - | - | - | - | - | - | <0.01 | <0.01 | 0% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Chrysene | mg/kg | - | - | - | - | - | - | - | - | - | 0.026 | 0.019 | 31% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Dibenz(a,h)anthracene | mg/kg | - | - | - | - | - | - | - | - | - | <0.005 | <0.005 | 0% | - | - | - | - | - | - | <0.005 | <0.005 | 0% | - | - | - |
| | Fluoranthene | mg/kg | - | - | - | - | - | - | - | - | - | 0.021 | 0.018 | 15% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Fluorene | mg/kg | - | - | - | - | - | - | - | - | - | <0.01 | <0.01 | 0% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Indeno(1,2,3-c,d)pyrene | mg/kg | - | - | - | - | - | - | - | - | - | <0.01 | <0.01 | 0% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | 2-Methylnaphthalene | mg/kg | - | - | - | - | - | - | - | - | - | 0.059 | 0.048 | 21% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Naphthalene | mg/kg | - | - | - | - | - | - | - | - | - | 0.029 | 0.022 | 27% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Phenanthrene | mg/kg | - | - | - | - | - | - | - | - | - | 0.06 | 0.05 | 24% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |
| | Pyrene | mg/kg | - | - | - | - | - | - | - | - | - | 0.018 | 0.015 | 18% | - | - | - | - | - | - | <0.010 | <0.010 | 0% | - | - | - |

**Table A.6:** **Laboratory Certified Reference Materials (CRM) Relative to Laboratory-specified Targets and Sediment Quality Guidelines**

| Analyte | | BCSQG[a] | 2014 | | | | | | | | 2015 | | | | 2016 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WG1940990-4 | | | | WG1940990-5 | | | | WG2168078-2 | | | | WG2383942-3 | | | |
| | | | Target | Achieved | Recovery | Limits | Target | Achieved | Recovery | Limits | Target | Achieved | Recovery | Limits | Target | Achieved | Recovery | Limits |
| | | | (mg/kg) | | % | | (mg/kg) | | % | | (mg/kg) | | % | | (mg/kg) | | % | |
| Total Metals | Aluminum (Al) | - | 11,100 | 11,700 | 105 | 70-130 | 18,200 | 17,700 | 97.4 | 70-130 | 18,200 | 18,300 | 101 | 70-130 | 18,200 | 18,900 | 104 | 70-130 |
| | Antimony (Sb) | - | 2.13 | 2.17 | 102 | 70-130 | 6.27 | 6.53 | 104 | 70-130 | 6.27 | 6.89 | 110 | 70-130 | 6.27 | 6.88 | 110 | 70-130 |
| | Arsenic (As) | 5.9/17 [b] | 19.6 | 20.0 | 103 | 70-130 | 15.4 | 15.9 | 104 | 70-130 | 15.4 | 18.0 | 117 | 70-130 | 15.4 | 17.3 | 112 | 70-130 |
| | Barium (Ba) | - | 273 | 274 | 100 | 70-130 | 80.6 | 83.3 | 103 | 70-130 | 80.6 | 84.7 | 105 | 70-130 | 80.6 | 82.7 | 103 | 70-130 |
| | Beryllium (Be) | - | 0.40 | 0.40 | 101 | 70-130 | 0.54 | 0.50 | 0.5* | 0.34-0.74* | 0.54 | 0.53 | 97.8 | 70-130 | 0.54 | 0.56 | 103 | 70-130 |
| | Bismuth (Bi) | - | 0.43 | 0.48 | 112 | 70-130 | 1.92 | 1.90 | 99.2 | 70-130 | 1.92 | 1.78 | 92.9 | 70-130 | 2.00 | 1.92 | 96.2 | 70-130 |
| | Boron (B) | - | - | - | - | - | - | - | - | - | 3.01 | 5.00 | 98.9 | 70-130 | 4.27 | < 5.0 | 89.5 | 50-150 |
| | Cadmium (Cd) | 0.6/3.5 [b] | 0.890 | 0.884 | 99.3 | 70-130 | 0.217 | 0.215 | 98.8 | 70-130 | 0.217 | 0.229 | 106 | 70-130 | 0.231 | 0.228 | 98.6 | 70-130 |
| | Calcium (Ca) | - | 15,400 | 15,800 | 103 | 70-130 | 3320 | 3640 | 110 | 70-130 | 3,320 | 3,550 | 107 | 70-130 | 3,320 | 3,520 | 106 | 70-130 |
| | Chromium (Cr) | 37.3/90 [b] | 26.9 | 27.5 | 102 | 70-130 | 27.2 | 28.2 | 104 | 70-130 | 27.2 | 29.9 | 110 | 70-130 | 27.2 | 28.8 | 106 | 70-130 |
| | Cobalt (Co) | - | 13.5 | 13.4 | 100 | 70-130 | 12.5 | 12.3 | 98.0 | 70-130 | 12.5 | 13.3 | 107 | 70-130 | 12.5 | 12.8 | 102 | 70-130 |
| | Copper (Cu) | 35.7/197 [b] | 33.1 | 32.8 | 99 | 70-130 | 44.9 | 41.9 | 93.4 | 70-130 | 44.9 | 47.4 | 106 | 70-130 | 44.9 | 46.8 | 104 | 70-130 |
| | Iron (Fe) | 21,200/43,766 [c] | 32,900 | 33,500 | 102 | 70-130 | 33300 | 32000 | 96.1 | 70-130 | 33,300 | 34,200 | 103 | 70-130 | 33,300 | 33,100 | 99.5 | 70-130 |
| | Lead (Pb) | 35/91 [b] | 32.4 | 34.3 | 106 | 70-130 | 14.4 | 13.2 | 92 | 70-130 | 14.4 | 13.3 | 92.3 | 70-130 | 14.4 | 13.8 | 95.8 | 70-130 |
| | Lithium (Li) | - | 8.3 | 8.1 | 97.6 | 70-130 | 10 | 10 | 99.1 | 70-130 | 10 | 10 | 99.8 | 70-130 | 10 | 11 | 111 | 70-130 |
| | Magnesium (Mg) | - | 7,500 | 7,620 | 102 | 70-130 | 5,830 | 5,710 | 97.9 | 70-130 | 5,830 | 6,120 | 105 | 70-130 | 5,830 | 5,900 | 101 | 70-130 |
| | Manganese (Mn) | 460/1,100 [c] | 3440 | 3,590 | 104 | 70-130 | 1,100 | 1,080 | 98.1 | 70-130 | 1,100 | 1,150 | 104 | 70-130 | 1,100 | 1,080 | 97.8 | 70-130 |
| | Molybdenum (Mo) | - | 0.98 | 1.0 | 105 | 70-130 | 0.74 | 0.66 | 0.66* | 0.24-1.24* | 0.74 | 0.72 | 96.9 | 70-130 | 0.74 | 0.73 | 98.5 | 70-130 |
| | Nickel (Ni) | 16/75 [c] | 19.7 | 20.5 | 104 | 70-130 | 17.4 | 17.2 | 98.8 | 70-130 | 17.4 | 19.1 | 110 | 70-130 | 17.4 | 18.8 | 108 | 70-130 |
| | Phosphorus (P) | - | 1,410 | 1,370 | 97.1 | 70-130 | 796 | 723 | 90.9 | 70-130 | 796 | 900 | 113 | 70-130 | 796 | 826 | 104 | 70-130 |
| | Potassium (K) | - | 790 | 840 | 107 | 70-130 | 620 | 710 | 114 | 70-130 | 619 | 690 | 112 | 70-130 | 619 | 600 | 96.9 | 70-130 |
| | Selenium (Se) | 2 | 1.5 | 1.6 | 103 | 70-130 | 0.32 | 0.33 | 0.33* | 0.12-0.52* | 0.32 | 0.30 | 0.3* | 0.12-0.52* | 0.32 | 0.28 | 87.5 | 70-130 |
| | Silver (Ag) | 0.5 | 0.31 | 0.33 | 106 | 70-130 | 0.22 | 0.21 | 0.21* | 0.12-0.32* | 0.22 | 0.23 | 105 | 70-130 | 0.22 | 0.26 | 117 | 70-130 |
| | Sodium (Na) | - | 280 | 310 | 111 | 70-130 | 340 | 410 | 122 | 70-130 | 340 | 391 | 115 | 70-130 | 340 | 367 | 108 | 70-130 |
| | Strontium (Sr) | - | 28.5 | 29.8 | 105 | 70-130 | 11.6 | 12.7 | 110 | 70-130 | 11.6 | 11.7 | 101 | 70-130 | 11.6 | 11.8 | 102 | 70-130 |
| | Thallium (Tl) | - | 0.240 | 0.251 | 105 | 70-130 | 0.125 | 0.133 | 0.133* | 0.075-0.175* | 0.125 | 0.119 | 94.8 | 70-130 | 0.125 | 0.115 | 91.7 | 70-130 |
| | Tin (Sn) | - | 1.7 | < 2.0 | 106 | 70-130 | 1.1 | < 2.0 | 1.0* | 0-3* | 1.1 | 2.0 | 95.7 | 70-130 | 1.1 | < 2.0 | 97.9 | 70-130 |
| | Titanium (Ti) | - | 312 | 354 | 113 | 70-130 | 874 | 971 | 111 | 70-130 | 874 | 994 | 114 | 70-130 | 874 | 805 | 92.1 | 70-130 |
| | Uranium (U) | - | - | - | - | - | 0.80 | 0.87 | 109 | 70-130 | 0.80 | 0.79 | 98.2 | 70-130 | 0.80 | 0.86 | 107 | 70-130 |
| | Vanadium (V) | - | 45.7 | 47.3 | 104 | 70-130 | 54.9 | 57.3 | 104 | 70-130 | 54.9 | 62.4 | 114 | 70-130 | 54.9 | 58.9 | 107 | 70-130 |
| | Zinc (Zn) | - | 153 | 155 | 102 | 70-130 | 67.5 | 66.3 | 98.3 | 70-130 | 67.5 | 71.4 | 106 | 70-130 | 67.5 | 70 | 104 | 70-130 |

* Laboratory results presented in mg/kg.

[a] Working guidelines for whole sediment (BCMOE 2006).

[b] Interim Sediment Quality Guideline (ISQG; or Threshold Effect Level [LEL]) / Probable Effect Level (PEL).

[c] Lowest Effect Level (LEL) / Severe Effect Level (SEL).

**Table A.7: Laboratory Method Detection Limits (MDLs) for Chemical Analysis of Zooplankton Tissue Samples**

| Analyte | Units | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 0.0041 - 0.02 | 0.056 - 0.52 | 0.012 - 0.027 |
| Antimony (Sb) | µg/g dw | 0.00053 - 0.0026 | 0.0057 - 0.053 | 0.0021 - 0.0048 |
| Arsenic (As) | µg/g dw | 0.0074 - 0.037 | 0.033 - 0.3 | 0.0086 - 0.019 |
| Barium (Ba) | µg/g dw | 0.00075 - 0.0037 | 0.008 - 0.074 | 0.0027 - 0.006 |
| Beryllium (Be) | µg/g dw | 0.0027 - 0.013 | 0.022 - 0.2 | 0.007 - 0.016 |
| Bismuth (Bi) | µg/g dw | 0.000096 - 0.00048 | 0.0014 - 0.013 | 0.00012 - 0.00027 |
| Boron (B) | µg/g dw | 0.27 - 1.3 | 1.3 - 12 | 0.28 - 0.64 |
| Cadmium (Cd) | µg/g dw | 0.001 - 0.0049 | 0.016 - 0.15 | 0.0037 - 0.0084 |
| Calcium (Ca) | µg/g dw | 0.96 - 4.8 | 13 - 120 | 5.5 - 12 |
| Cesium (Cs) | µg/g dw | 0.000064 - 0.00032 | 0.00043 - 0.0039 | 0.00028 - 0.00062 |
| Chromium (Cr) | µg/g dw | 0.0038 - 0.0190 | 0.0200 - 0.1800 | 0.0110 - 0.0240 |
| Cobalt (Co) | µg/g dw | 0.00052 - 0.0026 | 0.0032 - 0.029 | 0.0013 - 0.003 |
| Copper (Cu) | µg/g dw | 0.00200 - 0.01000 | 0.01500 - 0.14000 | 0.00510 - 0.01100 |
| Gallium (Ga) | µg/g dw | 0.00062 - 0.0031 | 0.0098 - 0.091 | 0.0032 - 0.0072 |
| Iron (Fe) | µg/g dw | 0.04 - 0.2 | 0.34 - 3.2 | 0.15 - 0.34 |
| Lead (Pb) | µg/g dw | 0.00042 - 0.0021 | 0.0026 - 0.024 | 0.00049 - 0.0011 |
| Lithium (Li) | µg/g dw | 0.0037 - 0.019 | 0.02 - 0.18 | 0.014 - 0.031 |
| Magnesium (Mg) | µg/g dw | 0.063 - 0.31 | 0.51 - 4.7 | 0.022 - 0.051 |
| Manganese (Mn) | µg/g dw | 0.004 - 0.021 | 0.067 - 0.62 | 0.19 - 0.43 |
| Mercury (Hg) | µg/g dw | 0.002 - 0.0054 | 0.0041 - 0.038 | 0.0013 - 0.003 |
| Molybdenum (Mo) | µg/g dw | 0.00059 - 0.0029 | 0.01 - 0.096 | 0.0021 - 0.0047 |
| Nickel (Ni) | µg/g dw | 0.0028 - 0.014 | 0.019 - 0.18 | 0.0049 - 0.011 |
| Phosphorus (P) | µg/g dw | 4.1 - 20 | 44 - 400 | 20 - 44 |
| Potassium (K) | µg/g dw | 0.74 - 3.7 | 8.7 - 81 | 2.8 - 6.2 |
| Rhenium (Re) | µg/g dw | 0.000058 - 0.00029 | 0.00039 - 0.0036 | 0.00013 - 0.00029 |
| Rubidium (Rb) | µg/g dw | 0.0012 - 0.0059 | 0.0045 - 0.042 | 0.0031 - 0.007 |
| Selenium (Se) | µg/g dw | 0.07 - 0.34 | 0.39 - 3.60 | 0.28 - 0.63 |
| Silver (Ag) | µg/g dw | 0.00037 - 0.0018 | 0.0023 - 0.021 | 0.00075 - 0.0017 |
| Sodium (Na) | µg/g dw | 0.13 - 0.66 | 0.99 - 9.2 | 0.8 - 1.8 |
| Strontium (Sr) | µg/g dw | 0.00014 - 0.00068 | 0.0025 - 0.023 | 0.00089 - 0.002 |
| Thallium (Tl) | µg/g dw | 0.000078 - 0.00039 | 0.00051 - 0.0047 | 0.00016 - 0.00036 |
| Thorium (Th) | µg/g dw | 0.000051 - 0.00025 | 0.0006 - 0.0055 | 0.00016 - 0.00036 |
| Tin (Sn) | µg/g dw | 0.00056 - 0.0028 | 0.0046 - 0.042 | 0.0012 - 0.0027 |
| Titanium (Ti) | µg/g dw | 0.0093 - 0.046 | 0.1 - 0.92 | 0.045 - 0.1 |
| Uranium (U) | µg/g dw | 0.00022 - 0.0011 | 0.00018 - 0.0017 | 0.00022 - 0.0005 |
| Vanadium (V) | µg/g dw | 0.00029 - 0.0014 | 0.0035 - 0.032 | 0.00097 - 0.0022 |
| Yttrium (Y) | µg/g dw | 0.000091 - 0.00045 | 0.00084 - 0.0077 | 0.00052 - 0.0012 |
| Zinc (Zn) | µg/g dw | 0.00380 - 0.01900 | 0.06300 - 0.58000 | 0.01100 - 0.02500 |
| Zirconium (Zr) | µg/g dw | 0.00041 - 0.002 | 0.0041 - 0.038 | 0.0033 - 0.0073 |

## Table A.8a: Laboratory Analyses of Certified Reference Materials for Zooplankton Tissue Chemistry Samples

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?$^1$ | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Aluminum (Al) | µg/g dw | - | 1.2 (0.7 - 1.7) | 1.1 | Yes | - | 92% | 30A SRM 1577 Bovine Liver |
| | | - | 200 | 86 | - | - | 43% | 31A CRM DOLT-4 |
| Antimony (Sb) | µg/g dw | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 70% | 30A SRM 1577 Bovine Liver |
| | | - | - | 0.010 | - | - | - | 31A CRM DOLT-4 |
| Arsenic (As) | µg/g dw | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.058 | Yes | 105% | 107% | 30A SRM 1577 Bovine Liver |
| | | 9.66 (9.04 - 10.28) | - | 8.34 | No | 86% | - | 31A CRM DOLT-4 |
| Cadmium (Cd) | µg/g dw | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.283 | Yes | 105% | 100% | 30A SRM 1577 Bovine Liver |
| | | 24.3 (23.5 - 25.1) | - | 21.2 | No | 87% | - | 31A CRM DOLT-4 |
| Calcium (Ca) | µg/g dw | 124 (118 - 130) | 121 (107 - 135) | 116 | No | 94% | 96% | 30A SRM 1577 Bovine Liver |
| | | - | 680 | 657 | - | - | 97% | 31A CRM DOLT-4 |
| Cesium (Cs) | µg/g dw | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 80% | 30A SRM 1577 Bovine Liver |
| | | - | - | 0.098 | - | - | - | 31A CRM DOLT-4 |
| Chromium (Cr) | µg/g dw | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.13 | No | 148% | 118% | 30A SRM 1577 Bovine Liver |
| | | - | 1.4 | 1.2 | - | - | 84% | 31A CRM DOLT-4 |
| Cobalt (Co) | µg/g dw | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 105% | 30A SRM 1577 Bovine Liver |
| | | - | 0.25 | 0.21 | - | - | 84% | 31A CRM DOLT-4 |
| Copper (Cu) | µg/g dw | 193 (183 - 203) | 190 (180 - 200) | 165 | No | 85% | 87% | 30A SRM 1577 Bovine Liver |
| | | 31.2 (30.1 - 32.3) | - | 26.3 | No | 84% | - | 31A CRM DOLT-4 |
| Iron (Fe) | µg/g dw | 268 (260 - 276) | 263 (241 - 285) | 253 | No | 94% | 96% | 30A SRM 1577 Bovine Liver |
| | | 1,833 (1,758 - 1,908) | - | 1,670 | No | 91% | - | 31A CRM DOLT-4 |
| Lead (Pb) | µg/g dw | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.31 | Yes | 91% | 91% | 30A SRM 1577 Bovine Liver |
| | | 0.16 (0.12 - 0.20) | - | 0.11 | No | 69% | - | 31A CRM DOLT-4 |
| Magnesium (Mg) | µg/g dw | 604 (595 - 613) | 608 (577 - 639) | 597 | Yes | 99% | 98% | 30A SRM 1577 Bovine Liver |
| | | - | 1,500 | 1,290 | - | - | 86% | 31A CRM DOLT-4 |
| Manganese (Mn) | µg/g dw | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 9.9 | Yes | 96% | 97% | 30A SRM 1577 Bovine Liver |
| | | - | - | 9.1 | - | - | - | 31A CRM DOLT-4 |
| Mercury (Hg) | µg/g dw | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 138% | 138% | 30A SRM 1577 Bovine Liver |
| | | 2.58 (2.36 - 2.80) | - | 2.2 | No | 85% | - | 31A CRM DOLT-4 |
| Molybdenum (Mo) | µg/g dw | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 113% | 30A SRM 1577 Bovine Liver |
| | | - | 1.0 | 1.0 | - | - | 100% | 31A CRM DOLT-4 |
| Nickel (Ni) | µg/g dw | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 22% | 30A SRM 1577 Bovine Liver |
| | | 0.97 (0.86 - 1.08) | - | 0.86 | Yes | 89% | - | 31A CRM DOLT-4 |
| Phosphorus (P) | µg/g dw | - | 11,200 (10,100 - 12,300) | 12,100 | Yes | - | 108% | 30A SRM 1577 Bovine Liver |
| | | - | - | 12,200 | - | - | - | 31A CRM DOLT-4 |
| Potassium (K) | µg/g dw | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,800 | No | 111% | 111% | 30A SRM 1577 Bovine Liver |
| | | - | 9,800 | 9,570 | - | - | 98% | 31A CRM DOLT-4 |
| Rubidium (Rb) | µg/g dw | 18.3 (17.3 - 19.3) | 18.2 (16.9 - 19.5) | 18.6 | Yes | 102% | 102% | 30A SRM 1577 Bovine Liver |
| | | - | - | 3.15 | - | - | - | 31A CRM DOLT-4 |
| Selenium (Se) | µg/g dw | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.00 | Yes | 91% | 92% | 30A SRM 1577 Bovine Liver |
| | | 8.30 (6.96 - 9.64) | - | 7.60 | Yes | 92% | - | 31A CRM DOLT-4 |
| Silver (Ag) | µg/g dw | - | 0.062 (0.051 - 0.073) | 0.055 | Yes | - | 89% | 30A SRM 1577 Bovine Liver |
| | | 0.93 (0.86 - 1.00) | - | 0.80 | No | 86% | - | 31A CRM DOLT-4 |
| Sodium (Na) | µg/g dw | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,300 | Yes | 95% | 96% | 30A SRM 1577 Bovine Liver |
| | | - | 6,800 | 6,150 | - | - | 90% | 31A CRM DOLT-4 |
| Strontium (Sr) | µg/g dw | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 30A SRM 1577 Bovine Liver |
| | | - | 5.5 | 5.1 | - | - | 93% | 31A CRM DOLT-4 |
| Tin (Sn) | µg/g dw | - | 0.016 (0.012 - 0.020) | 0.019 | Yes | - | 119% | 30A SRM 1577 Bovine Liver |
| | | - | 0.17 | 0.15 | - | - | 88% | 31A CRM DOLT-4 |
| Vanadium (V) | µg/g dw | - | 0.058 (0.052 - 0.064) | 0.060 | Yes | - | 103% | 30A SRM 1577 Bovine Liver |
| | | - | 0.6 | 0.56 | - | - | 93% | 31A CRM DOLT-4 |
| Zinc (Zn) | µg/g dw | 130 (117 - 143) | 131 (123 - 139) | 121 | Yes | 93% | 92% | 30A SRM 1577 Bovine Liver |
| | | 116 (110 - 122) | - | 101 | No | 87% | - | 31A CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values, 2014.

[1] If both a certified and an informational value, only compared measured value to certified range.

## Table A.8b: Laboratory Analyses of Certified Reference Materials for Zooplankton Tissue Chemistry Samples

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range? | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Aluminum (Al) | µg/g dw | - | 31.7 (27.5 - 35.7) | 15.4 | No | - | 49% | 17B CRM DOLT-5 |
| Antimony (Sb) | µg/g dw | - | 0.013 | 0.012 | - | - | 88% | 17B CRM DOLT-5 |
| Arsenic (As) | µg/g dw | 34.6 (32.2 - 37.0) | - | 31.6 | No | 91% | - | 17B CRM DOLT-5 |
| Cadmium (Cd) | µg/g dw | 14.5 (13.9 - 15.1) | - | 13.1 | No | 90% | - | 17B CRM DOLT-5 |
| Calcium (Ca) | µg/g dw | 550 (470 - 630) | - | 560 | Yes | 102% | - | 17B CRM DOLT-5 |
| Cesium (Cs) | µg/g dw | - | - | 0.069 | - | - | - | 17B CRM DOLT-5 |
| Chromium (Cr) | µg/g dw | - | 2.35 (1.77 - 2.93) | 2.13 | Yes | - | 91% | 17B CRM DOLT-5 |
| Cobalt (Co) | µg/g dw | 0.267 (0.241 - 0.293) | - | 0.240 | No | 90% | - | 17B CRM DOLT-5 |
| Copper (Cu) | µg/g dw | 35.0 (32.6 - 37.4) | - | 29.9 | No | 85% | - | 17B CRM DOLT-5 |
| Iron (Fe) | µg/g dw | 1,070 (990 - 1,150) | - | 1,040 | Yes | 97% | - | 17B CRM DOLT-5 |
| Lead (Pb) | µg/g dw | 0.162 (0.130 - 0.194) | - | 0.156 | Yes | 98% | - | 17B CRM DOLT-5 |
| Magnesium (Mg) | µg/g dw | 940 (840 - 1,040) | - | 868 | Yes | 92% | - | 17B CRM DOLT-5 |
| Manganese (Mn) | µg/g dw | - | 8.91 (8.21 - 9.61) | 8.93 | Yes | - | 100% | 17B CRM DOLT-5 |
| Mercury (Hg) | µg/g dw | 0.44 (0.26 - 0.62) | - | 0.41 | Yes | 92% | - | 17B CRM DOLT-5 |
| Molybdenum (Mo) | µg/g dw | 1.41 (1.19 - 1.63) | - | 1.37 | Yes | 97% | - | 17B CRM DOLT-5 |
| Nickel (Ni) | µg/g dw | - | 1.71 (1.15 - 2.27) | 1.39 | Yes | - | 81% | 17B CRM DOLT-5 |
| Phosphorus (P) | µg/g dw | - | 11,500 | 11,400 | - | - | 99% | 17B CRM DOLT-5 |
| Potassium (K) | µg/g dw | 14,400 (11,400 - 17,400) | - | 15,000 | Yes | 104% | - | 17B CRM DOLT-5 |
| Rubidium (Rb) | µg/g dw | - | - | 5.0 | - | - | - | 17B CRM DOLT-5 |
| Selenium (Se) | µg/g dw | 8.3 (6.5 - 10.1) | - | 7.7 | Yes | 92% | - | 17B CRM DOLT-5 |
| Silver (Ag) | µg/g dw | 2.05 (1.97 - 2.13) | - | 1.75 | No | 85% | - | 17B CRM DOLT-5 |
| Sodium (Na) | µg/g dw | 9,900 (8,300 - 11,500) | - | 10,300 | Yes | 104% | - | 17B CRM DOLT-5 |
| Strontium (Sr) | µg/g dw | 3.73 (3.47 - 3.99) | - | 3.71 | Yes | 99% | - | 17B CRM DOLT-5 |
| Tin (Sn) | µg/g dw | 0.069 (0.033 - 0.105) | - | 0.061 | Yes | 88% | - | 17B CRM DOLT-5 |
| Vanadium (V) | µg/g dw | 0.51 (0.45 - 0.57) | - | 0.49 | Yes | 96% | - | 17B CRM DOLT-5 |
| Zinc (Zn) | µg/g dw | 105.3 (99.9 - 110.7) | - | 93.6 | No | 89% | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values, 2015.

## Table A.8c: Laboratory Analyses of Certified Reference Materials for Zooplankton Tissue Chemistry Samples

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Aluminum (Al) | µg/g dw | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 96% | 01B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.1 | Yes | - | 88% | 04B SRM 1577 |
| | | - | 31.7 (27.5 - 35.7) | 14 | No | - | 43% | 02B CRM DOLT-5 |
| | | - | 31.7 (27.5 - 35.7) | 13 | No | - | 40% | 05B CRM DOLT-5 |
| Antimony (Sb) | µg/g dw | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 88% | 01B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 68% | 04B SRM 1577 |
| | | - | 0.013 | 0.012 | - | - | 134% | 02B CRM DOLT-5 |
| | | - | 0.013 | 0.017 | - | - | 189% | 05B CRM DOLT-5 |
| Arsenic (As) | µg/g dw | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.055 | Yes | 101% | 103% | 01B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.061 | No | 110% | 112% | 04B SRM 1577 |
| | | 34.6 (32.2 - 37) | - | 32.3 | Yes | 93% | - | 02B CRM DOLT-5 |
| | | 34.6 (32.2 - 37) | - | 35.7 | Yes | 103% | - | 05B CRM DOLT-5 |
| Cadmium (Cd) | µg/g dw | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.28 | Yes | 104% | 99% | 01B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 111% | 106% | 04B SRM 1577 |
| | | 14.5 (13.9 - 15.1) | - | 13.0 | No | 90% | - | 02B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 14.9 | Yes | 103% | - | 05B CRM DOLT-5 |
| Calcium (Ca) | µg/g dw | 124 (118 - 130) | 121 (107 - 135) | 126 | Yes | 102% | 104% | 01B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 111 | No | 90% | 92% | 04B SRM 1577 |
| | | 550 (470 - 630) | - | 554 | Yes | 101% | - | 02B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 540 | Yes | 98% | - | 05B CRM DOLT-5 |
| Cesium (Cs) | µg/g dw | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 84% | 01B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 81% | 04B SRM 1577 |
| | | - | - | 0.07 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 0.07 | - | - | - | 05B CRM DOLT-5 |
| Chromium (Cr) | µg/g dw | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.116 | No | 132% | 105% | 01B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.127 | No | 144% | 115% | 04B SRM 1577 |
| | | - | 2.35 (1.77 - 2.93) | 2.21 | Yes | - | 94% | 02B CRM DOLT-5 |
| | | - | 2.35 (1.77 - 2.93) | 1.82 | Yes | - | 77% | 05B CRM DOLT-5 |
| Cobalt (Co) | µg/g dw | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 105% | 01B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 113% | 04B SRM 1577 |
| | | 0.267 (0.241 - 0.293) | - | 0.229 | No | 86% | - | 02B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.266 | Yes | 100% | - | 05B CRM DOLT-5 |
| Copper (Cu) | µg/g dw | 193 (183 - 203) | 190 (180 - 200) | 168 | No | 87% | 88% | 01B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 172 | No | 89% | 91% | 04B SRM 1577 |
| | | 35.0 (32.6 - 37.4) | - | 29.5 | No | 84% | - | 02B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 33.8 | Yes | 97% | - | 05B CRM DOLT-5 |
| Iron (Fe) | µg/g dw | 268 (260 - 276) | 263 (241 - 285) | 258 | No | 96% | 98% | 01B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 266 | Yes | 99% | 101% | 04B SRM 1577 |
| | | 1,070 (990 - 1,150) | - | 995 | Yes | 93% | - | 02B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,110 | Yes | 104% | - | 05B CRM DOLT-5 |
| Lead (Pb) | µg/g dw | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.33 | Yes | 97% | 97% | 01B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.38 | Yes | 111% | 111% | 04B SRM 1577 |
| | | 0.162 (0.130 - 0.194) | - | 0.147 | Yes | 91% | - | 02B CRM DOLT-5 |
| | | 0.162 (0.130 - 0.194) | - | 0.167 | Yes | 103% | - | 05B CRM DOLT-5 |
| Magnesium (Mg) | µg/g dw | 604 (595 - 613) | 608 (577 - 639) | 577 | No | 96% | 95% | 01B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 593 | No | 98% | 98% | 04B SRM 1577 |
| | | 940 (840 - 1,040) | - | 815 | No | 87% | - | 02B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 947 | Yes | 101% | - | 05B CRM DOLT-5 |
| Manganese (Mn) | µg/g dw | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.5 | Yes | 102% | 103% | 01B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.6 | Yes | 103% | 104% | 04B SRM 1577 |
| | | - | 8.91 (8.21 - 9.61) | 8.84 | Yes | - | 99% | 02B CRM DOLT-5 |
| | | - | 8.91 (8.21 - 9.61) | 9.50 | Yes | - | 107% | 05B CRM DOLT-5 |
| Mercury (Hg) | µg/g dw | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.024 | No | 149% | 149% | 01B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.025 | No | 154% | 154% | 04B SRM 1577 |
| | | 0.44 (0.26 - 0.62) | - | 0.39 | Yes | 88% | - | 02B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.42 | Yes | 96% | - | 05B CRM DOLT-5 |
| Molybdenum (Mo) | µg/g dw | - | 3.2 (2.8 - 3.6) | 3.5 | Yes | - | 109% | 01B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 112% | 04B SRM 1577 |
| | | 1.41 (1.19 - 1.63) | - | 1.35 | Yes | 96% | - | 02B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.40 | Yes | 99% | - | 05B CRM DOLT-5 |
| Nickel (Ni) | µg/g dw | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 20% | 01B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 23% | 04B SRM 1577 |
| | | - | 1.71 (1.15 - 2.27) | 1.4 | No | - | 82% | 02B CRM DOLT-5 |
| | | - | 1.71 (1.15 - 2.27) | 1.2 | No | - | 69% | 05B CRM DOLT-5 |
| Phosphorus (P) | µg/g dw | - | 11,200 (10,100 - 12,300) | 11,100 | Yes | - | 99% | 01B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,500 | Yes | - | 103% | 04B SRM 1577 |
| | | - | 11,500 | 10,600 | - | - | - | 02B CRM DOLT-5 |
| | | - | 11,500 | 12,600 | - | - | - | 05B CRM DOLT-5 |
| Potassium (K) | µg/g dw | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,200 | Yes | 105% | 105% | 01B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 9,870 | Yes | 102% | 102% | 04B SRM 1577 |
| | | 14,400 (11,400 - 17,400) | - | 14,500 | Yes | 101% | - | 02B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 15,500 | Yes | 108% | - | 05B CRM DOLT-5 |
| Rubidium (Rb) | µg/g dw | - | 18.3 (17.3 - 19.3) | 18.4 | Yes | - | 101% | 01B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.5 | Yes | - | 101% | 04B SRM 1577 |
| | | - | - | 4.9 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 5.2 | - | - | - | 05B CRM DOLT-5 |
| Selenium (Se) | µg/g dw | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 107% | 108% | 01B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 105% | 106% | 04B SRM 1577 |
| | | 8.3 (6.5 - 10.1) | - | 7.34 | Yes | 88% | - | 02B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 8.55 | Yes | 103% | - | 05B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values, 2016.

[1] If both a certified and an informational value, only compared measured value to certified range.

## Table A.8c: Laboratory Analyses of Certified Reference Materials for Zooplankton Tissue Chemistry Samples

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Silver (Ag) | µg/g dw | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 90% | 01B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.057 | Yes | - | 92% | 04B SRM 1577 |
| | | 2.05 (1.97 - 2.13) | - | 1.79 | No | 87% | - | 02B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.99 | Yes | 97% | - | 05B CRM DOLT-5 |
| Sodium (Na) | µg/g dw | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,230 | No | 92% | 93% | 01B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,290 | No | 94% | 96% | 04B SRM 1577 |
| | | 9,900 (8,300 - 11,500) | - | 9,380 | Yes | 95% | - | 02B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 10,600 | Yes | 107% | - | 05B CRM DOLT-5 |
| Strontium (Sr) | µg/g dw | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 01B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 04B SRM 1577 |
| | | 3.73 (3.47 - 3.99) | - | 3.66 | Yes | 98% | - | 02B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.79 | Yes | 102% | - | 05B CRM DOLT-5 |
| Tin (Sn) | µg/g dw | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 57% | 01B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.012 | Yes | - | 72% | 04B SRM 1577 |
| | | 0.069 (0.033 n- 0.105) | - | 0.059 | Yes | 85% | - | 02B CRM DOLT-5 |
| | | 0.069 (0.033 n- 0.105) | - | 0.052 | Yes | 75% | - | 05B CRM DOLT-5 |
| Vanadium (V) | µg/g dw | - | 0.058 (0.052 - 0.064) | 0.057 | Yes | - | 99% | 01B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 105% | 04B SRM 1577 |
| | | 0.51 (0.45 - 0.57) | - | 0.46 | Yes | 89% | - | 02B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.50 | Yes | 98% | - | 05B CRM DOLT-5 |
| Zinc (Zn) | µg/g dw | 130 (117 - 143) | 131 (123 - 139) | 121 | Yes | 93% | 92% | 01B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 126 | Yes | 97% | 96% | 04B SRM 1577 |
| | | 105.3 (99.9 - 110.7) | - | 93 | No | 89% | - | 02B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 114 | Yes | 108% | - | 05B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values, 2016.

[1] If both a certified and an informational value, only compared measured value to certified range.

## **Table A.9:** Laboratory Duplicate Results for Zooplankton Chemical Analyses, 2014

| Analyte | Units | T2-6 Rep 1 | T2-6 Rep 2 | RPD (%) |
|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 1,330 | 1,170 | 13% |
| Antimony (Sb) | µg/g dw | 0.0148 | 0.0122 | 19% |
| Arsenic (As) | µg/g dw | 3.6 | 3.6 | 0% |
| Barium (Ba) | µg/g dw | 31.7 | 28.0 | 12% |
| Beryllium (Be) | µg/g dw | 0.056 | 0.050 | 11% |
| Bismuth (Bi) | µg/g dw | 0.0127 | 0.0126 | 1% |
| Boron (B) | µg/g dw | 1.69 | 1.61 | 5% |
| Cadmium (Cd) | µg/g dw | 1.04 | 1.01 | 3% |
| Calcium (Ca) | µg/g dw | 16,900 | 17,300 | 2% |
| Cesium (Cs) | µg/g dw | 0.16 | 0.14 | 13% |
| Chromium (Cr) | µg/g dw | 1.58 | 1.49 | 6% |
| Cobalt (Co) | µg/g dw | 0.559 | 0.572 | 2% |
| Copper (Cu) | µg/g dw | 6.71 | 7.45 | 10% |
| Gallium (Ga) | µg/g dw | 0.387 | 0.377 | 3% |
| Iron (Fe) | µg/g dw | 797 | 827 | 4% |
| Lead (Pb) | µg/g dw | 1.15 | 1.06 | 8% |
| Lithium (Li) | µg/g dw | 1.37 | 1.31 | 4% |
| Magnesium (Mg) | µg/g dw | 2,620 | 2,820 | 7% |
| Manganese (Mn) | µg/g dw | 58.8 | 57.9 | 2% |
| Mercury (Hg) | µg/g dw | 0.0319 | 0.0322 | 1% |
| Molybdenum (Mo) | µg/g dw | 0.3 | 0.3 | 5% |
| Nickel (Ni) | µg/g dw | 1.58 | 1.64 | 4% |
| Phosphorus (P) | µg/g dw | 9,660 | 9,560 | 1% |
| Potassium (K) | µg/g dw | 7,430 | 7,630 | 3% |
| Rhenium (Re) | µg/g dw | 0.00099 | 0.00097 | 2% |
| Rubidium (Rb) | µg/g dw | 12.2 | 12.2 | 0% |
| Selenium (Se) | µg/g dw | 2.64 | 2.63 | 0% |
| Silver (Ag) | µg/g dw | 0.0397 | 0.0376 | 5% |
| Sodium (Na) | µg/g dw | 2,900 | 3,160 | 9% |
| Strontium (Sr) | µg/g dw | 57.8 | 54.2 | 6% |
| Thallium (Tl) | µg/g dw | 0.0748 | 0.0743 | 1% |
| Thorium (Th) | µg/g dw | 0.237 | 0.221 | 7% |
| Tin (Sn) | µg/g dw | 0.146 | 0.147 | 1% |
| Titanium (Ti) | µg/g dw | 10.1 | 13.3 | 27% |
| Uranium (U) | µg/g dw | 0.182 | 0.165 | 10% |
| Vanadium (V) | µg/g dw | 1.44 | 1.29 | 11% |
| Yttrium (Y) | µg/g dw | 0.475 | 0.449 | 6% |
| Zinc (Zn) | µg/g dw | 64.8 | 65.5 | 1% |
| Zirconium (Zr) | µg/g dw | 1.46 | 1.30 | 12% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

**Table A.10:** **Laboratory Duplicate Results for Analysis of Zooplankton Cell Densities (no. of organisms/L) by Species**

| Group | Species | Sex | 2014 | | | 2015 | | | 2016 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | T2-5 | T2-5Q | RPD | TN-3 | TN-3X | RPD | TN-1 | TN-1 Recount | RPD |
| Copepoda | Calanoid nauplii | na | 3.9 | 3.6 | 7% | 0.19 | 0.15 | 28% | 0.76 | 0.81 | 6% |
| | Calanoid nauplii | na | 0.87 | 0.89 | 3% | 0.12 | 0.14 | 9% | 0.58 | 0.49 | 15% |
| | Calanoid copepodids | na | 2.0 | 2.3 | 17% | 0.12 | 0.12 | 0% | 0.36 | 0.26 | 34% |
| | Calanoid copepodids | na | 1.9 | 1.6 | 16% | 0.11 | 0.088 | 24% | 0.13 | 0.15 | 17% |
| | Cyclopoid nauplii | na | 3.5 | 4.1 | 16% | 0.094 | 0.10 | 6% | 0.72 | 0.85 | 17% |
| | Cyclopoid nauplii | na | 3.5 | 3.2 | 8% | 0.071 | 0.094 | 29% | 0.34 | 0.31 | 11% |
| | Cyclopoid copepodids | na | 3.2 | 3.2 | 1% | 0.11 | 0.11 | 0% | 0.86 | 0.86 | 0% |
| | Cyclopoid copepodids | na | 1.1 | 1.0 | 9% | 0.047 | 0.059 | 22% | 0.58 | 0.67 | 15% |
| | *Diaptomus sicilis* | M/F | 0.035 | 0.012 | 100% | 0.090 | 0.10 | 11% | 0.12 | 0.035 | 108% |
| | *Diaptomus oregonensis* | M/F | 0.96 | 0.90 | 6% | 0.080 | 0.090 | 12% | 0.094 | 0.11 | 12% |
| | *Epischura lacustris* | M/F | 0.024 | 0.012 | 67% | 0.020 | 0.040 | 67% | 0.035 | 0.035 | 0% |
| | *Cyclops bicuspidatus thomasi* | M/F | 1.3 | 1.2 | 5% | 0.040 | 0.020 | 67% | 0.65 | 0.53 | 20% |
| | Tropocyclops sp. | F | - | - | - | 0.0059 | 0 | 200% | - | - | - |
| Cladocera | *Daphnia galeata mendotae* | F | 1.6 | 1.2 | 24% | 0.094 | 0.076 | 21% | 2.5 | 2.6 | 3% |
| | *Bosmina longirostris* | F | 0 | 0.047 | 200% | 0.029 | 0.041 | 33% | 0.11 | 0.094 | 12% |
| | *Diaphanosoma birgei* | F | 0.56 | 0.52 | 9% | 0.30 | 0.20 | 40% | 0.059 | 0.082 | 33% |
| | *Leptadora kindtii* | na | 0.024 | 0.024 | 0% | 0 | 0.0059 | 200% | - | - | - |
| Rotifera | *Keratella cochlearis* | na | 9.6 | 13 | 29% | - | - | - | 5.5 | 6.1 | 10% |
| | *Kellicottia longispina* | na | 2.8 | 1.4 | 67% | 0.24 | 0.24 | 0% | 4.7 | 3.8 | 22% |
| | *Polyarthra remata* | na | 3.0 | 2.0 | 40% | 8.0 | 6.0 | 29% | - | - | - |
| | *Polyarthra vulgaris* | na | 16 | 13 | 18% | 0 | 0.066 | 200% | 1.5 | 2.2 | 38% |
| | *Gastropus stylifer* | na | 6.1 | 3.8 | 48% | 0.35 | 0.12 | 100% | - | 0.24 | - |
| | *Keratella crassa* | na | 3.3 | 3.5 | 7% | - | - | - | - | - | - |
| | *Ascomorpha ovalis* | na | 5.4 | 5.2 | 4% | 0.35 | 0.12 | 100% | 0.24 | 0.47 | 67% |
| | Collotheca | na | 16 | 17 | 3% | 2.4 | 1.2 | 67% | 6.1 | 5.6 | 8% |
| | Synchaeta sp. | na | 3.5 | 3.5 | 0% | 0.24 | 0 | 200% | - | - | - |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

**Table A.11:** **Laboratory Duplicate Results for Analysis of Zooplankton Group Densities (No. of Organisms/L)**

| Zooplankton Density (no. of organisms/L) | 2014 | | | 2015 | | | 2016 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **T2-5** | **T2-5X** | **RPD** | **TN-3** | **TN-3X** | **RPD** | **TN-1** | **TN-1 Recount** | **RPD** |
| Copepoda | 22 | 22 | 1% | 1.1 | 1.1 | 1% | 5.2 | 5.1 | 2% |
| Cladocera | 2.2 | 1.8 | 17% | 0.42 | 0.32 | 27% | 2.70 | 2.80 | 3% |
| Rotifera | 66 | 63 | 6% | 12 | 7.7 | 40% | 18 | 18 | 2% |
| **Total** | **91** | **87** | **5%** | **13** | **9.1** | **35%** | **26** | **26** | **1%** |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.12: Laboratory Duplicate Results for Analysis of Phytoplankton Cell Densities (No. of Cells/L) by Species

| Group | Species | 2014 | | | 2015 | | | 2016 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | T2-6 | T2-6Q | RPD | TN-3 | TN-3R | RPD | T4-3 | T4-3R | RPD |
| Cyanophyte | *Aphanocapsa delicatissima* | - | - | - | 600 | 400 | 40% | - | - | - |
| | *Aphanothece* sp. | 14,368 | 0 | 200% | - | - | - | - | - | - |
| | *Planktolyngbya limnetica* | - | - | - | - | - | - | 31,200 | 26,200 | 17% |
| Chlorophyte | *Chlamydomonas* spp. | 14,368 | 7,184 | 67% | 39,683 | 79,366 | 67% | 14,368 | 7,184 | 67% |
| | Ankistrodesmus spiralis Lemmermann | - | - | - | - | - | - | | 7,184 | - |
| | *Oocystis lacustris* | 64,656 | 100,576 | 43% | 317,464 | 158,732 | 67% | - | - | - |
| | *Collodictyon* sp | - | - | - | 39,683 | 39,683 | 0% | - | - | - |
| Chyrsophyte | *Small chrysophyceae* | 122,128 | 143,680 | 16% | 39,683 | 39,683 | 0% | 86,208 | 107,760 | 22% |
| | *Large chrysophyceae* | 14,368 | 7,184 | 67% | 39,683 | 0 | 200% | 35,920 | - | - |
| | *Chrysostephanospaera globulifera* | - | - | - | 39,683 | 79,366 | 67% | - | - | - |
| | *Chrysochromulina parva* | 165,232 | 136,496 | 19% | - | - | - | 14,368 | 14,368 | 0% |
| | *Chrysococcus* sp. | 150,864 | 136,496 | 10% | - | - | - | 129,312 | 179,600 | 33% |
| | *Kephyrion* sp. | 50,288 | 35,920 | 33% | 0 | 39,683 | 200% | 50,288 | 35,920 | 33% |
| | *Mallomonas crassisquama* | - | - | - | 600 | 200 | 100% | - | - | - |
| | *Dinobryon bavaricum* | - | - | - | - | - | - | 50,288 | 64,656 | 25% |
| | *Dinobryon sertularia* | 15,168 | 36,320 | 82% | 0 | 79,366 | 200% | - | - | - |
| | *Dinobryon sociale* | 194,168 | 180,200 | 7% | 79,366 | 79,366 | 0% | 21,552 | 14,368 | 40% |
| | *Bitrichia chodatii* | - | - | - | - | - | - | - | 14,368 | - |
| | *Chrysochromulina laurentiana* | 7,184 | 14,368 | 67% | - | - | - | - | - | - |
| | *Stichogloea* sp. | 28,736 | 43,104 | 40% | - | - | - | - | - | - |
| | *Salpingoeca frequentissima* | 7,184 | 14,368 | 67% | 39,683 | 119,049 | 100% | - | - | - |
| Diatom | *Cyclotella stelligera* | 39,600 | 40,800 | 3% | 2,000 | 1,600 | 22% | 1,200 | 1,000 | 18% |
| | *Cyclotella pseudostelligera* | 6,286,000 | 6,343,472 | 1% | 14,087,465 | 13,135,073 | 7% | 747,136 | 761,504 | 2% |
| | *Cyclotella ocellata* | 14,368 | 7,184 | 67% | - | - | - | - | - | - |
| | *Rhizosolenia eriense* | - | - | - | 39,683 | 39,683 | 0% | - | - | - |
| | *Tabellaria fenestrata* | - | - | - | - | - | - | 200 | 800 | 120% |
| | *Tabellaria flocculsa* | - | - | - | - | - | - | 200 | - | - |
| | *Fragliaria construens* | 200 | 800 | 120% | - | - | - | 6,400 | 7,200 | 12% |
| | *Synedra acus* | - | - | - | 25,400 | 29,200 | 14% | 8,200 | 7,200 | 13% |
| | *Synedra ulna* | 8,400 | 7,800 | 7% | 400 | 800 | 67% | - | - | - |
| | *Cyclotella bodanica* | 8,400 | 7,800 | 7% | - | - | - | - | - | - |
| | *Cyclotella michiganiana* | - | - | - | 79,366 | 39,683 | 67% | 502,880 | 359,200 | 33% |
| Cryptophyte | *Rhodomonas minuta* | 258,624 | 237,072 | 9% | 158,732 | 79,366 | 67% | 93,392 | 71,840 | 26% |
| | *Cryptomonas erosa* | 3,200 | 2,400 | 29% | 2,800 | 2,200 | 24% | 6,800 | 5,000 | 31% |
| | *Cryptomonas reflexa* | 400 | 800 | 67% | - | - | - | - | - | - |
| | *Cryptomonas rostratiformis* | - | - | - | 200 | 400 | 67% | - | - | - |
| | *Katablepharis ovalis* | 35,920 | 14,368 | 86% | 119,049 | 158,732 | 29% | 21,552 | 7,184 | 100% |
| Dinoflagellate | *Gymnodinium* sp. | 1,000 | 800 | 22% | 40,083 | 0 | 200% | - | - | - |
| | *Ceratium hirundenella* | 400 | 600 | 40% | - | - | - | - | 200 | - |
| | *Peridinium pusillum* | 1,800 | 1,400 | 25% | 3,600 | 3,400 | 6% | 600 | 200 | 100% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

**Table A.13:** Laboratory Duplicate Results for Analysis of Phytoplankton Group Densities (No. of Cells/L)

| Algal Density (no. of cells/L) | 2014 | | | 2015 | | | 2016 | | |
|---|---|---|---|---|---|---|---|---|---|
| | T2-6 | T2-6Q | RPD | TN-3 | TN-3R | RPD | T4-3 | T4-3R | RPD |
| Cyanophyte | 14,368 | 0 | 200% | 600 | 400 | 40% | 31,200 | 26,200 | 17% |
| Chlorophyte | 79,024 | 107,760 | 31% | 396,830 | 277,781 | 35% | 14,368 | 14,368 | 0% |
| Chrysophyte | 755,320 | 748,136 | 1% | 238,698 | 436,713 | 59% | 387,936 | 431,040 | 11% |
| Diatom | 6,358,968 | 6,409,656 | 1% | 14,234,314 | 13,246,039 | 7% | 1,266,216 | 1,136,904 | 11% |
| Cryptophyte | 298,144 | 254,640 | 16% | 280,781 | 240,698 | 15% | 121,744 | 84,024 | 37% |
| Dinoflagellate | 3,200 | 2,800 | 13% | 43,683 | 3,400 | 171% | 600 | 400 | 40% |
| **Total** | **7,509,024** | **7,522,992** | **0%** | **15,194,906** | **14,205,031** | **7%** | **1,822,064** | **1,692,936** | **7%** |

Note: Highlighted values did not meet the data quality objective of ≤ 30% relative percent difference (RPD).

**Table A.14:** **Laboratory Method Detection Limits (MDLs) for Chemical Analysis of Benthic Invertebrate Tissue Samples**

| Analyte | Units | 2014 | 2015 | 2016 |
|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 0.0049 - 0.097 | 0.022 - 0.083 | 0.021 - 0.068 |
| Antimony (Sb) | µg/g dw | 0.00023 - 0.012 | 0.0022 - 0.0085 | 0.0038 - 0.0089 |
| Arsenic (As) | µg/g dw | 0.0047 - 0.18 | 0.013 - 0.048 | 0.015 - 0.049 |
| Barium (Ba) | µg/g dw | 0.00065 - 0.018 | 0.0031 - 0.012 | 0.0033 - 0.0084 |
| Beryllium (Be) | µg/g dw | 0.0032 - 0.065 | 0.0084 - 0.032 | 0.012 - 0.029 |
| Bismuth (Bi) | µg/g dw | 0.000042 - 0.0023 | 0.00053 - 0.002 | 0.00021 - 0.00048 |
| Boron (B) | µg/g dw | 0.095 - 6.3 | 0.52 - 2 | 0.38 - 0.89 |
| Cadmium (Cd) | µg/g dw | 0.00085 - 0.024 | 0.0061 - 0.023 | 0.0067 - 0.021 |
| Calcium (Ca) | µg/g dw | 0.94 - 23 | 4.9 - 19 | 8.8 - 19 |
| Cesium (Cs) | µg/g dw | 0.000076 - 0.0015 | 0.00016 - 0.00063 | 0.00049 - 0.0015 |
| Chromium (Cr) | µg/g dw | 0.0028 - 0.091 | 0.0077 - 0.029 | 0.0190 - 0.041 |
| Cobalt (Co) | µg/g dw | 0.00062 - 0.012 | 0.0012 - 0.0047 | 0.0011 - 0.0042 |
| Copper (Cu) | µg/g dw | 0.00110 - 0.048 | 0.00580 - 0.022 | 0.00780 - 0.017 |
| Gallium (Ga) | µg/g dw | 0.00052 - 0.015 | 0.0038 - 0.015 | 0.0032 - 0.01 |
| Iron (Fe) | µg/g dw | 0.047 - 0.95 | 0.13 - 0.51 | 0.2 - 0.47 |
| Lead (Pb) | µg/g dw | 0.00025 - 0.01 | 0.00099 - 0.0038 | 0.00088 - 0.0025 |
| Lithium (Li) | µg/g dw | 0.0044 - 0.089 | 0.0076 - 0.029 | 0.017 - 0.043 |
| Magnesium (Mg) | µg/g dw | 0.039 - 1.5 | 0.2 - 0.76 | 0.22 - 0.61 |
| Manganese (Mn) | µg/g dw | 0.0041 - 0.1 | 0.026 - 0.099 | 0.038 - 0.084 |
| Mercury (Hg) | µg/g dw | 0.0023 - 0.047 | 0.0016 - 0.0061 | 0.0023 - 0.0066 |
| Molybdenum (Mo) | µg/g dw | 0.0068 - 0.014 | 0.004 - 0.015 | 0.0037 - 0.013 |
| Nickel (Ni) | µg/g dw | 0.0012 - 0.067 | 0.0074 - 0.028 | 0.0088 - 0.021 |
| Phosphorus (P) | µg/g dw | 3.2 - 99 | 17 - 65 | 26 - 62 |
| Potassium (K) | µg/g dw | 0.59 - 18 | 3.4 - 13 | 4.4 - 9.7 |
| Rhenium (Re) | µg/g dw | 0.000069 - 0.0014 | 0.00015 - 0.00058 | 0.00021 - 0.00046 |
| Rubidium (Rb) | µg/g dw | 0.0014 - 0.028 | 0.0017 - 0.0066 | 0.0036 - 0.0098 |
| Selenium (Se) | µg/g dw | 0.05 - 1.7 | 0.15 - 0.57 | 0.50 - 1.4 |
| Silver (Ag) | µg/g dw | 0.00042 - 0.0088 | 0.00089 - 0.0034 | 0.0013 - 0.0078 |
| Sodium (Na) | µg/g dw | 0.072 - 3.2 | 0.38 - 1.5 | 0.61 - 2.5 |
| Strontium (Sr) | µg/g dw | 0.00016 - 0.0033 | 0.00095 - 0.0036 | 0.0016 - 0.004 |
| Thallium (Tl) | µg/g dw | 0.000077 - 0.0066 | 0.0002 - 0.00075 | 0.00028 - 0.00076 |
| Thorium (Th) | µg/g dw | 0.000033 - 0.0012 | 0.00023 - 0.00088 | 0.00028 - 0.00084 |
| Tin (Sn) | µg/g dw | 0.00064 - 0.013 | 0.0018 - 0.0067 | 0.0021 - 0.011 |
| Titanium (Ti) | µg/g dw | 0.011 - 0.22 | 0.039 - 0.15 | 0.04 - 0.14 |
| Uranium (U) | µg/g dw | 0.00015 - 0.0053 | 0.000071 - 0.00027 | 0.00019 - 0.00069 |
| Vanadium (V) | µg/g dw | 0.00035 - 0.007 | 0.0014 - 0.0052 | 0.0017 - 0.0043 |
| Yttrium (Y) | µg/g dw | 0.00011 - 0.0022 | 0.00032 - 0.0012 | 0.00036 - 0.0016 |
| Zinc (Zn) | µg/g dw | 0.00370 - 0.09 | 0.02400 - 0.093 | 0.01900 - 0.042 |
| Zirconium (Zr) | µg/g dw | 0.00048 - 0.0097 | 0.0016 - 0.0061 | 0.0018 - 0.01 |

## Table A.15a: Benthic Invertebrate Community Organism Recoveries

| Station ID | Number of Organisms Recovered (initial sort) | Number of Organisms in Re-sort | Percent Recovery |
|---|---|---|---|
| **2014** | | | |
| T2-4 | 130 | 130 | 100.0% |
| T4-6 | 487 | 491 | 99.2% |
| | | Average % Recovery | 99.6% |
| **2015** | | | |
| TN-3 | 87 | 92 | 94.6% |
| T4-2 | 361 | 363 | 99.4% |
| | | Average % Recovery | 97.0% |
| **2016** | | | |
| TN-1 | 184 | 186 | 98.9% |
| T4-4 | 488 | 497 | 98.2% |
| | | Average % Recovery | 98.6% |

Note: Highlighted values did not meet the data quality objective of ≥90% recovery.

## Table A.15b: Calculation of Subsampling Error for Benthic Macroinvertebrate Samples

| Station | Whole Organisms | Number of Organisms in Fraction 1 | Number of Organisms in Fraction 2 | Number of Organisms in Fraction 3 | Number of Organisms in Fraction 4 | Actual Density* | Precision % RPD range) | | Accuracy % | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | min [a] | max [b] | min | max |
| T4-4 | - | 242 | 255 | - | - | - | NA | 5.1 | 97.4 | 103.0 |

Note: Highlighted values did not meet the data quality objectives of ≤20% for precision or within 80% to 120% for accuracy.

* whole large organisms excluded in calculations.

[a] min = minimum absolute % error.

[b] max = maximum absolute % error.

## Table A.15c: Sample Fractions Sorted from Koocanusa Reservoir, 2016

| Station | Fraction Sorted | Station | Fraction Sorted |
|---|---|---|---|
| TN-1 | Whole | T4-2 | Whole |
| TN-2 | Whole | T4-3 | Whole |
| TN-3 | Whole | T4-4 | Whole [c] |
| TN-4 | Whole | T4-5 | Whole |
| TN-5 | 1/2 | T4-6 | Whole |

[c] two halves sorted for subsampling error calculations.

### QA/QC Notes

Pupae were not counted toward total number of taxa unless they were the sole representative of their taxa group.
Immatures were not counted toward total number of taxa unless they were the sole representative of their taxa group.
Correction to 2015 data based on 2016 reference listed below
All *Cyprinotus* are *Isocypris*
All *Limnocythere* are *Cytherissa lacustris*
All *Ilyocypris* are *Limnocythere*
Keys to Nearctic Fauna 2016.
Edited by James H. Thorp and Christopher Rogers
Fourth Edition. Academic Press.

## Table A.16: Laboratory Method Detection Limits (MDLs) Associated with Fish Tissue Chemical Analysis

| Analyte | Units | 2014 | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Muscle Fillet | Muscle Plug | Egg and Ovary | Whole Body | Muscle Fillet | Muscle Plug | Egg and Ovary | Whole Body |
| Aluminum (Al) | µg/g dw | 0.0027 - 0.0088 | 0.0069 - 0.17 | 0.004 - 0.019 | 0.0033 - 0.0042 | 0.0023 - 0.02 | 0.009 - 0.13 | 0.0033 - 0.032 | 0.0048 - 0.0076 |
| Antimony (Sb) | µg/g dw | 0.00025 - 0.00098 | 0.00064 - 0.012 | 0.0002 - 0.0015 | 0.00043 - 0.00053 | 0.00032 - 0.0061 | 0.00028 - 0.004 | 0.00041 - 0.0096 | 0.00055 - 0.00078 |
| Arsenic (As) | µg/g dw | 0.003 - 0.013 | 0.0052 - 0.093 | 0.015 - 0.002 | 0.006 - 0.0075 | 0.0023 - 0.024 | 0.0033 - 0.047 | 0.0039 - 0.038 | 0.0037 - 0.011 |
| Barium (Ba) | µg/g dw | 0.0007 - 0.0058 | 0.0011 - 0.025 | 0.0005 - 0.0038 | 0.00061 - 0.00077 | 0.0004 - 0.0078 | 0.00043 - 0.0061 | 0.00041 - 0.004 | 0.00056 - 0.0011 |
| Beryllium (Be) | µg/g dw | 0.0021 - 0.0067 | 0.0048 - 0.054 | 0.0024 - 0.0095 | 0.0022 - 0.0027 | 0.0021 - 0.014 | 0.0051 - 0.072 | 0.0021 - 0.022 | 0.0023 - 0.0029 |
| Bismuth (Bi) | µg/g dw | 0.00003 - 0.00014 | 0.000092 - 0.0011 | 0.00003 - 0.00015 | 0.000078 - 0.000098 | 0.000076 - 0.00069 | 0.000092 - 0.0013 | 0.000099 - 0.00096 | 0.000078 - 0.00019 |
| Boron (B) | µg/g dw | 0.07 - 0.23 | 0.11 - 2.4 | 0.051 - 0.44 | 0.22 - 0.27 | 0.066 - 0.74 | 0.095 - 1.3 | 0.1 - 1.2 | 0.15 - 0.25 |
| Cadmium (Cd) | µg/g dw | 0.0006 - 0.0016 | 0.0012 - 0.019 | 0.001 - 0.004 | 0.0008 - 0.001 | 0.00099 - 0.0092 | 0.00088 - 0.012 | 0.0015 - 0.015 | 0.0018 - 0.0023 |
| Calcium (Ca) | µg/g dw | 0.56 - 3 | 1.9 - 23 | 0.83 - 3.3 | 0.78 - 0.98 | 0.73 - 5.4 | 0.95 - 14 | 0.74 - 7.2 | 0.85 - 1.7 |
| Cesium (Cs) | µg/g dw | 0.00005 - 0.0003 | 0.000086 - 0.002 | 0.00004 - 0.0003 | 0.000052 - 0.000065 | 0.000055 - 0.00057 | 0.000077 - 0.0011 | 0.000052 - 0.00091 | 0.000049 - 0.00014 |
| Chromium (Cr) | µg/g dw | 0.0018 - 0.0064 | 0.0047 - 0.057 | 0.0029 - 0.012 | 0.0031 - 0.0039 | 0.0015 - 0.014 | 0.0025 - 0.036 | 0.0022 - 0.022 | 0.0019 - 0.0027 |
| Cobalt (Co) | µg/g dw | 0.0003 - 0.0014 | 0.00076 - 0.013 | 0.0002 - 0.0023 | 0.00042 - 0.00053 | 0.00017 - 0.0018 | 0.00022 - 0.0031 | 0.00024 - 0.0039 | 0.00018 - 0.00043 |
| Copper (Cu) | µg/g dw | 0.0013 - 0.0087 | 0.0018 - 0.021 | 0.0011 - 0.0071 | 0.0017 - 0.0021 | 0.001 - 0.01 | 0.0014 - 0.019 | 0.0012 - 0.016 | 0.0017 - 0.002 |
| Gallium (Ga) | µg/g dw | 0.0005 - 0.003 | 0.0011 - 0.04 | 0.0005 - 0.0021 | 0.0005 - 0.00063 | 0.00042 - 0.0054 | 0.00056 - 0.0079 | 0.00066 - 0.0086 | 0.00078 - 0.0013 |
| Iron (Fe) | µg/g dw | 0.026 - 0.2 | 0.069 - 0.86 | 0.03 - 0.18 | 0.032 - 0.04 | 0.025 - 0.3 | 0.037 - 0.53 | 0.021 - 0.47 | 0.039 - 0.05 |
| Lead (Pb) | µg/g dw | 0.0002 - 0.0014 | 0.00046 - 0.0069 | 0.00024 - 0.0016 | 0.00034 - 0.00043 | 0.00024 - 0.0021 | 0.00012 - 0.0016 | 0.00034 - 0.0033 | 0.00025 - 0.00035 |
| Lithium (Li) | µg/g dw | 0.0041 - 0.016 | 0.012 - 0.17 | 0.0046 - 0.018 | 0.003 - 0.0038 | 0.0011 - 0.035 | 0.0042 - 0.06 | 0.0019 - 0.045 | 0.0012 - 0.0027 |
| Magnesium (Mg) | µg/g dw | 0.033 - 0.16 | 0.067 - 1.3 | 0.034 - 0.19 | 0.051 - 0.064 | 0.035 - 0.23 | 0.031 - 0.44 | 0.038 - 0.37 | 0.045 - 0.069 |
| Manganese (Mn) | µg/g dw | 0.003 - 0.01 | 0.0099 - 0.19 | 0.004 - 0.016 | 0.0035 - 0.0044 | 0.0034 - 0.032 | 0.0049 - 0.07 | 0.0044 - 0.051 | 0.0041 - 0.0091 |
| Mercury (Hg) | µg/g dw | 0.0016 - 0.0028 | 0.0051 - 0.049 | 0.0019 - 0.0087 | 0.0016 - 0.002 | 0.00076 - 0.0073 | 0.00043 - 0.0061 | 0.00062 - 0.0075 | 0.00047 - 0.00073 |
| Molybdenum (Mo) | µg/g dw | 0.0005 - 0.0017 | 0.0014 - 0.015 | 0.0006 - 0.0023 | 0.00048 - 0.0006 | 0.0007 - 0.0065 | 0.00043 - 0.0061 | 0.00066 - 0.01 | 0.0012 - 0.0015 |
| Nickel (Ni) | µg/g dw | 0.0014 - 0.0051 | 0.0043 - 0.068 | 0.0012 - 0.0088 | 0.0023 - 0.0029 | 0.00092 - 0.013 | 0.0014 - 0.019 | 0.0013 - 0.021 | 0.0022 - 0.0028 |
| Phosphorus (P) | µg/g dw | 2.9 - 11 | 9.7 - 120 | 5.9 - 23 | 3.4 - 4.2 | 3.4 - 28 | 6.2 - 88 | 3.2 - 44 | 5 - 6.8 |
| Potassium (K) | µg/g dw | 0.5 - 2.9 | 2 - 24 | 0.98 - 3.9 | 0.6 - 0.75 | 0.61 - 6.1 | 0.89 - 13 | 0.89 - 9.7 | 0.64 - 1.2 |
| Rhenium (Re) | µg/g dw | 0.00004 - 0.0006 | 0.00011 - 0.0036 | 0.00004 - 0.00015 | 0.000047 - 0.000059 | 2.6E-06 - 0.00015 | 0.00018 - 0.0026 | 3.5E-06 - 0.00015 | 2.7E-06 - 0.000053 |
| Rubidium (Rb) | µg/g dw | 0.0005 - 0.0018 | 0.0001 - 0.018 | 0.0004 - 0.0023 | 0.00097 - 0.0012 | 0.00031 - 0.0037 | 0.00074 - 0.011 | 0.00034 - 0.0059 | 0.00052 - 0.00078 |
| Selenium (Se) | µg/g dw | 0.05 - 0.17 | 0.077 - 1.3 | 0.04 - 0.29 | 0.057 - 0.071 | 0.039 - 0.39 | 0.094 - 1.3 | 0.064 - 0.62 | 0.044 - 0.098 |
| Silver (Ag) | µg/g dw | 0.0005 - 0.0016 | 0.00078 - 0.018 | 0.0003 - 0.0018 | 0.0003 - 0.0004 | 0.0002 - 0.0025 | 0.00026 - 0.0036 | 0.00032 - 0.0031 | 0.00021 - 0.00031 |
| Sodium (Na) | µg/g dw | 0.057 - 0.18 | 0.098 - 1.7 | 0.07 - 0.33 | 0.11 - 0.14 | 0.045 - 0.39 | 0.091 - 1.3 | 0.046 - 0.62 | 0.046 - 0.13 |
| Strontium (Sr) | µg/g dw | 0.00016 - 0.00043 | 0.0004 - 0.0063 | 0.0002 - 0.0011 | 0.00011 - 0.00014 | 0.00017 - 0.0019 | 0.00015 - 0.0021 | 0.00017 - 0.0018 | 0.00028 - 0.0006 |
| Thallium (Tl) | µg/g dw | 0.00004 - 0.00015 | 0.000079 - 0.0013 | 0.00006 - 0.0004 | 0.000063 - 0.000079 | 0.000042 - 0.00081 | 0.00017 - 0.0024 | 0.00004 - 0.0013 | 0.000048 - 0.000069 |
| Thorium (Th) | µg/g dw | 0.00003 - 0.00012 | 0.00011 - 0.0012 | 0.00005 - 0.00025 | 0.000042 - 0.000052 | 0.000039 - 0.002 | 0.00041 - 0.0058 | 0.000046 - 0.00069 | 0.000069 - 0.000094 |
| Tin (Sn) | µg/g dw | 0.0005 - 0.0012 | 0.00076 - 0.018 | 0.0004 - 0.0034 | 0.00046 - 0.00057 | 0.00047 - 0.0062 | 0.0006 - 0.0086 | 0.00054 - 0.0098 | 0.00048 - 0.00062 |
| Titanium (Ti) | µg/g dw | 0.006 - 0.019 | 0.01 - 0.18 | 0.0051 - 0.061 | 0.0076 - 0.0095 | 0.0054 - 0.049 | 0.0062 - 0.088 | 0.0077 - 0.078 | 0.0067 - 0.013 |
| Uranium (U) | µg/g dw | 0.0001 - 0.00091 | 0.00022 - 0.0063 | 0.0001 - 0.001 | 0.00018 - 0.00023 | 0.000014 - 0.0011 | 0.000028 - 0.0004 | 0.000067 - 0.00083 | 0.000015 - 0.000025 |
| Vanadium (V) | µg/g dw | 0.00019 - 0.00087 | 0.00045 - 0.011 | 0.00023 - 0.0013 | 0.00024 - 0.0003 | 0.00013 - 0.0023 | 0.00021 - 0.003 | 0.00038 - 0.0037 | 0.0004 - 0.0005 |
| Yttrium (Y) | µg/g dw | 0.00013 - 0.0005 | 0.00025 - 0.0028 | 0.0001 - 0.0006 | 0.000074 - 0.000092 | 0.00016 - 0.001 | 0.00014 - 0.002 | 0.00016 - 0.0016 | 0.000096 - 0.00019 |
| Zinc (Zn) | µg/g dw | 0.0031 - 0.014 | 0.0086 - 0.11 | 0.0053 - 0.032 | 0.0031 - 0.0038 | 0.0026 - 0.026 | 0.0079 - 0.11 | 0.0025 - 0.039 | 0.0052 - 0.0086 |
| Zirconium (Zr) | µg/g dw | 0.00038 - 0.0016 | 0.0009 - 0.011 | 0.0004 - 0.0028 | 0.00033 - 0.00041 | 0.00049 - 0.0039 | 0.00083 - 0.012 | 0.00044 - 0.0062 | 0.00047 - 0.00061 |

**Table A.16: Laboratory Method Detection Limits (MDLs) Associated with Fish Tissue Chemical Analysis**

| Analyte | Units | 2016 | | | |
|---|---|---|---|---|---|
| | | Muscle Fillet | Muscle Plug | Egg and Ovary | Whole Body |
| Aluminum (Al) | µg/g dw | 0.002 - 0.022 | 0.0041 - 0.14 | 0.0031 - 0.019 | 0.0056 - 0.0075 |
| Antimony (Sb) | µg/g dw | 0.00034 - 0.0032 | 0.00035 - 0.018 | 0.00033 - 0.0024 | 0.00059 - 0.00099 |
| Arsenic (As) | µg/g dw | 0.0025 - 0.02 | 0.0047 - 0.1 | 0.0024 - 0.015 | 0.0044 - 0.0054 |
| Barium (Ba) | µg/g dw | 0.00056 - 0.0082 | 0.00057 - 0.015 | 0.00056 - 0.0071 | 0.00062 - 0.00079 |
| Beryllium (Be) | µg/g dw | 0.0022 - 0.014 | 0.0024 - 0.058 | 0.0023 - 0.027 | 0.0027 - 0.0035 |
| Bismuth (Bi) | µg/g dw | 0.000044 - 0.00032 | 0.000076 - 0.00096 | 0.000045 - 0.00046 | 0.000045 - 0.000068 |
| Boron (B) | µg/g dw | 0.038 - 0.36 | 0.079 - 1.7 | 0.037 - 0.79 | 0.079 - 0.093 |
| Cadmium (Cd) | µg/g dw | 0.00079 - 0.0062 | 0.0012 - 0.043 | 0.0011 - 0.0074 | 0.0012 - 0.0024 |
| Calcium (Ca) | µg/g dw | 0.99 - 11 | 1 - 39 | 1.1 - 7.6 | 1.3 - 2.1 |
| Cesium (Cs) | µg/g dw | 0.000061 - 0.00076 | 0.000062 - 0.0031 | 0.00006 - 0.0015 | 0.00014 - 0.00017 |
| Chromium (Cr) | µg/g dw | 0.0026 - 0.017 | 0.0026 - 0.083 | 0.0025 - 0.084 | 0.0037 - 0.0045 |
| Cobalt (Co) | µg/g dw | 0.00017 - 0.0059 | 0.00031 - 0.01 | 0.00019 - 0.0039 | 0.00024 - 0.00055 |
| Copper (Cu) | µg/g dw | 0.00096 - 0.015 | 0.0015 - 0.035 | 0.0013 - 0.012 | 0.0013 - 0.0019 |
| Gallium (Ga) | µg/g dw | 0.00053 - 0.012 | 0.00063 - 0.02 | 0.00062 - 0.0041 | 0.00066 - 0.0012 |
| Iron (Fe) | µg/g dw | 0.039 - 0.24 | 0.045 - 0.88 | 0.028 - 0.24 | 0.027 - 0.048 |
| Lead (Pb) | µg/g dw | 0.00014 - 0.0015 | 0.00014 - 0.0052 | 0.00014 - 0.0031 | 0.00014 - 0.00028 |
| Lithium (Li) | µg/g dw | 0.0032 - 0.04 | 0.0031 - 0.074 | 0.0032 - 0.036 | 0.0034 - 0.0041 |
| Magnesium (Mg) | µg/g dw | 0.032 - 0.19 | 0.033 - 0.97 | 0.032 - 0.45 | 0.045 - 0.066 |
| Manganese (Mn) | µg/g dw | 0.0033 - 0.045 | 0.0039 - 0.17 | 0.0033 - 0.025 | 0.0054 - 0.0093 |
| Mercury (Hg) | µg/g dw | 0.00042 - 0.0042 | 0.00058 - 0.013 | 0.00059 - 0.0069 | 0.00062 - 0.001 |
| Molybdenum (Mo) | µg/g dw | 0.00046 - 0.008 | 0.0012 - 0.027 | 0.00079 - 0.0052 | 0.0011 - 0.0015 |
| Nickel (Ni) | µg/g dw | 0.00086 - 0.0094 | 0.0015 - 0.043 | 0.0012 - 0.01 | 0.0014 - 0.0023 |
| Phosphorus (P) | µg/g dw | 3.1 - 37 | 5.5 - 110 | 3.3 - 20 | 5.3 - 7.9 |
| Potassium (K) | µg/g dw | 0.62 - 5 | 0.74 - 20 | 0.72 - 6 | 0.91 - 2.1 |
| Rhenium (Re) | µg/g dw | 3.6E-06 - 0.0003 | 0.000028 - 0.00093 | 0.000027 - 0.00056 | 0.000043 - 0.00017 |
| Rubidium (Rb) | µg/g dw | 0.0006 - 0.0099 | 0.00061 - 0.017 | 0.00059 - 0.0073 | 0.00074 - 0.0011 |
| Selenium (Se) | µg/g dw | 0.024 - 0.62 | 0.025 - 2.9 | 0.024 - 0.41 | 0.079 - 0.16 |
| Silver (Ag) | µg/g dw | 0.00025 - 0.004 | 0.00038 - 0.016 | 0.00026 - 0.0019 | 0.00034 - 0.00086 |
| Sodium (Na) | µg/g dw | 0.048 - 0.86 | 0.05 - 2.7 | 0.07 - 0.79 | 0.13 - 0.2 |
| Strontium (Sr) | µg/g dw | 0.00022 - 0.0024 | 0.00031 - 0.0081 | 0.00024 - 0.0024 | 0.00028 - 0.00044 |
| Thallium (Tl) | µg/g dw | 0.000056 - 0.00047 | 0.000073 - 0.0015 | 0.000045 - 0.0011 | 0.000045 - 0.000084 |
| Thorium (Th) | µg/g dw | 0.00004 - 0.0004 | 0.00004 - 0.0017 | 0.000037 - 0.00035 | 0.000052 - 0.000093 |
| Tin (Sn) | µg/g dw | 0.0004 - 0.0048 | 0.0007 - 0.023 | 0.00041 - 0.003 | 0.00055 - 0.0013 |
| Titanium (Ti) | µg/g dw | 0.0054 - 0.07 | 0.0055 - 0.18 | 0.0053 - 0.053 | 0.0082 - 0.011 |
| Uranium (U) | µg/g dw | 0.000055 - 0.0012 | 0.000059 - 0.0032 | 0.000039 - 0.0033 | 0.000038 - 0.00024 |
| Vanadium (V) | µg/g dw | 0.0002 - 0.002 | 0.00033 - 0.0087 | 0.00031 - 0.0029 | 0.0004 - 0.0008 |
| Yttrium (Y) | µg/g dw | 0.00012 - 0.0012 | 0.00021 - 0.0021 | 0.000074 - 0.001 | 0.000073 - 0.00035 |
| Zinc (Zn) | µg/g dw | 0.0021 - 0.026 | 0.0042 - 0.085 | 0.0028 - 0.018 | 0.0039 - 0.0054 |
| Zirconium (Zr) | µg/g dw | 0.00069 - 0.0084 | 0.00073 - 0.015 | 0.00037 - 0.0051 | 0.00037 - 0.00071 |

## Table A.17a: Laboratory Duplicate Results for Fish Muscle Samples, 2014

| Analyte | Unit | SC-PC-04M Rep 1 | SC-PC-04M Rep 2 | RPD | ER-PC-08M Rep 1 | ER-PC-08M Rep 2 | RPD | GC-KO-1 Rep 1 | GC-KO-1 Rep 2 | RPD | GC-YP-5 Rep 1 | GC-YP-5 Rep 2 | RPD | GC-PM-3 Rep 1 | GC-PM-3 Rep 2 | RPD | SC-PM-1 Rep 1 | SC-PM-1 Rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 32.2 | 18.6 | 54% | 13.1 | 6.7 | 65% | 0.447 | 0.319 | 33% | 0.952 | 0.952 | 0% | 5.21 | 5.24 | 1% | 2.76 | 2.76 | 0% |
| Antimony (Sb) | µg/g dw | 0.00193 | 0.00182 | 6% | 0.00134 | 0.00142 | 6% | <0.00054 | 0.00068 | 23% | <0.00040 | <0.00042 | 5% | 0.0132 | 0.0147 | 11% | 0.00285 | 0.00187 | 42% |
| Arsenic (As) | µg/g dw | 0.19 | 0.157 | 19% | 0.0744 | 0.0632 | 16% | 0.0944 | 0.0872 | 8% | 0.0194 | 0.0181 | 7% | 0.0361 | 0.0392 | 8% | 0.027 | 0.0168 | 47% |
| Barium (Ba) | µg/g dw | 1.21 | 1.72 | 35% | 1.81 | 2.52 | 33% | 0.128 | 0.14 | 9% | 0.0274 | 0.204 | 153% | 0.658 | 0.938 | 35% | 0.403 | 0.527 | 27% |
| Beryllium (Be) | µg/g dw | <0.0026 | <0.0023 | 12% | <0.0027 | <0.0024 | 12% | <0.0025 | <0.0022 | 13% | <0.0027 | <0.0029 | 7% | <0.0030 | <0.0030 | 0% | <0.0038 | <0.0039 | 3% |
| Bismuth (Bi) | µg/g dw | 0.0127 | 0.00272 | 129% | 0.008 | 0.00763 | 5% | 0.000108 | 0.000105 | 3% | 0.00504 | 0.00505 | 0% | 0.00245 | 0.00253 | 3% | 0.0018 | 0.00184 | 2% |
| Boron (B) | µg/g dw | 0.147 | 0.086 | 52% | 0.161 | 0.166 | 3% | <0.11 | <0.097 | 13% | <0.070 | <0.075 | 7% | <0.076 | <0.078 | 3% | <0.12 | <0.12 | 0% |
| Cadmium (Cd) | µg/g dw | 0.0029 | 0.00367 | 23% | 0.0054 | 0.0043 | 23% | 0.00121 | 0.00086 | 34% | <0.00065 | 0.00106 | 48% | 0.0109 | 0.0116 | 6% | 0.00906 | 0.00753 | 18% |
| Calcium (Ca) | µg/g dw | 2480 | 4100 | 49% | 3180 | 4940 | 43% | 828 | 1020 | 21% | 382 | 2350 | 144% | 1120 | 1850 | 49% | 1060 | 1980 | 61% |
| Cesium (Cs) | µg/g dw | 0.0882 | 0.0844 | 4% | 0.0773 | 0.0729 | 6% | 0.0469 | 0.0471 | 0% | 0.0787 | 0.0828 | 5% | 0.0723 | 0.0739 | 2% | 0.131 | 0.13 | 1% |
| Chromium (Cr) | µg/g dw | 0.125 | 0.111 | 12% | 0.0828 | 0.092 | 11% | 0.0604 | 0.0671 | 11% | 0.0619 | 0.07 | 12% | 0.0932 | 0.0885 | 5% | 0.0873 | 0.13 | 39% |
| Cobalt (Co) | µg/g dw | 0.0178 | 0.0143 | 22% | 0.00886 | 0.00977 | 10% | 0.0146 | 0.012 | 20% | 0.00561 | 0.00571 | 2% | 0.0065 | 0.0069 | 6% | 0.007 | 0.0059 | 17% |
| Copper (Cu) | µg/g dw | 0.612 | 0.539 | 13% | 0.657 | 0.53 | 21% | 0.967 | 0.89 | 8% | 0.422 | 0.396 | 6% | 0.877 | 0.918 | 5% | 0.683 | 0.641 | 6% |
| Gallium (Ga) | µg/g dw | 0.0181 | 0.0191 | 5% | 0.014 | 0.0119 | 16% | 0.0068 | 0.0074 | 8% | 0.0123 | 0.00892 | 32% | 0.00754 | 0.00797 | 6% | 0.00971 | 0.0088 | 10% |
| Iron (Fe) | µg/g dw | 26.2 | 20.9 | 23% | 13.7 | 11.3 | 19% | 9.58 | 8.61 | 11% | 5.32 | 5.37 | 1% | 10.6 | 11.4 | 7% | 12 | 10.5 | 13% |
| Lead (Pb) | µg/g dw | 0.0366 | 0.0412 | 12% | 0.0319 | 0.0466 | 37% | 0.00906 | 0.00778 | 15% | 0.00283 | 0.00431 | 41% | 0.261 | 0.31 | 17% | 0.0314 | 0.0256 | 20% |
| Lithium (Li) | µg/g dw | 0.0266 | 0.0155 | 53% | 0.0191 | 0.0196 | 3% | 0.0361 | 0.0344 | 5% | 0.0191 | 0.0234 | 20% | 0.0131 | 0.0143 | 9% | 0.0113 | 0.0123 | 8% |
| Magnesium (Mg) | µg/g dw | 1330 | 1270 | 5% | 1290 | 1300 | 1% | 1240 | 1260 | 2% | 1230 | 1330 | 8% | 1320 | 1360 | 3% | 1310 | 1300 | 1% |
| Manganese (Mn) | µg/g dw | 1.26 | 1.62 | 25% | 1.4 | 1.87 | 29% | 0.291 | 0.33 | 13% | 0.472 | 0.622 | 27% | 0.881 | 1.21 | 31% | 0.716 | 0.845 | 17% |
| Mercury (Hg) | µg/g dw | 0.866 | 0.759 | 13% | 1.54 | 1.49 | 3% | 0.184 | 0.218 | 17% | 0.666 | 0.648 | 3% | 0.793 | 0.786 | 1% | 1.18 | 1.2 | 2% |
| Molybdenum (Mo) | µg/g dw | 0.00525 | 0.00387 | 30% | 0.004 | 0.00314 | 24% | 0.00813 | 0.00684 | 17% | 0.00374 | 0.00367 | 2% | 0.00413 | 0.00452 | 9% | 0.0036 | 0.0041 | 13% |
| Nickel (Ni) | µg/g dw | 0.0638 | 0.0594 | 7% | 0.0391 | 0.0419 | 7% | 0.0122 | 0.0108 | 12% | 0.0218 | 0.023 | 5% | 0.198 | 0.204 | 3% | 0.0603 | 0.0598 | 1% |
| Phosphorus (P) | µg/g dw | 10500 | 10800 | 3% | 11500 | 11900 | 3% | 11000 | 11600 | 5% | 10700 | 12100 | 12% | 10500 | 10800 | 3% | 9860 | 10400 | 5% |
| Potassium (K) | µg/g dw | 21100 | 20000 | 5% | 23300 | 22100 | 5% | 19100 | 19200 | 1% | 22900 | 23200 | 1% | 20600 | 20500 | 0% | 20200 | 20900 | 3% |
| Rhenium (Re) | µg/g dw | <0.000054 | <0.000053 | 2% | <0.000056 | <0.000049 | 13% | 0.00015 | <0.00012 | 22% | <0.00024 | <0.00026 | 8% | <0.00027 | <0.00027 | 0% | <0.00011 | <0.00011 | 0% |
| Rubidium (Rb) | µg/g dw | 17.5 | 16.9 | 3% | 13.6 | 13.1 | 4% | 9.89 | 10 | 1% | 25 | 25.8 | 3% | 18.6 | 18.1 | 3% | 20.9 | 20.8 | 0% |
| Selenium (Se) | µg/g dw | 1.41 | 1.05 | 29% | 2.69 | 2.4 | 11% | 1.77 | 1.95 | 10% | 2.6 | 2.57 | 1% | 2.42 | 2.35 | 3% | 1.64 | 1.81 | 10% |
| Silver (Ag) | µg/g dw | <0.00066 | <0.00036 | 59% | <0.00068 | <0.00060 | 13% | <0.00047 | <0.00040 | 16% | <0.00066 | <0.00070 | 6% | <0.00071 | <0.00073 | 3% | <0.00077 | <0.00079 | 3% |
| Sodium (Na) | µg/g dw | 998 | 1070 | 7% | 1030 | 978 | 5% | 1010 | 1040 | 3% | 944 | 977 | 3% | 1500 | 1490 | 1% | 1290 | 1310 | 2% |
| Strontium (Sr) | µg/g dw | 3.43 | 5.69 | 50% | 3.77 | 6.2 | 49% | 0.577 | 0.726 | 23% | 0.0659 | 1.01 | 175% | 0.635 | 1.21 | 62% | 0.602 | 1.3 | 73% |
| Thallium (Tl) | µg/g dw | 0.0111 | 0.00914 | 19% | 0.00761 | 0.00712 | 7% | 0.0581 | 0.061 | 5% | 0.0363 | 0.041 | 12% | 0.00474 | 0.00487 | 3% | 0.00503 | 0.00508 | 1% |
| Thorium (Th) | µg/g dw | 0.0048 | 0.00337 | 35% | 0.00198 | 0.00123 | 47% | <0.000070 | <0.000060 | 15% | 0.000097 | 0.00011 | 13% | 0.000633 | 0.000654 | 3% | 0.000754 | 0.000625 | 19% |
| Tin (Sn) | µg/g dw | 0.0198 | 0.0193 | 3% | 0.00626 | 0.00435 | 36% | 0.00113 | 0.00065 | 54% | 0.00141 | 0.00153 | 8% | 0.0194 | 0.0223 | 14% | 0.0208 | 0.0156 | 29% |
| Titanium (Ti) | µg/g dw | 0.521 | 0.384 | 30% | 0.279 | 0.221 | 23% | 0.083 | 0.092 | 10% | 0.113 | 0.146 | 25% | 0.224 | 0.289 | 25% | 0.279 | 0.188 | 39% |
| Uranium (U) | µg/g dw | 0.00186 | 0.00225 | 19% | 0.00316 | 0.00481 | 41% | <0.00083 | <0.00071 | 16% | <0.00037 | <0.00039 | 5% | <0.00040 | 0.00068 | 52% | 0.00045 | 0.00054 | 18% |
| Vanadium (V) | µg/g dw | 0.0399 | 0.0307 | 26% | 0.0187 | 0.0166 | 12% | 0.00178 | 0.0019 | 7% | 0.00209 | 0.00313 | 40% | 0.0105 | 0.0124 | 17% | 0.0103 | 0.00916 | 12% |
| Yttrium (Y) | µg/g dw | 0.0091 | 0.00697 | 27% | 0.00397 | 0.00224 | 56% | <0.00020 | <0.00017 | 16% | 0.00092 | 0.00092 | 0% | 0.00172 | 0.00202 | 16% | 0.00148 | 0.00148 | 0% |
| Zinc (Zn) | µg/g dw | 20.1 | 18.5 | 8% | 20.2 | 15.3 | 28% | 16.6 | 16.9 | 2% | 20.3 | 19.8 | 2% | 22.6 | 23.1 | 2% | 20 | 21 | 5% |
| Zirconium (Zr) | µg/g dw | 0.0249 | 0.0134 | 60% | 0.0166 | 0.0138 | 18% | 0.00343 | 0.00256 | 29% | 0.0066 | 0.00272 | 83% | 0.0144 | 0.0119 | 19% | 0.0231 | 0.0124 | 60% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17a: Laboratory Duplicate Results for Fish Muscle Samples, 2014

| Analyte | Unit | SC-PM-6 Rep 1 | SC-PM-6 Rep 2 | RPD | SC-KO-10 Rep 1 | SC-KO-10 Rep 2 | RPD | SC-KO-20 Rep 1 | SC-KO-20 Rep 2 | RPD | ER-PM-2 Rep 1 | ER-PM-2 Rep 2 | RPD | ER-PM-6 Rep 1 | ER-PM-6 Rep 2 | RPD | SCPM-01M Rep 1 | SCPM-01M Rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 2.86 | 2.86 | 0% | 1.16 | 1.16 | 0% | 1.37 | 1.37 | 0% | 2.72 | 2.72 | 0% | 1.99 | 1.99 | 0% | 6.61 | 6.61 | 0% |
| Antimony (Sb) | µg/g dw | 0.00084 | 0.00085 | 1% | <0.00039 | <0.00041 | 5% | 0.00065 | 0.00071 | 9% | 0.00073 | 0.00113 | 43% | 0.00179 | 0.00188 | 5% | 0.00177 | 0.00097 | 58% |
| Arsenic (As) | µg/g dw | 0.0213 | 0.0236 | 10% | 0.149 | 0.17 | 13% | 0.0968 | 0.0909 | 6% | 0.02 | 0.0181 | 10% | 0.0259 | 0.02 | 26% | 0.0216 | 0.0169 | 24% |
| Barium (Ba) | µg/g dw | 0.611 | 0.553 | 10% | 0.159 | 0.0721 | 75% | 0.177 | 0.117 | 41% | 0.532 | 0.395 | 30% | 0.248 | 0.156 | 46% | 0.428 | 0.624 | 37% |
| Beryllium (Be) | µg/g dw | <0.0039 | <0.0039 | 0% | <0.0036 | <0.0038 | 5% | <0.0036 | <0.0039 | 8% | <0.0024 | <0.0023 | 4% | <0.0023 | <0.0024 | 4% | <0.0022 | <0.0024 | 9% |
| Bismuth (Bi) | µg/g dw | 0.00177 | 0.00175 | 1% | 0.000087 | 0.000086 | 1% | 0.000051 | 0.000076 | 39% | 0.000745 | 0.000841 | 12% | 0.00205 | 0.00172 | 18% | 0.00182 | 0.00171 | 6% |
| Boron (B) | µg/g dw | <0.12 | <0.12 | 0% | <0.11 | <0.12 | 9% | <0.11 | <0.12 | 9% | <0.086 | <0.083 | 4% | <0.081 | <0.085 | 5% | <0.080 | <0.088 | 10% |
| Cadmium (Cd) | µg/g dw | 0.00209 | 0.00197 | 6% | 0.00085 | 0.001 | 16% | 0.00124 | 0.00106 | 16% | 0.00322 | 0.00449 | 33% | 0.00384 | 0.00282 | 31% | 0.00117 | 0.00104 | 12% |
| Calcium (Ca) | µg/g dw | 2050 | 2190 | 7% | 1260 | 601 | 71% | 1110 | 599 | 60% | 1470 | 929 | 45% | 546 | 456 | 18% | 1770 | 3040 | 53% |
| Cesium (Cs) | µg/g dw | 0.0888 | 0.0881 | 1% | 0.0406 | 0.04 | 1% | 0.0632 | 0.0657 | 4% | 0.0564 | 0.0585 | 4% | 0.177 | 0.148 | 18% | 0.17 | 0.175 | 3% |
| Chromium (Cr) | µg/g dw | 0.398 | 0.0708 | 140% | 0.0697 | 0.0812 | 15% | 0.0715 | 0.0696 | 3% | 0.0943 | 0.0748 | 23% | 0.0848 | 0.0701 | 19% | 0.0727 | 0.0788 | 8% |
| Cobalt (Co) | µg/g dw | 0.0072 | 0.0064 | 12% | 0.0127 | 0.0117 | 8% | 0.012 | 0.0114 | 5% | 0.0051 | 0.00481 | 6% | 0.00532 | 0.00444 | 18% | 0.00768 | 0.00646 | 17% |
| Copper (Cu) | µg/g dw | 0.629 | 0.63 | 0% | 0.929 | 0.929 | 0% | 1.09 | 1.1 | 1% | 0.871 | 0.984 | 12% | 0.735 | 0.605 | 19% | 0.731 | 0.581 | 23% |
| Gallium (Ga) | µg/g dw | 0.0102 | 0.00957 | 6% | 0.0101 | 0.00794 | 24% | 0.00891 | 0.00836 | 6% | 0.00915 | 0.00805 | 13% | 0.0099 | 0.00826 | 18% | 0.0116 | 0.00685 | 51% |
| Iron (Fe) | µg/g dw | 13.1 | 9.65 | 30% | 9.47 | 9.05 | 5% | 8.41 | 8.4 | 0% | 11.1 | 11.6 | 4% | 8.24 | 5.81 | 35% | 18 | 14.9 | 19% |
| Lead (Pb) | µg/g dw | 0.0252 | 0.0163 | 43% | 0.00691 | 0.00571 | 19% | 0.0191 | 0.0164 | 15% | 0.0313 | 0.017 | 59% | 0.0259 | 0.0176 | 38% | 0.0219 | 0.0153 | 35% |
| Lithium (Li) | µg/g dw | 0.0106 | 0.0076 | 33% | 0.0211 | 0.0218 | 3% | 0.0465 | 0.0412 | 12% | 0.0148 | 0.0149 | 1% | 0.0184 | 0.0151 | 20% | 0.0114 | 0.0116 | 2% |
| Magnesium (Mg) | µg/g dw | 1450 | 1410 | 3% | 1110 | 1110 | 0% | 1190 | 1210 | 2% | 1460 | 1460 | 0% | 1370 | 1140 | 18% | 1260 | 1290 | 2% |
| Manganese (Mn) | µg/g dw | 1.18 | 1.19 | 1% | 0.46 | 0.22 | 71% | 0.461 | 0.264 | 54% | 0.752 | 0.671 | 11% | 0.331 | 0.253 | 27% | 0.717 | 0.939 | 27% |
| Mercury (Hg) | µg/g dw | 0.461 | 0.465 | 1% | 0.196 | 0.197 | 1% | 0.213 | 0.218 | 2% | 0.647 | 0.654 | 1% | 4.66 | 3.86 | 19% | 1.3 | 1.29 | 1% |
| Molybdenum (Mo) | µg/g dw | 0.006 | 0.0055 | 9% | 0.0082 | 0.0088 | 7% | 0.0088 | 0.0098 | 11% | 0.00244 | 0.00209 | 15% | 0.00286 | 0.00181 | 45% | 0.00225 | 0.00543 | 83% |
| Nickel (Ni) | µg/g dw | 0.0456 | 0.0369 | 21% | 0.015 | 0.0094 | 46% | 0.0184 | 0.017 | 8% | 0.0497 | 0.0349 | 35% | 0.0305 | 0.0218 | 33% | 0.0627 | 0.0514 | 20% |
| Phosphorus (P) | µg/g dw | 10600 | 10900 | 3% | 10400 | 10100 | 3% | 10900 | 10800 | 1% | 11200 | 10500 | 6% | 11900 | 9720 | 20% | 9720 | 10400 | 7% |
| Potassium (K) | µg/g dw | 20800 | 21300 | 2% | 17000 | 17500 | 3% | 19000 | 19400 | 2% | 22000 | 21100 | 4% | 24900 | 20300 | 20% | 19500 | 19700 | 1% |
| Rhenium (Re) | µg/g dw | <0.00011 | <0.00011 | 0% | 0.00014 | <0.00011 | 24% | <0.00010 | <0.00011 | 10% | <0.000049 | <0.000048 | 2% | <0.000046 | <0.000048 | 4% | <0.000046 | <0.000050 | 8% |
| Rubidium (Rb) | µg/g dw | 16.7 | 16.7 | 0% | 7.6 | 7.56 | 1% | 12.1 | 12.5 | 3% | 10.5 | 10.6 | 1% | 19.7 | 16.4 | 18% | 18 | 17.9 | 1% |
| Selenium (Se) | µg/g dw | 2.39 | 2.54 | 6% | 1.9 | 1.79 | 6% | 1.91 | 1.94 | 2% | 7.47 | 7.37 | 1% | 2.86 | 2.38 | 18% | 2.97 | 2.91 | 2% |
| Silver (Ag) | µg/g dw | <0.00080 | <0.00079 | 1% | <0.00073 | <0.00077 | 5% | <0.00073 | <0.00078 | 7% | <0.00081 | <0.00078 | 4% | <0.00076 | <0.00080 | 5% | <0.00075 | <0.00083 | 10% |
| Sodium (Na) | µg/g dw | 1320 | 1330 | 1% | 982 | 1020 | 4% | 1450 | 1500 | 3% | 1670 | 1610 | 4% | 1330 | 1100 | 19% | 990 | 1000 | 1% |
| Strontium (Sr) | µg/g dw | 1.51 | 1.65 | 9% | 0.975 | 0.441 | 75% | 0.824 | 0.427 | 63% | 0.819 | 0.466 | 55% | 0.163 | 0.134 | 20% | 1.33 | 2.45 | 59% |
| Thallium (Tl) | µg/g dw | 0.00701 | 0.00695 | 1% | 0.0434 | 0.0422 | 3% | 0.0445 | 0.0454 | 2% | 0.0109 | 0.0109 | 0% | 0.00551 | 0.00482 | 13% | 0.00981 | 0.0102 | 4% |
| Thorium (Th) | µg/g dw | 0.000732 | 0.000513 | 35% | <0.000075 | <0.00008 | 6% | 0.000177 | 0.000138 | 25% | 0.000461 | 0.00106 | 79% | 0.000493 | 0.000401 | 21% | 0.0019 | 0.00165 | 14% |
| Tin (Sn) | µg/g dw | 0.00785 | 0.0119 | 41% | 0.00071 | 0.00088 | 21% | 0.00236 | 0.00222 | 6% | 0.00387 | 0.00428 | 10% | 0.00511 | 0.00404 | 23% | 0.00869 | 0.00918 | 5% |
| Titanium (Ti) | µg/g dw | 0.208 | 0.157 | 28% | 0.0822 | 0.0951 | 15% | 0.173 | 0.118 | 38% | 0.152 | 0.17 | 11% | 0.235 | 0.142 | 49% | 0.266 | 0.196 | 30% |
| Uranium (U) | µg/g dw | 0.00038 | 0.00038 | 0% | 0.00021 | <0.00022 | 5% | <0.00021 | <0.00022 | 5% | 0.00025 | 0.00013 | 63% | 0.00031 | 0.00023 | 30% | 0.00068 | 0.00108 | 45% |
| Vanadium (V) | µg/g dw | 0.0131 | 0.00739 | 56% | 0.00282 | 0.00189 | 39% | 0.00423 | 0.00355 | 17% | 0.00653 | 0.00622 | 5% | 0.0114 | 0.00745 | 42% | 0.0148 | 0.0124 | 18% |
| Yttrium (Y) | µg/g dw | 0.00147 | 0.00106 | 32% | <0.00026 | <0.00026 | 0% | 0.00109 | 0.00027 | 121% | 0.00142 | 0.00142 | 0% | 0.00058 | 0.00058 | 0% | 0.00241 | 0.00241 | 0% |
| Zinc (Zn) | µg/g dw | 30.6 | 30 | 2% | 22.8 | 20.1 | 13% | 14.6 | 14 | 4% | 24.8 | 23.9 | 4% | 17.4 | 14.5 | 18% | 24.8 | 20.7 | 18% |
| Zirconium (Zr) | µg/g dw | 0.00512 | 0.00333 | 42% | 0.00667 | 0.00199 | 108% | 0.00401 | 0.0121 | 100% | 0.00668 | 0.00956 | 35% | 0.0106 | 0.00514 | 69% | 0.0125 | 0.00499 | 86% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17a: Laboratory Duplicate Results for Fish Muscle Samples, 2014

| Analyte | Unit | SCPM-05M Rep 1 | SCPM-05M Rep 2 | RPD | ERPM-7M Rep 1 | ERPM-7M Rep 2 | RPD | GCPM-04M Rep 1 | GCPM-04M Rep 2 | RPD | GCPM-07M Rep 1 | GCPM-07M Rep 2 | RPD | KOSC1-PM-10M Rep 1 | KOSC1-PM-10M Rep 2 | RPD | KOSC1-RT1M Rep 1 | KOSC1-RT1M Rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 12.9 | 12.9 | 0% | 6.31 | 6.31 | 0% | 11.5 | 11.5 | 0% | 3.32 | 3.32 | 0% | 1.97 | 1.97 | 0% | 3.6 | 0.941 | 117% |
| Antimony (Sb) | µg/g dw | 0.0006 | 0.00064 | 6% | 0.00245 | 0.00284 | 15% | 0.00142 | 0.00261 | 59% | 0.00074 | 0.00053 | 33% | 0.00391 | 0.00548 | 33% | 0.0024 | 0.00139 | 53% |
| Arsenic (As) | µg/g dw | 0.0121 | 0.0127 | 5% | 0.0229 | 0.0227 | 1% | 0.0421 | 0.0413 | 2% | 0.0329 | 0.0334 | 2% | 0.0371 | 0.0305 | 20% | 0.0629 | 0.0626 | 0% |
| Barium (Ba) | µg/g dw | 0.228 | 0.688 | 100% | 1.35 | 0.586 | 79% | 0.511 | 0.357 | 35% | 0.446 | 0.385 | 15% | 0.0934 | 0.171 | 59% | 0.023 | 0.0222 | 4% |
| Beryllium (Be) | µg/g dw | <0.0023 | <0.0024 | 4% | <0.0026 | <0.0027 | 4% | <0.0026 | <0.0027 | 4% | <0.0027 | <0.0026 | 4% | <0.0026 | <0.0025 | 4% | <0.0025 | <0.0026 | 4% |
| Bismuth (Bi) | µg/g dw | 0.00112 | 0.00118 | 5% | 0.00195 | 0.002 | 3% | 0.00119 | 0.00122 | 2% | 0.000974 | 0.00104 | 7% | 0.00102 | 0.00111 | 8% | 0.00155 | 0.00161 | 4% |
| Boron (B) | µg/g dw | <0.085 | <0.085 | 0% | <0.17 | <0.17 | 0% | 0.35 | 0.41 | 16% | <0.17 | <0.17 | 0% | <0.17 | <0.16 | 6% | <0.055 | <0.057 | 4% |
| Cadmium (Cd) | µg/g dw | 0.00114 | 0.00092 | 21% | 0.003 | 0.0017 | 55% | 0.0011 | 0.0012 | 9% | 0.0017 | 0.0016 | 6% | 0.002 | 0.00228 | 13% | <0.0010 | <0.0010 | 0% |
| Calcium (Ca) | µg/g dw | 510 | 1570 | 102% | 4750 | 1720 | 94% | 535 | 532 | 1% | 529 | 549 | 4% | 482 | 621 | 25% | 386 | 527 | 31% |
| Cesium (Cs) | µg/g dw | 0.241 | 0.245 | 2% | 0.0856 | 0.0816 | 5% | 0.139 | 0.141 | 1% | 0.0937 | 0.0952 | 2% | 0.17 | 0.169 | 1% | 0.211 | 0.211 | 0% |
| Chromium (Cr) | µg/g dw | 0.0665 | 0.0807 | 19% | 0.0788 | 0.0753 | 5% | 0.0837 | 0.0722 | 15% | 0.0744 | 0.0735 | 1% | 0.0764 | 0.0811 | 6% | 0.0715 | 0.0864 | 19% |
| Cobalt (Co) | µg/g dw | 0.00719 | 0.00833 | 15% | 0.0077 | 0.0069 | 11% | 0.00869 | 0.0078 | 11% | 0.0075 | 0.0066 | 13% | 0.0038 | 0.0035 | 8% | 0.0166 | 0.0165 | 1% |
| Copper (Cu) | µg/g dw | 0.646 | 0.665 | 3% | 0.639 | 0.617 | 4% | 1.01 | 0.938 | 7% | 0.851 | 0.779 | 9% | 1.06 | 0.971 | 9% | 1.11 | 1.07 | 4% |
| Gallium (Ga) | µg/g dw | 0.0098 | 0.0107 | 9% | 0.0152 | 0.0111 | 31% | 0.013 | 0.0106 | 20% | 0.0079 | 0.0073 | 8% | 0.0077 | 0.0076 | 1% | 0.0122 | 0.0115 | 6% |
| Iron (Fe) | µg/g dw | 18.7 | 20.1 | 7% | 18 | 15.5 | 15% | 21.5 | 19.3 | 11% | 20.9 | 15.8 | 28% | 9.17 | 9.12 | 1% | 10.1 | 9.75 | 4% |
| Lead (Pb) | µg/g dw | 0.00988 | 0.0132 | 29% | 0.00994 | 0.00576 | 53% | 0.0197 | 0.0163 | 19% | 0.0137 | 0.00958 | 35% | 0.0243 | 0.0285 | 16% | 0.0346 | 0.0218 | 45% |
| Lithium (Li) | µg/g dw | 0.0113 | 0.0168 | 39% | 0.026 | 0.015 | 54% | 0.012 | <0.011 | 9% | <0.010 | <0.010 | 0% | <0.010 | <0.0098 | 2% | <0.0061 | <0.0063 | 3% |
| Magnesium (Mg) | µg/g dw | 1180 | 1260 | 7% | 1280 | 1140 | 12% | 1160 | 1180 | 2% | 1190 | 1160 | 3% | 1240 | 1210 | 2% | 1140 | 1110 | 3% |
| Manganese (Mn) | µg/g dw | 0.607 | 0.832 | 31% | 1.41 | 0.771 | 59% | 0.563 | 0.525 | 7% | 0.527 | 0.493 | 7% | 0.26 | 0.286 | 10% | 0.542 | 0.565 | 4% |
| Mercury (Hg) | µg/g dw | 2.33 | 2.62 | 12% | 1.09 | 1.08 | 1% | 2.79 | 2.84 | 2% | 3.57 | 3.6 | 1% | 1.40 | 1.41 | 1% | 0.717 | 0.714 | 0% |
| Molybdenum (Mo) | µg/g dw | 0.00298 | 0.00296 | 1% | 0.00237 | 0.00185 | 25% | 0.00315 | 0.00272 | 15% | 0.00143 | 0.00109 | 27% | 0.0023 | 0.0016 | 36% | 0.00517 | 0.0049 | 5% |
| Nickel (Ni) | µg/g dw | 0.0309 | 0.0339 | 9% | 0.0431 | 0.0292 | 38% | 0.0339 | 0.0266 | 24% | 0.0213 | 0.0392 | 59% | 0.0339 | 0.0303 | 11% | 0.0164 | 0.0137 | 18% |
| Phosphorus (P) | µg/g dw | 9650 | 10400 | 7% | 11800 | 10100 | 16% | 9630 | 10100 | 5% | 9160 | 9200 | 0% | 9540 | 9580 | 0% | 9880 | 9720 | 2% |
| Potassium (K) | µg/g dw | 21200 | 21900 | 3% | 20300 | 20500 | 1% | 19300 | 20400 | 6% | 20100 | 20400 | 1% | 20100 | 19300 | 4% | 19500 | 19400 | 1% |
| Rhenium (Re) | µg/g dw | <0.000048 | <0.000049 | 2% | <0.00011 | <0.00012 | 9% | <0.00011 | <0.00012 | 9% | <0.00012 | <0.00011 | 9% | <0.00011 | <0.00011 | 0% | 0.000225 | 0.000183 | 21% |
| Rubidium (Rb) | µg/g dw | 21.5 | 22 | 2% | 15.8 | 15.7 | 1% | 22 | 22.8 | 4% | 20 | 20.4 | 2% | 24.9 | 24.9 | 0% | 22.5 | 22.5 | 0% |
| Selenium (Se) | µg/g dw | 1.39 | 1.55 | 11% | 4.56 | 4.64 | 2% | 1.77 | 1.74 | 2% | 1.32 | 1.23 | 7% | 1.21 | 1.18 | 3% | 1.37 | 1.26 | 8% |
| Silver (Ag) | µg/g dw | <0.00080 | <0.00080 | 0% | <0.00094 | <0.00098 | 4% | <0.00094 | <0.00097 | 3% | <0.00097 | <0.00096 | 1% | <0.00096 | <0.00091 | 5% | <0.00040 | <0.00042 | 5% |
| Sodium (Na) | µg/g dw | 1060 | 1110 | 5% | 952 | 963 | 1% | 1110 | 1180 | 6% | 1080 | 1120 | 4% | 875 | 864 | 1% | 970 | 931 | 4% |
| Strontium (Sr) | µg/g dw | 0.249 | 1.2 | 131% | 3.5 | 1.11 | 104% | 0.264 | 0.257 | 3% | 0.199 | 0.193 | 3% | 0.216 | 0.41 | 62% | 0.0747 | 0.163 | 74% |
| Thallium (Tl) | µg/g dw | 0.00946 | 0.00958 | 1% | 0.0137 | 0.0129 | 6% | 0.00801 | 0.00795 | 1% | 0.0104 | 0.00995 | 4% | 0.00942 | 0.00956 | 1% | 0.0317 | 0.0318 | 0% |
| Thorium (Th) | µg/g dw | 0.00221 | 0.00235 | 6% | 0.00189 | 0.0016 | 17% | 0.00491 | 0.00188 | 89% | 0.00111 | 0.000525 | 72% | 0.000244 | 0.000322 | 28% | 0.000218 | 0.000173 | 23% |
| Tin (Sn) | µg/g dw | 0.00349 | 0.00391 | 11% | 0.00171 | 0.00125 | 31% | 0.00365 | 0.00285 | 25% | 0.00324 | 0.0016 | 68% | 0.0095 | 0.00998 | 5% | 0.00241 | 0.00149 | 47% |
| Titanium (Ti) | µg/g dw | 0.261 | 0.36 | 32% | 0.362 | 0.22 | 49% | 0.504 | 0.431 | 16% | 0.265 | 0.164 | 47% | 0.187 | 0.162 | 14% | 0.124 | 0.116 | 7% |
| Uranium (U) | µg/g dw | 0.00048 | 0.00084 | 55% | 0.00106 | 0.0005 | 72% | 0.00059 | 0.00042 | 34% | <0.00033 | <0.00032 | 3% | <0.00032 | <0.00031 | 3% | <0.00012 | <0.00012 | 0% |
| Vanadium (V) | µg/g dw | 0.0151 | 0.0219 | 37% | 0.0337 | 0.0178 | 62% | 0.027 | 0.0203 | 28% | 0.0139 | 0.00802 | 54% | 0.00491 | 0.00413 | 17% | 0.0031 | 0.00314 | 1% |
| Yttrium (Y) | µg/g dw | 0.0044 | 0.00423 | 4% | 0.00245 | 0.00245 | 0% | 0.00397 | 0.00397 | 0% | 0.00116 | 0.00116 | 0% | 0.00082 | 0.00069 | 17% | 0.00089 | 0.00033 | 92% |
| Zinc (Zn) | µg/g dw | 16.9 | 19.3 | 13% | 21.9 | 19.8 | 10% | 26.2 | 20.3 | 25% | 17.7 | 16.2 | 9% | 16.2 | 16.4 | 1% | 11.9 | 11 | 8% |
| Zirconium (Zr) | µg/g dw | 0.00779 | 0.00716 | 8% | 0.0112 | 0.00465 | 83% | 0.00993 | 0.0072 | 32% | 0.00687 | 0.0031 | 76% | 0.00458 | 0.0124 | 92% | 0.00398 | 0.0016 | 85% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17b: Laboratory Duplicate Results for Fish Muscle Samples, 2015

| Analyte | Unit | SC-CSU-02-APR rep 1 | SC-CSU-02-APR rep 2 | RPD | SC-NSC-13-APR rep 1 | SC-NSC-13-APR rep 2 | RPD | SC-NSC-46-APR rep 1 | SC-NSC-46-APR rep 2 | RPD | SC-PCC-05-APR rep 1 | SC-PCC-05-APR rep 2 | RPD | GC-YP-06-APR rep 1 | GC-YP-06-APR rep 2 | RPD | GC-NSC-02-APR rep 1 | GC-NSC-02-APR rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 11.900 | 11.900 | 0% | 0.908 | 1.01 | 11% | 2.910 | 2.890 | 1% | 2.740 | 1.760 | 44% | 1.590 | 1.480 | 7% | 1.620 | 8.930 | 139% |
| Antimony (Sb) | µg/g dw | 0.0016 | 0.0016 | 0% | 0.0014 | 0.0022 | 44% | <0.0012 | <0.0011 | 9% | 0.0014 | <0.0012 | 15% | <0.0012 | <0.0011 | 9% | <0.0011 | <0.0011 | 0% |
| Arsenic (As) | µg/g dw | 0.2390 | 0.2310 | 3% | 0.0074 | 0.0096 | 26% | 0.0106 | 0.0105 | 1% | 0.1700 | 0.1520 | 11% | 0.0202 | 0.0172 | 16% | 0.0165 | 0.0162 | 2% |
| Barium (Ba) | µg/g dw | 1.120 | 0.815 | 32% | 0.37 | 0.172 | 73% | 0.262 | 0.155 | 51% | 2.180 | 1.560 | 33% | 0.172 | 0.148 | 15% | 0.573 | 0.586 | 2% |
| Beryllium (Be) | µg/g dw | <0.0022 | <0.0024 | 9% | <0.0028 | <0.0025 | 11% | <0.0025 | <0.0024 | 4% | <0.0024 | <0.0025 | 4% | <0.0025 | <0.0025 | 0% | <0.0023 | <0.0025 | 8% |
| Bismuth (Bi) | µg/g dw | 0.00863 | 0.00856 | 1% | 0.0025 | 0.00328 | 27% | 0.00254 | 0.00271 | 6% | 0.00486 | 0.00512 | 5% | 0.00560 | 0.00602 | 7% | 0.00176 | 0.00198 | 12% |
| Boron (B) | µg/g dw | <0.071 | <0.077 | 8% | <0.088 | <0.078 | 12% | <0.079 | <0.077 | 3% | 0.121 | 0.160 | 28% | <0.080 | <0.079 | 1% | <0.072 | 0.090 | 22% |
| Cadmium (Cd) | µg/g dw | 0.0053 | 0.0047 | 12% | <0.0016 | <0.0015 | 6% | 0.0048 | 0.0060 | 22% | 0.0051 | 0.0039 | 27% | 0.0041 | 0.0056 | 31% | <0.0013 | <0.0015 | 14% |
| Calcium (Ca) | µg/g dw | 4,290 | 2,650 | 47% | 2620 | 2580 | 2% | 909 | 618 | 38% | 3,310 | 3,340 | 1% | 2,320 | 1,600 | 37% | 2,320 | 2,050 | 12% |
| Cesium (Cs) | µg/g dw | 0.1940 | 0.1860 | 4% | 0.157 | 0.163 | 4% | 0.1500 | 0.1530 | 2% | 0.0661 | 0.0711 | 7% | 0.1290 | 0.1370 | 6% | 0.0671 | 0.0698 | 4% |
| Chromium (Cr) | µg/g dw | 0.0752 | 0.0649 | 15% | 0.0478 | 0.0579 | 19% | 0.0608 | 0.0667 | 9% | 0.0585 | 0.0688 | 16% | 0.0532 | 0.1450 | 93% | 0.0564 | 0.1440 | 87% |
| Cobalt (Co) | µg/g dw | 0.04020 | 0.03700 | 8% | 0.00311 | 0.00565 | 58% | 0.00623 | 0.00587 | 6% | 0.02350 | 0.01860 | 23% | 0.02090 | 0.02110 | 1% | 0.00453 | 0.00662 | 37% |
| Copper (Cu) | µg/g dw | 0.962 | 1.020 | 6% | 0.64 | 0.76 | 17% | 0.857 | 0.875 | 2% | 1.430 | 1.010 | 34% | 0.753 | 0.689 | 9% | 0.596 | 0.580 | 3% |
| Gallium (Ga) | µg/g dw | 0.01430 | 0.01160 | 21% | 0.00451 | 0.00617 | 31% | 0.00688 | 0.00590 | 15% | 0.00683 | 0.00680 | 0% | 0.00664 | 0.00657 | 1% | 0.00528 | 0.00904 | 53% |
| Iron (Fe) | µg/g dw | 24.4 | 17.6 | 32% | 7.58 | 9.24 | 20% | 10.6 | 10.6 | 0% | 22.1 | 13.6 | 48% | 14.6 | 15.5 | 6% | 7.0 | 12.4 | 55% |
| Lead (Pb) | µg/g dw | 0.05940 | 0.03920 | 41% | 0.00498 | 0.00798 | 46% | 0.0223 | 0.0224 | 0% | 0.0250 | 0.0203 | 21% | 0.0054 | 0.0066 | 20% | 0.00661 | 0.01210 | 59% |
| Lithium (Li) | µg/g dw | 0.0194 | 0.0095 | 69% | <0.0078 | 0.0117 | 40% | <0.0070 | <0.0068 | 3% | 0.0077 | <0.0070 | 10% | 0.0238 | 0.0211 | 12% | <0.0064 | 0.0118 | 59% |
| Magnesium (Mg) | µg/g dw | 1,380 | 1,310 | 5% | 1220 | 1230 | 1% | 1,170 | 1,220 | 4% | 1,300 | 1,390 | 7% | 1,180 | 1,290 | 9% | 1,220 | 1,210 | 1% |
| Manganese (Mn) | µg/g dw | 3.200 | 2.130 | 40% | 0.835 | 0.904 | 8% | 0.578 | 0.508 | 13% | 1.320 | 1.260 | 5% | 0.841 | 0.889 | 6% | 0.922 | 0.864 | 6% |
| Mercury (Hg) | µg/g dw | 1.000 | 1.030 | 3% | 1.240 | 1.120 | 10% | 1.920 | 2.100 | 9% | 0.804 | 0.876 | 9% | 1.190 | 1.220 | 2% | 0.684 | 0.676 | 1% |
| Molybdenum (Mo) | µg/g dw | 0.0086 | 0.0103 | 18% | 0.0038 | 0.0079 | 70% | 0.0060 | 0.0051 | 16% | 0.0070 | 0.0053 | 28% | 0.0077 | 0.0080 | 4% | 0.0063 | 0.0071 | 12% |
| Nickel (Ni) | µg/g dw | 0.0418 | 0.0317 | 27% | 0.0101 | 0.0558 | 139% | 0.0118 | 0.0119 | 1% | 0.0246 | 0.0222 | 10% | 0.0139 | 0.0129 | 7% | 0.0130 | 0.0568 | 126% |
| Phosphorus (P) | µg/g dw | 12,900 | 11,500 | 11% | 10000 | 10500 | 5% | 9,550 | 9,700 | 2% | 10,800 | 11,500 | 6% | 11,400 | 11,300 | 1% | 9,550 | 9,260 | 3% |
| Potassium (K) | µg/g dw | 24,500 | 23,400 | 5% | 20400 | 21200 | 4% | 21,100 | 22,400 | 6% | 21,300 | 22,900 | 7% | 24,400 | 24,900 | 2% | 20,700 | 20,300 | 2% |
| Rhenium (Re) | µg/g dw | <0.000026 | <0.000028 | 7% | <0.000032 | <0.000028 | 13% | <0.000029 | <0.000028 | 4% | <0.000027 | <0.000029 | 7% | <0.000029 | <0.000029 | 0% | <0.000026 | <0.000028 | 7% |
| Rubidium (Ru) | µg/g dw | 21.7 | 20.8 | 4% | 21.4 | 24.5 | 14% | 27.3 | 28.5 | 4% | 12.3 | 13.1 | 6% | 29.4 | 30.7 | 4% | 20.3 | 20.8 | 2% |
| Selenium (Se) | µg/g dw | 1.19 | 1.3 | 9% | 1.34 | 1.68 | 23% | 1.58 | 1.8 | 13% | 2.58 | 2.51 | 3% | 2.33 | 2.36 | 1% | 1.99 | 2.02 | 1% |
| Silver (Ag) | µg/g dw | <0.00044 | <0.00048 | 9% | <0.00054 | <0.00048 | 12% | <0.00049 | <0.00047 | 4% | <0.00046 | <0.00049 | 6% | <0.00049 | <0.00048 | 2% | <0.00044 | <0.00048 | 9% |
| Sodium (Na) | µg/g dw | 1,320 | 1,310 | 1% | 774 | 926 | 18% | 958 | 998 | 4% | 881 | 955 | 8% | 1,660 | 1,810 | 9% | 926 | 898 | 3% |
| Strontium (Sr) | µg/g dw | 4.63 | 2.79 | 50% | 1.99 | 1.34 | 39% | 0.54 | 0.25 | 73% | 4.79 | 4.69 | 2% | 1.01 | 0.71 | 35% | 1.58 | 1.36 | 15% |
| Thallium (Tl) | µg/g dw | 0.0210 | 0.0210 | 0% | 0.0114 | 0.0209 | 59% | 0.0056 | 0.0060 | 6% | 0.0109 | 0.0089 | 21% | 0.0230 | 0.0242 | 5% | 0.0081 | 0.0084 | 3% |
| Thorium (Th) | µg/g dw | 0.00511 | 0.00622 | 20% | <0.00045 | <0.00039 | 14% | 0.00056 | 0.00068 | 19% | 0.00056 | 0.00050 | 11% | <0.00040 | <0.00040 | 0% | <0.00036 | 0.00117 | 106% |
| Tin (Sn) | µg/g dw | 0.00209 | 0.00165 | 24% | 0.00197 | 0.00084 | 80% | 0.00081 | 0.00117 | 36% | 0.00086 | 0.00075 | 14% | 0.00139 | 0.00168 | 19% | 0.00132 | 0.00120 | 10% |
| Titanium (Ti) | µg/g dw | 0.4870 | 0.2790 | 54% | 0.0972 | 0.118 | 19% | 0.1440 | 0.1450 | 1% | 0.1210 | 0.1100 | 10% | 0.1330 | 0.1430 | 7% | 0.1540 | 0.1590 | 3% |
| Uranium (U) | µg/g dw | 0.00255 | 0.00216 | 17% | 0.00057 | 0.00025 | 78% | 0.00038 | <0.00022 | 53% | 0.00259 | 0.00193 | 29% | 0.00056 | 0.00048 | 15% | 0.00039 | 0.00039 | 0% |
| Vanadium (V) | µg/g dw | 0.03280 | 0.01930 | 52% | 0.00244 | 0.00425 | 54% | 0.00736 | 0.00763 | 4% | 0.01000 | 0.00663 | 41% | 0.00577 | 0.00498 | 15% | 0.00599 | 0.01310 | 74% |
| Yttrium (Y) | µg/g dw | 0.00522 | 0.00522 | 0% | 0.00029 | 0.00033 | 13% | 0.00093 | 0.00139 | 40% | 0.00119 | 0.00048 | 85% | 0.00159 | 0.00101 | 45% | 0.00057 | 0.00094 | 49% |
| Zinc (Zn) | µg/g dw | 31.0 | 34.7 | 11% | 17.4 | 21.1 | 19% | 17.4 | 17.4 | 0% | 49.0 | 36.0 | 31% | 26.3 | 24.9 | 5% | 27.5 | 18.8 | 38% |
| Zirconium (Zr) | µg/g dw | 0.0335 | 0.0217 | 43% | 0.0263 | 0.0234 | 12% | 0.0088 | 0.0062 | 35% | 0.0177 | 0.0142 | 22% | 0.0303 | 0.0102 | 99% | 0.0163 | 0.0124 | 27% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## **Table A.17b:** Laboratory Duplicate Results for Fish Muscle Samples, 2015

| Analyte | Unit | GC-NSC-49-APR rep 1 | GC-NSC-49-APR rep 2 | RPD | GC-CSU-10-APR rep 1 | GC-CSU-10-APR rep 2 | RPD | GC-PCC-05-APR rep 1 | GC-PCC-05-APR rep 2 | RPD | ER-CSU-02-APR rep 1 | ER-CSU-02-APR rep 2 | RPD | ER-CSU-09-APR rep 1 | ER-CSU-09-APR rep 2 | RPD | ER-CSU-17-APR rep 1 | ER-CSU-17-APR rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 1.100 | 1.100 | 0% | 2.00 | 2.60 | 26% | 3.130 | 3.130 | 0% | 2.01 | 1.84 | 9% | 2.68 | 2.68 | 0% | 5.88 | 5.88 | 0% |
| Antimony (Sb) | µg/g dw | 0.0014 | 0.0008 | 49% | 0.0020 | 0.0016 | 19% | 0.0012 | 0.0016 | 24% | 0.0008 | 0.0016 | 71% | 0.0020 | 0.0016 | 22% | 0.0030 | 0.0027 | 10% |
| Arsenic (As) | µg/g dw | 0.0919 | 0.0801 | 14% | 0.0845 | 0.0834 | 1% | 0.0842 | 0.0777 | 8% | 0.1060 | 0.1210 | 13% | 0.0981 | 0.0989 | 1% | 0.0407 | 0.0366 | 11% |
| Barium (Ba) | µg/g dw | 0.207 | 0.135 | 42% | 1.330 | 1.440 | 8% | 1.930 | 1.330 | 37% | 1.220 | 1.450 | 17% | 3.490 | 3.730 | 7% | 1.130 | 1.730 | 42% |
| Beryllium (Be) | µg/g dw | <0.0024 | <0.0024 | 0% | <0.0026 | <0.0025 | 4% | <0.0023 | <0.0026 | 12% | <0.0023 | <0.0025 | 8% | <0.0022 | <0.0027 | 20% | <0.0027 | <0.0026 | 4% |
| Bismuth (Bi) | µg/g dw | 0.00060 | 0.00046 | 26% | 0.00462 | 0.00475 | 3% | 0.00375 | 0.00351 | 7% | 0.00249 | 0.00246 | 1% | 0.00408 | 0.00396 | 3% | 0.00961 | 0.00936 | 3% |
| Boron (B) | µg/g dw | <0.095 | <0.097 | 2% | <0.100 | 0.110 | 10% | <0.093 | <0.100 | 7% | 0.104 | 0.170 | 48% | <0.120 | <0.140 | 15% | <0.110 | <0.110 | 0% |
| Cadmium (Cd) | µg/g dw | <0.0010 | <0.0011 | 10% | 0.0063 | 0.0054 | 15% | 0.0033 | 0.0050 | 41% | 0.0040 | 0.0035 | 13% | 0.0047 | 0.0032 | 38% | 0.0072 | 0.0074 | 3% |
| Calcium (Ca) | µg/g dw | 662 | 469 | 34% | 2,070 | 2,600 | 23% | 4,350 | 2,420 | 57% | 3,280 | 4,160 | 24% | 7,460 | 8,230 | 10% | 2,800 | 4,890 | 54% |
| Cesium (Cs) | µg/g dw | 0.1110 | 0.1090 | 2% | 0.0259 | 0.0273 | 5% | 0.0677 | 0.0688 | 2% | 0.1130 | 0.1160 | 3% | 0.0839 | 0.0787 | 6% | 0.0546 | 0.0553 | 1% |
| Chromium (Cr) | µg/g dw | 0.0638 | 0.0724 | 13% | 0.0590 | 0.0727 | 21% | 0.0556 | 0.0634 | 13% | 0.0493 | 0.0540 | 9% | 0.0579 | 0.0587 | 1% | 0.0608 | 0.0603 | 1% |
| Cobalt (Co) | µg/g dw | 0.00453 | 0.00415 | 9% | 0.02860 | 0.02440 | 16% | 0.01130 | 0.01180 | 4% | 0.03260 | 0.03570 | 9% | 0.01790 | 0.02000 | 11% | 0.03970 | 0.02940 | 30% |
| Copper (Cu) | µg/g dw | 1.310 | 1.390 | 6% | 1.230 | 1.170 | 5% | 0.876 | 1.050 | 18% | 1.030 | 1.150 | 11% | 0.695 | 0.747 | 7% | 1.260 | 1.030 | 20% |
| Gallium (Ga) | µg/g dw | 0.00476 | 0.00485 | 2% | 0.00660 | 0.00719 | 9% | 0.00778 | 0.00789 | 1% | 0.00637 | 0.00727 | 13% | 0.01060 | 0.00880 | 19% | 0.00980 | 0.00821 | 18% |
| Iron (Fe) | µg/g dw | 13.9 | 9.7 | 36% | 16.5 | 16.0 | 3% | 14.4 | 17.6 | 20% | 13.9 | 15.9 | 13% | 9.8 | 10.7 | 9% | 28.8 | 21.2 | 30% |
| Lead (Pb) | µg/g dw | 0.02110 | 0.01400 | 40% | 0.02180 | 0.02700 | 21% | 0.02460 | 0.01520 | 47% | 0.02380 | 0.03200 | 29% | 0.06250 | 0.07020 | 12% | 0.03400 | 0.05570 | 48% |
| Lithium (Li) | µg/g dw | <0.0060 | <0.0061 | 2% | 0.0116 | 0.0135 | 15% | 0.0082 | <0.0065 | 23% | 0.0217 | 0.0207 | 5% | 0.0197 | 0.0209 | 6% | 0.0323 | 0.0237 | 31% |
| Magnesium (Mg) | µg/g dw | 1,060 | 1,070 | 1% | 1,170 | 1,250 | 7% | 1,330 | 1,390 | 4% | 1,180 | 1,280 | 8% | 1,300 | 1,260 | 3% | 1,150 | 1,250 | 8% |
| Manganese (Mn) | µg/g dw | 0.294 | 0.232 | 24% | 1.600 | 2.090 | 27% | 2.000 | 1.240 | 47% | 2.150 | 2.700 | 23% | 5.410 | 5.480 | 1% | 2.080 | 3.390 | 48% |
| Mercury (Hg) | µg/g dw | 0.839 | 0.870 | 4% | 3.020 | 3.090 | 2% | 0.763 | 0.752 | 1% | 0.676 | 0.647 | 4% | 0.841 | 0.789 | 6% | 1.290 | 1.280 | 1% |
| Molybdenum (Mo) | µg/g dw | 0.0062 | 0.0039 | 46% | 0.0105 | 0.0111 | 6% | 0.0076 | 0.0078 | 3% | 0.0094 | 0.0093 | 1% | 0.0110 | 0.0112 | 2% | 0.0104 | 0.0096 | 8% |
| Nickel (Ni) | µg/g dw | 0.0074 | 0.0046 | 46% | 0.0391 | 0.0442 | 12% | 0.0251 | 0.0179 | 33% | 0.0319 | 0.0366 | 14% | 0.0569 | 0.0570 | 0% | 0.0530 | 0.0421 | 23% |
| Phosphorus (P) | µg/g dw | 8,980 | 9,030 | 1% | 12,500 | 13,100 | 5% | 11,900 | 11,100 | 7% | 11,900 | 12,500 | 5% | 14,200 | 14,300 | 1% | 11,900 | 12,900 | 8% |
| Potassium (K) | µg/g dw | 16,900 | 16,800 | 1% | 25,100 | 26,100 | 4% | 21,200 | 22,200 | 5% | 23,900 | 23,600 | 1% | 23,000 | 22,500 | 2% | 23,900 | 24,000 | 0% |
| Rhenium (Re) | µg/g dw | <0.000030 | <0.000030 | 0% | <0.000033 | <0.000032 | 3% | <0.000029 | <0.000032 | 10% | <0.000029 | <0.000031 | 7% | <0.000034 | <0.000041 | 19% | <0.000033 | <0.000033 | 0% |
| Rubidium (Ru) | µg/g dw | 19.5 | 18.9 | 3% | 11.9 | 12.6 | 6% | 18.8 | 19.4 | 3% | 17.1 | 17.3 | 1% | 11.5 | 10.9 | 5% | 7.9 | 8.1 | 2% |
| Selenium (Se) | µg/g dw | 1.39 | 1.23 | 12% | 0.99 | 0.94 | 5% | 1.88 | 1.8 | 4% | 3.11 | 3.22 | 3% | 4.54 | 4.37 | 4% | 8.61 | 8.09 | 6% |
| Silver (Ag) | µg/g dw | 0.00125 | 0.00094 | 28% | 0.00250 | 0.00208 | 18% | 0.00035 | 0.00061 | 54% | 0.00086 | 0.00090 | 5% | 0.00071 | 0.00047 | 41% | 0.00050 | 0.00049 | 2% |
| Sodium (Na) | µg/g dw | 817 | 838 | 3% | 1,590 | 1,630 | 2% | 1,000 | 1,010 | 1% | 1,340 | 1,370 | 2% | 1,090 | 1,070 | 2% | 1,530 | 1,550 | 1% |
| Strontium (Sr) | µg/g dw | 0.35 | 0.19 | 58% | 1.48 | 1.68 | 13% | 6.06 | 3.13 | 64% | 3.20 | 3.96 | 21% | 7.08 | 7.48 | 5% | 2.49 | 4.30 | 53% |
| Thallium (Tl) | µg/g dw | 0.0254 | 0.0253 | 0% | 0.0080 | 0.0084 | 5% | 0.0054 | 0.0052 | 5% | 0.0308 | 0.0334 | 8% | 0.0287 | 0.0284 | 1% | 0.0216 | 0.0222 | 3% |
| Thorium (Th) | µg/g dw | 0.000322 | 0.000596 | 60% | 0.00030 | 0.00040 | 28% | 0.000455 | 0.000508 | 11% | 0.00031 | 0.00028 | 8% | 0.00043 | 0.00059 | 33% | 0.00119 | 0.00144 | 19% |
| Tin (Sn) | µg/g dw | 0.00084 | 0.00065 | 26% | 0.00226 | 0.00295 | 26% | 0.00620 | 0.00199 | 103% | 0.00119 | 0.00162 | 31% | 0.00203 | 0.00140 | 37% | 0.00203 | 0.00140 | 37% |
| Titanium (Ti) | µg/g dw | 0.1220 | 0.0880 | 32% | 0.1070 | 0.1540 | 36% | 0.157 | 0.205 | 27% | 0.130 | 0.128 | 2% | 0.111 | 0.114 | 3% | 0.573 | 0.355 | 47% |
| Uranium (U) | µg/g dw | <0.00015 | <0.00015 | 0% | 0.00137 | 0.00214 | 44% | 0.00264 | 0.00141 | 61% | 0.00090 | 0.00122 | 30% | 0.00139 | 0.00153 | 10% | 0.00096 | 0.00186 | 64% |
| Vanadium (V) | µg/g dw | 0.00559 | 0.00410 | 31% | 0.00447 | 0.00704 | 45% | 0.00858 | 0.00962 | 11% | 0.00884 | 0.01060 | 18% | 0.00832 | 0.01150 | 32% | 0.02010 | 0.01630 | 21% |
| Yttrium (Y) | µg/g dw | 0.00074 | 0.00058 | 24% | 0.00101 | 0.00141 | 33% | 0.00167 | 0.00153 | 9% | 0.00097 | 0.00137 | 34% | 0.00243 | 0.00164 | 39% | 0.00352 | 0.00444 | 23% |
| Zinc (Zn) | µg/g dw | 19.5 | 18.6 | 5% | 26.0 | 26.5 | 2% | 30.0 | 30.7 | 2% | 30.1 | 31.8 | 5% | 38.8 | 39.0 | 1% | 36.1 | 30.5 | 17% |
| Zirconium (Zr) | µg/g dw | 0.0071 | 0.0041 | 53% | 0.0056 | 0.0070 | 22% | 0.0074 | 0.0082 | 10% | 0.0064 | 0.0058 | 11% | 0.0078 | 0.0100 | 24% | 0.0088 | 0.0079 | 11% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17b: Laboratory Duplicate Results for Fish Muscle Samples, 2015

| Analyte | Unit | ER-PCC-10-APR rep 1 | ER-PCC-10-APR rep 2 | RPD | ER-YP-08-APR rep 1 | ER-YP-08-APR rep 2 | RPD | ER-NSC-13-APR rep 1 | ER-NSC-13-APR rep 2 | RPD | ER-NSC-03 rep 1 | ER-NSC-03 rep 2 | RPD | SC-KO-02 rep 1 | SC-KO-02 rep 2 | RPD | GC-NSC-02 rep 1 | GC-NSC-02 rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 4.400 | 4.950 | 12% | 1.560 | 1.340 | 15% | 1.080 | 0.577 | 61% | 21.3 | 38.4 | 57% | 1.78 | 4.61 | 89% | 0.552 | 0.552 | 0% |
| Antimony (Sb) | µg/g dw | 0.0036 | 0.0020 | 57% | <0.0011 | <0.0011 | 0% | <0.0010 | 0.0016 | 46% | 0.00068 | 0.00146 | 73% | <0.00063 | 0.00087 | 32% | 0.00128 | 0.0008 | 46% |
| Arsenic (As) | µg/g dw | 0.1430 | 0.1500 | 5% | 0.0181 | 0.0239 | 28% | 0.0389 | 0.0421 | 8% | 0.0271 | 0.033 | 20% | 0.347 | 0.266 | 26% | 0.0277 | 0.0268 | 3% |
| Barium (Ba) | µg/g dw | 2.490 | 2.230 | 11% | 0.052 | 0.100 | 63% | 0.828 | 0.267 | 102% | 0.827 | 0.897 | 8% | 0.356 | 0.315 | 12% | 0.297 | 0.311 | 5% |
| Beryllium (Be) | µg/g dw | <0.0026 | <0.0026 | 0% | <0.0025 | <0.0025 | 0% | <0.0023 | <0.0026 | 12% | <0.0024 | <0.0026 | 8% | <0.0026 | <0.0024 | 8% | <0.0024 | <0.0024 | 0% |
| Bismuth (Bi) | µg/g dw | 0.00726 | 0.00736 | 1% | 0.00884 | 0.00911 | 3% | 0.00201 | 0.00214 | 6% | 0.00283 | 0.00283 | 0% | <0.000090 | <0.000085 | 6% | 0.00499 | 0.0041 | 20% |
| Boron (B) | µg/g dw | <0.100 | 0.160 | 46% | <0.140 | <0.140 | 0% | <0.120 | <0.140 | 15% | 0.23 | 0.35 | 41% | <0.24 | <0.22 | 9% | <0.22 | <0.22 | 0% |
| Cadmium (Cd) | µg/g dw | 0.0078 | 0.0082 | 5% | 0.0050 | 0.0049 | 2% | <0.0015 | <0.0018 | 18% | 0.0148 | 0.0187 | 23% | 0.0072 | 0.0048 | 40% | <0.0021 | 0.0023 | 9% |
| Calcium (Ca) | µg/g dw | 4,980 | 4,570 | 9% | 606 | 1,320 | 74% | 4,290 | 1,230 | 111% | 971 | 1,410 | 37% | 1,920 | 1,550 | 21% | 546 | 523 | 4% |
| Cesium (Cs) | µg/g dw | 0.0307 | 0.0338 | 10% | 0.2980 | 0.3050 | 2% | 0.0954 | 0.0961 | 1% | 0.137 | 0.145 | 6% | 0.054 | 0.0567 | 5% | 0.081 | 0.0794 | 2% |
| Chromium (Cr) | µg/g dw | 0.0599 | 0.0663 | 10% | 0.0577 | 0.1180 | 69% | 0.0485 | 0.0595 | 20% | 0.0675 | 0.115 | 52% | 0.062 | 0.0666 | 7% | 0.0567 | 0.0622 | 9% |
| Cobalt (Co) | µg/g dw | 0.01880 | 0.01690 | 11% | 0.01510 | 0.01450 | 4% | 0.00249 | 0.00229 | 8% | 0.00995 | 0.0125 | 23% | 0.019 | 0.0171 | 11% | 0.00588 | 0.00571 | 3% |
| Copper (Cu) | µg/g dw | 0.957 | 0.833 | 14% | 0.441 | 0.460 | 4% | 0.525 | 0.547 | 4% | 1.3 | 1.33 | 2% | 1.42 | 1.21 | 16% | 0.871 | 0.855 | 2% |
| Gallium (Ga) | µg/g dw | 0.00766 | 0.00667 | 14% | 0.00684 | 0.00748 | 9% | 0.00754 | 0.00540 | 33% | 0.012 | 0.0174 | 37% | 0.00532 | 0.00615 | 14% | 0.0128 | 0.00594 | 73% |
| Iron (Fe) | µg/g dw | 18.9 | 16.4 | 14% | 7.1 | 7.7 | 8% | 6.7 | 6.8 | 1% | 26.5 | 41.1 | 43% | 18.8 | 18.1 | 4% | 20 | 12.9 | 43% |
| Lead (Pb) | µg/g dw | 0.02600 | 0.02340 | 11% | 0.01860 | 0.01820 | 2% | 0.01260 | 0.01130 | 11% | 0.0163 | 0.0986 | 143% | 0.00422 | 0.00469 | 11% | 0.00452 | 0.00236 | 63% |
| Lithium (Li) | µg/g dw | 0.0157 | 0.0177 | 12% | 0.0226 | 0.0252 | 11% | 0.0101 | <0.0054 | 61% | 0.0117 | 0.0417 | 112% | 0.022 | 0.0218 | 1% | 0.0055 | 0.0044 | 22% |
| Magnesium (Mg) | µg/g dw | 1,210 | 1,300 | 7% | 1,170 | 1,190 | 2% | 1,170 | 1,140 | 3% | 1260 | 1500 | 17% | 1,060 | 1,100 | 4% | 1280 | 1260 | 2% |
| Manganese (Mn) | µg/g dw | 1.260 | 1.210 | 4% | 0.569 | 0.698 | 20% | 1.220 | 0.478 | 87% | 0.917 | 1.61 | 55% | 0.532 | 0.571 | 7% | 0.65 | 0.476 | 31% |
| Mercury (Hg) | µg/g dw | 0.834 | 0.835 | 0% | 1.680 | 1.660 | 1% | 0.931 | 0.949 | 2% | 1.38 | 1.48 | 7% | 0.128 | 0.138 | 8% | 1.73 | 1.7 | 2% |
| Molybdenum (Mo) | µg/g dw | 0.0097 | 0.0097 | 0% | 0.0112 | 0.0121 | 8% | 0.0061 | 0.0054 | 12% | 0.019 | 0.0197 | 4% | 0.0173 | 0.0203 | 16% | 0.0105 | 0.0105 | 0% |
| Nickel (Ni) | µg/g dw | 0.0482 | 0.0489 | 1% | 0.0187 | 0.0194 | 4% | 0.0164 | 0.0101 | 48% | 0.0423 | 0.0466 | 10% | 0.0235 | 0.0218 | 8% | 0.0119 | 0.0061 | 64% |
| Phosphorus (P) | µg/g dw | 12,800 | 12,800 | 0% | 12,300 | 12,500 | 2% | 11,200 | 9,350 | 18% | 10,200 | 10,700 | 5% | 11,200 | 11,400 | 2% | 10,400 | 10,400 | 0% |
| Potassium (K) | µg/g dw | 24,100 | 24,400 | 1% | 24,600 | 24,500 | 0% | 20,800 | 20,400 | 2% | 22,400 | 22,900 | 2% | 17,700 | 18,700 | 5% | 21,800 | 21,800 | 0% |
| Rhenium (Re) | µg/g dw | <0.000033 | <0.000032 | 3% | <0.000039 | 0.0000103 | 116% | 0.00002 | 0.0000215 | 7% | 0.0000038 | 0.000017 | 127% | 0.000454 | 0.000429 | 6% | 0.0000236 | 0.0000094 | 86% |
| Rubidium (Ru) | µg/g dw | 8.8 | 9.3 | 5% | 38.1 | 38.0 | 0% | 19.6 | 19.7 | 1% | 24.5 | 25.3 | 3% | 16.4 | 17.4 | 6% | 24.5 | 24.2 | 1% |
| Selenium (Se) | µg/g dw | 9.35 | 9.11 | 3% | 3.28 | 3.54 | 8% | 5.83 | 6.06 | 4% | 2.68 | 2.59 | 3% | 1.75 | 1.8 | 3% | 2.34 | 2.17 | 8% |
| Silver (Ag) | µg/g dw | 0.00085 | 0.00089 | 5% | <0.00036 | 0.00122 | 109% | <0.00032 | <0.00037 | 14% | 0.00159 | 0.00187 | 16% | 0.00031 | 0.00032 | 3% | <0.00023 | <0.00022 | 4% |
| Sodium (Na) | µg/g dw | 1,370 | 1,390 | 1% | 2,430 | 2,330 | 4% | 747 | 723 | 3% | 1,320 | 1,360 | 3% | 872 | 916 | 5% | 1,200 | 1,180 | 2% |
| Strontium (Sr) | µg/g dw | 6.17 | 5.71 | 8% | 0.20 | 0.58 | 97% | 2.89 | 0.63 | 129% | 0.707 | 0.977 | 32% | 1.4 | 1.13 | 21% | 0.316 | 0.105 | 100% |
| Thallium (Tl) | µg/g dw | 0.0081 | 0.0083 | 3% | 0.0377 | 0.0393 | 4% | 0.0150 | 0.0133 | 12% | 0.00952 | 0.0105 | 10% | 0.0482 | 0.0501 | 4% | 0.00376 | 0.00405 | 7% |
| Thorium (Th) | µg/g dw | 0.00139 | 0.000903 | 42% | 0.000223 | 0.000296 | 28% | 0.000163 | <0.000083 | 65% | 0.00305 | 0.00623 | 69% | 0.000124 | 0.000094 | 28% | 0.00105 | 0.000108 | 163% |
| Tin (Sn) | µg/g dw | 0.00257 | 0.00325 | 23% | 0.00300 | 0.00160 | 61% | 0.00110 | <0.0012 | 9% | 0.00378 | 0.0037 | 2% | 0.00226 | 0.00167 | 30% | 0.00298 | 0.00217 | 31% |
| Titanium (Ti) | µg/g dw | 0.193 | 0.186 | 4% | 0.114 | 0.116 | 2% | 0.0800 | 0.0711 | 12% | 0.292 | 0.564 | 64% | 0.0793 | 0.0951 | 18% | 0.126 | 0.0789 | 46% |
| Uranium (U) | µg/g dw | 0.00200 | 0.00187 | 7% | 0.00023 | 0.00026 | 13% | 0.00064 | 0.00012 | 138% | 0.000944 | 0.00457 | 132% | 0.000947 | 0.00083 | 13% | 0.00073 | <0.000016 | 191% |
| Vanadium (V) | µg/g dw | 0.01850 | 0.01750 | 6% | 0.00562 | 0.00695 | 21% | 0.01080 | 0.00394 | 93% | 0.018 | 0.0765 | 124% | 0.00467 | 0.00753 | 47% | 0.0275 | 0.00292 | 162% |
| Yttrium (Y) | µg/g dw | 0.00188 | 0.00228 | 19% | 0.00049 | 0.00112 | 78% | 0.00040 | 0.00033 | 19% | 0.0071 | 0.0302 | 124% | 0.00066 | 0.00055 | 18% | 0.00022 | 0.00022 | 0% |
| Zinc (Zn) | µg/g dw | 24.8 | 21.9 | 12% | 25.5 | 30.2 | 17% | 17.6 | 18.3 | 4% | 39.6 | 35.7 | 10% | 26.4 | 24.5 | 7% | 29.6 | 30.7 | 4% |
| Zirconium (Zr) | µg/g dw | 0.0075 | 0.0065 | 15% | 0.0047 | 0.0042 | 12% | 0.0024 | 0.0050 | 71% | 0.019 | 0.0352 | 60% | 0.00635 | 0.00571 | 11% | 0.00808 | 0.00486 | 50% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17b: Laboratory Duplicate Results for Fish Muscle Samples, 2015

| Analyte | Unit | ER-KO-01 rep 1 | ER-KO-01 rep 2 | RPD | SC-NSC-06 rep 1 | SC-NSC-06 rep 2 | RPD | SC-NSC-11 rep 1 | SC-NSC-11 rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 0.459 | 0.459 | 0% | 1.33 | 1.33 | 0% | 1.1 | 1.10 | 0% |
| Antimony (Sb) | µg/g dw | <0.00061 | <0.00061 | 0% | 0.00215 | 0.00092 | 80% | 0.00081 | 0.00065 | 22% |
| Arsenic (As) | µg/g dw | 0.22 | 0.181 | 19% | 0.036 | 0.034 | 6% | 0.0425 | 0.0377 | 12% |
| Barium (Ba) | µg/g dw | 0.159 | 0.0777 | 69% | 0.742 | 0.792 | 7% | 0.188 | 0.110 | 52% |
| Beryllium (Be) | µg/g dw | <0.0025 | <0.0025 | 0% | <0.0026 | <0.0025 | 4% | <0.0022 | <0.0023 | 4% |
| Bismuth (Bi) | µg/g dw | <0.000088 | 0.000277 | 104% | 0.00106 | 0.00103 | 3% | 0.00088 | 0.000718 | 20% |
| Boron (B) | µg/g dw | <0.23 | <0.23 | 0% | <0.24 | <0.23 | 4% | <0.20 | <0.21 | 5% |
| Cadmium (Cd) | µg/g dw | <0.0022 | <0.0022 | 0% | 0.003 | 0.0028 | 7% | 0.002 | <0.0020 | 0% |
| Calcium (Ca) | µg/g dw | 1,130 | 670 | 51% | 565 | 597 | 6% | 839 | 523 | 46% |
| Cesium (Cs) | µg/g dw | 0.0451 | 0.0466 | 3% | 0.148 | 0.146 | 1% | 0.526 | 0.513 | 3% |
| Chromium (Cr) | µg/g dw | 0.0593 | 0.0614 | 3% | 0.068 | 0.0763 | 12% | 0.0704 | 0.0681 | 3% |
| Cobalt (Co) | µg/g dw | 0.0146 | 0.0142 | 3% | 0.00592 | 0.00646 | 9% | 0.00367 | 0.00304 | 19% |
| Copper (Cu) | µg/g dw | 1.25 | 1.09 | 14% | 0.978 | 1.01 | 3% | 0.776 | 0.766 | 1% |
| Gallium (Ga) | µg/g dw | 0.00611 | 0.00491 | 22% | 0.0124 | 0.00603 | 69% | 0.00508 | 0.00416 | 20% |
| Iron (Fe) | µg/g dw | 15.7 | 13.9 | 12% | 16.7 | 18 | 7% | 25.9 | 24.3 | 6% |
| Lead (Pb) | µg/g dw | 0.00189 | 0.00341 | 57% | 0.048 | 0.0105 | 128% | 0.00711 | 0.00573 | 21% |
| Lithium (Li) | µg/g dw | 0.123 | 0.122 | 1% | 0.0052 | 0.0087 | 50% | 0.0039 | 0.0032 | 20% |
| Magnesium (Mg) | µg/g dw | 1,120 | 1,180 | 5% | 1210 | 1220 | 1% | 1320 | 1310 | 1% |
| Manganese (Mn) | µg/g dw | 0.372 | 0.284 | 27% | 0.51 | 0.514 | 1% | 0.471 | 0.392 | 18% |
| Mercury (Hg) | µg/g dw | 0.122 | 0.127 | 4% | 1.35 | 1.34 | 1% | 0.858 | 0.889 | 4% |
| Molybdenum (Mo) | µg/g dw | 0.0113 | 0.0144 | 24% | 0.0072 | 0.0085 | 17% | 0.0097 | 0.0118 | 20% |
| Nickel (Ni) | µg/g dw | 0.0068 | 0.0066 | 3% | 0.0375 | 0.0181 | 70% | 0.0306 | 0.0242 | 23% |
| Phosphorus (P) | µg/g dw | 11,200 | 11,400 | 2% | 10,400 | 10,600 | 2% | 10,800 | 10,700 | 1% |
| Potassium (K) | µg/g dw | 20,000 | 21,200 | 6% | 21,700 | 21,300 | 2% | 20,900 | 21,100 | 1% |
| Rhenium (Re) | µg/g dw | 0.0000679 | 0.0000904 | 28% | <0.0000031 | <0.0000030 | 3% | <0.0000026 | <0.0000027 | 4% |
| Rubidium (Ru) | µg/g dw | 16 | 16.8 | 5% | 20.6 | 20.2 | 2% | 35.6 | 35.3 | 1% |
| Selenium (Se) | µg/g dw | 1.94 | 1.91 | 2% | 2.72 | 2.66 | 2% | 1.34 | 1.37 | 2% |
| Silver (Ag) | µg/g dw | <0.00024 | <0.00023 | 4% | 0.000570 | 0.000240 | 81% | 0.00031 | 0.00033 | 6% |
| Sodium (Na) | µg/g dw | 1,360 | 1,440 | 6% | 1,340 | 1,370 | 2% | 955 | 976 | 2% |
| Strontium (Sr) | µg/g dw | 0.761 | 0.412 | 60% | 0.122 | 0.149 | 20% | 0.45 | 0.178 | 87% |
| Thallium (Tl) | µg/g dw | 0.0491 | 0.0473 | 4% | 0.00712 | 0.00678 | 5% | 0.00716 | 0.00706 | 1% |
| Thorium (Th) | µg/g dw | <0.000089 | <0.000088 | 1% | 0.00044 | 0.000548 | 22% | 0.000751 | 0.000198 | 117% |
| Tin (Sn) | µg/g dw | 0.00241 | 0.00209 | 14% | 0.0177 | 0.0216 | 20% | 0.002 | 0.00163 | 20% |
| Titanium (Ti) | µg/g dw | 0.0736 | 0.0958 | 26% | 0.124 | 0.124 | 0% | 0.125 | 0.111 | 12% |
| Uranium (U) | µg/g dw | 0.000141 | 0.000098 | 36% | 0.000108 | 0.000083 | 26% | 0.000443 | 0.000281 | 45% |
| Vanadium (V) | µg/g dw | 0.00296 | 0.00226 | 27% | 0.00525 | 0.00544 | 4% | 0.00429 | 0.0025 | 53% |
| Yttrium (Y) | µg/g dw | 0.00019 | 0.00019 | 0% | 0.0006 | 0.00060 | 0% | 0.00046 | 0.00046 | 0% |
| Zinc (Zn) | µg/g dw | 22.1 | 21.5 | 3% | 31.6 | 34.5 | 9% | 20.1 | 18.8 | 7% |
| Zirconium (Zr) | µg/g dw | 0.0213 | 0.0134 | 46% | 0.0195 | 0.00975 | 67% | 0.0118 | 0.009 | 27% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17c: Laboratory Duplicate Results for Fish Muscle Samples, 2016

| Analyte | Unit | ER-PCC-01 M rep 1 | ER-PCC-01 M rep 2 | RPD | ER-BT-04 M rep 1 | ER-BT-04 M rep 2 | RPD | SC-PCC-06 M rep 1 | SC-PCC-06 M rep 2 | RPD | SC-RT-01 M rep 1 | SC-RT-01 M rep 2 | RPD | GC-BT-02 M rep 1 | GC-BT-02 M rep 2 | RPD | GC-BT-04 M rep 1 | GC-BT-04 M rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | - | 0.885 | - | - | 2.88 | - | - | 2.65 | - | - | 0.721 | - | - | 1.73 | - | - | 1.47 | - |
| Antimony (Sb) | µg/g dw | 0.0028 | 0.0019 | 38% | 0.0019 | 0.0014 | 30% | 0.0015 | 0.0014 | 7% | <0.0011 | <0.0012 | 9% | 0.00121 | 0.00076 | 46% | 0.0007 | 0.00073 | 4% |
| Arsenic (As) | µg/g dw | 0.134 | 0.131 | 2% | 0.0997 | 0.0987 | 1% | 0.181 | 0.191 | 5% | 0.0858 | 0.0837 | 2% | 0.0333 | 0.0389 | 16% | 0.0361 | 0.035 | 3% |
| Barium (Ba) | µg/g dw | 1.99 | 1.93 | 3% | 0.0569 | 0.0422 | 30% | 0.825 | 1.48 | 57% | 0.341 | 0.0393 | 159% | 0.029 | 0.0246 | 16% | 0.0691 | 0.0733 | 6% |
| Beryllium (Be) | µg/g dw | <0.0054 | <0.0053 | 2% | <0.0053 | <0.0050 | 6% | <0.0053 | <0.0056 | 6% | <0.0054 | <0.0056 | 4% | <0.0026 | <0.0026 | 0% | <0.0026 | <0.0024 | 8% |
| Bismuth (Bi) | µg/g dw | 0.00542 | 0.00593 | 9% | 0.0004 | 0.00046 | 14% | 0.0112 | 0.0103 | 8% | 0.000289 | 0.000316 | 9% | 0.0017 | 0.00203 | 18% | 0.00617 | 0.00573 | 7% |
| Boron (B) | µg/g dw | <0.0860 | <0.0840 | 2% | 0.089 | 0.112 | 23% | 0.127 | <0.0880 | 36% | <0.0850 | 0.165 | 64% | <0.1000 | <0.1000 | 0% | <0.0990 | 0.166 | 51% |
| Cadmium (Cd) | µg/g dw | 0.0056 | 0.0047 | 17% | <0.0024 | <0.0023 | 4% | 0.0043 | 0.0034 | 23% | <0.0024 | <0.0025 | 4% | <0.0013 | <0.0013 | 0% | <0.0012 | <0.0012 | 0% |
| Calcium (Ca) | µg/g dw | 2,520 | 3,250 | 25% | 302 | 292 | 3% | 1,740 | 3,100 | 56% | 4,530 | 678 | 148% | 400 | 405 | 1% | 987 | 1100 | 11% |
| Cesium (Cs) | µg/g dw | 0.0286 | 0.0297 | 4% | 0.113 | 0.113 | 0% | 0.0756 | 0.0693 | 9% | 0.0357 | 0.0364 | 2% | 0.111 | 0.121 | 9% | 0.0826 | 0.081 | 2% |
| Chromium (Cr) | µg/g dw | 0.0681 | 0.0505 | 30% | 0.0645 | 0.0606 | 6% | 0.71 | 0.365 | 64% | 0.0455 | 0.0471 | 3% | 0.0638 | 0.0798 | 22% | 0.0786 | 0.0842 | 7% |
| Cobalt (Co) | µg/g dw | 0.0191 | 0.016 | 18% | 0.00949 | 0.00918 | 3% | 0.0191 | 0.0234 | 20% | 0.0125 | 0.0118 | 6% | 0.0107 | 0.011 | 3% | 0.0178 | 0.0165 | 8% |
| Copper (Cu) | µg/g dw | 1.93 | 1.48 | 26% | 1.13 | 1.12 | 1% | 1.19 | 1.92 | 47% | 1.02 | 1.1 | 8% | 0.894 | 1 | 11% | 1.07 | 1.04 | 3% |
| Gallium (Ga) | µg/g dw | 0.0043 | 0.0045 | 5% | 0.0069 | 0.0035 | 65% | 0.0038 | 0.0047 | 21% | 0.0062 | 0.0038 | 48% | 0.00807 | 0.00701 | 14% | 0.014 | 0.00819 | 52% |
| Iron (Fe) | µg/g dw | 31.2 | 22.2 | 34% | 13.9 | 13.7 | 1% | 24 | 28.5 | 17% | 13.7 | 14.2 | 4% | 8.61 | 9.52 | 10% | 9.97 | 9.56 | 4% |
| Lead (Pb) | µg/g dw | 0.0147 | 0.0154 | 5% | 0.0217 | 0.0108 | 67% | 0.0202 | 0.0241 | 18% | 0.00516 | 0.00198 | 89% | 0.00146 | 0.00284 | 64% | 0.0102 | 0.0103 | 1% |
| Lithium (Li) | µg/g dw | 0.0071 | 0.0116 | 48% | 0.0047 | <0.0033 | 35% | 0.0086 | 0.0071 | 19% | 0.0132 | 0.0104 | 24% | <0.0034 | <0.0033 | 3% | 0.0051 | 0.0072 | 34% |
| Magnesium (Mg) | µg/g dw | 1,300 | 1,390 | 7% | 1,020 | 994 | 3% | 1,350 | 1,270 | 6% | 1,380 | 1,300 | 6% | 1,180 | 1,280 | 8% | 1,360 | 1,320 | 3% |
| Manganese (Mn) | µg/g dw | 0.872 | 0.947 | 8% | 0.371 | 0.386 | 4% | 0.9 | 1.38 | 42% | 0.972 | 0.367 | 90% | 0.43 | 0.458 | 6% | 0.48 | 0.443 | 8% |
| Mercury (Hg) | µg/g dw | 0.439 | 0.476 | 8% | 1.02 | 1.01 | 1% | 1.06 | 0.946 | 11% | 0.164 | 0.162 | 1% | 0.641 | 0.71 | 10% | 0.0248 | 0.0231 | 7% |
| Molybdenum (Mo) | µg/g dw | <0.0030 | <0.0030 | 0% | <0.0029 | <0.0028 | 4% | 0.0068 | 0.0062 | 9% | <0.0030 | <0.0031 | 3% | 0.006 | 0.0067 | 11% | 0.0071 | 0.0067 | 6% |
| Nickel (Ni) | µg/g dw | 0.0559 | 0.0394 | 35% | 0.029 | 0.0203 | 35% | 0.0386 | 0.0337 | 14% | 0.024 | 0.0141 | 52% | 0.016 | 0.0113 | 34% | 0.046 | 0.0214 | 73% |
| Phosphorus (P) | µg/g dw | 12,400 | 13,600 | 9% | 9,870 | 9,950 | 1% | 11,100 | 11,500 | 4% | 15,400 | 13,300 | 15% | 10,100 | 10,900 | 8% | 12,200 | 11,700 | 4% |
| Potassium (K) | µg/g dw | 21,200 | 22,700 | 7% | 17,500 | 17,100 | 2% | 20,900 | 19,500 | 7% | 24,300 | 24,000 | 1% | 19,700 | 21,400 | 8% | 23,100 | 21,800 | 6% |
| Rhenium (Re) | µg/g dw | <0.0000 | <0.0000 | 2% | 0.000114 | 0.000117 | 3% | <0.0000 | <0.0000 | 7% | 0.000067 | <0.0000 | 41% | 0.00006 | 0.000057 | 5% | 0.000057 | 0.000098 | 53% |
| Rubidium (Rb) | µg/g dw | 4.86 | 5.13 | 5% | 22 | 21.9 | 0% | 8.6 | 8.05 | 7% | 9.96 | 9.97 | 0% | 24.5 | 26.7 | 9% | 23.9 | 24 | 0% |
| Selenium (Se) | µg/g dw | 4.85 | 5.2 | 7% | 2.29 | 2.07 | 10% | 3.02 | 3.12 | 3% | 1.42 | 1.63 | 14% | 2.2 | 2.32 | 5% | 2.73 | 2.71 | 1% |
| Silver (Ag) | µg/g dw | <0.0005 | <0.0005 | 2% | <0.0005 | <0.0005 | 4% | <0.0005 | <0.0005 | 6% | <0.0005 | <0.0005 | 4% | <0.0004 | <0.0004 | 2% | 0.00149 | 0.0021 | 34% |
| Sodium (Na) | µg/g dw | 955 | 1,030 | 8% | 886 | 886 | 0% | 842 | 796 | 6% | 1,290 | 1,240 | 4% | 756 | 811 | 7% | 928 | 894 | 4% |
| Strontium (Sr) | µg/g dw | 3.14 | 4.04 | 25% | 0.0856 | 0.0812 | 5% | 1.64 | 3.32 | 68% | 3.26 | 0.359 | 160% | 0.074 | 0.0679 | 9% | 0.4 | 0.483 | 19% |
| Thallium (Tl) | µg/g dw | 0.0401 | 0.0262 | 42% | 0.0292 | 0.0289 | 1% | 0.00636 | 0.00802 | 23% | 0.0116 | 0.0106 | 9% | 0.0312 | 0.0346 | 10% | 0.0338 | 0.0336 | 1% |
| Thorium (Th) | µg/g dw | 0.000151 | 0.000106 | 35% | 0.000633 | 0.000715 | 12% | 0.000927 | 0.000416 | 76% | 0.00008 | <0.0001 | 46% | 0.000182 | 0.000212 | 15% | 0.000217 | 0.000221 | 2% |
| Tin (Sn) | µg/g dw | <0.0011 | <0.0010 | 10% | 0.0048 | 0.00502 | 4% | 0.0048 | 0.0038 | 23% | <0.0010 | 0.0016 | 46% | 0.00105 | <0.0008 | 33% | 0.00146 | 0.00147 | 1% |
| Titanium (Ti) | µg/g dw | 0.109 | 0.114 | 4% | 0.164 | 0.11 | 39% | 0.169 | 0.0988 | 52% | 0.0738 | 0.0706 | 4% | 0.229 | 0.135 | 52% | 0.117 | 0.116 | 1% |
| Uranium (U) | µg/g dw | 0.00139 | 0.00151 | 8% | 0.000309 | 0.000299 | 3% | 0.00212 | 0.00371 | 55% | 0.000356 | 0.000137 | 89% | <0.0001 | <0.0001 | 3% | 0.000271 | 0.000163 | 50% |
| Vanadium (V) | µg/g dw | 0.0115 | 0.00965 | 17% | 0.0104 | 0.00705 | 38% | 0.0147 | 0.0109 | 30% | 0.00297 | 0.00213 | 33% | 0.00832 | 0.0038 | 75% | 0.00329 | 0.00246 | 29% |
| Yttrium (Y) | µg/g dw | - | 0.00042 | - | - | 0.00134 | - | - | 0.00065 | - | - | <0.0002 | - | - | 0.00066 | - | - | 0.00065 | - |
| Zinc (Zn) | µg/g dw | 36.4 | 33.4 | 9% | 12.3 | 12.2 | 1% | 31.9 | 45.2 | 35% | 21 | 17.6 | 18% | 12.3 | 13.7 | 11% | 14.6 | 14.6 | 0% |
| Zirconium (Zr) | µg/g dw | 0.00676 | 0.00638 | 6% | 0.012 | 0.00571 | 71% | 0.00703 | 0.00953 | 30% | 0.00646 | 0.00414 | 44% | 0.00632 | 0.0029 | 74% | 0.0189 | 0.0105 | 57% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17c: Laboratory Duplicate Results for Fish Muscle Samples, 2016

| Analyte | Unit | ER-YP-02 M rep 1 | ER-YP-02 M rep 2 | RPD | ER-RSC-13 M rep 1 | ER-RSC-13 M rep 2 | RPD | ER-CSU-04 M rep 1 | ER-CSU-04 M rep 2 | RPD | ER-CSU-34 M rep 1 | ER-CSU-34 M rep 2 | RPD | ER-NSC-28 M rep 1 | ER-NSC-28 M rep 2 | RPD | GC-CSU-04 M rep 1 | GC-CSU-04 M rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 3.21 | 4.09 | 24% | 1.86 | 1.59 | 16% | 3.87 | 3.72 | 4% | - | 5.34 | - | 0.682 | 0.818 | 18% | 9.38 | 7.17 | 27% |
| Antimony (Sb) | µg/g dw | 0.00067 | <0.0006 | 9% | 0.00107 | <0.0010 | 7% | 0.0015 | 0.00165 | 10% | 0.00268 | 0.00353 | 27% | <0.0006 | <0.0006 | 3% | 0.00094 | 0.00066 | 35% |
| Arsenic (As) | µg/g dw | 0.0099 | 0.0112 | 12% | 0.0525 | 0.0356 | 38% | 0.136 | 0.139 | 2% | 0.213 | 0.237 | 11% | 0.0719 | 0.0644 | 11% | 0.0961 | 0.0915 | 5% |
| Barium (Ba) | µg/g dw | 0.115 | 0.409 | 112% | 1.25 | 0.897 | 33% | 1.38 | 1.48 | 7% | 0.627 | 0.738 | 16% | 0.451 | 0.162 | 94% | 0.459 | 0.236 | 64% |
| Beryllium (Be) | µg/g dw | <0.0026 | <0.0027 | 4% | <0.0046 | <0.0049 | 6% | <0.0024 | <0.0023 | 4% | <0.0026 | <0.0026 | 0% | <0.0026 | <0.0027 | 4% | <0.0025 | <0.0022 | 13% |
| Bismuth (Bi) | µg/g dw | 0.00505 | 0.00464 | 8% | 0.00081 | 0.00077 | 5% | 0.00331 | 0.00319 | 4% | 0.00711 | 0.00733 | 3% | 0.00046 | 0.000376 | 20% | 0.00144 | 0.00131 | 9% |
| Boron (B) | µg/g dw | 0.157 | 0.124 | 23% | 0.35 | 0.33 | 6% | 0.128 | 0.24 | 61% | 0.111 | <0.0650 | 52% | 0.105 | 0.34 | 106% | 0.096 | 0.244 | 87% |
| Cadmium (Cd) | µg/g dw | 0.0041 | 0.0054 | 27% | 0.0121 | 0.0147 | 19% | 0.002 | 0.0025 | 22% | 0.0092 | 0.0082 | 11% | <0.0011 | 0.0014 | 24% | <0.0009 | 0.00203 | 76% |
| Calcium (Ca) | µg/g dw | 1,090 | 4,440 | 121% | 3,140 | 2,730 | 14% | 3,320 | 3,490 | 5% | 1,100 | 1,910 | 54% | 2,420 | 699 | 110% | 1,600 | 870 | 59% |
| Cesium (Cs) | µg/g dw | 0.2 | 0.203 | 1% | 0.0433 | 0.0456 | 5% | 0.0583 | 0.0605 | 4% | 0.0542 | 0.0563 | 4% | 0.14 | 0.137 | 2% | 0.234 | 0.238 | 2% |
| Chromium (Cr) | µg/g dw | 0.102 | 0.127 | 22% | 0.0841 | 0.0464 | 58% | 0.058 | 0.0605 | 4% | 0.0758 | 0.0677 | 11% | 0.0651 | 0.0993 | 42% | 0.0607 | 0.0618 | 2% |
| Cobalt (Co) | µg/g dw | 0.01 | 0.0118 | 17% | 0.0117 | 0.0112 | 4% | 0.0157 | 0.0147 | 7% | 0.0452 | 0.035 | 25% | 0.003 | 0.0031 | 3% | 0.0245 | 0.0228 | 7% |
| Copper (Cu) | µg/g dw | 0.623 | 0.804 | 25% | 1.58 | 1.05 | 40% | 0.867 | 0.814 | 6% | 1.9 | 1.09 | 54% | 0.703 | 0.785 | 11% | 1.01 | 0.895 | 12% |
| Gallium (Ga) | µg/g dw | 0.008 | 0.0078 | 3% | 0.0076 | 0.0061 | 22% | 0.0072 | 0.0081 | 12% | 0.0116 | 0.0087 | 29% | 0.0048 | 0.0042 | 13% | 0.00961 | 0.0089 | 8% |
| Iron (Fe) | µg/g dw | 10.5 | 12.8 | 20% | 20.1 | 15.1 | 28% | 11.9 | 11.4 | 4% | 51.9 | 24.4 | 72% | 5.94 | 6.85 | 14% | 15.7 | 12.8 | 20% |
| Lead (Pb) | µg/g dw | 0.029 | 0.0499 | 53% | 0.00932 | 0.00877 | 6% | 0.0156 | 0.0211 | 30% | 0.0133 | 0.0125 | 6% | 0.00354 | 0.0022 | 47% | 0.0151 | 0.00905 | 50% |
| Lithium (Li) | µg/g dw | 0.0898 | 0.102 | 13% | 0.013 | 0.015 | 14% | 0.013 | 0.0162 | 22% | 0.0118 | 0.0087 | 30% | <0.0074 | <0.0076 | 3% | 0.0097 | 0.0063 | 43% |
| Magnesium (Mg) | µg/g dw | 1,250 | 1,330 | 6% | 1,360 | 1,370 | 1% | 1,290 | 1,310 | 2% | 1,070 | 1,190 | 11% | 1,130 | 1,090 | 4% | 1,400 | 1,410 | 1% |
| Manganese (Mn) | µg/g dw | 0.709 | 1.16 | 48% | 2.22 | 2.35 | 6% | 2.31 | 2.65 | 14% | 0.884 | 1.12 | 24% | 0.379 | 0.209 | 58% | 1.85 | 1.12 | 49% |
| Mercury (Hg) | µg/g dw | 1.08 | 1.06 | 2% | 0.312 | 0.306 | 2% | 0.39 | 0.381 | 2% | 0.731 | 0.848 | 15% | 1.61 | 1.66 | 3% | 0.358 | 0.365 | 2% |
| Molybdenum (Mo) | µg/g dw | 0.0039 | 0.0044 | 12% | 0.00777 | 0.0058 | 29% | 0.0035 | 0.0034 | 3% | 0.0072 | 0.0033 | 74% | 0.0016 | 0.002 | 22% | 0.00364 | 0.00328 | 10% |
| Nickel (Ni) | µg/g dw | 0.0254 | 0.033 | 26% | 0.0475 | 0.0493 | 4% | 0.0192 | 0.0208 | 8% | 0.0386 | 0.0345 | 11% | 0.0079 | 0.042 | 137% | 0.0256 | 0.0225 | 13% |
| Phosphorus (P) | µg/g dw | 11,800 | 13,700 | 15% | 12,000 | 11,400 | 5% | 12,400 | 12,600 | 2% | 10,800 | 11,700 | 8% | 9,510 | 8,590 | 10% | 11,500 | 11,100 | 4% |
| Potassium (K) | µg/g dw | 24,600 | 25,100 | 2% | 17,800 | 17,900 | 1% | 24,000 | 23,800 | 1% | 21,200 | 23,100 | 9% | 16,100 | 15,500 | 4% | 21,400 | 21,800 | 2% |
| Rhenium (Re) | µg/g dw | <0.0001 | <0.0001 | 2% | <0.0002 | <0.0002 | 6% | <0.0000 | <0.0000 | 4% | <0.0000 | <0.0001 | 2% | <0.0000 | <0.0001 | 4% | <0.0001 | <0.0001 | 13% |
| Rubidium (Rb) | µg/g dw | 35.1 | 35.6 | 1% | 9.57 | 9.73 | 2% | 12.3 | 12.5 | 2% | 8.6 | 9.45 | 9% | 19.5 | 19.5 | 0% | 16 | 16.4 | 2% |
| Selenium (Se) | µg/g dw | 3.66 | 3.91 | 7% | 5.63 | 6.72 | 18% | 4.07 | 4.04 | 1% | 6.34 | 6.49 | 2% | 1.57 | 1.76 | 11% | 0.73 | 0.71 | 3% |
| Silver (Ag) | µg/g dw | <0.0007 | <0.0008 | 3% | <0.0012 | <0.0013 | 8% | <0.0007 | <0.0007 | 3% | 0.00253 | 0.00187 | 30% | <0.0007 | <0.0008 | 3% | <0.0007 | <0.0006 | 11% |
| Sodium (Na) | µg/g dw | 2,070 | 2,110 | 2% | 1,090 | 1,060 | 3% | 998 | 989 | 1% | 1,180 | 1,260 | 7% | 846 | 848 | 0% | 1,080 | 1,060 | 2% |
| Strontium (Sr) | µg/g dw | 0.534 | 2.57 | 131% | 3.52 | 2.98 | 17% | 2.92 | 3.22 | 10% | 0.849 | 1.62 | 62% | 1.91 | 0.485 | 119% | 1.36 | 0.609 | 76% |
| Thallium (Tl) | µg/g dw | 0.028 | 0.0307 | 9% | 0.0196 | 0.0174 | 12% | 0.0146 | 0.0149 | 2% | 0.0238 | 0.0229 | 4% | 0.00741 | 0.00787 | 6% | 0.0065 | 0.00635 | 2% |
| Thorium (Th) | µg/g dw | 0.000675 | 0.000812 | 18% | 0.0004 | <0.0002 | 50% | 0.000638 | 0.000485 | 27% | 0.00215 | 0.00116 | 60% | 0.000117 | 0.000341 | 98% | 0.00172 | 0.00161 | 7% |
| Tin (Sn) | µg/g dw | 0.00174 | 0.0023 | 28% | 0.0029 | 0.0021 | 32% | <0.0008 | <0.0008 | 4% | 0.00112 | 0.00102 | 9% | <0.0009 | <0.0009 | 3% | 0.00157 | 0.00142 | 10% |
| Titanium (Ti) | µg/g dw | 0.171 | 0.206 | 19% | 0.141 | 0.108 | 27% | 0.152 | 0.173 | 13% | 0.305 | 0.167 | 58% | 0.09 | 0.126 | 33% | 0.288 | 0.206 | 33% |
| Uranium (U) | µg/g dw | 0.00076 | 0.00072 | 5% | 0.00058 | 0.00043 | 30% | 0.00081 | 0.0008 | 1% | 0.00085 | 0.00092 | 8% | 0.00039 | <0.0002 | 56% | 0.00086 | 0.00054 | 46% |
| Vanadium (V) | µg/g dw | 0.00862 | 0.0126 | 38% | 0.00627 | 0.00418 | 40% | 0.0112 | 0.0106 | 6% | 0.0365 | 0.0185 | 65% | 0.00499 | 0.00299 | 50% | 0.0107 | 0.00961 | 11% |
| Yttrium (Y) | µg/g dw | 0.00137 | 0.00164 | 18% | - | 0.00058 | - | - | 0.00162 | - | - | 0.00287 | - | 0.0004 | 0.00033 | 19% | 0.00424 | 0.0037 | 14% |
| Zinc (Zn) | µg/g dw | 28.2 | 34.2 | 19% | 60.9 | 37.4 | 48% | 24.5 | 24.5 | 0% | 27.7 | 23 | 19% | 13.8 | 13 | 6% | 18.9 | 17.5 | 8% |
| Zirconium (Zr) | µg/g dw | 0.007 | 0.0092 | 27% | 0.014 | 0.0108 | 26% | 0.0063 | 0.0049 | 25% | 0.0082 | 0.0079 | 4% | 0.0043 | 0.0027 | 46% | 0.0347 | 0.0172 | 67% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17c: Laboratory Duplicate Results for Fish Muscle Samples, 2016

| Analyte | Unit | GC-CSU-09 M rep 1 | GC-CSU-09 M rep 2 | RPD | SC-CSU-36 M rep 1 | SC-CSU-36 M rep 2 | RPD | SC-NSC-25 M rep 1 | SC-NSC-25 M rep 2 | RPD | SC-NSC-34 M rep 1 | SC-NSC-34 M rep 2 | RPD | GC-YP-31 M rep 1 | GC-YP-31 M rep 2 | RPD | GC-NSC-01 M rep 1 | GC-NSC-01 M rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 1.4 | 1.59 | 13% | - | 2.2 | - | - | 0.195 | - | - | 6.84 | - | - | 1.39 | - | - | 1.4 | - |
| Antimony (Sb) | µg/g dw | <0.0005 | 0.0011 | 72% | 0.00134 | 0.00122 | 9% | <0.0005 | <0.0005 | 8% | 0.00092 | 0.0008 | 14% | 0.0007 | <0.0006 | 19% | 0.00078 | 0.00055 | 35% |
| Arsenic (As) | µg/g dw | 0.139 | 0.144 | 4% | 0.0834 | 0.0751 | 10% | 0.0184 | 0.0144 | 24% | 0.0399 | 0.0319 | 22% | 0.0094 | 0.0084 | 11% | 0.0222 | 0.0236 | 6% |
| Barium (Ba) | µg/g dw | 1.16 | 0.44 | 90% | 0.166 | 0.154 | 8% | 0.354 | 0.265 | 29% | 0.301 | 0.12 | 86% | 0.0711 | 0.0573 | 21% | 2.26 | 0.318 | 151% |
| Beryllium (Be) | µg/g dw | <0.0024 | <0.0024 | 0% | <0.0028 | <0.0027 | 4% | <0.0026 | <0.0025 | 4% | <0.0028 | <0.0028 | 0% | <0.0027 | <0.0028 | 4% | <0.0049 | <0.0046 | 6% |
| Bismuth (Bi) | µg/g dw | 0.00229 | 0.00259 | 12% | 0.00591 | 0.00538 | 9% | 0.00124 | 0.00118 | 5% | 0.000868 | 0.000939 | 8% | 0.0085 | 0.00854 | 0% | 0.00141 | 0.00163 | 14% |
| Boron (B) | µg/g dw | 0.094 | <0.0790 | 17% | <0.1600 | <0.1500 | 6% | 0.17 | 0.22 | 26% | <0.1600 | <0.1500 | 6% | <0.1500 | 0.28 | 60% | 0.102 | 0.068 | 40% |
| Cadmium (Cd) | µg/g dw | 0.00164 | 0.00111 | 39% | 0.0069 | 0.0047 | 38% | <0.0014 | <0.0013 | 7% | <0.0014 | <0.0014 | 0% | <0.0014 | <0.0015 | 7% | 0.0012 | <0.0011 | 9% |
| Calcium (Ca) | µg/g dw | 3,180 | 1,210 | 90% | 454 | 454 | 0% | 2,200 | 1,520 | 37% | 2,110 | 860 | 84% | 397 | 412 | 4% | 6,680 | 571 | 169% |
| Cesium (Cs) | µg/g dw | 0.27 | 0.276 | 2% | 0.0674 | 0.0639 | 5% | 0.394 | 0.403 | 2% | 0.167 | 0.173 | 4% | 0.204 | 0.198 | 3% | 0.0817 | 0.0868 | 6% |
| Chromium (Cr) | µg/g dw | 0.0595 | 0.0625 | 5% | 0.0571 | 0.0583 | 2% | 0.0564 | 0.0569 | 1% | 0.0667 | 0.11 | 49% | 0.0823 | 0.059 | 33% | 0.063 | 0.069 | 9% |
| Cobalt (Co) | µg/g dw | 0.0364 | 0.0345 | 5% | 0.0249 | 0.0246 | 1% | 0.00653 | 0.00553 | 17% | 0.00396 | 0.00281 | 34% | 0.00993 | 0.00547 | 58% | 0.0062 | 0.00512 | 19% |
| Copper (Cu) | µg/g dw | 0.956 | 0.97 | 1% | 1.1 | 1.13 | 3% | 1.26 | 1.01 | 22% | 0.794 | 0.674 | 16% | 1.18 | 0.513 | 79% | 0.799 | 0.845 | 6% |
| Gallium (Ga) | µg/g dw | 0.00627 | 0.00601 | 4% | 0.00772 | 0.00715 | 8% | 0.00757 | 0.00645 | 16% | 0.00812 | 0.00639 | 24% | 0.00771 | 0.00682 | 12% | 0.00702 | 0.00566 | 21% |
| Iron (Fe) | µg/g dw | 9.04 | 9.53 | 5% | 17.2 | 18.6 | 8% | 16.7 | 13.7 | 20% | 10.1 | 8.14 | 21% | 14 | 6.81 | 69% | 11 | 10.5 | 5% |
| Lead (Pb) | µg/g dw | 0.0376 | 0.00951 | 119% | 0.00651 | 0.00638 | 2% | 0.00232 | 0.00162 | 36% | 0.00725 | 0.00356 | 68% | 0.0065 | 0.00592 | 9% | 0.00861 | 0.00362 | 82% |
| Lithium (Li) | µg/g dw | 0.0062 | <0.0053 | 16% | <0.0072 | <0.0070 | 3% | <0.0067 | <0.0063 | 6% | 0.0084 | <0.0070 | 18% | 0.0552 | 0.0467 | 17% | 0.0088 | <0.0063 | 33% |
| Magnesium (Mg) | µg/g dw | 1,310 | 1,300 | 1% | 1,230 | 1,220 | 1% | 1,310 | 1,330 | 2% | 1,240 | 1,210 | 2% | 1,200 | 1,180 | 2% | 1,220 | 1,190 | 2% |
| Manganese (Mn) | µg/g dw | 3.99 | 1.73 | 79% | 0.506 | 0.486 | 4% | 0.969 | 0.659 | 38% | 0.41 | 0.245 | 50% | 0.424 | 0.393 | 8% | 1.51 | 0.373 | 121% |
| Mercury (Hg) | µg/g dw | 0.517 | 0.549 | 6% | 1.13 | 1.08 | 5% | 0.684 | 0.722 | 5% | 1.21 | 1.22 | 1% | 1.19 | 1.23 | 3% | 1.16 | 1.33 | 14% |
| Molybdenum (Mo) | µg/g dw | 0.00531 | 0.00423 | 23% | 0.0028 | 0.0037 | 28% | 0.0031 | 0.0023 | 30% | 0.0016 | <0.0013 | 21% | 0.0035 | 0.0017 | 69% | 0.00143 | 0.00222 | 43% |
| Nickel (Ni) | µg/g dw | 0.0285 | 0.0238 | 18% | 0.0184 | 0.0182 | 1% | 0.012 | 0.00866 | 32% | 0.0142 | 0.0104 | 31% | 0.0139 | 0.0138 | 1% | 0.0273 | 0.0152 | 57% |
| Phosphorus (P) | µg/g dw | 11,500 | 10,800 | 6% | 11,000 | 10,700 | 3% | 11,000 | 10,900 | 1% | 10,500 | 9,710 | 8% | 11,100 | 10,300 | 7% | 12,500 | 9,850 | 24% |
| Potassium (K) | µg/g dw | 20,100 | 20,500 | 2% | 24,500 | 23,000 | 6% | 20,100 | 20,400 | 1% | 20,200 | 20,200 | 0% | 23,100 | 23,200 | 0% | 18,200 | 19,400 | 6% |
| Rhenium (Re) | µg/g dw | <0.0001 | <0.0001 | 0% | <0.0000 | 0.0000062 | 36% | 0.0000202 | 0.0000308 | 42% | <0.0000 | 0.0000127 | 101% | 0.0000211 | <0.0000 | 132% | <0.0001 | <0.0001 | 2% |
| Rubidium (Rb) | µg/g dw | 16.5 | 17 | 3% | 9.44 | 8.62 | 9% | 21.9 | 22.3 | 2% | 24.5 | 25.1 | 2% | 35.9 | 34.9 | 3% | 23.3 | 24.6 | 5% |
| Selenium (Se) | µg/g dw | 0.67 | 0.97 | 37% | 5.55 | 4.78 | 15% | 2.41 | 2.72 | 12% | 1.4 | 1.29 | 8% | 2.69 | 2.64 | 2% | 1.49 | 1.64 | 10% |
| Silver (Ag) | µg/g dw | <0.0006 | <0.0006 | 0% | 0.00079 | 0.00084 | 6% | <0.0007 | <0.0006 | 8% | <0.0007 | <0.0007 | 1% | <0.0007 | <0.0007 | 4% | <0.0003 | <0.0003 | 3% |
| Sodium (Na) | µg/g dw | 1,140 | 1,130 | 1% | 1,420 | 1,420 | 0% | 1,270 | 1,290 | 2% | 928 | 906 | 2% | 1,690 | 1,600 | 5% | 909 | 924 | 2% |
| Strontium (Sr) | µg/g dw | 3.01 | 1.05 | 97% | 0.124 | 0.119 | 4% | 1.95 | 1.17 | 50% | 1.62 | 0.546 | 99% | 0.136 | 0.124 | 9% | 4.62 | 0.224 | 182% |
| Thallium (Tl) | µg/g dw | 0.00752 | 0.0076 | 1% | 0.00983 | 0.0096 | 2% | 0.0105 | 0.00978 | 7% | 0.0104 | 0.00962 | 8% | 0.0276 | 0.0242 | 13% | 0.0125 | 0.0109 | 14% |
| Thorium (Th) | µg/g dw | 0.00015 | 0.00047 | 103% | 0.00093 | 0.00046 | 68% | <0.0001 | <0.0001 | 0% | 0.00082 | 0.00135 | 49% | 0.00042 | 0.00025 | 51% | 0.000112 | 0.000145 | 26% |
| Tin (Sn) | µg/g dw | 0.00149 | 0.00091 | 48% | 0.00088 | 0.00084 | 5% | <0.0006 | <0.0006 | 7% | 0.00072 | 0.00076 | 5% | 0.00256 | 0.00214 | 18% | 0.00081 | 0.00101 | 22% |
| Titanium (Ti) | µg/g dw | 0.125 | 0.134 | 7% | 0.118 | 0.119 | 1% | 0.086 | 0.069 | 22% | 0.14 | 0.132 | 6% | 0.136 | 0.111 | 20% | 0.0951 | 0.101 | 6% |
| Uranium (U) | µg/g dw | 0.00171 | 0.0004 | 124% | 0.00027 | 0.00027 | 0% | 0.00095 | 0.00043 | 75% | 0.00041 | 0.00033 | 22% | 0.00027 | <0.0002 | 30% | 0.00138 | <0.0006 | 82% |
| Vanadium (V) | µg/g dw | 0.00341 | 0.00315 | 8% | 0.00462 | 0.00408 | 12% | 0.00276 | 0.00181 | 42% | 0.00716 | 0.00653 | 9% | 0.00385 | 0.00282 | 31% | 0.0102 | 0.00353 | 97% |
| Yttrium (Y) | µg/g dw | 0.00065 | 0.00195 | 100% | 0.0008 | 0.00112 | 33% | - | <0.0001 | - | - | 0.00164 | - | - | 0.00058 | - | - | 0.00044 | - |
| Zinc (Zn) | µg/g dw | 16.5 | 16.1 | 2% | 27.5 | 24.7 | 11% | 17.3 | 15.8 | 9% | 14.6 | 12.8 | 13% | 30.1 | 22.2 | 30% | 21.5 | 17.4 | 21% |
| Zirconium (Zr) | µg/g dw | 0.00606 | 0.00482 | 23% | 0.0043 | 0.00422 | 2% | 0.00332 | 0.00196 | 52% | 0.00931 | 0.00873 | 6% | 0.00755 | 0.00481 | 44% | 0.00434 | 0.00378 | 14% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17c: Laboratory Duplicate Results for Fish Muscle Samples, 2016

| Analyte | Unit | GC-NSC-26 M rep 1 | GC-NSC-26 M rep 2 | RPD | SC-NSC-01A rep 1 | SC-NSC-01A rep 2 | RPD | GC-NSC-01A rep 1 | GC-NSC-01A rep 2 | RPD | ER-NSC-01A rep 1 | ER-NSC-01A rep 2 | RPD | ER-NSC-02A rep 1 | ER-NSC-02A rep 2 | RPD | ER-NSC-04A rep 1 | ER-NSC-04A rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | - | 0.719 | - | - | 6.13 | - | - | 8.99 | - | 1.37 | 1.58 | 14% | 1.3 | 1.12 | 15% | - | 1.27 | - |
| Antimony (Sb) | µg/g dw | 0.00236 | <0.0004 | 138% | 0.00239 | 0.0021 | 13% | 0.00531 | 0.00519 | 2% | 0.0008 | 0.00125 | 44% | 0.00079 | <0.0008 | 1% | 0.00102 | 0.00152 | 39% |
| Arsenic (As) | µg/g dw | 0.0599 | 0.0536 | 11% | 0.0354 | 0.0215 | 49% | 0.0552 | 0.0567 | 3% | 0.269 | 0.258 | 4% | 0.353 | 0.326 | 8% | 0.123 | 0.113 | 8% |
| Barium (Ba) | µg/g dw | 0.124 | 0.13 | 5% | 1.09 | 1.03 | 6% | 0.592 | 0.421 | 34% | 0.134 | 0.142 | 6% | 0.198 | 0.123 | 47% | 0.127 | 0.241 | 62% |
| Beryllium (Be) | µg/g dw | <0.0044 | <0.0048 | 9% | <0.0025 | <0.0026 | 4% | <0.0025 | <0.0026 | 4% | <0.0026 | <0.0026 | 0% | <0.0026 | <0.0026 | 0% | <0.0026 | <0.0026 | 0% |
| Bismuth (Bi) | µg/g dw | 0.000853 | 0.00077 | 10% | 0.00201 | 0.0025 | 22% | 0.00362 | 0.00361 | 0% | 0.00047 | 0.00054 | 14% | 0.000563 | 0.000648 | 14% | 0.00055 | 0.00041 | 29% |
| Boron (B) | µg/g dw | 0.142 | 0.296 | 70% | 0.109 | <0.0640 | 52% | 0.21 | 0.303 | 36% | 0.13 | <0.0630 | 69% | 0.16 | <0.1000 | 46% | 0.133 | 0.328 | 85% |
| Cadmium (Cd) | µg/g dw | <0.0011 | <0.0012 | 9% | 0.0019 | 0.0024 | 23% | 0.005 | 0.0041 | 20% | <0.0012 | 0.0014 | 15% | <0.0014 | <0.0014 | 0% | <0.0011 | 0.0026 | 81% |
| Calcium (Ca) | µg/g dw | 500 | 522 | 4% | 1,990 | 2,330 | 16% | 1,420 | 941 | 41% | 286 | 311 | 8% | 710 | 282 | 86% | 498 | 812 | 48% |
| Cesium (Cs) | µg/g dw | 0.118 | 0.121 | 3% | 0.167 | 0.179 | 7% | 0.0793 | 0.078 | 2% | 0.102 | 0.108 | 6% | 0.106 | 0.106 | 0% | 0.126 | 0.132 | 5% |
| Chromium (Cr) | µg/g dw | 0.06 | 0.064 | 6% | 0.0745 | 0.0793 | 6% | 0.126 | 0.166 | 27% | 0.0766 | 0.0932 | 20% | 0.0713 | 0.0765 | 7% | 0.067 | 0.0771 | 14% |
| Cobalt (Co) | µg/g dw | 0.00378 | 0.0036 | 5% | 0.0101 | 0.00911 | 10% | 0.00759 | 0.00782 | 3% | 0.00656 | 0.00744 | 13% | 0.00602 | 0.00585 | 3% | 0.00474 | 0.00463 | 2% |
| Copper (Cu) | µg/g dw | 0.826 | 0.771 | 7% | 1.3 | 1.03 | 23% | 0.93 | 1.13 | 19% | 1.34 | 1.37 | 2% | 1.21 | 0.978 | 21% | 1.1 | 0.85 | 26% |
| Gallium (Ga) | µg/g dw | 0.00566 | 0.00503 | 12% | 0.0072 | 0.0059 | 20% | 0.0111 | 0.0074 | 40% | 0.0034 | 0.0036 | 6% | 0.0037 | 0.0034 | 8% | 0.0046 | 0.003 | 42% |
| Iron (Fe) | µg/g dw | 8.7 | 7.16 | 19% | 22.1 | 18.2 | 19% | 17.4 | 19.3 | 10% | 15 | 18 | 18% | 12.5 | 10.1 | 21% | 13.2 | 11.8 | 11% |
| Lead (Pb) | µg/g dw | 0.00163 | 0.00152 | 7% | 0.0362 | 0.0399 | 10% | 0.175 | 0.0916 | 63% | 0.0143 | 0.0207 | 37% | 0.0105 | 0.0145 | 32% | 0.00795 | 0.0103 | 26% |
| Lithium (Li) | µg/g dw | <0.0059 | <0.0065 | 10% | 0.013 | 0.0126 | 3% | 0.0236 | 0.0186 | 24% | <0.0085 | <0.0083 | 2% | 0.0056 | 0.0085 | 41% | 0.0124 | <0.0083 | 40% |
| Magnesium (Mg) | µg/g dw | 1,130 | 1,140 | 1% | 1,230 | 1,310 | 6% | 1,250 | 1,210 | 3% | 720 | 745 | 3% | 864 | 896 | 4% | 988 | 1,060 | 7% |
| Manganese (Mn) | µg/g dw | 0.198 | 0.191 | 4% | 0.83 | 0.866 | 4% | 0.666 | 0.593 | 12% | 0.153 | 0.199 | 26% | 0.188 | 0.174 | 8% | 0.16 | 0.188 | 16% |
| Mercury (Hg) | µg/g dw | 1.53 | 1.57 | 3% | 1.17 | 1.29 | 10% | 1.25 | 1.2 | 4% | 1.55 | 1.48 | 5% | 1.89 | 1.93 | 2% | 1.39 | 1.44 | 4% |
| Molybdenum (Mo) | µg/g dw | 0.00181 | 0.0014 | 26% | 0.0048 | 0.0048 | 0% | 0.0055 | 0.0047 | 16% | 0.0028 | 0.0035 | 22% | 0.00203 | 0.00212 | 4% | 0.0024 | 0.002 | 18% |
| Nickel (Ni) | µg/g dw | 0.0069 | 0.0099 | 36% | 0.0339 | 0.037 | 9% | 0.0607 | 0.0571 | 6% | 0.0129 | 0.0171 | 28% | 0.0077 | 0.0094 | 20% | 0.013 | 0.0256 | 65% |
| Phosphorus (P) | µg/g dw | 8,790 | 8,800 | 0% | 9,830 | 10,600 | 8% | 10,400 | 10,000 | 4% | 6,690 | 7,080 | 6% | 7,540 | 7,530 | 0% | 8,960 | 9,360 | 4% |
| Potassium (K) | µg/g dw | 15,700 | 16,000 | 2% | 17,800 | 18,700 | 5% | 19,700 | 18,600 | 6% | 11,900 | 12,800 | 7% | 13,100 | 13,600 | 4% | 16,300 | 17,100 | 5% |
| Rhenium (Re) | µg/g dw | <0.0001 | <0.0001 | 7% | <0.00005 | <0.00005 | 4% | <0.00005 | <0.00005 | 4% | <0.00005 | <0.00005 | 2% | <0.00005 | <0.00005 | 0% | <0.00005 | <0.00005 | 0% |
| Rubidium (Rb) | µg/g dw | 21.9 | 22.2 | 1% | 25.1 | 26.6 | 6% | 23.2 | 23 | 1% | 15.9 | 16.2 | 2% | 16.2 | 16.2 | 0% | 20.5 | 21.1 | 3% |
| Selenium (Se) | µg/g dw | 1.5 | 1.54 | 3% | 1.83 | 1.79 | 2% | 2.3 | 2.31 | 0% | 1.12 | 1.26 | 12% | 1.23 | 1.27 | 3% | 1.58 | 1.62 | 3% |
| Silver (Ag) | µg/g dw | <0.0003 | <0.0003 | 9% | <0.0003 | 0.00077 | 93% | 0.00192 | 0.00174 | 10% | 0.00039 | 0.00038 | 3% | <0.0003 | <0.0003 | 0% | <0.0003 | <0.0003 | 0% |
| Sodium (Na) | µg/g dw | 797 | 794 | 0% | 1,260 | 1,320 | 5% | 1,310 | 1,260 | 4% | 738 | 789 | 7% | 910 | 943 | 4% | 1,120 | 1,160 | 4% |
| Strontium (Sr) | µg/g dw | 0.249 | 0.262 | 5% | 1.54 | 1.79 | 15% | 1.03 | 0.653 | 45% | 0.165 | 0.17 | 3% | 0.463 | 0.107 | 125% | 0.292 | 0.594 | 68% |
| Thallium (Tl) | µg/g dw | 0.0151 | 0.0151 | 0% | 0.00537 | 0.00494 | 8% | 0.00287 | 0.00316 | 10% | 0.00982 | 0.0102 | 4% | 0.00727 | 0.00661 | 10% | 0.00924 | 0.00904 | 2% |
| Thorium (Th) | µg/g dw | 0.00132 | 0.000094 | 173% | 0.00076 | 0.00078 | 3% | 0.00518 | 0.00465 | 11% | 0.00045 | 0.00038 | 17% | 0.000158 | 0.000144 | 9% | 0.00021 | <0.0001 | 55% |
| Tin (Sn) | µg/g dw | 0.00057 | 0.00084 | 38% | 0.00669 | 0.00772 | 14% | 0.0227 | 0.0207 | 9% | 0.00191 | 0.00287 | 40% | 0.00133 | 0.00184 | 32% | 0.00098 | 0.00173 | 55% |
| Titanium (Ti) | µg/g dw | 0.103 | 0.0856 | 18% | 0.306 | 0.394 | 25% | 0.509 | 0.483 | 5% | 0.106 | 0.094 | 12% | 0.086 | 0.083 | 4% | 0.106 | 0.134 | 23% |
| Uranium (U) | µg/g dw | <0.0006 | <0.0006 | 9% | 0.000994 | 0.00112 | 12% | 0.00207 | 0.00208 | 0% | 0.00034 | 0.000378 | 11% | 0.000232 | 0.000164 | 34% | 0.00022 | 0.000237 | 7% |
| Vanadium (V) | µg/g dw | 0.00355 | 0.0022 | 47% | 0.0183 | 0.0188 | 3% | 0.0199 | 0.0199 | 0% | 0.00418 | 0.00481 | 14% | 0.00569 | 0.00442 | 25% | 0.00708 | 0.00454 | 44% |
| Yttrium (Y) | µg/g dw | - | 0.0004 | - | - | 0.00208 | - | 0.00412 | 0.00402 | 2% | 0.00038 | 0.00097 | 87% | 0.00087 | 0.00025 | 111% | - | 0.00038 | - |
| Zinc (Zn) | µg/g dw | 14.5 | 14.5 | 0% | 30.7 | 27 | 13% | 24.7 | 26.7 | 8% | 14.2 | 14 | 1% | 15.3 | 13.4 | 13% | 15.3 | 15.7 | 3% |
| Zirconium (Zr) | µg/g dw | 0.0101 | 0.00561 | 57% | 0.0259 | 0.028 | 8% | 0.0469 | 0.0483 | 3% | 0.00637 | 0.00854 | 29% | 0.0149 | 0.005 | 99% | 0.00438 | 0.00476 | 8% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.17c: Laboratory Duplicate Results for Fish Muscle Samples, 2016

| Analyte | Unit | ER-MW-03A rep 1 | ER-MW-03A rep 2 | RPD | SC-MW-02A rep 1 | SC-MW-02A rep 2 | RPD |
|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | - | 1.53 | - | - | 2.22 | - |
| Antimony (Sb) | µg/g dw | <0.0019 | <0.0016 | 17% | 0.0023 | <0.0015 | 42% |
| Arsenic (As) | µg/g dw | 0.102 | 0.11 | 8% | 0.229 | 0.217 | 5% |
| Barium (Ba) | µg/g dw | 0.217 | 0.0576 | 116% | 0.0811 | 0.0573 | 34% |
| Beryllium (Be) | µg/g dw | <0.0064 | <0.0052 | 21% | <0.0055 | <0.0051 | 8% |
| Bismuth (Bi) | µg/g dw | 0.00027 | 0.000325 | 18% | 0.000246 | 0.000287 | 15% |
| Boron (B) | µg/g dw | <0.2600 | <0.2100 | 21% | <0.2200 | <0.2000 | 10% |
| Cadmium (Cd) | µg/g dw | 0.0035 | <0.0028 | 22% | 0.0137 | 0.0127 | 8% |
| Calcium (Ca) | µg/g dw | 239 | 236 | 1% | 342 | 374 | 9% |
| Cesium (Cs) | µg/g dw | 0.0417 | 0.0425 | 2% | 0.0428 | 0.0467 | 9% |
| Chromium (Cr) | µg/g dw | 1.36 | 3.82 | 95% | 1.41 | 1.59 | 12% |
| Cobalt (Co) | µg/g dw | 0.0536 | 0.0458 | 16% | 0.0421 | 0.0332 | 24% |
| Copper (Cu) | µg/g dw | 1 | 0.889 | 12% | 2.07 | 1.72 | 18% |
| Gallium (Ga) | µg/g dw | 0.0064 | 0.0047 | 31% | 0.0047 | 0.0049 | 4% |
| Iron (Fe) | µg/g dw | 37.8 | 44.4 | 16% | 25.2 | 26 | 3% |
| Lead (Pb) | µg/g dw | 0.0344 | 0.00859 | 120% | 0.0249 | 0.0154 | 47% |
| Lithium (Li) | µg/g dw | 0.208 | 0.219 | 5% | 0.089 | 0.0818 | 8% |
| Magnesium (Mg) | µg/g dw | 1,110 | 1,180 | 6% | 1,320 | 1,380 | 4% |
| Manganese (Mn) | µg/g dw | 0.47 | 0.53 | 12% | 0.682 | 0.658 | 4% |
| Mercury (Hg) | µg/g dw | 0.0699 | 0.0692 | 1% | 0.106 | 0.113 | 6% |
| Molybdenum (Mo) | µg/g dw | 0.0115 | 0.0178 | 43% | 0.0187 | 0.0164 | 13% |
| Nickel (Ni) | µg/g dw | 0.184 | 0.207 | 12% | 0.628 | 0.36 | 54% |
| Phosphorus (P) | µg/g dw | 9,140 | 9,870 | 8% | 11,300 | 12,200 | 8% |
| Potassium (K) | µg/g dw | 14,200 | 15,000 | 5% | 17,500 | 18,500 | 6% |
| Rhenium (Re) | µg/g dw | <0.0001 | <0.0001 | 22% | <0.0001 | 0.000186 | 60% |
| Rubidium (Rb) | µg/g dw | 7.85 | 8.27 | 5% | 10.2 | 11 | 8% |
| Selenium (Se) | µg/g dw | 4.45 | 4.76 | 7% | 3.48 | 3.73 | 7% |
| Silver (Ag) | µg/g dw | <0.0007 | <0.0006 | 21% | <0.0006 | <0.0006 | 9% |
| Sodium (Na) | µg/g dw | 929 | 971 | 4% | 1,100 | 1,150 | 4% |
| Strontium (Sr) | µg/g dw | 0.0813 | 0.0618 | 27% | 0.069 | 0.0635 | 8% |
| Thallium (Tl) | µg/g dw | 0.127 | 0.139 | 9% | 0.0359 | 0.039 | 8% |
| Thorium (Th) | µg/g dw | 0.00186 | 0.00017 | 167% | 0.00097 | 0.0011 | 13% |
| Tin (Sn) | µg/g dw | 0.0089 | 0.00445 | 67% | 0.016 | 0.00874 | 59% |
| Titanium (Ti) | µg/g dw | 0.337 | 0.08 | 123% | 0.146 | 0.146 | 0% |
| Uranium (U) | µg/g dw | 0.0179 | 0.00688 | 89% | 0.00381 | 0.00288 | 28% |
| Vanadium (V) | µg/g dw | 0.0391 | 0.0192 | 68% | 0.013 | 0.0132 | 2% |
| Yttrium (Y) | µg/g dw | - | 0.00099 | - | - | 0.00122 | - |
| Zinc (Zn) | µg/g dw | 21.7 | 16.8 | 25% | 19.1 | 18.1 | 5% |
| Zirconium (Zr) | µg/g dw | 0.0149 | 0.008 | 60% | 0.0067 | 0.0072 | 7% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.18a: Laboratory Duplicate Results for Fish Ovary Samples, 2014

| Analyte | Unit | SC-KO-7 Ovary Rep 1 | SC-KO-7 Ovary Rep 2 | SC-KO-7 Ovary Rep 3 | RSD | SC-KO-24 Ovary Rep 1 | SC-KO-24 Ovary Rep 2 | RPD | KOER3-PM-6G Rep 1 | KOER3-PM-6G Rep 2 | RPD | KOSC1-PM-10G Rep 1 | KOSC1-PM-10G Rep 2 | KOSC1-PM-10G Rep 3 | RSD | SC-PC-02G Rep 1 | SC-PC-02G Rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 1.03 | 1.03 | 0.609 | 27% | 0.253 | 0.224 | 12% | 4.3 | 5.78 | 29% | 1.96 | 1.96 | 2.49 | 14% | 36.8 | 87.4 | 81% |
| Antimony (Sb) | µg/g dw | 0.00079 | 0.00059 | 0.00073 | 15% | <0.00058 | <0.00055 | 5% | 0.00215 | 0.00248 | 14% | 0.00198 | 0.00299 | 0.00363 | 29% | 0.00218 | 0.00296 | 30% |
| Arsenic (As) | µg/g dw | 0.228 | 0.215 | 0.211 | 4% | 0.224 | 0.214 | 5% | 0.0516 | 0.0562 | 9% | 0.112 | 0.0905 | 0.11 | 11% | 0.139 | 0.197 | 35% |
| Barium (Ba) | µg/g dw | 0.431 | 0.436 | 0.43 | 1% | 0.395 | 0.385 | 3% | 0.52 | 0.554 | 6% | 0.0517 | 0.0571 | 0.071 | 17% | 1.58 | 2.3 | 37% |
| Beryllium (Be) | µg/g dw | <0.0034 | <0.0038 | <0.0039 | 7% | <0.0040 | <0.0038 | 5% | <0.0037 | <0.0037 | 0% | <0.0039 | <0.0037 | <0.0036 | 4% | <0.0026 | <0.0027 | 4% |
| Bismuth (Bi) | µg/g dw | <0.000098 | <0.00011 | <0.00011 | 7% | <0.00011 | <0.00011 | 0% | 0.0004 | 0.00053 | 28% | 0.00024 | 0.00019 | 0.00032 | 26% | 0.00203 | 0.00277 | 31% |
| Boron (B) | µg/g dw | <0.070 | <0.079 | <0.080 | 7% | <0.082 | <0.078 | 5% | <0.077 | <0.076 | 1% | <0.080 | <0.077 | <0.075 | 3% | <0.12 | <0.13 | 8% |
| Cadmium (Cd) | µg/g dw | 0.0083 | 0.0069 | 0.0056 | 19% | 0.0042 | 0.0031 | 30% | 0.0119 | 0.012 | 1% | 0.0023 | 0.0025 | 0.0032 | 18% | 0.0259 | 0.0254 | 2% |
| Calcium (Ca) | µg/g dw | 1,140 | 1,210 | 1,200 | 3% | 1,340 | 1,360 | 1% | 2,050 | 2,180 | 6% | 1,070 | 1,280 | 1,170 | 9% | 434 | 688 | 45% |
| Cesium (Cs) | µg/g dw | 0.012 | 0.013 | 0.013 | 5% | 0.0154 | 0.0164 | 6% | 0.0477 | 0.0461 | 3% | 0.102 | 0.114 | 0.111 | 6% | 0.0198 | 0.0257 | 26% |
| Chromium (Cr) | µg/g dw | 0.0774 | 0.0892 | 0.0984 | 12% | 0.0745 | 0.0761 | 2% | 0.0866 | 0.0831 | 4% | 0.0701 | 0.0767 | 0.0891 | 12% | 0.12 | 0.228 | 62% |
| Cobalt (Co) | µg/g dw | 0.0603 | 0.0591 | 0.0601 | 1% | 0.0429 | 0.0402 | 6% | 0.0539 | 0.0527 | 2% | 0.0418 | 0.0507 | 0.0477 | 10% | 0.0841 | 0.116 | 32% |
| Copper (Cu) | µg/g dw | 50.8 | 50.2 | 48.7 | 2% | 27.5 | 27 | 2% | 2.41 | 2.3 | 5% | 2.72 | 2.96 | 2.87 | 4% | 3.66 | 3.7 | 1% |
| Gallium (Ga) | µg/g dw | 0.00819 | 0.0078 | 0.0076 | 4% | 0.00783 | 0.00698 | 11% | 0.0103 | 0.0109 | 6% | 0.00868 | 0.00824 | 0.00877 | 3% | 0.0236 | 0.0453 | 63% |
| Iron (Fe) | µg/g dw | 82.9 | 76.1 | 76 | 5% | 52.6 | 44.7 | 16% | 125 | 132 | 5% | 102 | 109 | 117 | 7% | 79 | 160 | 68% |
| Lead (Pb) | µg/g dw | 0.0541 | 0.0475 | 0.0503 | 7% | 0.00492 | 0.00361 | 31% | 0.0511 | 0.0856 | 50% | 0.0114 | 0.0107 | 0.014 | 14% | 0.0447 | 0.0871 | 64% |
| Lithium (Li) | µg/g dw | 0.0278 | 0.0365 | 0.0301 | 14% | 0.0365 | 0.0407 | 11% | 0.0138 | 0.0148 | 7% | <0.0073 | <0.0070 | <0.0068 | 4% | 0.0304 | 0.101 | 107% |
| Magnesium (Mg) | µg/g dw | 1,420 | 1,480 | 1,460 | 2% | 1,150 | 1,180 | 3% | 898 | 872 | 3% | 801 | 895 | 844 | 6% | 820 | 881 | 7% |
| Manganese (Mn) | µg/g dw | 4.14 | 4.27 | 4.26 | 2% | 3.04 | 3.16 | 4% | 3.99 | 4.11 | 3% | 1.42 | 1.64 | 1.56 | 7% | 9.69 | 11.0 | 13% |
| Mercury (Hg) | µg/g dw | 0.0214 | 0.0212 | 0.0191 | 6% | 0.0179 | 0.0181 | 1% | 0.0366 | 0.0344 | 6% | 0.0565 | 0.0632 | 0.0672 | 9% | 0.0218 | 0.024 | 10% |
| Molybdenum (Mo) | µg/g dw | 0.0467 | 0.0456 | 0.0443 | 3% | 0.0445 | 0.044 | 1% | 0.146 | 0.153 | 5% | 0.102 | 0.129 | 0.12 | 12% | 0.109 | 0.114 | 4% |
| Nickel (Ni) | µg/g dw | 0.018 | 0.0147 | 0.0145 | 12% | 0.0082 | 0.0081 | 1% | 0.0443 | 0.0518 | 16% | 0.023 | 0.0214 | 0.031 | 20% | 0.0943 | 0.165 | 55% |
| Phosphorus (P) | µg/g dw | 9,230 | 9,590 | 9,570 | 2% | 9,230 | 9,640 | 4% | 11,000 | 10,900 | 1% | 8,390 | 9,370 | 8,850 | 6% | 11,400 | 11,300 | 1% |
| Potassium (K) | µg/g dw | 5,410 | 5,810 | 5,680 | 4% | 5,450 | 5,640 | 3% | 13,100 | 12,500 | 5% | 10,100 | 11,600 | 10,900 | 7% | 7,860 | 7,810 | 1% |
| Rhenium (Re) | µg/g dw | 0.00231 | 0.00241 | 0.00245 | 3% | 0.00127 | 0.00128 | 1% | <0.000074 | <0.000074 | 0% | <0.000077 | <0.000074 | <0.000073 | 3% | 0.000074 | 0.000114 | 43% |
| Rubidium (Rb) | µg/g dw | 3.66 | 3.82 | 3.78 | 2% | 3.43 | 3.45 | 1% | 8.61 | 8.34 | 3% | 15.4 | 17.6 | 17 | 7% | 5.87 | 5.81 | 1% |
| Selenium (Se) | µg/g dw | 5.01 | 4.88 | 4.91 | 1% | 3.86 | 3.88 | 1% | 41.4 | 38.7 | 7% | 3.52 | 3.84 | 4.01 | 7% | 4.49 | 4.56 | 2% |
| Silver (Ag) | µg/g dw | 0.174 | 0.177 | 0.168 | 3% | 0.103 | 0.101 | 2% | 0.00355 | 0.00376 | 6% | 0.00428 | 0.00493 | 0.00508 | 9% | 0.0141 | 0.014 | 1% |
| Sodium (Na) | µg/g dw | 1,550 | 1,630 | 1,580 | 3% | 2,430 | 2,510 | 3% | 2,510 | 2,400 | 4% | 1,680 | 2,080 | 1,990 | 11% | 1,640 | 1,540 | 6% |
| Strontium (Sr) | µg/g dw | 1.55 | 1.59 | 1.6 | 2% | 2.03 | 2 | 1% | 0.846 | 0.902 | 6% | 0.299 | 0.355 | 0.327 | 9% | 0.529 | 1.04 | 65% |
| Thallium (Tl) | µg/g dw | 0.00856 | 0.00907 | 0.00836 | 4% | 0.00371 | 0.00387 | 4% | 0.0261 | 0.0257 | 2% | 0.0195 | 0.0227 | 0.0226 | 8% | 0.0095 | 0.0108 | 13% |
| Thorium (Th) | µg/g dw | 0.000143 | 0.00011 | 0.000106 | 17% | <0.000062 | <0.000059 | 5% | 0.000706 | 0.00196 | 94% | 0.000763 | 0.000282 | 0.000552 | 45% | 0.00626 | 0.0308 | 132% |
| Tin (Sn) | µg/g dw | 0.00107 | 0.00098 | 0.00094 | 7% | <0.00088 | <0.00083 | 6% | 0.00895 | 0.0105 | 16% | 0.00623 | 0.00571 | 0.00938 | 28% | 0.0229 | 0.0224 | 2% |
| Titanium (Ti) | µg/g dw | 0.0741 | 0.0857 | 0.0682 | 12% | 0.0674 | 0.0683 | 1% | 0.253 | 0.263 | 4% | 0.104 | 0.123 | 0.147 | 17% | 0.654 | 1.32 | 67% |
| Uranium (U) | µg/g dw | 0.00032 | 0.00036 | 0.00031 | 8% | 0.00035 | 0.0004 | 13% | 0.00131 | 0.00198 | 41% | 0.00041 | 0.00046 | 0.00052 | 12% | 0.00476 | 0.00955 | 67% |
| Vanadium (V) | µg/g dw | 0.00573 | 0.00683 | 0.00617 | 9% | 0.00416 | 0.00401 | 4% | 0.0327 | 0.0369 | 12% | 0.0203 | 0.0197 | 0.0236 | 10% | 0.0622 | 0.136 | 74% |
| Yttrium (Y) | µg/g dw | Note 1 | 0.00087 | 0.00072 | 13% | 0.00037 | 0.00042 | 13% | 0.00223 | 0.00984 | 126% | 0.00243 | 0.00203 | 0.00242 | 10% | 0.0119 | 0.0357 | 100% |
| Zinc (Zn) | µg/g dw | 89.8 | 90.4 | 88.8 | 1% | 88.2 | 87.3 | 1% | 185 | 188 | 2% | 134 | 146 | 146 | 5% | 126 | 135 | 7% |
| Zirconium (Zr) | µg/g dw | 0.00211 | 0.00133 | 0.00134 | 28% | 0.00153 | 0.00084 | 58% | 0.00529 | 0.00938 | 56% | 0.00369 | 0.00184 | 0.0026 | 34% | 0.0669 | 0.11 | 49% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD) or relative standard deviation (RSD).

## Table A.18a: Laboratory Duplicate Results for Fish Ovary Samples, 2014

| Analyte | Unit | SC-RT-01G Rep 1 | SC-RT-01G Rep 2 | RPD | GC-PC-15G Rep 1 | GC-PC-15G Rep 2 | RPD | ML-08G Rep 1 | ML-08G Rep 2 | RPD | KOSCB6G Rep 1 | KOSCB6G Rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 3.24 | 1.84 | 55% | 3.05 | 1.56 | 65% | 0.357 | 0.31 | 14% | 0.949 | 0.864 | 9% |
| Antimony (Sb) | µg/g dw | 0.00049 | <0.00034 | 36% | 0.00078 | 0.00085 | 9% | 0.00122 | 0.00155 | 24% | 0.00552 | 0.00382 | 36% |
| Arsenic (As) | µg/g dw | 0.086 | 0.08 | 7% | 0.143 | 0.139 | 3% | 0.403 | 0.384 | 5% | 0.584 | 0.475 | 21% |
| Barium (Ba) | µg/g dw | 0.235 | 0.253 | 7% | 1.31 | 1.24 | 5% | 0.398 | 0.395 | 1% | 0.058 | 0.0527 | 10% |
| Beryllium (Be) | µg/g dw | <0.0028 | <0.0025 | 11% | <0.0027 | <0.0027 | 0% | <0.0025 | <0.0025 | 0% | <0.0025 | <0.0025 | 0% |
| Bismuth (Bi) | µg/g dw | 0.000133 | 0.00181 | 173% | 0.0015 | 0.00144 | 4% | 0.00147 | 0.00157 | 7% | 0.00631 | 0.00491 | 25% |
| Boron (B) | µg/g dw | <0.13 | <0.056 | 80% | 0.14 | <0.13 | 7% | <0.051 | <0.051 | 0% | <0.052 | <0.054 | 4% |
| Cadmium (Cd) | µg/g dw | <0.0012 | <0.0010 | 18% | 0.0252 | 0.0242 | 4% | <0.0012 | <0.0012 | 0% | 0.0045 | 0.00494 | 9% |
| Calcium (Ca) | µg/g dw | 1,300 | 1,400 | 7% | 709 | 673 | 5% | 375 | 403 | 7% | 364 | 404 | 10% |
| Cesium (Cs) | µg/g dw | 0.028 | 0.0282 | 1% | 0.0104 | 0.0103 | 1% | 0.0604 | 0.0592 | 2% | 0.185 | 0.188 | 2% |
| Chromium (Cr) | µg/g dw | 0.073 | 0.0871 | 18% | 0.0758 | 0.0971 | 25% | 0.0738 | 0.107 | 37% | 0.0797 | 0.0818 | 3% |
| Cobalt (Co) | µg/g dw | 0.0794 | 0.0782 | 2% | 0.124 | 0.12 | 3% | 0.0478 | 0.047 | 2% | 0.131 | 0.126 | 4% |
| Copper (Cu) | µg/g dw | 12.3 | 10.8 | 13% | 3.62 | 3.46 | 5% | 2.58 | 2.46 | 5% | 2.39 | 2.37 | 1% |
| Gallium (Ga) | µg/g dw | 0.00811 | 0.012 | 39% | 0.0114 | 0.0118 | 3% | 0.00939 | 0.00898 | 4% | 0.0118 | 0.0188 | 46% |
| Iron (Fe) | µg/g dw | 62.3 | 62.2 | 0% | 110 | 104 | 6% | 30 | 28.9 | 4% | 60.3 | 54.4 | 10% |
| Lead (Pb) | µg/g dw | 0.00169 | 0.00182 | 7% | 0.0137 | 0.0115 | 17% | 0.00189 | 0.00324 | 53% | 0.0175 | 0.0105 | 50% |
| Lithium (Li) | µg/g dw | 0.0055 | <0.0062 | 12% | 0.0065 | <0.0051 | 24% | <0.0055 | <0.0055 | 0% | <0.0056 | <0.0059 | 5% |
| Magnesium (Mg) | µg/g dw | 1,440 | 1,450 | 1% | 1,240 | 1,190 | 4% | 404 | 402 | 0% | 780 | 804 | 3% |
| Manganese (Mn) | µg/g dw | 3.02 | 3.06 | 1% | 28.3 | 26.7 | 6% | 1.01 | 0.994 | 2% | 1.48 | 1.61 | 8% |
| Mercury (Hg) | µg/g dw | 0.0207 | 0.0222 | 7% | 0.0537 | 0.0473 | 13% | 0.322 | 0.312 | 3% | 0.342 | 0.337 | 1% |
| Molybdenum (Mo) | µg/g dw | 0.0142 | 0.0147 | 3% | 0.196 | 0.194 | 1% | 0.0236 | 0.0237 | 0% | 0.122 | 0.122 | 0% |
| Nickel (Ni) | µg/g dw | 0.0103 | 0.0111 | 7% | 0.0392 | 0.0352 | 11% | 0.0055 | 0.0049 | 12% | 0.0314 | 0.0303 | 4% |
| Phosphorus (P) | µg/g dw | 10,900 | 10,200 | 7% | 10,600 | 10,100 | 5% | 10,900 | 10,500 | 4% | 15,200 | 16,000 | 5% |
| Potassium (K) | µg/g dw | 4,860 | 5,200 | 7% | 10,600 | 10,300 | 3% | 15,000 | 14,600 | 3% | 17,500 | 17,400 | 1% |
| Rhenium (Re) | µg/g dw | 0.00755 | 0.00723 | 4% | <0.000040 | <0.000040 | 0% | <0.000051 | <0.000051 | 0% | 0.000462 | 0.000378 | 20% |
| Rubidium (Rb) | µg/g dw | 8.32 | 8.88 | 7% | 8.87 | 8.93 | 1% | 20.8 | 20.7 | 0% | 28.5 | 28 | 2% |
| Selenium (Se) | µg/g dw | 5.85 | 5.44 | 7% | 16.1 | 15.4 | 4% | 2.59 | 2.57 | 1% | 4.56 | 4.1 | 11% |
| Silver (Ag) | µg/g dw | 0.0629 | 0.0592 | 6% | 0.0141 | 0.0126 | 11% | 0.00191 | 0.00169 | 12% | <0.00064 | 0.0005 | 25% |
| Sodium (Na) | µg/g dw | 1,550 | 1,770 | 13% | 2,680 | 2,590 | 3% | 4,090 | 4,010 | 2% | 6,650 | 6,690 | 1% |
| Strontium (Sr) | µg/g dw | 1.03 | 1.1 | 7% | 0.451 | 0.451 | 0% | 0.434 | 0.449 | 3% | 0.578 | 0.59 | 2% |
| Thallium (Tl) | µg/g dw | 0.00527 | 0.00467 | 12% | 0.0132 | 0.0125 | 5% | 0.0179 | 0.0177 | 1% | 0.0543 | 0.0507 | 7% |
| Thorium (Th) | µg/g dw | 0.000402 | 0.000234 | 53% | 0.000833 | 0.000498 | 50% | <0.000052 | <0.000052 | 0% | 0.0002 | 0.000158 | 23% |
| Tin (Sn) | µg/g dw | 0.00141 | 0.0015 | 6% | 0.00329 | 0.00242 | 30% | 0.00103 | 0.00101 | 2% | 0.00693 | 0.00581 | 18% |
| Titanium (Ti) | µg/g dw | 0.102 | 0.105 | 3% | 0.138 | 0.117 | 16% | 0.077 | 0.065 | 17% | 0.117 | 0.112 | 4% |
| Uranium (U) | µg/g dw | 0.00028 | 0.00025 | 11% | 0.0042 | 0.00388 | 8% | 0.00038 | 0.00043 | 12% | 0.0005 | 0.00061 | 20% |
| Vanadium (V) | µg/g dw | 0.00635 | 0.00678 | 7% | 0.0273 | 0.0248 | 10% | 0.016 | 0.0175 | 9% | 0.015 | 0.0144 | 4% |
| Yttrium (Y) | µg/g dw | 0.00188 | 0.00129 | 37% | 0.00731 | 0.00708 | 3% | 0.00599 | 0.00612 | 2% | 0.00144 | 0.00105 | 31% |
| Zinc (Zn) | µg/g dw | 79.6 | 71.3 | 11% | 118 | 111 | 6% | 53.8 | 50.4 | 7% | 144 | 137 | 5% |
| Zirconium (Zr) | µg/g dw | 0.00281 | 0.00139 | 68% | 0.016 | 0.0174 | 8% | 0.00131 | 0.00145 | 10% | 0.0217 | 0.00869 | 86% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD) or relative standard deviation (RSD).

## Table A.18b: Laboratory Duplicate Results for Fish Ovary Samples, 2015

| Analyte | Unit | SC-CSU-05-APR rep 1 | SC-CSU-05-APR rep 2 | SC-CSU-05-APR rep 3 | RSD | SC-YP-17-APR rep 1 | SC-YP-17-APR rep 2 | RPD | SC-YP-19-APR rep 1 | SC-YP-19-APR rep 2 | RPD | SC-NSC-46-APR rep 1 | SC-NSC-46-APR rep 2 | RPD | SC-PCC-05-APR rep 1 | SC-PCC-05-APR rep 2 | RPD | SC-PCC-08-APR rep 1 | SC-PCC-08-APR rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 8.88 | 9.31 | 5.75 | 24% | 0.512 | 1.08 | 71% | 0.579 | 0.84 | 37% | 2.03 | 2.03 | 0% | 4.12 | 9.47 | 79% | 2.91 | 2.91 | 0% |
| Antimony (Sb) | µg/g dw | 0.002 | <0.00099 | <0.0010 | 44% | 0.0013 | <0.0012 | 8% | <0.0011 | <0.0010 | 10% | <0.0011 | <0.0011 | 0% | 0.0015 | 0.0013 | 14% | 0.00192 | 0.00176 | 9% |
| Arsenic (As) | µg/g dw | 0.211 | 0.229 | 0.208 | 5% | 0.0733 | 0.0787 | 7% | 0.0392 | 0.0364 | 7% | 0.0344 | 0.032 | 7% | 0.128 | 0.125 | 2% | 0.118 | 0.0886 | 28% |
| Barium (Ba) | µg/g dw | 0.57 | 0.785 | 0.49 | 25% | 0.153 | 0.162 | 6% | 0.221 | 0.226 | 2% | 0.103 | 0.0896 | 14% | 1.39 | 1.5 | 8% | 1.66 | 1.38 | 18% |
| Beryllium (Be) | µg/g dw | <0.0024 | <0.0022 | <0.0023 | 4% | <0.0026 | <0.0026 | 0% | <0.0025 | <0.0023 | 8% | <0.0026 | <0.0026 | 0% | <0.0024 | <0.0026 | 8% | <0.0025 | <0.0026 | 4% |
| Bismuth (Bi) | µg/g dw | 0.00049 | 0.000434 | 0.000595 | 16% | 0.00095 | 0.00091 | 4% | 0.00067 | 0.00057 | 16% | 0.00093 | 0.00072 | 25% | 0.00093 | 0.00092 | 1% | 0.00219 | 0.00194 | 12% |
| Boron (B) | µg/g dw | <0.13 | <0.12 | <0.12 | 5% | <0.14 | <0.14 | 0% | <0.14 | <0.13 | 7% | <0.14 | <0.14 | 0% | <0.13 | <0.14 | 7% | <0.11 | <0.12 | 9% |
| Cadmium (Cd) | µg/g dw | 0.0104 | 0.0104 | 0.0101 | 2% | <0.0018 | 0.002 | 11% | <0.0017 | 0.0028 | 49% | 0.0103 | 0.0074 | 33% | 0.0105 | 0.0119 | 13% | 0.02 | 0.018 | 11% |
| Calcium (Ca) | µg/g dw | 773 | 1,440 | 668 | 44% | 1,020 | 999 | 2% | 1,080 | 1,160 | 7% | 1,360 | 1,330 | 2% | 299 | 307 | 3% | 419 | 398 | 5% |
| Cesium (Cs) | µg/g dw | 0.0244 | 0.0248 | 0.0241 | 1% | 0.0442 | 0.0425 | 4% | 0.031 | 0.0303 | 2% | 0.0835 | 0.0835 | 0% | 0.0169 | 0.0179 | 6% | 0.0157 | 0.0164 | 4% |
| Chromium (Cr) | µg/g dw | 0.0613 | 0.0777 | 0.067 | 12% | 0.0561 | 0.0677 | 19% | 0.0568 | 0.063 | 10% | 0.0602 | 0.0673 | 11% | 0.0614 | 0.0698 | 13% | 0.113 | 0.0718 | 45% |
| Cobalt (Co) | µg/g dw | 0.19 | 0.189 | 0.187 | 1% | 0.0434 | 0.0451 | 4% | 0.0437 | 0.0413 | 6% | 0.0415 | 0.0411 | 1% | 0.0931 | 0.0925 | 1% | 0.0706 | 0.0668 | 6% |
| Copper (Cu) | µg/g dw | 5.62 | 5.59 | 5.74 | 1% | 2.08 | 2.12 | 2% | 1.98 | 1.94 | 2% | 2.57 | 2.38 | 8% | 3.4 | 3.47 | 2% | 3.16 | 3.22 | 2% |
| Gallium (Ga) | µg/g dw | 0.00973 | 0.0109 | 0.0105 | 6% | 0.0056 | 0.0047 | 17% | 0.00635 | 0.00583 | 9% | 0.0064 | 0.0062 | 3% | 0.00632 | 0.0113 | 57% | 0.0134 | 0.00718 | 60% |
| Iron (Fe) | µg/g dw | 81.6 | 78.9 | 76.7 | 3% | 31.3 | 35.4 | 12% | 29.9 | 38.7 | 26% | 103 | 101 | 2% | 56.2 | 60.1 | 7% | 84.9 | 80.5 | 5% |
| Lead (Pb) | µg/g dw | 0.0127 | 0.0169 | 0.00852 | 33% | 0.0029 | 0.00402 | 32% | 0.00515 | 0.00531 | 3% | 0.0288 | 0.0235 | 20% | 0.0111 | 0.0136 | 20% | 0.0155 | 0.0128 | 19% |
| Lithium (Li) | µg/g dw | 0.0063 | 0.0089 | 0.0047 | 32% | 0.119 | 0.12 | 1% | 0.0937 | 0.0812 | 14% | 0.0068 | 0.0055 | 21% | <0.0050 | 0.0096 | 63% | 0.0046 | 0.0056 | 20% |
| Magnesium (Mg) | µg/g dw | 826 | 834 | 832 | 1% | 1,080 | 1,090 | 1% | 1,140 | 1,090 | 4% | 989 | 969 | 2% | 820 | 843 | 3% | 946 | 966 | 2% |
| Manganese (Mn) | µg/g dw | 23.1 | 24.2 | 23.5 | 2% | 2.11 | 2.17 | 3% | 2.27 | 2.28 | 0% | 5.44 | 5.45 | 0% | 9.56 | 9.72 | 2% | 6.99 | 6.97 | 0% |
| Mercury (Hg) | µg/g dw | 0.0201 | 0.0177 | 0.0182 | 7% | 0.0162 | 0.0147 | 10% | 0.0137 | 0.0146 | 6% | 0.123 | 0.12 | 2% | 0.0373 | 0.0352 | 6% | 0.0504 | 0.0496 | 2% |
| Molybdenum (Mo) | µg/g dw | 0.137 | 0.143 | 0.143 | 2% | 0.0385 | 0.041 | 6% | 0.0431 | 0.0451 | 5% | 0.154 | 0.146 | 5% | 0.107 | 0.108 | 1% | 0.133 | 0.128 | 4% |
| Nickel (Ni) | µg/g dw | 0.0416 | 0.0445 | 0.0382 | 8% | 0.008 | 0.0134 | 50% | 0.0117 | 0.0104 | 12% | 0.0164 | 0.0138 | 17% | 0.0329 | 0.0381 | 15% | 0.0558 | 0.0342 | 48% |
| Phosphorus (P) | µg/g dw | 10,400 | 10,800 | 10,700 | 2% | 8,010 | 7,960 | 1% | 9,150 | 8,920 | 3% | 9,740 | 9,660 | 1% | 10,300 | 10,400 | 1% | 11,300 | 11,800 | 4% |
| Potassium (K) | µg/g dw | 8,190 | 8,080 | 8,200 | 1% | 7,590 | 7,300 | 4% | 9,290 | 9,020 | 3% | 13,400 | 13,200 | 2% | 7,310 | 7,460 | 2% | 8,670 | 8,900 | 3% |
| Rhenium (Re) | µg/g dw | 0.0000327 | 0.0000107 | 0.0000414 | 56% | <0.0000040 | 0.0000084 | 71% | 0.000028 | <0.0000036 | 154% | <0.000004 | <0.000004 | 0% | <0.0000037 | <0.0000040 | 8% | <0.000036 | <0.000037 | 3% |
| Rubidium (Rb) | µg/g dw | 8.01 | 7.92 | 8.07 | 1% | 16.6 | 16.4 | 1% | 16 | 15.3 | 4% | 22.8 | 22.9 | 0% | 5.92 | 6.12 | 3% | 5.07 | 5.04 | 1% |
| Selenium (Se) | µg/g dw | 2.55 | 2.6 | 2.64 | 2% | 2.25 | 2.46 | 9% | 3.46 | 3.24 | 7% | 5.84 | 5.8 | 1% | 17.2 | 16.9 | 2% | 22.5 | 22.6 | 0% |
| Silver (Ag) | µg/g dw | 0.027 | 0.0267 | 0.0272 | 1% | 0.00152 | 0.00185 | 20% | 0.0018 | 0.00175 | 3% | 0.00665 | 0.00654 | 2% | 0.0181 | 0.0182 | 1% | 0.0155 | 0.0154 | 1% |
| Sodium (Na) | µg/g dw | 1,810 | 1,830 | 1,790 | 1% | 12,200 | 12,400 | 2% | 13,600 | 13,700 | 1% | 2,110 | 2,070 | 2% | 1,290 | 1,340 | 4% | 1,490 | 1,520 | 2% |
| Strontium (Sr) | µg/g dw | 0.654 | 1.43 | 0.578 | 53% | 1.49 | 1.46 | 2% | 1.66 | 1.67 | 1% | 0.358 | 0.356 | 1% | 0.35 | 0.378 | 8% | 0.28 | 0.261 | 7% |
| Thallium (Tl) | µg/g dw | 0.0129 | 0.0135 | 0.0135 | 3% | 0.0193 | 0.0201 | 4% | 0.0119 | 0.0117 | 2% | 0.012 | 0.0118 | 2% | 0.00625 | 0.00669 | 7% | 0.00474 | 0.0044 | 7% |
| Thorium (Th) | µg/g dw | 0.00208 | 0.00333 | 0.00157 | 39% | 0.000699 | 0.000624 | 11% | 0.000324 | 0.000254 | 24% | 0.000564 | 0.000417 | 30% | 0.00192 | 0.00537 | 95% | 0.000982 | 0.00114 | 15% |
| Tin (Sn) | µg/g dw | 0.0011 | <0.0010 | <0.0010 | 6% | <0.0012 | <0.0012 | 0% | 0.0014 | <0.0010 | 33% | 0.0012 | 0.0018 | 40% | <0.0011 | <0.0012 | 9% | <0.00060 | <0.00063 | 5% |
| Titanium (Ti) | µg/g dw | 0.16 | 0.182 | 0.128 | 17% | 0.0911 | 0.0884 | 3% | 0.079 | 0.0871 | 10% | 0.115 | 0.11 | 4% | 0.108 | 0.171 | 45% | 0.145 | 0.12 | 19% |
| Uranium (U) | µg/g dw | 0.00633 | 0.00654 | 0.00615 | 3% | 0.000179 | 0.000193 | 8% | 0.000335 | 0.000289 | 15% | 0.000667 | 0.000587 | 13% | 0.00568 | 0.00596 | 5% | 0.0127 | 0.0115 | 10% |
| Vanadium (V) | µg/g dw | 0.0138 | 0.0131 | 0.00976 | 18% | 0.0146 | 0.0181 | 21% | 0.0169 | 0.0165 | 2% | 0.0366 | 0.0357 | 2% | 0.0166 | 0.0215 | 26% | 0.0301 | 0.027 | 11% |
| Yttrium (Y) | µg/g dw | 0.00992 | 0.00923 | 0.00867 | 7% | 0.00083 | 0.00122 | 38% | 0.0009 | 0.00091 | 1% | 0.00276 | 0.00274 | 1% | 0.00248 | 0.00448 | 57% | 0.00472 | 0.00472 | 0% |
| Zinc (Zn) | µg/g dw | 113 | 109 | 111 | 2% | 68.6 | 66.3 | 3% | 71.5 | 66.8 | 7% | 155 | 154 | 1% | 91.2 | 90.4 | 1% | 108 | 106 | 2% |
| Zirconium (Zr) | µg/g dw | 0.00974 | 0.00893 | 0.00708 | 16% | 0.00554 | 0.00621 | 11% | 0.00684 | 0.00695 | 2% | 0.00768 | 0.00621 | 21% | 0.00866 | 0.0107 | 21% | 0.0216 | 0.0143 | 41% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD) or relative standard deviation (RSD).

## Table A.18b: Laboratory Duplicate Results for Fish Ovary Samples, 2015

| Analyte | Unit | GC-YP-06-APR rep 1 | GC-YP-06-APR rep 2 | RPD | GC-NSC-49-APR rep 1 | GC-NSC-49-APR rep 2 | RPD | GC-PCC-08-APR rep 1 | GC-PCC-08-APR rep 2 | RPD | ER-PCC-02-APR rep 1 | ER-PCC-02-APR rep 2 | RPD | ER-YP-01-APR rep 1 | ER-YP-01-APR rep 2 | RPD | ER-YP-02-APR rep 1 | ER-YP-02-APR rep 2 | RPD | ER-YP-11-APR rep 1 | ER-YP-11-APR rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 0.435 | 0.256 | 52% | 1.52 | 1.52 | 0% | 0.789 | 1.01 | 25% | 4.79 | 4.79 | 0% | 34.3 | 27.2 | 23% | 3.09 | 3.3 | 7% | 0.953 | 0.443 | 73% |
| Antimony (Sb) | µg/g dw | <0.00055 | <0.00060 | 9% | 0.00071 | <0.00061 | 15% | 0.00132 | 0.0008 | 49% | 0.00663 | 0.00524 | 23% | 0.00089 | 0.00174 | 65% | 0.00129 | 0.00072 | 57% | 0.00071 | 0.00062 | 14% |
| Arsenic (As) | µg/g dw | 0.0369 | 0.0385 | 4% | 0.0881 | 0.0934 | 6% | 0.244 | 0.3 | 21% | 0.0638 | 0.0679 | 6% | 0.0861 | 0.0923 | 7% | 0.035 | 0.0412 | 16% | 0.0405 | 0.036 | 12% |
| Barium (Ba) | µg/g dw | 0.438 | 0.432 | 1% | 0.0766 | 0.044 | 54% | 1.26 | 1.91 | 41% | 1.83 | 1.72 | 6% | 0.784 | 0.83 | 6% | 0.315 | 0.315 | 0% | 0.675 | 0.663 | 2% |
| Beryllium (Be) | µg/g dw | <0.0024 | <0.0026 | 8% | <0.0026 | <0.0026 | 0% | <0.0027 | <0.0027 | 0% | <0.0023 | <0.0024 | 4% | <0.0024 | <0.0022 | 9% | <0.0022 | <0.0025 | 13% | <0.0024 | <0.0023 | 4% |
| Bismuth (Bi) | µg/g dw | 0.00065 | 0.00073 | 12% | 0.00017 | <0.00016 | 6% | <0.00016 | <0.00016 | 0% | 0.00358 | 0.00418 | 15% | 0.00091 | 0.00091 | 0% | 0.0012 | 0.00108 | 11% | 0.00072 | 0.00096 | 29% |
| Boron (B) | µg/g dw | <0.11 | 0.14 | 24% | <0.12 | <0.12 | 0% | <0.12 | 0.14 | 15% | 0.23 | 0.23 | 0% | <0.12 | 0.14 | 15% | <0.11 | <0.12 | 9% | <0.12 | <0.12 | 0% |
| Cadmium (Cd) | µg/g dw | 0.0044 | 0.0038 | 15% | 0.0019 | 0.0023 | 19% | 0.0083 | 0.01 | 19% | 0.0394 | 0.0392 | 1% | 0.0184 | 0.0227 | 21% | 0.0026 | 0.004 | 42% | 0.004 | 0.0035 | 13% |
| Calcium (Ca) | µg/g dw | 1,170 | 1,200 | 3% | 1,180 | 1,120 | 5% | 319 | 489 | 42% | 657 | 678 | 3% | 1,020 | 2,030 | 66% | 1,030 | 1,020 | 1% | 844 | 840 | 0% |
| Cesium (Cs) | µg/g dw | 0.0301 | 0.0299 | 1% | 0.072 | 0.0735 | 2% | 0.0159 | 0.0153 | 4% | 0.0173 | 0.0175 | 1% | 0.0244 | 0.024 | 2% | 0.0189 | 0.0191 | 1% | 0.0233 | 0.0241 | 3% |
| Chromium (Cr) | µg/g dw | 0.0523 | 0.0545 | 4% | 0.0592 | 0.0767 | 26% | 0.062 | 0.0833 | 29% | 0.0793 | 0.0865 | 9% | 0.233 | 0.119 | 65% | 0.0619 | 0.0749 | 19% | 0.0621 | 0.0657 | 6% |
| Cobalt (Co) | µg/g dw | 0.0905 | 0.0891 | 2% | 0.0411 | 0.0413 | 0% | 0.0657 | 0.0641 | 2% | 0.0868 | 0.0854 | 2% | 0.0632 | 0.0597 | 6% | 0.0507 | 0.0491 | 3% | 0.0722 | 0.0719 | 0% |
| Copper (Cu) | µg/g dw | 1.97 | 1.97 | 0% | 2.94 | 3.06 | 4% | 4.6 | 4.51 | 2% | 2.39 | 2.43 | 2% | 2.13 | 2.03 | 5% | 2.29 | 2.27 | 1% | 2.16 | 2.18 | 1% |
| Gallium (Ga) | µg/g dw | 0.00432 | 0.00462 | 7% | 0.00536 | 0.00464 | 14% | 0.00611 | 0.0056 | 9% | 0.00933 | 0.0099 | 6% | 0.0178 | 0.0131 | 30% | 0.00432 | 0.0061 | 34% | 0.00546 | 0.00381 | 36% |
| Iron (Fe) | µg/g dw | 33.5 | 33.6 | 0% | 91.3 | 93.8 | 3% | 50.8 | 50.7 | 0% | 229 | 228 | 0% | 57.7 | 50.5 | 13% | 34.1 | 33.8 | 1% | 34.7 | 34.9 | 1% |
| Lead (Pb) | µg/g dw | 0.00176 | 0.00181 | 3% | 0.0124 | 0.00923 | 29% | 0.00471 | 0.0059 | 22% | 0.101 | 0.092 | 9% | 0.0214 | 0.0192 | 11% | 0.0113 | 0.0108 | 5% | 0.00372 | 0.00358 | 4% |
| Lithium (Li) | µg/g dw | 0.115 | 0.108 | 6% | 0.0062 | 0.0074 | 18% | 0.0056 | 0.0056 | 0% | 0.0137 | 0.0116 | 17% | 0.259 | 0.238 | 8% | 0.235 | 0.223 | 5% | 0.292 | 0.291 | 0% |
| Magnesium (Mg) | µg/g dw | 1,260 | 1,280 | 2% | 853 | 875 | 3% | 908 | 889 | 2% | 1,230 | 1,250 | 2% | 1,220 | 1,160 | 5% | 1,300 | 1,270 | 2% | 1,160 | 1,180 | 2% |
| Manganese (Mn) | µg/g dw | 2.9 | 2.96 | 2% | 0.902 | 0.881 | 2% | 9.49 | 10 | 5% | 9.14 | 9.44 | 3% | 4.84 | 4.75 | 2% | 3.17 | 3.1 | 2% | 3.13 | 3.21 | 3% |
| Mercury (Hg) | µg/g dw | 0.0653 | 0.0654 | 0% | 0.0603 | 0.0619 | 3% | 0.0119 | 0.0109 | 9% | 0.138 | 0.141 | 2% | 0.0184 | 0.0168 | 9% | 0.0176 | 0.0174 | 1% | 0.0127 | 0.0128 | 1% |
| Molybdenum (Mo) | µg/g dw | 0.0388 | 0.0377 | 3% | 0.127 | 0.131 | 3% | 0.133 | 0.135 | 1% | 0.232 | 0.222 | 4% | 0.0403 | 0.0373 | 8% | 0.0366 | 0.0367 | 0% | 0.0472 | 0.0478 | 1% |
| Nickel (Ni) | µg/g dw | 0.0081 | 0.0084 | 4% | 0.0094 | 0.0079 | 17% | 0.0163 | 0.0182 | 11% | 0.138 | 0.118 | 16% | 0.0576 | 0.0526 | 9% | 0.0147 | 0.017 | 15% | 0.0206 | 0.0223 | 8% |
| Phosphorus (P) | µg/g dw | 10,100 | 10,100 | 0% | 8,990 | 9,220 | 3% | 9,620 | 9,570 | 1% | 11,300 | 11,400 | 1% | 9,590 | 9,700 | 1% | 8,890 | 8,750 | 2% | 8,840 | 9,240 | 4% |
| Potassium (K) | µg/g dw | 8,970 | 9,040 | 1% | 11,200 | 11,600 | 4% | 8,290 | 8,000 | 4% | 10,900 | 11,000 | 1% | 8,000 | 7,650 | 4% | 7,270 | 7,130 | 2% | 7,600 | 7,740 | 2% |
| Rhenium (Re) | µg/g dw | 0.000052 | 0.000049 | 6% | <0.000037 | <0.000038 | 3% | <0.000038 | <0.000038 | 0% | <0.000035 | <0.000036 | 3% | 0.000043 | 0.000057 | 28% | <0.000033 | <0.000037 | 11% | 0.000058 | <0.000035 | 49% |
| Rubidium (Rb) | µg/g dw | 13.4 | 13.3 | 1% | 16.4 | 16.8 | 2% | 10.7 | 10.5 | 2% | 4.34 | 4.37 | 1% | 12.2 | 11.5 | 6% | 12 | 12 | 0% | 12 | 11.9 | 1% |
| Selenium (Se) | µg/g dw | 3.01 | 3.17 | 5% | 3.42 | 3.64 | 6% | 8.62 | 8.33 | 3% | 13.2 | 13.6 | 3% | 3.91 | 3.59 | 9% | 4.16 | 4.55 | 9% | 4.18 | 4.57 | 9% |
| Silver (Ag) | µg/g dw | 0.00235 | 0.00221 | 6% | 0.00305 | 0.00337 | 10% | 0.0248 | 0.0243 | 2% | 0.00878 | 0.00876 | 0% | 0.00324 | 0.00317 | 2% | 0.0038 | 0.00434 | 13% | 0.00392 | 0.00348 | 12% |
| Sodium (Na) | µg/g dw | 15,000 | 14,700 | 2% | 1,770 | 1,820 | 3% | 1,660 | 1,640 | 1% | 2,480 | 2,550 | 3% | 11,500 | 10,800 | 6% | 11,600 | 11,200 | 4% | 9,310 | 9,590 | 3% |
| Strontium (Sr) | µg/g dw | 1.39 | 1.4 | 1% | 0.338 | 0.264 | 25% | 0.303 | 0.500 | 49% | 0.386 | 0.401 | 4% | 1.67 | 2.24 | 29% | 1.39 | 1.38 | 1% | 1.37 | 1.37 | 0% |
| Thallium (Tl) | µg/g dw | 0.0194 | 0.0189 | 3% | 0.0547 | 0.0567 | 4% | 0.0217 | 0.0217 | 0% | 0.00522 | 0.00553 | 6% | 0.0465 | 0.0454 | 2% | 0.0299 | 0.0296 | 1% | 0.037 | 0.0365 | 1% |
| Thorium (Th) | µg/g dw | 0.00011 | 0.000105 | 5% | 0.000319 | 0.000279 | 13% | 0.000163 | 0.000242 | 39% | 0.0023 | 0.00136 | 51% | 0.00844 | 0.00602 | 33% | 0.000557 | 0.000511 | 9% | 0.000159 | 0.000196 | 21% |
| Tin (Sn) | µg/g dw | <0.00057 | 0.00070 | 20% | <0.00063 | <0.00063 | 0% | <0.00064 | 0.00118 | 59% | 0.00957 | 0.00647 | 39% | 0.00257 | 0.00189 | 30% | <0.00058 | 0.00112 | 64% | <0.00064 | <0.00062 | 3% |
| Titanium (Ti) | µg/g dw | 0.084 | 0.0858 | 2% | 0.101 | 0.0721 | 33% | 0.0574 | 0.052 | 10% | 0.189 | 0.181 | 4% | 0.68 | 0.499 | 31% | 0.155 | 0.129 | 18% | 0.084 | 0.062 | 30% |
| Uranium (U) | µg/g dw | 0.000916 | 0.000953 | 4% | 0.00029 | 0.000223 | 26% | 0.000837 | 0.00086 | 3% | 0.00877 | 0.00899 | 2% | 0.0027 | 0.00242 | 11% | 0.00057 | 0.00044 | 26% | 0.00082 | 0.00077 | 6% |
| Vanadium (V) | µg/g dw | 0.0202 | 0.0203 | 0% | 0.0178 | 0.0182 | 2% | 0.0153 | 0.0178 | 15% | 0.0979 | 0.0936 | 4% | 0.089 | 0.075 | 17% | 0.0317 | 0.0334 | 5% | 0.0255 | 0.0261 | 2% |
| Yttrium (Y) | µg/g dw | 0.00212 | 0.00195 | 8% | 0.00239 | 0.00207 | 14% | 0.00184 | 0.0018 | 2% | 0.00957 | 0.00946 | 1% | 0.0175 | 0.015 | 15% | 0.00286 | 0.0023 | 22% | 0.00189 | 0.00156 | 19% |
| Zinc (Zn) | µg/g dw | 80.6 | 79.4 | 1% | 133 | 135 | 1% | 114 | 118 | 3% | 154 | 151 | 2% | 75.8 | 71.5 | 6% | 74.9 | 75.3 | 1% | 71.1 | 71.6 | 1% |
| Zirconium (Zr) | µg/g dw | 0.00354 | 0.00282 | 23% | 0.00379 | 0.00493 | 26% | 0.00755 | 0.00723 | 4% | 0.0359 | 0.0344 | 4% | 0.0206 | 0.0151 | 31% | 0.0041 | 0.0051 | 22% | 0.0036 | 0.0041 | 13% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD) or relative standard deviation (RSD).

## Table A.18c: Laboratory Duplicate Results for Fish Ovary Samples, 2016

| Analyte | Unit | SC-RT-04 O rep 1 | SC-RT-04 O rep 2 | RSD | GC-PCC-90 O rep 1 | GC-PCC-90 O rep 2 | RPD | ER-PCC-06 O rep 1 | ER-PCC-06 O rep 2 | RPD | SC-PCC-12 O rep 1 | SC-PCC-12 O rep 2 | RPD | GC-YP-33 O rep 1 | GC-YP-33 O rep 2 | RPD | GC-CSU-04 O rep 1 | GC-CSU-04 O rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | 0.701 | 0.621 | 9% | 10.4 | 7.09 | 38% | - | 4.45 | - | - | 3.21 | - | 0.584 | 0.512 | 13% | - | 2.05 | - |
| Antimony (Sb) | µg/g dw | 0.00214 | <0.0004 | 97% | 0.00122 | 0.00121 | 1% | <0.0010 | <0.0010 | 1% | 0.0022 | 0.00134 | 49% | 0.00449 | 0.00128 | 111% | 0.00067 | 0.00042 | 46% |
| Arsenic (As) | µg/g dw | 0.205 | 0.205 | 0% | 0.104 | 0.109 | 5% | 0.2 | 0.186 | 7% | 0.139 | 0.116 | 18% | 0.0772 | 0.0672 | 14% | 0.11 | 0.0953 | 14% |
| Barium (Ba) | µg/g dw | 0.255 | 0.256 | 0% | 1.17 | 1.23 | 5% | 0.866 | 0.802 | 8% | 1.7 | 1.58 | 7% | 0.323 | 0.315 | 3% | 0.377 | 0.339 | 11% |
| Beryllium (Be) | µg/g dw | <0.0026 | <0.0027 | 3% | <0.0026 | <0.0027 | 4% | <0.0031 | <0.0032 | 3% | <0.0030 | <0.0030 | 0% | <0.0046 | <0.0050 | 8% | <0.0050 | <0.0045 | 11% |
| Bismuth (Bi) | µg/g dw | <0.0001 | <0.0001 | 6% | 0.00182 | 0.00176 | 3% | 0.000403 | 0.000454 | 12% | 0.00189 | 0.00187 | 1% | 0.000825 | 0.000762 | 8% | 0.000232 | 0.000226 | 3% |
| Boron (B) | µg/g dw | <0.0980 | <0.1000 | 1% | <0.1000 | 0.2 | 67% | 0.165 | 0.117 | 34% | 0.099 | 0.202 | 68% | 0.128 | 0.111 | 14% | 0.144 | 0.297 | 69% |
| Cadmium (Cd) | µg/g dw | 0.0019 | 0.0016 | 12% | 0.0115 | 0.0119 | 3% | 0.0061 | 0.0074 | 19% | 0.0112 | 0.0097 | 14% | 0.0032 | 0.002 | 46% | 0.0028 | 0.0014 | 67% |
| Calcium (Ca) | µg/g dw | 1,230 | 1,200 | 2% | 258 | 257 | 0% | 182 | 177 | 3% | 414 | 372 | 11% | 1,070 | 1,090 | 2% | 370 | 365 | 1% |
| Cesium (Cs) | µg/g dw | 0.0416 | 0.0414 | 0% | 0.00819 | 0.00859 | 5% | 0.0184 | 0.0165 | 11% | 0.0149 | 0.0153 | 3% | 0.0195 | 0.0182 | 7% | 0.0254 | 0.0243 | 4% |
| Chromium (Cr) | µg/g dw | 0.0729 | 0.0865 | 12% | 0.0787 | 0.0762 | 3% | 0.0855 | 0.0928 | 8% | 0.0742 | 0.0794 | 7% | 0.059 | 0.065 | 10% | 0.065 | 0.068 | 5% |
| Cobalt (Co) | µg/g dw | 0.081 | 0.0804 | 1% | 0.0742 | 0.0735 | 1% | 0.0509 | 0.0485 | 5% | 0.0692 | 0.069 | 0% | 0.0763 | 0.0791 | 4% | 0.103 | 0.103 | 0% |
| Copper (Cu) | µg/g dw | 17.6 | 16.7 | 4% | 3.25 | 3.2 | 2% | 3.82 | 3.54 | 8% | 3.68 | 3.82 | 4% | 1.93 | 1.86 | 4% | 3.48 | 3.43 | 1% |
| Gallium (Ga) | µg/g dw | 0.00596 | 0.00586 | 1% | 0.00893 | 0.0104 | 15% | 0.00869 | 0.00802 | 8% | 0.00789 | 0.0077 | 2% | 0.00453 | 0.00482 | 6% | 0.00829 | 0.00865 | 4% |
| Iron (Fe) | µg/g dw | 63.1 | 58.5 | 5% | 76 | 78.2 | 3% | 42.7 | 41 | 4% | 73.9 | 71.9 | 3% | 29.8 | 28.3 | 5% | 29.3 | 27.4 | 7% |
| Lead (Pb) | µg/g dw | 0.00247 | 0.00207 | 12% | 0.0124 | 0.0151 | 20% | 0.00848 | 0.00924 | 9% | 0.012 | 0.0117 | 3% | 0.00376 | 0.00326 | 14% | 0.00578 | 0.00564 | 2% |
| Lithium (Li) | µg/g dw | <0.0033 | <0.0035 | 4% | 0.0076 | 0.0065 | 16% | 0.0085 | 0.0047 | 58% | 0.0097 | 0.0109 | 12% | 0.091 | 0.0933 | 2% | <0.0068 | <0.0061 | 11% |
| Magnesium (Mg) | µg/g dw | 1,480 | 1,460 | 1% | 748 | 733 | 2% | 749 | 702 | 6% | 879 | 898 | 2% | 1,150 | 1,130 | 2% | 532 | 526 | 1% |
| Manganese (Mn) | µg/g dw | 1.57 | 1.58 | 0% | 4.75 | 4.77 | 0% | 6.97 | 6.62 | 5% | 11.7 | 11.7 | 0% | 1.94 | 1.96 | 1% | 19.8 | 19.4 | 2% |
| Mercury (Hg) | µg/g dw | 0.0248 | 0.0231 | 5% | 0.0244 | 0.0256 | 5% | 0.0107 | 0.00988 | 8% | 0.0262 | 0.0275 | 5% | 0.0238 | 0.0218 | 9% | 0.0087 | 0.0075 | 15% |
| Molybdenum (Mo) | µg/g dw | 0.0192 | 0.019 | 1% | 0.101 | 0.104 | 3% | 0.095 | 0.0871 | 9% | 0.124 | 0.121 | 2% | 0.0348 | 0.0331 | 5% | 0.0594 | 0.0563 | 5% |
| Nickel (Ni) | µg/g dw | 0.0094 | 0.0092 | 2% | 0.0497 | 0.0479 | 4% | 0.0242 | 0.0233 | 4% | 0.038 | 0.0314 | 19% | 0.0287 | 0.0305 | 6% | 0.0312 | 0.0321 | 3% |
| Phosphorus (P) | µg/g dw | 10,200 | 10,200 | 0% | 10,400 | 10,000 | 4% | 11,200 | 10,500 | 6% | 10,900 | 11,100 | 2% | 8,650 | 8,580 | 1% | 11,000 | 11,100 | 1% |
| Potassium (K) | µg/g dw | 5,330 | 5,150 | 2% | 6,790 | 6,550 | 4% | 6,560 | 6,270 | 5% | 7,160 | 7,360 | 3% | 8,460 | 8,160 | 4% | 6,800 | 6,580 | 3% |
| Rhenium (Re) | µg/g dw | 0.00564 | 0.00526 | 5% | <0.00003 | <0.00003 | 3% | <0.0001 | <0.0001 | 0% | <0.00005 | <0.00005 | 0% | <0.0001 | <0.0001 | 4% | <0.0001 | <0.0001 | 16% |
| Rubidium (Rb) | µg/g dw | 11.3 | 11.4 | 1% | 2.89 | 2.94 | 2% | 7.23 | 6.92 | 4% | 3.85 | 3.94 | 2% | 13.5 | 13.3 | 1% | 5.31 | 5.37 | 1% |
| Selenium (Se) | µg/g dw | 10.7 | 10.7 | 0% | 15.1 | 15 | 1% | 8.55 | 7.75 | 10% | 14 | 14.3 | 2% | 4.29 | 4.49 | 5% | 0.951 | 0.972 | 2% |
| Silver (Ag) | µg/g dw | 0.0571 | 0.0541 | 4% | 0.0354 | 0.0361 | 2% | 0.0304 | 0.0303 | 0% | 0.0169 | 0.0169 | 0% | 0.00224 | 0.00213 | 5% | 0.0201 | 0.0214 | 6% |
| Sodium (Na) | µg/g dw | 1,700 | 1,700 | 0% | 1,210 | 1,190 | 2% | 1,180 | 1,120 | 5% | 1,290 | 1,290 | 0% | 12,500 | 12,300 | 2% | 1,390 | 1,320 | 5% |
| Strontium (Sr) | µg/g dw | 1.01 | 1 | 1% | 0.19 | 0.209 | 10% | 0.236 | 0.22 | 7% | 0.334 | 0.287 | 15% | 1.75 | 1.74 | 1% | 0.306 | 0.293 | 4% |
| Thallium (Tl) | µg/g dw | 0.0166 | 0.0163 | 1% | 0.00491 | 0.00467 | 5% | 0.0213 | 0.0201 | 6% | 0.00668 | 0.00631 | 6% | 0.0186 | 0.017 | 9% | 0.00387 | 0.00349 | 10% |
| Thorium (Th) | µg/g dw | 0.000111 | 0.000075 | 27% | 0.00159 | 0.00318 | 67% | 0.000808 | 0.00102 | 23% | 0.00124 | 0.000824 | 40% | 0.000126 | 0.000132 | 5% | 0.000666 | 0.000368 | 58% |
| Tin (Sn) | µg/g dw | <0.0007 | <0.0008 | 5% | <0.0008 | <0.0008 | 4% | 0.0035 | 0.0019 | 59% | <0.0012 | <0.0012 | 0% | 0.00125 | 0.00106 | 16% | 0.00088 | <0.0090 | 164% |
| Titanium (Ti) | µg/g dw | 0.074 | 0.0621 | 12% | 0.204 | 0.202 | 1% | 0.163 | 0.155 | 5% | 0.143 | 0.101 | 34% | 0.0724 | 0.083 | 14% | 0.176 | 0.0955 | 59% |
| Uranium (U) | µg/g dw | 0.000322 | 0.000301 | 5% | 0.003 | 0.00303 | 1% | 0.00249 | 0.00201 | 21% | 0.0481 | 0.00447 | 166% | <0.0006 | <0.0006 | 10% | 0.00157 | 0.00157 | 0% |
| Vanadium (V) | µg/g dw | 0.00367 | 0.00426 | 11% | 0.0239 | 0.0241 | 1% | 0.0196 | 0.0188 | 4% | 0.0214 | 0.0202 | 6% | 0.0213 | 0.021 | 1% | 0.00747 | 0.00457 | 48% |
| Yttrium (Y) | µg/g dw | 0.00067 | 0.00074 | 7% | 0.00624 | 0.00746 | 18% | - | 0.00261 | - | - | 0.003 | - | 0.00144 | 0.00167 | 15% | - | 0.00237 | - |
| Zinc (Zn) | µg/g dw | 87.2 | 87.2 | 0% | 72.1 | 71.6 | 1% | 92.9 | 88.8 | 5% | 105 | 107 | 2% | 74.2 | 74.6 | 1% | 91.7 | 75 | 20% |
| Zirconium (Zr) | µg/g dw | 0.00337 | 0.00853 | 61% | 0.0113 | 0.00888 | 24% | 0.00725 | 0.00537 | 30% | 0.00844 | 0.00748 | 12% | 0.0039 | 0.00488 | 22% | 0.0066 | 0.00479 | 32% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD) or relative standard deviation (RSD).

## Table A.18c: Laboratory Duplicate Results for Fish Ovary Samples, 2016

| Analyte | Unit | GC-CSU-31 O rep 1 | GC-CSU-31 O rep 2 | RPD | GC-NSC-13 O rep 1 | GC-NSC-13 O rep 2 | RPD | ER-YP-05 O rep 1 | ER-YP-05 O rep 2 | RPD | ER-CSU-03 O rep 1 | ER-CSU-03 O rep 2 | RPD | ER-CSU-04 O rep 1 | ER-CSU-04 O rep 2 | RPD | ER-NSC-27 O rep 1 | ER-NSC-27 O rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | - | 1.25 | - | - | 3.46 | - | - | 1.43 | - | 1.61 | 3.8 | 81% | - | 0.626 | - | - | 1.3 | - |
| Antimony (Sb) | µg/g dw | 0.00194 | 0.00203 | 5% | 0.00109 | <0.0004 | 87% | 0.0023 | 0.00248 | 8% | 0.00266 | 0.00341 | 25% | 0.0013 | 0.00064 | 68% | 0.00077 | 0.00129 | 50% |
| Arsenic (As) | µg/g dw | 0.0759 | 0.0523 | 37% | 0.0805 | 0.0738 | 9% | 0.0595 | 0.0638 | 7% | 0.113 | 0.14 | 21% | 0.148 | 0.144 | 3% | 0.177 | 0.178 | 1% |
| Barium (Ba) | µg/g dw | 0.788 | 0.613 | 25% | 0.111 | 0.123 | 10% | 0.374 | 0.351 | 6% | 0.693 | 0.949 | 31% | 0.53 | 0.531 | 0% | 0.138 | 0.0653 | 72% |
| Beryllium (Be) | µg/g dw | <0.0035 | <0.0035 | 0% | <0.0034 | <0.0034 | 0% | <0.0035 | <0.0034 | 3% | <0.0034 | <0.0032 | 6% | <0.0023 | <0.0027 | 16% | <0.0023 | <0.0025 | 8% |
| Bismuth (Bi) | µg/g dw | 0.00572 | 0.00553 | 3% | 0.000111 | 0.000167 | 40% | 0.000348 | 0.000289 | 19% | 0.00289 | 0.00262 | 10% | 0.000386 | 0.0005 | 26% | 0.000543 | 0.000394 | 32% |
| Boron (B) | µg/g dw | <0.1200 | <0.1200 | 0% | 0.16 | 0.32 | 67% | 0.18 | 0.15 | 18% | 0.22 | 0.41 | 60% | <0.1500 | <0.1800 | 18% | <0.1500 | 0.34 | 78% |
| Cadmium (Cd) | µg/g dw | 0.0032 | 0.0041 | 25% | <0.0013 | 0.0017 | 27% | 0.0038 | 0.0046 | 19% | 0.0103 | 0.0107 | 4% | 0.0049 | 0.0049 | 0% | 0.0041 | 0.0047 | 14% |
| Calcium (Ca) | µg/g dw | 949 | 933 | 2% | 499 | 489 | 2% | 1,080 | 922 | 16% | 614 | 625 | 2% | 454 | 464 | 2% | 1,390 | 1,020 | 31% |
| Cesium (Cs) | µg/g dw | 0.00845 | 0.00798 | 6% | 0.0478 | 0.0462 | 3% | 0.028 | 0.0258 | 8% | 0.0067 | 0.00668 | 0% | 0.00757 | 0.00806 | 6% | 0.0981 | 0.0989 | 1% |
| Chromium (Cr) | µg/g dw | 0.0641 | 0.0653 | 2% | 0.0616 | 0.0734 | 17% | 0.0644 | 0.0632 | 2% | 0.0627 | 0.0745 | 17% | 0.0663 | 0.0724 | 9% | 0.0693 | 0.0677 | 2% |
| Cobalt (Co) | µg/g dw | 0.128 | 0.126 | 2% | 0.0262 | 0.026 | 1% | 0.0728 | 0.0697 | 4% | 0.213 | 0.213 | 0% | 0.0658 | 0.0656 | 0% | 0.0322 | 0.0337 | 5% |
| Copper (Cu) | µg/g dw | 3.02 | 3.1 | 3% | 3.21 | 3.21 | 0% | 2.05 | 2.06 | 0% | 5.37 | 5.3 | 1% | 3.42 | 3.43 | 0% | 2.4 | 2.66 | 10% |
| Gallium (Ga) | µg/g dw | 0.00763 | 0.00697 | 9% | 0.00518 | 0.00555 | 7% | 0.00592 | 0.00375 | 45% | 0.00707 | 0.00753 | 6% | 0.00655 | 0.00634 | 3% | 0.00515 | 0.00509 | 1% |
| Iron (Fe) | µg/g dw | 56 | 56.7 | 1% | 78.3 | 83.4 | 6% | 40.9 | 42.3 | 3% | 90.5 | 90.2 | 0% | 33.9 | 35.2 | 4% | 96 | 101 | 5% |
| Lead (Pb) | µg/g dw | 0.00675 | 0.00463 | 37% | 0.00743 | 0.0051 | 37% | 0.00621 | 0.00665 | 7% | 0.00728 | 0.0113 | 43% | 0.00388 | 0.00448 | 14% | 0.0302 | 0.0265 | 13% |
| Lithium (Li) | µg/g dw | <0.0120 | <0.0120 | 0% | <0.0120 | <0.0120 | 0% | 0.203 | 0.196 | 4% | 0.013 | 0.017 | 27% | 0.0105 | 0.0115 | 9% | <0.0063 | <0.0069 | 9% |
| Magnesium (Mg) | µg/g dw | 1,020 | 1,020 | 0% | 614 | 601 | 2% | 1,140 | 1,090 | 4% | 773 | 778 | 1% | 674 | 680 | 1% | 810 | 835 | 3% |
| Manganese (Mn) | µg/g dw | 40.3 | 40.5 | 0% | 0.634 | 0.645 | 2% | 2.38 | 2.28 | 4% | 17.7 | 17.6 | 1% | 15.8 | 15.6 | 1% | 1.46 | 1.42 | 3% |
| Mercury (Hg) | µg/g dw | 0.0285 | 0.029 | 2% | 0.0686 | 0.0691 | 1% | 0.0186 | 0.0187 | 1% | 0.0125 | 0.0121 | 3% | 0.00608 | 0.0055 | 10% | 0.0375 | 0.0399 | 6% |
| Molybdenum (Mo) | µg/g dw | 0.174 | 0.174 | 0% | 0.0708 | 0.0658 | 7% | 0.0367 | 0.035 | 5% | 0.109 | 0.105 | 4% | 0.074 | 0.0804 | 8% | 0.111 | 0.115 | 4% |
| Nickel (Ni) | µg/g dw | 0.0421 | 0.0382 | 10% | 0.0114 | 0.0133 | 15% | 0.025 | 0.0258 | 3% | 0.114 | 0.12 | 5% | 0.0381 | 0.0397 | 4% | 0.0158 | 0.0158 | 0% |
| Phosphorus (P) | µg/g dw | 9,650 | 10,100 | 5% | 10,400 | 10,200 | 2% | 9,170 | 8,920 | 3% | 9,930 | 9,780 | 2% | 10,600 | 10,300 | 3% | 8,240 | 8,450 | 3% |
| Potassium (K) | µg/g dw | 7,700 | 7,740 | 1% | 7,760 | 7,550 | 3% | 8,150 | 7,870 | 3% | 6,930 | 6,950 | 0% | 6,340 | 6,150 | 3% | 9,970 | 10,200 | 2% |
| Rhenium (Re) | µg/g dw | <0.0001 | <0.0001 | 0% | <0.0001 | <0.0001 | 9% | <0.0001 | <0.0001 | 0% | <0.0001 | <0.0001 | 0% | <0.0001 | <0.0001 | 17% | <0.0001 | <0.0001 | 9% |
| Rubidium (Rb) | µg/g dw | 5.06 | 5.03 | 1% | 12.2 | 11.8 | 3% | 16 | 15.4 | 4% | 2.47 | 2.41 | 2% | 3.81 | 3.83 | 1% | 18.7 | 18.8 | 1% |
| Selenium (Se) | µg/g dw | 5.59 | 6.1 | 9% | 3.55 | 3.88 | 9% | 4.67 | 4.76 | 2% | 9.21 | 8.93 | 3% | 3.9 | 3.79 | 3% | 7.34 | 7.89 | 7% |
| Silver (Ag) | µg/g dw | 0.0212 | 0.0207 | 2% | 0.00631 | 0.00629 | 0% | 0.00345 | 0.00401 | 15% | 0.086 | 0.083 | 4% | 0.0291 | 0.0289 | 1% | 0.00329 | 0.0034 | 3% |
| Sodium (Na) | µg/g dw | 1,920 | 1,940 | 1% | 1,650 | 1,640 | 1% | 13,000 | 12,500 | 4% | 1,950 | 1,970 | 1% | 1,490 | 1,460 | 2% | 1,930 | 1,980 | 3% |
| Strontium (Sr) | µg/g dw | 0.45 | 0.434 | 4% | 0.218 | 0.219 | 0% | 1.86 | 1.71 | 8% | 0.344 | 0.349 | 1% | 0.279 | 0.271 | 3% | 0.81 | 0.289 | 95% |
| Thallium (Tl) | µg/g dw | 0.00625 | 0.006 | 4% | 0.00806 | 0.00743 | 8% | 0.0189 | 0.0174 | 8% | 0.00825 | 0.00781 | 5% | 0.00961 | 0.0101 | 5% | 0.0218 | 0.0215 | 1% |
| Thorium (Th) | µg/g dw | 0.000587 | 0.000432 | 30% | 0.000438 | 0.000641 | 38% | 0.0002 | 0.000345 | 53% | 0.000491 | 0.000745 | 41% | 0.000352 | 0.000156 | 77% | 0.000267 | 0.000299 | 11% |
| Tin (Sn) | µg/g dw | 0.00072 | <0.0120 | 177% | 0.0011 | 0.00161 | 38% | <0.0120 | 0.00085 | 174% | 0.00114 | 0.00249 | 74% | <0.0067 | <0.0079 | 16% | 0.00116 | 0.00142 | 20% |
| Titanium (Ti) | µg/g dw | 0.096 | 0.083 | 15% | 0.074 | 0.103 | 33% | 0.085 | 0.096 | 12% | 0.082 | 0.14 | 52% | 0.0648 | 0.0726 | 11% | 0.0985 | 0.0765 | 25% |
| Uranium (U) | µg/g dw | 0.00168 | 0.0018 | 7% | 0.00222 | 0.00295 | 28% | 0.00082 | 0.0008 | 2% | 0.00227 | 0.00227 | 0% | 0.00093 | 0.00095 | 2% | 0.0006 | 0.00051 | 16% |
| Vanadium (V) | µg/g dw | 0.00674 | 0.00561 | 18% | 0.0435 | 0.0524 | 19% | 0.061 | 0.0581 | 5% | 0.00773 | 0.0132 | 52% | 0.00474 | 0.00432 | 9% | 0.0149 | 0.0167 | 11% |
| Yttrium (Y) | µg/g dw | 0.00757 | 0.0074 | 2% | 0.00217 | 0.00242 | 11% | 0.00196 | 0.00162 | 19% | 0.00947 | 0.0106 | 11% | 0.00285 | 0.00235 | 19% | 0.00183 | 0.0016 | 13% |
| Zinc (Zn) | µg/g dw | 154 | 137 | 12% | 154 | 155 | 1% | 77.1 | 76.3 | 1% | 98.9 | 131 | 28% | 71.4 | 73.9 | 3% | 126 | 127 | 1% |
| Zirconium (Zr) | µg/g dw | 0.00529 | 0.00445 | 17% | 0.0056 | 0.00535 | 5% | 0.0032 | 0.0032 | 0% | 0.0065 | 0.00841 | 26% | 0.00206 | 0.00252 | 20% | 0.0109 | 0.0116 | 6% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD) or relative standard deviation (RSD).

## Table A.18c: Laboratory Duplicate Results for Fish Ovary Samples, 2016

| Analyte | Unit | SC-YP-10 O rep 1 | SC-YP-10 O rep 2 | RPD | SC-CSU-08 O rep 1 | SC-CSU-08 O rep 2 | RPD | SC-NSC-09 O rep 1 | SC-NSC-09 O rep 2 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | µg/g dw | - | 1.3 | - | - | 1.22 | - | - | 6.27 | - |
| Antimony (Sb) | µg/g dw | 0.00089 | 0.00077 | 14% | 0.0025 | 0.00271 | 8% | 0.00099 | 0.00097 | 2% |
| Arsenic (As) | µg/g dw | 0.06 | 0.0587 | 2% | 0.0798 | 0.0789 | 1% | 0.141 | 0.148 | 5% |
| Barium (Ba) | µg/g dw | 0.227 | 0.16 | 35% | 0.362 | 0.388 | 7% | 0.234 | 0.227 | 3% |
| Beryllium (Be) | µg/g dw | <0.0025 | <0.0026 | 4% | <0.0026 | <0.0026 | 0% | <0.0035 | <0.0035 | 0% |
| Bismuth (Bi) | µg/g dw | 0.000608 | 0.00059 | 3% | 0.00251 | 0.00267 | 6% | 0.000395 | 0.000563 | 35% |
| Boron (B) | µg/g dw | <0.1700 | <0.1700 | 0% | 0.2 | 0.33 | 49% | 0.136 | 0.089 | 42% |
| Cadmium (Cd) | µg/g dw | 0.0017 | 0.002 | 16% | 0.0119 | 0.0103 | 14% | 0.0238 | 0.0215 | 10% |
| Calcium (Ca) | µg/g dw | 1,850 | 903 | 69% | 629 | 609 | 3% | 899 | 824 | 9% |
| Cesium (Cs) | µg/g dw | 0.0455 | 0.0475 | 4% | 0.0116 | 0.0112 | 4% | 0.0718 | 0.0667 | 7% |
| Chromium (Cr) | µg/g dw | 0.0561 | 0.0671 | 18% | 0.0593 | 0.0651 | 9% | 0.0881 | 0.113 | 25% |
| Cobalt (Co) | µg/g dw | 0.1 | 0.0985 | 2% | 0.105 | 0.105 | 0% | 0.036 | 0.0341 | 5% |
| Copper (Cu) | µg/g dw | 2.64 | 2.7 | 2% | 4.98 | 4.77 | 4% | 2.39 | 2.24 | 6% |
| Gallium (Ga) | µg/g dw | 0.00558 | 0.00471 | 17% | 0.00834 | 0.0077 | 8% | 0.0087 | 0.0083 | 5% |
| Iron (Fe) | µg/g dw | 33.2 | 32.7 | 2% | 51.9 | 54.7 | 5% | 202 | 215 | 6% |
| Lead (Pb) | µg/g dw | 0.00662 | 0.00659 | 0% | 0.00843 | 0.00852 | 1% | 0.00711 | 0.0079 | 11% |
| Lithium (Li) | µg/g dw | 0.2 | 0.206 | 3% | <0.0070 | <0.0071 | 1% | 0.0112 | 0.0132 | 16% |
| Magnesium (Mg) | µg/g dw | 1,180 | 1,160 | 2% | 834 | 827 | 1% | 694 | 642 | 8% |
| Manganese (Mn) | µg/g dw | 3.3 | 3.18 | 4% | 26.1 | 26 | 0% | 2.51 | 2.39 | 5% |
| Mercury (Hg) | µg/g dw | 0.0147 | 0.0157 | 7% | 0.0205 | 0.0208 | 1% | 0.0578 | 0.0566 | 2% |
| Molybdenum (Mo) | µg/g dw | 0.0409 | 0.044 | 7% | 0.0876 | 0.0871 | 1% | 0.104 | 0.101 | 3% |
| Nickel (Ni) | µg/g dw | 0.0193 | 0.0168 | 14% | 0.0289 | 0.0287 | 1% | 0.0242 | 0.023 | 5% |
| Phosphorus (P) | µg/g dw | 8,980 | 8,670 | 4% | 11,200 | 10,500 | 6% | 9,140 | 8,410 | 8% |
| Potassium (K) | µg/g dw | 7,620 | 7,750 | 2% | 7,590 | 7,200 | 5% | 10,200 | 9,490 | 7% |
| Rhenium (Re) | µg/g dw | <0.0001 | <0.0001 | 1% | <0.0001 | <0.0001 | 2% | <0.0002 | <0.0002 | 0% |
| Rubidium (Rb) | µg/g dw | 17.7 | 17.7 | 0% | 5.54 | 5.53 | 0% | 13.6 | 12.7 | 7% |
| Selenium (Se) | µg/g dw | 2.05 | 2.14 | 4% | 2.66 | 2.62 | 2% | 17.8 | 17.4 | 2% |
| Silver (Ag) | µg/g dw | 0.00257 | 0.00336 | 27% | 0.0329 | 0.0324 | 2% | 0.0047 | 0.00465 | 1% |
| Sodium (Na) | µg/g dw | 15,400 | 15,600 | 1% | 1,860 | 1,760 | 6% | 1,370 | 1,280 | 7% |
| Strontium (Sr) | µg/g dw | 2.03 | 1.49 | 31% | 0.358 | 0.373 | 4% | 0.293 | 0.282 | 4% |
| Thallium (Tl) | µg/g dw | 0.0437 | 0.0436 | 0% | 0.00322 | 0.00319 | 1% | 0.0227 | 0.0211 | 7% |
| Thorium (Th) | µg/g dw | 0.000709 | 0.000368 | 63% | 0.000677 | 0.000628 | 8% | 0.00147 | 0.0018 | 20% |
| Tin (Sn) | µg/g dw | <0.0075 | <0.0075 | 0% | 0.0009 | 0.00086 | 5% | 0.00136 | 0.00193 | 35% |
| Titanium (Ti) | µg/g dw | 0.121 | 0.0959 | 23% | 0.0674 | 0.0939 | 33% | 0.174 | 0.14 | 22% |
| Uranium (U) | µg/g dw | 0.00057 | 0.00044 | 26% | 0.00763 | 0.00707 | 8% | 0.0042 | 0.00421 | 0% |
| Vanadium (V) | µg/g dw | 0.0188 | 0.0163 | 14% | 0.00638 | 0.00721 | 12% | 0.0607 | 0.0638 | 5% |
| Yttrium (Y) | µg/g dw | 0.00207 | 0.00213 | 3% | 0.00882 | 0.00771 | 13% | 0.00904 | 0.00983 | 8% |
| Zinc (Zn) | µg/g dw | 71.5 | 74 | 3% | 95.2 | 99.4 | 4% | 183 | 172 | 6% |
| Zirconium (Zr) | µg/g dw | 0.00588 | 0.00349 | 51% | 0.00842 | 0.00746 | 12% | 0.0101 | 0.00701 | 36% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD) or relative standard deviation (RSD).

## **Table A.19:** Laboratory Duplicate Results for Peamouth Chub Whole Body Samples, 2014 to 2016

| Analyte | Units | 2014 | | | | | | | | | 2015 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SC-PC-01W Rep 1 | SC-PC-01W Rep 2 | RPD | GC-PC-16W Rep 1 | GC-PC-16W Rep 2 | RPD | ER-PC-23W Rep 1 | ER-PC-23W Rep 2 | RPD | SC-PCC-12-APR Rep 1 | SC-PCC-12-APR Rep 2 | RPD | ER-PCC-27-APR Rep 1 | ER-PCC-27-APR Rep 2 | RPD |
| Aluminum (Al) | µg/g dw | 44.4 | 23.4 | 62% | 17.2 | 16.4 | 5% | 20.4 | 20.7 | 1% | 212 | 170 | 22% | 5.95 | 5.29 | 12% |
| Antimony (Sb) | µg/g dw | 0.0045 | 0.0041 | 10% | 0.0018 | 0.0021 | 14% | 0.0034 | 0.0035 | 5% | 0.00395 | 0.00445 | 12% | 0.00286 | 0.00249 | 14% |
| Arsenic (As) | µg/g dw | 0.234 | 0.193 | 19% | 0.213 | 0.204 | 4% | 0.121 | 0.114 | 6% | 0.161 | 0.139 | 15% | 0.35 | 0.312 | 11% |
| Barium (Ba) | µg/g dw | 8.31 | 12.8 | 43% | 7.33 | 6.87 | 6% | 12.1 | 11.7 | 3% | 15 | 13.8 | 8% | 8.27 | 7.26 | 13% |
| Beryllium (Be) | µg/g dw | <0.0027 | <0.0025 | 8% | <0.0026 | <0.0023 | 12% | <0.0023 | <0.0025 | 8% | 0.0058 | 0.0033 | 55% | <0.0028 | <0.0025 | 11% |
| Bismuth (Bi) | µg/g dw | 0.0023 | 0.0018 | 26% | 0.0018 | 0.0019 | 6% | 0.0065 | 0.006 | 8% | 0.00393 | 0.00377 | 4% | 0.00129 | 0.00153 | 17% |
| Boron (B) | µg/g dw | 0.27 | 0.25 | 8% | 0.25 | 0.23 | 8% | 0.23 | 0.24 | 4% | 0.98 | 0.9 | 9% | <0.1700 | 0.16 | 6% |
| Cadmium (Cd) | µg/g dw | 0.106 | 0.086 | 21% | 0.092 | 0.088 | 3% | 0.098 | 0.102 | 4% | 0.181 | 0.177 | 2% | 0.156 | 0.165 | 6% |
| Calcium (Ca) | µg/g dw | 36,400 | 70,700 | 64% | 39,500 | 36,100 | 9% | 66,100 | 55,200 | 18% | 44,100 | 61,000 | 32% | 30,000 | 25,300 | 17% |
| Cesium (Cs) | µg/g dw | 0.0659 | 0.0571 | 14% | 0.0203 | 0.0201 | 1% | 0.0411 | 0.0424 | 3% | 0.0473 | 0.0434 | 9% | 0.0497 | 0.052 | 5% |
| Chromium (Cr) | µg/g dw | 0.112 | 0.092 | 19% | 0.098 | 0.099 | 1% | 0.1 | 0.104 | 4% | 0.335 | 0.308 | 8% | 0.217 | 0.151 | 36% |
| Cobalt (Co) | µg/g dw | 0.165 | 0.131 | 23% | 0.113 | 0.11 | 3% | 0.078 | 0.079 | 2% | 0.141 | 0.128 | 10% | 0.0661 | 0.0636 | 4% |
| Copper (Cu) | µg/g dw | 2.59 | 2.02 | 25% | 2.06 | 1.93 | 7% | 1.73 | 1.82 | 5% | 1.79 | 1.51 | 17% | 2.17 | 1.91 | 13% |
| Gallium (Ga) | µg/g dw | 0.036 | 0.045 | 22% | 0.03 | 0.03 | 1% | 0.046 | 0.041 | 12% | 0.074 | 0.0655 | 12% | 0.0113 | 0.0129 | 13% |
| Iron (Fe) | µg/g dw | 81.2 | 61 | 28% | 48.3 | 46 | 5% | 73.4 | 75.3 | 3% | 184 | 160 | 14% | 72.8 | 74.2 | 2% |
| Lead (Pb) | µg/g dw | 0.135 | 0.15 | 11% | 0.03 | 0.029 | 2% | 0.108 | 0.1 | 8% | 0.253 | 0.23 | 10% | 0.165 | 0.209 | 24% |
| Lithium (Li) | µg/g dw | 0.077 | 0.09 | 16% | 0.074 | 0.057 | 26% | 0.11 | 0.113 | 3% | 0.28 | 0.3 | 7% | 0.101 | 0.0911 | 10% |
| Magnesium (Mg) | µg/g dw | 2,070 | 2,260 | 9% | 1,900 | 1,770 | 7% | 1,690 | 1,620 | 4% | 1,550 | 1,740 | 12% | 1,360 | 1,320 | 3% |
| Manganese (Mn) | µg/g dw | 7.03 | 10 | 35% | 7 | 6.3 | 11% | 10.3 | 9.27 | 11% | 8.96 | 9.56 | 6% | 6.37 | 6.37 | 0% |
| Mercury (Hg) | µg/g dw | 0.514 | 0.423 | 19% | 0.182 | 0.176 | 3% | 0.334 | 0.348 | 4% | 0.681 | 0.7 | 3% | 0.779 | 0.807 | 4% |
| Molybdenum (Mo) | µg/g dw | 0.04 | 0.037 | 8% | 0.031 | 0.029 | 6% | 0.042 | 0.044 | 5% | 0.0426 | 0.0437 | 3% | 0.0535 | 0.0563 | 5% |
| Nickel (Ni) | µg/g dw | 0.213 | 0.329 | 43% | 0.203 | 0.184 | 10% | 0.343 | 0.302 | 13% | 0.277 | 0.303 | 9% | 0.163 | 0.121 | 30% |
| Phosphorus (P) | µg/g dw | 27,200 | 43,400 | 46% | 29,200 | 26,800 | 9% | 42,700 | 37,100 | 14% | 30,700 | 38,700 | 23% | 24,600 | 23,100 | 6% |
| Potassium (K) | µg/g dw | 12,700 | 11,500 | 10% | 13,400 | 12,500 | 7% | 14,400 | 14,500 | 1% | 13,500 | 13,500 | 0% | 16,200 | 16,300 | 1% |
| Rhenium (Re) | µg/g dw | <0.000059 | <0.000054 | 9% | <0.000055 | <0.000050 | 10% | <0.000135 | <0.000090 | 40% | 0.000056 | <0.00005 | 11% | <0.00005 | <0.00005 | 10% |
| Rubidium (Rb) | µg/g dw | 10.6 | 9.32 | 13% | 11.3 | 11 | 3% | 10.8 | 11.2 | 4% | 11.7 | 11.8 | 1% | 11.4 | 11.6 | 2% |
| Selenium (Se) | µg/g dw | 1.5 | 1.4 | 13% | 1.8 | 1.8 | 2% | 1.4 | 1.5 | 4% | 3.19 | 3.21 | 1% | 2.62 | 2.99 | 13% |
| Silver (Ag) | µg/g dw | 0.0058 | 0.0041 | 35% | 0.0058 | 0.0056 | 4% | 0.003 | 0.0027 | 12% | 0.0025 | 0.00194 | 25% | 0.00192 | 0.00275 | 36% |
| Sodium (Na) | µg/g dw | 3,370 | 3,590 | 6% | 2,990 | 2,800 | 7% | 4,080 | 4,110 | 1% | 4,220 | 4,450 | 5% | 4,080 | 4,000 | 2% |
| Strontium (Sr) | µg/g dw | 50.8 | 98 | 63% | 48.7 | 45 | 8% | 91.4 | 79 | 15% | 57.7 | 75 | 26% | 37.9 | 31.7 | 18% |
| Thallium (Tl) | µg/g dw | 0.0207 | 0.0195 | 6% | 0.0178 | 0.0171 | 4% | 0.00836 | 0.00855 | 2% | 0.0144 | 0.0139 | 4% | 0.0119 | 0.0115 | 3% |
| Thorium (Th) | µg/g dw | 0.0083 | 0.005 | 49% | 0.0044 | 0.0065 | 40% | 0.0037 | 0.004 | 6% | 0.0383 | 0.0332 | 14% | 0.000763 | 0.000946 | 21% |
| Tin (Sn) | µg/g dw | 0.0532 | 0.0488 | 9% | 0.0041 | 0.0038 | 7% | 0.0072 | 0.0067 | 8% | 0.00993 | 0.0077 | 25% | 0.00387 | 0.00451 | 15% |
| Titanium (Ti) | µg/g dw | 0.746 | 0.49 | 41% | 0.463 | 0.481 | 4% | 0.447 | 0.473 | 6% | 3.49 | 2.79 | 22% | 0.185 | 0.195 | 5% |
| Uranium (U) | µg/g dw | 0.0105 | 0.0161 | 42% | 0.005 | 0.0047 | 7% | 0.0175 | 0.0175 | 0% | 0.018 | 0.0196 | 9% | 0.00556 | 0.00509 | 9% |
| Vanadium (V) | µg/g dw | 0.084 | 0.074 | 13% | 0.063 | 0.057 | 10% | 0.08 | 0.079 | 1% | 0.301 | 0.263 | 13% | 0.0398 | 0.0422 | 6% |
| Yttrium (Y) | µg/g dw | 0.0154 | 0.0102 | 41% | 0.019 | 0.0181 | 5% | 0.0159 | 0.0139 | 13% | 0.0768 | 0.0643 | 18% | 0.0294 | 0.0258 | 13% |
| Zinc (Zn) | µg/g dw | 107 | 92.9 | 14% | 66 | 63 | 6% | 108 | 113 | 5% | 136 | 94.4 | 36% | 122 | 110 | 10% |
| Zirconium (Zr) | µg/g dw | 0.095 | 0.068 | 33% | 0.111 | 0.099 | 12% | 0.068 | 0.058 | 15% | 0.296 | 0.235 | 23% | 0.334 | 0.274 | 20% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

**Table A.19:** **Laboratory Duplicate Results for Peamouth Chub Whole Body Samples, 2014 to 2016**

| Analyte | Units | 2016 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ER-PCC-13 WB rep 1 | ER-PCC-13 WB rep 2 | RPD | GC-PCC-27 WB A rep 1 | GC-PCC-27 WB A rep 2 | RPD | ER-RSC-01 WB rep 1 | ER-RSC-01 WB rep 2 | RPD | SC-RSC-18 WB rep 1 | SC-RSC-18 WB rep 2 | RPD |
| Aluminum (Al) | µg/g dw | 24 | 21.3 | 12% | 17.1 | 11 | 43% | 63.3 | 63.4 | 0% | 71.6 | 67 | 7% |
| Antimony (Sb) | µg/g dw | 0.00204 | 0.00216 | 6% | 0.00145 | 0.00207 | 35% | 0.00323 | 0.00256 | 23% | 0.00263 | 0.00321 | 20% |
| Arsenic (As) | µg/g dw | 0.161 | 0.187 | 15% | 0.355 | 0.332 | 7% | 0.218 | 0.228 | 4% | 0.4 | 0.444 | 10% |
| Barium (Ba) | µg/g dw | 10.2 | 12.9 | 23% | 8.04 | 8.89 | 10% | 5.67 | 5.42 | 5% | 7.53 | 6.29 | 18% |
| Beryllium (Be) | µg/g dw | 0.0032 | <0.0031 | 3% | <0.0027 | <0.0030 | 11% | <0.0033 | <0.0034 | 3% | <0.0033 | 0.0035 | 6% |
| Bismuth (Bi) | µg/g dw | 0.00124 | 0.00138 | 11% | 0.00254 | 0.00257 | 1% | 0.000934 | 0.00106 | 13% | 0.00238 | 0.00254 | 7% |
| Boron (B) | µg/g dw | 0.421 | 0.42 | 0% | 0.143 | 0.318 | 76% | 0.755 | 0.842 | 11% | 0.183 | 0.204 | 11% |
| Cadmium (Cd) | µg/g dw | 0.0466 | 0.0469 | 1% | 0.0662 | 0.0804 | 19% | 0.0551 | 0.0551 | 0% | 0.0915 | 0.106 | 15% |
| Calcium (Ca) | µg/g dw | 48800 | 66700 | 31% | 25500 | 38100 | 40% | 36500 | 35700 | 2% | 58900 | 41800 | 34% |
| Cesium (Cs) | µg/g dw | 0.0608 | 0.067 | 10% | 0.0386 | 0.0345 | 11% | 0.0736 | 0.0741 | 1% | 0.0622 | 0.0665 | 7% |
| Chromium (Cr) | µg/g dw | 0.312 | 0.125 | 86% | 0.137 | 0.147 | 7% | 0.176 | 0.161 | 9% | 0.152 | 0.156 | 3% |
| Cobalt (Co) | µg/g dw | 0.0616 | 0.0656 | 6% | 0.0853 | 0.0993 | 15% | 0.0737 | 0.0733 | 1% | 0.199 | 0.214 | 7% |
| Copper (Cu) | µg/g dw | 2.22 | 2.21 | 0% | 2.01 | 1.87 | 7% | 1.62 | 1.69 | 4% | 2.38 | 2.75 | 14% |
| Gallium (Ga) | µg/g dw | 0.0282 | 0.0279 | 1% | 0.0176 | 0.0166 | 6% | 0.0319 | 0.032 | 0% | 0.0402 | 0.034 | 17% |
| Iron (Fe) | µg/g dw | 56.4 | 60.2 | 7% | 60.9 | 55 | 10% | 82.1 | 85.6 | 4% | 90.6 | 97 | 7% |
| Lead (Pb) | µg/g dw | 0.119 | 0.0853 | 33% | 0.0537 | 0.0557 | 4% | 0.0972 | 0.0917 | 6% | 0.0569 | 0.0529 | 7% |
| Lithium (Li) | µg/g dw | 0.0738 | 0.1 | 30% | 0.0571 | 0.0717 | 23% | 0.109 | 0.118 | 8% | 0.135 | 0.124 | 8% |
| Magnesium (Mg) | µg/g dw | 1,580 | 1,970 | 22% | 1,290 | 1,390 | 7% | 1,430 | 1,380 | 4% | 1,520 | 1,400 | 8% |
| Manganese (Mn) | µg/g dw | 6.26 | 8.76 | 33% | 3.77 | 4.65 | 21% | 9.46 | 9.39 | 1% | 13.1 | 10.6 | 21% |
| Mercury (Hg) | µg/g dw | 0.186 | 0.201 | 8% | 0.187 | 0.162 | 14% | 0.192 | 0.2 | 4% | 0.193 | 0.212 | 9% |
| Molybdenum (Mo) | µg/g dw | 0.0407 | 0.0347 | 16% | 0.0315 | 0.0327 | 4% | 0.0446 | 0.0447 | 0% | 0.0513 | 0.0518 | 1% |
| Nickel (Ni) | µg/g dw | 0.394 | 0.345 | 13% | 0.203 | 0.225 | 10% | 0.151 | 0.149 | 1% | 0.208 | 0.176 | 17% |
| Phosphorus (P) | µg/g dw | 34,200 | 45,000 | 27% | 22,000 | 27,700 | 23% | 25,700 | 25,000 | 3% | 36,000 | 28,600 | 23% |
| Potassium (K) | µg/g dw | 12,300 | 13,500 | 9% | 11,500 | 11,200 | 3% | 12,800 | 12,400 | 3% | 11,100 | 12,000 | 8% |
| Rhenium (Re) | µg/g dw | <0.00005 | <0.00005 | 8% | <0.00004 | <0.00005 | 11% | <0.0002 | <0.0002 | 6% | <0.0002 | <0.0002 | 0% |
| Rubidium (Rb) | µg/g dw | 11.5 | 12.5 | 8% | 8.45 | 7.84 | 7% | 11.2 | 11.1 | 1% | 8.43 | 9.02 | 7% |
| Selenium (Se) | µg/g dw | 2.76 | 3.4 | 21% | 3.82 | 3.56 | 7% | 2.15 | 2.07 | 4% | 3.25 | 3.61 | 10% |
| Silver (Ag) | µg/g dw | 0.00541 | 0.00572 | 6% | 0.00507 | 0.00474 | 7% | 0.00219 | 0.00198 | 10% | 0.00345 | 0.00361 | 5% |
| Sodium (Na) | µg/g dw | 3,480 | 3,890 | 11% | 2,620 | 2,630 | 0% | 3,090 | 3,020 | 2% | 2,890 | 2,880 | 0% |
| Strontium (Sr) | µg/g dw | 62.9 | 81.8 | 26% | 32.3 | 44.6 | 32% | 45.8 | 44.9 | 2% | 70.1 | 49.8 | 34% |
| Thallium (Tl) | µg/g dw | 0.0297 | 0.0342 | 14% | 0.0269 | 0.0281 | 4% | 0.0134 | 0.0148 | 10% | 0.0176 | 0.0177 | 1% |
| Thorium (Th) | µg/g dw | 0.00405 | 0.00422 | 4% | 0.00317 | 0.00267 | 17% | 0.0112 | 0.0117 | 4% | 0.0146 | 0.0155 | 6% |
| Tin (Sn) | µg/g dw | 0.0033 | 0.0036 | 9% | 0.0028 | 0.0021 | 29% | 0.00501 | 0.00561 | 11% | 0.00431 | 0.00534 | 21% |
| Titanium (Ti) | µg/g dw | 0.649 | 0.567 | 13% | 0.375 | 0.3 | 22% | 1.15 | 1.06 | 8% | 1.12 | 1.12 | 0% |
| Uranium (U) | µg/g dw | 0.0067 | 0.00733 | 9% | 0.00522 | 0.00586 | 12% | 0.00469 | 0.00493 | 5% | 0.00653 | 0.00574 | 13% |
| Vanadium (V) | µg/g dw | 0.0785 | 0.0876 | 11% | 0.0489 | 0.0545 | 11% | 0.128 | 0.128 | 0% | 0.0932 | 0.0928 | 0% |
| Yttrium (Y) | µg/g dw | 0.026 | 0.0182 | 35% | 0.0126 | 0.0101 | 22% | 0.0269 | 0.0303 | 12% | 0.0383 | 0.0388 | 1% |
| Zinc (Zn) | µg/g dw | 118 | 128 | 8% | 76.7 | 76.7 | 0% | 108 | 110 | 2% | 126 | 125 | 1% |
| Zirconium (Zr) | µg/g dw | 0.129 | 0.105 | 21% | 0.0982 | 0.101 | 3% | 0.0825 | 0.0801 | 3% | 0.143 | 0.13 | 10% |

Note: Highlighted values did not meet the data quality objective of ≤30% relative percent difference (RPD).

## Table A.20a: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2014

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Aluminum (Al) | µg/g dw | - | 1.2 (0.7 - 1.7) | 1.3 | Yes | - | 104% | 01B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.4 | Yes | - | 113% | 03B SRM 1577 (Set 18) |
| | | - | 1.2 (0.7 - 1.7) | 1.3 | Yes | - | 106% | 03B SRM 1577 (Set 19) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 102% | 05B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.4 | Yes | - | 113% | 06B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.1 | Yes | - | 94% | 07B SRM 1577 (Set 18) |
| | | - | 1.2 (0.7 - 1.7) | 1.4 | Yes | - | 113% | 07B SRM 1577 (Set 19) |
| | | - | 1.2 (0.7 - 1.7) | 1.3 | Yes | - | 105% | 09B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.5 | Yes | - | 123% | 11B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 97% | 13B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 96% | 15B SRM 1577 |
| | | - | 200 | 74 | - | - | 37% | 02B CRM DOLT-4 |
| | | - | 200 | 99 | - | - | 50% | 04B CRM DOLT-4 (Set 18) |
| | | - | 200 | 53 | - | - | 27% | 04B CRM DOLT-4 (Set 19) |
| | | - | 200 | 58 | - | - | 29% | 06B CRM DOLT-4 |
| | | - | 200 | 86 | - | - | 43% | 08B CRM DOLT-4 (Set 18) |
| | | - | 200 | 57 | - | - | 29% | 08B CRM DOLT-4 (Set 19) |
| | | - | 200 | 46 | - | - | 23% | 10B CRM DOLT-4 |
| | | - | 200 | 57 | - | - | 28% | 12B CRM DOLT-4 |
| | | - | 200 | 46 | - | - | 23% | 14B CRM DOLT-4 |
| | | - | 200 | 67 | - | - | 34% | 16B CRM DOLT-4 |
| Antimony (Sb) | µg/g dw | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 76% | 01B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.011 | Yes | - | 117% | 03B SRM 1577 (Set 18) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 77% | 03B SRM 1577 (Set 19) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 74% | 05B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.009 | Yes | - | 98% | 06B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 70% | 07B SRM 1577 (Set 18) |
| | | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 64% | 07B SRM 1577 (Set 19) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 83% | 09B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 74% | 11B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.009 | Yes | - | 99% | 13B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.014 | Yes | - | 157% | 15B SRM 1577 |
| | | - | - | 0.018 | - | - | - | 02B CRM DOLT-4 |
| | | - | - | 0.011 | - | - | - | 04B CRM DOLT-4 (Set 18) |
| | | - | - | 0.011 | - | - | - | 04B CRM DOLT-4 (Set 19) |
| | | - | - | 0.012 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 0.010 | - | - | - | 08B CRM DOLT-4 (Set 18) |
| | | - | - | 0.016 | - | - | - | 08B CRM DOLT-4 (Set 19) |
| | | - | - | 0.013 | - | - | - | 10B CRM DOLT-4 |
| | | - | - | 0.013 | - | - | - | 12B CRM DOLT-4 |
| | | - | - | 0.014 | - | - | - | 14B CRM DOLT-4 |
| | | - | - | 0.011 | - | - | - | 16B CRM DOLT-4 |
| Arsenic (As) | µg/g dw | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.051 | Yes | 93% | 95% | 01B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.055 | Yes | 100% | 102% | 03B SRM 1577 (Set 18) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.047 | No | 85% | 86% | 03B SRM 1577 (Set 19) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.056 | Yes | 102% | 104% | 05B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.059 | Yes | 107% | 109% | 06B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.058 | Yes | 106% | 108% | 07B SRM 1577 (Set 18) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.049 | No | 90% | 91% | 07B SRM 1577 (Set 19) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.047 | No | 86% | 88% | 09B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.054 | Yes | 97% | 99% | 11B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.068 | No | 124% | 126% | 13B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.076 | No | 138% | 141% | 15B SRM 1577 |
| | | 9.66 (9.04 - 10.28) | - | 8.3 | No | 85% | - | 02B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.3 | No | 86% | - | 04B CRM DOLT-4 (Set 18) |
| | | 9.66 (9.04 - 10.28) | - | 7.7 | No | 80% | - | 04B CRM DOLT-4 (Set 19) |
| | | 9.66 (9.04 - 10.28) | - | 8.3 | No | 86% | - | 06B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.3 | No | 86% | - | 08B CRM DOLT-4 (Set 18) |
| | | 9.66 (9.04 - 10.28) | - | 8.1 | No | 84% | - | 08B CRM DOLT-4 (Set 19) |
| | | 9.66 (9.04 - 10.28) | - | 8.4 | No | 87% | - | 10B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.1 | No | 84% | - | 12B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 9.3 | Yes | 96% | - | 14B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.4 | No | 87% | - | 16B CRM DOLT-4 |
| Cadmium (Cd) | µg/g dw | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 111% | 106% | 01B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.29 | Yes | 106% | 101% | 03B SRM 1577 (Set 18) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 110% | 105% | 03B SRM 1577 (Set 19) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.29 | Yes | 106% | 101% | 05B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.36 | No | 132% | 126% | 06B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.28 | Yes | 105% | 100% | 07B SRM 1577 (Set 18) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.29 | Yes | 109% | 104% | 07B SRM 1577 (Set 19) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 110% | 105% | 09B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 111% | 106% | 11B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.34 | No | 124% | 118% | 13B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.34 | No | 126% | 120% | 15B SRM 1577 |
| | | 24.3 (23.5 - 25.1) | - | 22.0 | No | 91% | - | 02B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 22.6 | No | 93% | - | 04B CRM DOLT-4 (Set 18) |
| | | 24.3 (23.5 - 25.1) | - | 21.3 | No | 88% | - | 04B CRM DOLT-4 (Set 19) |
| | | 24.3 (23.5 - 25.1) | - | 21.6 | No | 89% | - | 06B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 21.2 | No | 87% | - | 08B CRM DOLT-4 (Set 18) |
| | | 24.3 (23.5 - 25.1) | - | 21.6 | No | 89% | - | 08B CRM DOLT-4 (Set 19) |
| | | 24.3 (23.5 - 25.1) | - | 21.9 | No | 90% | - | 10B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 21.6 | No | 89% | - | 12B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 24.1 | Yes | 99% | - | 14B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 22.1 | No | 91% | - | 16B CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

**Table A.20a: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2014**

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Calcium (Ca) | µg/g dw | 124 (118 - 130) | 121 (107 - 135) | 123 | Yes | 99% | 102% | 01B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 125 | Yes | 101% | 103% | 03B SRM 1577 (Set 18) |
| | | 124 (118 - 130) | 121 (107 - 135) | 132 | Yes | 106% | 109% | 03B SRM 1577 (Set 19) |
| | | 124 (118 - 130) | 121 (107 - 135) | 124 | Yes | 100% | 102% | 05B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 149 | Yes | 120% | 123% | 06B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 116 | No | 94% | 96% | 07B SRM 1577 (Set 18) |
| | | 124 (118 - 130) | 121 (107 - 135) | 121 | Yes | 98% | 100% | 07B SRM 1577 (Set 19) |
| | | 124 (118 - 130) | 121 (107 - 135) | 121 | Yes | 98% | 100% | 09B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 126 | Yes | 102% | 104% | 11B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 122 | Yes | 98% | 101% | 13B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 130 | Yes | 105% | 107% | 15B SRM 1577 |
| | | - | 680 | 632 | - | - | 93% | 02B CRM DOLT-4 |
| | | - | 680 | 710 | - | - | 104% | 04B CRM DOLT-4 (Set 18) |
| | | - | 680 | 665 | - | - | 98% | 04B CRM DOLT-4 (Set 19) |
| | | - | 680 | 638 | - | - | 94% | 06B CRM DOLT-4 |
| | | - | 680 | 657 | - | - | 97% | 08B CRM DOLT-4 (Set 18) |
| | | - | 680 | 660 | - | - | 97% | 08B CRM DOLT-4 (Set 19) |
| | | - | 680 | 645 | - | - | 95% | 10B CRM DOLT-4 |
| | | - | 680 | 629 | - | - | 93% | 12B CRM DOLT-4 |
| | | - | 680 | 628 | - | - | 92% | 14B CRM DOLT-4 |
| | | - | 680 | 671 | - | - | 99% | 16B CRM DOLT-4 |
| Cesium (Cs) | µg/g dw | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 83% | 01B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 87% | 03B SRM 1577 (Set 18) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 83% | 03B SRM 1577 (Set 19) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 83% | 05B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.015 | Yes | - | 102% | 06B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 83% | 07B SRM 1577 (Set 18) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 82% | 07B SRM 1577 (Set 19) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 85% | 09B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 82% | 11B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 82% | 13B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 86% | 15B SRM 1577 |
| | | - | - | 0.098 | - | - | - | 02B CRM DOLT-4 |
| | | - | - | 0.106 | - | - | - | 04B CRM DOLT-4 (Set 18) |
| | | - | - | 0.103 | - | - | - | 04B CRM DOLT-4 (Set 19) |
| | | - | - | 0.099 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 0.098 | - | - | - | 08B CRM DOLT-4 (Set 18) |
| | | - | - | 0.098 | - | - | - | 08B CRM DOLT-4 (Set 19) |
| | | - | - | 0.098 | - | - | - | 10B CRM DOLT-4 |
| | | - | - | 0.098 | - | - | - | 12B CRM DOLT-4 |
| | | - | - | 0.093 | - | - | - | 14B CRM DOLT-4 |
| | | - | - | 0.096 | - | - | - | 16B CRM DOLT-4 |
| Chromium (Cr) | µg/g dw | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.23 | No | 260% | 208% | 01B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.13 | No | 142% | 114% | 03B SRM 1577 (Set 18) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.18 | No | 207% | 165% | 03B SRM 1577 (Set 19) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.14 | No | 155% | 124% | 05B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.16 | No | 183% | 146% | 06B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.13 | No | 150% | 120% | 07B SRM 1577 (Set 18) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.11 | No | 126% | 101% | 07B SRM 1577 (Set 19) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.11 | No | 127% | 102% | 09B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.13 | No | 147% | 117% | 11B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.11 | No | 126% | 101% | 13B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.37 | No | 418% | 335% | 15B SRM 1577 |
| | | - | 1.40 | 1.36 | - | - | 97% | 02B CRM DOLT-4 |
| | | - | 1.40 | 1.24 | - | - | 89% | 04B CRM DOLT-4 (Set 18) |
| | | - | 1.40 | 1.19 | - | - | 85% | 04B CRM DOLT-4 (Set 19) |
| | | - | 1.40 | 1.09 | - | - | 78% | 06B CRM DOLT-4 |
| | | - | 1.40 | 1.17 | - | - | 84% | 08B CRM DOLT-4 (Set 18) |
| | | - | 1.40 | 1.10 | - | - | 79% | 08B CRM DOLT-4 (Set 19) |
| | | - | 1.40 | 1.07 | - | - | 76% | 10B CRM DOLT-4 |
| | | - | 1.40 | 1.31 | - | - | 94% | 12B CRM DOLT-4 |
| | | - | 1.40 | 1.09 | - | - | 78% | 14B CRM DOLT-4 |
| | | - | 1.40 | 1.10 | - | - | 79% | 16B CRM DOLT-4 |
| Cobalt (Co) | µg/g dw | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 113% | 01B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 110% | 03B SRM 1577 (Set 18) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 107% | 03B SRM 1577 (Set 19) |
| | | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 105% | 05B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.28 | No | - | 129% | 06B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 105% | 07B SRM 1577 (Set 18) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 109% | 07B SRM 1577 (Set 19) |
| | | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 106% | 09B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 113% | 11B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 111% | 13B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 115% | 15B SRM 1577 |
| | | - | 0.25 | 0.22 | - | - | 86% | 02B CRM DOLT-4 |
| | | - | 0.25 | 0.22 | - | - | 88% | 04B CRM DOLT-4 (Set 18) |
| | | - | 0.25 | 0.20 | - | - | 78% | 04B CRM DOLT-4 (Set 19) |
| | | - | 0.25 | 0.20 | - | - | 80% | 06B CRM DOLT-4 |
| | | - | 0.25 | 0.21 | - | - | 83% | 08B CRM DOLT-4 (Set 18) |
| | | - | 0.25 | 0.21 | - | - | 83% | 08B CRM DOLT-4 (Set 19) |
| | | - | 0.25 | 0.20 | - | - | 79% | 10B CRM DOLT-4 |
| | | - | 0.25 | 0.21 | - | - | 84% | 12B CRM DOLT-4 |
| | | - | 0.25 | 0.20 | - | - | 81% | 14B CRM DOLT-4 |
| | | - | 0.25 | 0.21 | - | - | 86% | 16B CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20a: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2014

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Copper (Cu) | µg/g dw | 193 (183 - 203) | 190 (180 - 200) | 177 | No | 92% | 93% | 01B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 172 | No | 89% | 91% | 03B SRM 1577 (Set 18) |
| | | 193 (183 - 203) | 190 (180 - 200) | 169 | No | 88% | 89% | 03B SRM 1577 (Set 19) |
| | | 193 (183 - 203) | 190 (180 - 200) | 172 | No | 89% | 91% | 05B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 207 | No | 107% | 109% | 06B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 165 | No | 85% | 87% | 07B SRM 1577 (Set 18) |
| | | 193 (183 - 203) | 190 (180 - 200) | 169 | No | 88% | 89% | 07B SRM 1577 (Set 19) |
| | | 193 (183 - 203) | 190 (180 - 200) | 174 | No | 90% | 92% | 09B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 178 | No | 92% | 94% | 11B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 180 | No | 93% | 95% | 13B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 187 | Yes | 97% | 98% | 15B SRM 1577 |
| | | 31.2 (30.1 - 32.3) | - | 27.9 | No | 89% | - | 02B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 27.4 | No | 88% | - | 04B CRM DOLT-4 (Set 18) |
| | | 31.2 (30.1 - 32.3) | - | 25.7 | No | 82% | - | 04B CRM DOLT-4 (Set 19) |
| | | 31.2 (30.1 - 32.3) | - | 26.9 | No | 86% | - | 06B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 26.3 | No | 84% | - | 08B CRM DOLT-4 (Set 18) |
| | | 31.2 (30.1 - 32.3) | - | 27.4 | No | 88% | - | 08B CRM DOLT-4 (Set 19) |
| | | 31.2 (30.1 - 32.3) | - | 28.0 | No | 90% | - | 10B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 27.8 | No | 89% | - | 12B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 28.9 | No | 93% | - | 14B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 28.1 | No | 90% | - | 16B CRM DOLT-4 |
| Iron (Fe) | µg/g dw | 268 (260 - 276) | 263 (241 - 285) | 273 | Yes | 102% | 104% | 01B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 266 | Yes | 99% | 101% | 03B SRM 1577 (Set 18) |
| | | 268 (260 - 276) | 263 (241 - 285) | 275 | Yes | 103% | 105% | 03B SRM 1577 (Set 19) |
| | | 268 (260 - 276) | 263 (241 - 285) | 259 | No | 97% | 98% | 05B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 335 | No | 125% | 127% | 06B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 253 | No | 94% | 96% | 07B SRM 1577 (Set 18) |
| | | 268 (260 - 276) | 263 (241 - 285) | 261 | Yes | 97% | 99% | 07B SRM 1577 (Set 19) |
| | | 268 (260 - 276) | 263 (241 - 285) | 268 | Yes | 100% | 102% | 09B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 270 | Yes | 101% | 103% | 11B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 264 | Yes | 99% | 100% | 13B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 278 | No | 104% | 106% | 15B SRM 1577 |
| | | 1,833 (1,758 - 1,908) | - | 1,790 | Yes | 98% | - | 02B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,810 | Yes | 99% | - | 04B CRM DOLT-4 (Set 18) |
| | | 1,833 (1,758 - 1,908) | - | 1,710 | No | 93% | - | 04B CRM DOLT-4 (Set 19) |
| | | 1,833 (1,758 - 1,908) | - | 1,660 | No | 91% | - | 06B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,670 | No | 91% | - | 08B CRM DOLT-4 (Set 18) |
| | | 1,833 (1,758 - 1,908) | - | 1,710 | No | 93% | - | 08B CRM DOLT-4 (Set 19) |
| | | 1,833 (1,758 - 1,908) | - | 1,730 | No | 94% | - | 10B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,720 | No | 94% | - | 12B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,670 | No | 91% | - | 14B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,730 | No | 94% | - | 16B CRM DOLT-4 |
| Lead (Pb) | µg/g dw | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.37 | Yes | 110% | 110% | 01B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.36 | Yes | 105% | 105% | 03B SRM 1577 (Set 18) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.33 | Yes | 97% | 97% | 03B SRM 1577 (Set 19) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.35 | Yes | 101% | 101% | 05B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.48 | No | 140% | 140% | 06B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.31 | Yes | 91% | 91% | 07B SRM 1577 (Set 18) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.34 | Yes | 100% | 100% | 07B SRM 1577 (Set 19) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.35 | Yes | 102% | 102% | 09B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.35 | Yes | 102% | 102% | 11B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.36 | Yes | 105% | 105% | 13B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.38 | Yes | 111% | 111% | 15B SRM 1577 |
| | | 0.16 (0.12 - 0.20) | - | 0.23 | Yes | 141% | - | 02B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.14 | Yes | 86% | - | 04B CRM DOLT-4 (Set 18) |
| | | 0.16 (0.12 - 0.20) | - | 0.12 | Yes | 73% | - | 04B CRM DOLT-4 (Set 19) |
| | | 0.16 (0.12 - 0.20) | - | 0.12 | Yes | 73% | - | 06B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.11 | No | 69% | - | 08B CRM DOLT-4 (Set 18) |
| | | 0.16 (0.12 - 0.20) | - | 0.15 | Yes | 94% | - | 08B CRM DOLT-4 (Set 19) |
| | | 0.16 (0.12 - 0.20) | - | 0.15 | Yes | 91% | - | 10B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.13 | Yes | 83% | - | 12B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.11 | No | 71% | - | 14B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.14 | Yes | 85% | - | 16B CRM DOLT-4 |
| Magnesium (Mg) | µg/g dw | 604 (595 - 613) | 608 (577 - 639) | 582 | No | 96% | 96% | 01B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 586 | No | 97% | 96% | 03B SRM 1577 (Set 18) |
| | | 604 (595 - 613) | 608 (577 - 639) | 612 | Yes | 101% | 101% | 03B SRM 1577 (Set 19) |
| | | 604 (595 - 613) | 608 (577 - 639) | 581 | No | 96% | 96% | 05B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 755 | No | 125% | 124% | 06B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 597 | Yes | 99% | 98% | 07B SRM 1577 (Set 18) |
| | | 604 (595 - 613) | 608 (577 - 639) | 588 | No | 97% | 97% | 07B SRM 1577 (Set 19) |
| | | 604 (595 - 613) | 608 (577 - 639) | 613 | Yes | 101% | 101% | 09B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 615 | No | 102% | 101% | 11B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 631 | No | 104% | 104% | 13B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 648 | No | 107% | 107% | 15B SRM 1577 |
| | | - | 1,500 | 1,290 | - | - | 86% | 02B CRM DOLT-4 |
| | | - | 1,500 | 1,340 | - | - | 89% | 04B CRM DOLT-4 (Set 18) |
| | | - | 1,500 | 1,310 | - | - | 87% | 04B CRM DOLT-4 (Set 19) |
| | | - | 1,500 | 1,260 | - | - | 84% | 06B CRM DOLT-4 |
| | | - | 1,500 | 1,290 | - | - | 86% | 08B CRM DOLT-4 (Set 18) |
| | | - | 1,500 | 1,300 | - | - | 87% | 08B CRM DOLT-4 (Set 19) |
| | | - | 1,500 | 1,360 | - | - | 91% | 10B CRM DOLT-4 |
| | | - | 1,500 | 1,340 | - | - | 89% | 12B CRM DOLT-4 |
| | | - | 1,500 | 1,380 | - | - | 92% | 14B CRM DOLT-4 |
| | | - | 1,500 | 1,340 | - | - | 89% | 16B CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20a: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2014

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Manganese (Mn) | µg/g dw | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.6 | Yes | 103% | 104% | 01B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.4 | Yes | 101% | 102% | 03B SRM 1577 (Set 18) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.8 | Yes | 105% | 106% | 03B SRM 1577 (Set 19) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 9.9 | Yes | 96% | 97% | 05B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 13.0 | No | 126% | 127% | 06B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 9.9 | Yes | 96% | 97% | 07B SRM 1577 (Set 18) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.2 | Yes | 99% | 100% | 07B SRM 1577 (Set 19) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.3 | Yes | 100% | 101% | 09B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.2 | Yes | 99% | 100% | 11B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 9.9 | Yes | 96% | 97% | 13B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.9 | Yes | 106% | 107% | 15B SRM 1577 |
| | | - | - | 9.9 | - | - | - | 02B CRM DOLT-4 |
| | | - | - | 10.4 | - | - | - | 04B CRM DOLT-4 (Set 18) |
| | | - | - | 9.5 | - | - | - | 04B CRM DOLT-4 (Set 19) |
| | | - | - | 9.1 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 9.1 | - | - | - | 08B CRM DOLT-4 (Set 18) |
| | | - | - | 9.4 | - | - | - | 08B CRM DOLT-4 (Set 19) |
| | | - | - | 9.2 | - | - | - | 10B CRM DOLT-4 |
| | | - | - | 9.4 | - | - | - | 12B CRM DOLT-4 |
| | | - | - | 8.8 | - | - | - | 14B CRM DOLT-4 |
| | | - | - | 9.4 | - | - | - | 16B CRM DOLT-4 |
| Mercury (Hg) | µg/g dw | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.020 | No | 128% | 128% | 01B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 136% | 136% | 03B SRM 1577 (Set 18) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.021 | No | 133% | 133% | 03B SRM 1577 (Set 19) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.023 | No | 143% | 143% | 05B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.026 | No | 159% | 159% | 06B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 138% | 138% | 07B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.019 | No | 118% | 118% | 09B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.020 | No | 126% | 126% | 11B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.005 | No | 33% | 33% | 13B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.011 | No | 69% | 69% | 15B SRM 1577 |
| | | 2.58 (2.36 - 2.80) | - | 2.37 | Yes | 92% | - | 02B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.52 | Yes | 98% | - | 04B CRM DOLT-4 (Set 18) |
| | | 2.58 (2.36 - 2.80) | - | 2.47 | Yes | 96% | - | 04B CRM DOLT-4 (Set 19) |
| | | 2.58 (2.36 - 2.80) | - | 2.45 | Yes | 95% | - | 06B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.44 | Yes | 95% | - | 08B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.43 | Yes | 94% | - | 10B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.49 | Yes | 97% | - | 12B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.41 | Yes | 93% | - | 14B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.44 | Yes | 95% | - | 16B CRM DOLT-4 |
| Molybdenum (Mo) | µg/g dw | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 113% | 01B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.7 | No | - | 117% | 03B SRM 1577 (Set 18) |
| | | - | 3.2 (2.8 - 3.6) | 3.5 | Yes | - | 110% | 03B SRM 1577 (Set 19) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 111% | 05B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 4.2 | No | - | 130% | 06B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 111% | 07B SRM 1577 (Set 18) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 112% | 07B SRM 1577 (Set 19) |
| | | - | 3.2 (2.8 - 3.6) | 3.5 | Yes | - | 110% | 09B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 113% | 11B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 112% | 13B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.8 | No | - | 118% | 15B SRM 1577 |
| | | - | 1.00 | 1.04 | - | - | 104% | 02B CRM DOLT-4 |
| | | - | 1.00 | 1.07 | - | - | 107% | 04B CRM DOLT-4 (Set 18) |
| | | - | 1.00 | 1.00 | - | - | 100% | 04B CRM DOLT-4 (Set 19) |
| | | - | 1.00 | 1.01 | - | - | 101% | 06B CRM DOLT-4 |
| | | - | 1.00 | 1.04 | - | - | 104% | 08B CRM DOLT-4 (Set 18) |
| | | - | 1.00 | 1.03 | - | - | 103% | 08B CRM DOLT-4 (Set 19) |
| | | - | 1.00 | 1.02 | - | - | 102% | 10B CRM DOLT-4 |
| | | - | 1.00 | 1.04 | - | - | 104% | 12B CRM DOLT-4 |
| | | - | 1.00 | 1.00 | - | - | 100% | 14B CRM DOLT-4 |
| | | - | 1.00 | 1.02 | - | - | 102% | 16B CRM DOLT-4 |
| Nickel (Ni) | µg/g dw | - | 0.18 (0.10 - 0.26) | 0.10 | Yes | - | 57% | 01B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 23% | 03B SRM 1577 (Set 18) |
| | | - | 0.18 (0.10 - 0.26) | 0.07 | No | - | 38% | 03B SRM 1577 (Set 19) |
| | | - | 0.18 (0.10 - 0.26) | 0.07 | No | - | 39% | 05B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.19 | Yes | - | 107% | 06B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 22% | 07B SRM 1577 (Set 18) |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 19% | 07B SRM 1577 (Set 19) |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 17% | 09B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 21% | 11B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 25% | 13B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.18 | Yes | - | 98% | 15B SRM 1577 |
| | | 0.97 (0.86 - 1.08) | - | 1.30 | No | 134% | - | 02B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.85 | No | 88% | - | 04B CRM DOLT-4 (Set 18) |
| | | 0.97 (0.86 - 1.08) | - | 0.80 | No | 83% | - | 04B CRM DOLT-4 (Set 19) |
| | | 0.97 (0.86 - 1.08) | - | 0.71 | No | 73% | - | 06B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.86 | Yes | 89% | - | 08B CRM DOLT-4 (Set 18) |
| | | 0.97 (0.86 - 1.08) | - | 0.74 | Yes | 76% | - | 08B CRM DOLT-4 (Set 19) |
| | | 0.97 (0.86 - 1.08) | - | 0.84 | No | 86% | - | 10B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.90 | Yes | 92% | - | 12B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.82 | No | 84% | - | 14B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.84 | No | 86% | - | 16B CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20a: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2014

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Phosphorus (P) | µg/g dw | - | 11,200 (10,100 - 12,300) | 11,700 | Yes | - | 104% | 01B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,300 | Yes | - | 101% | 03B SRM 1577 (Set 18) |
| | | - | 11,200 (10,100 - 12,300) | 11,400 | Yes | - | 102% | 03B SRM 1577 (Set 19) |
| | | - | 11,200 (10,100 - 12,300) | 11,400 | Yes | - | 102% | 05B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 15,200 | No | - | 136% | 06B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 12,100 | Yes | - | 108% | 07B SRM 1577 (Set 18) |
| | | - | 11,200 (10,100 - 12,300) | 11,000 | Yes | - | 98% | 07B SRM 1577 (Set 19) |
| | | - | 11,200 (10,100 - 12,300) | 11,400 | Yes | - | 102% | 09B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,900 | Yes | - | 106% | 11B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 13,300 | No | - | 119% | 13B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 13,800 | No | - | 123% | 15B SRM 1577 |
| | | - | - | 12,100 | - | - | - | 02B CRM DOLT-4 |
| | | - | - | 11,800 | - | - | - | 04B CRM DOLT-4 (Set 18) |
| | | - | - | 11,400 | - | - | - | 04B CRM DOLT-4 (Set 19) |
| | | - | - | 11,300 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 12,200 | - | - | - | 08B CRM DOLT-4 (Set 18) |
| | | - | - | 11,900 | - | - | - | 08B CRM DOLT-4 (Set 19) |
| | | - | - | 12,100 | - | - | - | 10B CRM DOLT-4 |
| | | - | - | 12,100 | - | - | - | 12B CRM DOLT-4 |
| | | - | - | 13,200 | - | - | - | 14B CRM DOLT-4 |
| | | - | - | 12,300 | - | - | - | 16B CRM DOLT-4 |
| Potassium (K) | µg/g dw | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,900 | No | 112% | 112% | 01B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,600 | No | 109% | 109% | 03B SRM 1577 (Set 18) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,600 | No | 109% | 109% | 03B SRM 1577 (Set 19) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,600 | No | 109% | 109% | 05B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 13,100 | No | 135% | 135% | 06B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,800 | No | 111% | 111% | 07B SRM 1577 (Set 18) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,600 | No | 109% | 109% | 07B SRM 1577 (Set 19) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,800 | No | 111% | 111% | 09B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,600 | No | 109% | 109% | 11B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,300 | Yes | 106% | 106% | 13B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,600 | No | 109% | 109% | 15B SRM 1577 |
| | | - | 9,800 | 9,180 | - | - | 94% | 02B CRM DOLT-4 |
| | | - | 9,800 | 9,520 | - | - | 97% | 04B CRM DOLT-4 (Set 18) |
| | | - | 9,800 | 9,590 | - | - | 98% | 04B CRM DOLT-4 (Set 19) |
| | | - | 9,800 | 8,950 | - | - | 91% | 06B CRM DOLT-4 |
| | | - | 9,800 | 9,570 | - | - | 98% | 08B CRM DOLT-4 (Set 18) |
| | | - | 9,800 | 9,760 | - | - | 100% | 08B CRM DOLT-4 (Set 19) |
| | | - | 9,800 | 10,000 | - | - | 102% | 10B CRM DOLT-4 |
| | | - | 9,800 | 9,160 | - | - | 93% | 12B CRM DOLT-4 |
| | | - | 9,800 | 9,270 | - | - | 95% | 14B CRM DOLT-4 |
| | | - | 9,800 | 9,300 | - | - | 95% | 16B CRM DOLT-4 |
| Rubidium (Rb) | µg/g dw | - | 18.3 (17.3 - 19.3) | 19.0 | Yes | - | 104% | 01B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.8 | Yes | - | 103% | 03B SRM 1577 (Set 18) |
| | | - | 18.3 (17.3 - 19.3) | 18.9 | Yes | - | 103% | 03B SRM 1577 (Set 19) |
| | | - | 18.3 (17.3 - 19.3) | 18.4 | Yes | - | 101% | 05B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 23.1 | No | - | 126% | 06B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.6 | Yes | - | 102% | 07B SRM 1577 (Set 18) |
| | | - | 18.3 (17.3 - 19.3) | 18.4 | Yes | - | 101% | 07B SRM 1577 (Set 19) |
| | | - | 18.3 (17.3 - 19.3) | 18.4 | Yes | - | 101% | 09B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.7 | Yes | - | 102% | 11B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.8 | Yes | - | 103% | 13B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 19.5 | No | - | 107% | 15B SRM 1577 |
| | | - | - | 3.2 | - | - | - | 02B CRM DOLT-4 |
| | | - | - | 3.2 | - | - | - | 04B CRM DOLT-4 (Set 18) |
| | | - | - | 3.1 | - | - | - | 04B CRM DOLT-4 (Set 19) |
| | | - | - | 3.1 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 3.2 | - | - | - | 08B CRM DOLT-4 (Set 18) |
| | | - | - | 3.1 | - | - | - | 08B CRM DOLT-4 (Set 19) |
| | | - | - | 3.1 | - | - | - | 10B CRM DOLT-4 |
| | | - | - | 3.1 | - | - | - | 12B CRM DOLT-4 |
| | | - | - | 3.0 | - | - | - | 14B CRM DOLT-4 |
| | | - | - | 3.2 | - | - | - | 16B CRM DOLT-4 |
| Selenium (Se) | µg/g dw | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.12 | Yes | 102% | 103% | 01B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.15 | Yes | 105% | 106% | 03B SRM 1577 (Set 18) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.04 | Yes | 95% | 95% | 03B SRM 1577 (Set 19) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.14 | Yes | 104% | 105% | 05B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.55 | No | 141% | 142% | 06B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.00 | Yes | 91% | 92% | 07B SRM 1577 (Set 18) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.15 | Yes | 105% | 106% | 07B SRM 1577 (Set 19) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 0.98 | No | 89% | 90% | 09B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.16 | Yes | 105% | 106% | 11B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.42 | No | 129% | 130% | 13B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.54 | No | 140% | 141% | 15B SRM 1577 |
| | | 8.30 (6.96 - 9.64) | - | 7.56 | Yes | 91% | - | 02B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 7.39 | Yes | 89% | - | 04B CRM DOLT-4 (Set 18) |
| | | 8.30 (6.96 - 9.64) | - | 7.29 | Yes | 88% | - | 04B CRM DOLT-4 (Set 19) |
| | | 8.30 (6.96 - 9.64) | - | 7.62 | Yes | 92% | - | 06B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 7.60 | Yes | 92% | - | 08B CRM DOLT-4 (Set 18) |
| | | 8.30 (6.96 - 9.64) | - | 7.32 | Yes | 88% | - | 08B CRM DOLT-4 (Set 19) |
| | | 8.30 (6.96 - 9.64) | - | 7.48 | Yes | 90% | - | 10B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 7.49 | Yes | 90% | - | 12B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 8.98 | Yes | 108% | - | 14B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 7.99 | Yes | 96% | - | 16B CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20a: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2014

| Analyte | Units | Certified Reference Material | | | | | |
|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Silver (Ag) | µg/g dw | - | 0.062 (0.051 - 0.073) | 0.055 | Yes | - | 89% | 01B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 94% | 03B SRM 1577 (Set 18) |
| | | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 93% | 03B SRM 1577 (Set 19) |
| | | - | 0.062 (0.051 - 0.073) | 0.055 | Yes | - | 88% | 05B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.068 | Yes | - | 110% | 06B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.055 | Yes | - | 89% | 07B SRM 1577 (Set 18) |
| | | - | 0.062 (0.051 - 0.073) | 0.054 | Yes | - | 87% | 07B SRM 1577 (Set 19) |
| | | - | 0.062 (0.051 - 0.073) | 0.054 | Yes | - | 87% | 09B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 90% | 11B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.057 | Yes | - | 92% | 13B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.061 | Yes | - | 99% | 15B SRM 1577 |
| | | 0.93 (0.86 - 1.00) | - | 0.81 | No | 87% | - | 02B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.84 | No | 91% | - | 04B CRM DOLT-4 (Set 18) |
| | | 0.93 (0.86 - 1.00) | - | 0.80 | No | 86% | - | 04B CRM DOLT-4 (Set 19) |
| | | 0.93 (0.86 - 1.00) | - | 0.81 | No | 87% | - | 06B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.80 | No | 86% | - | 08B CRM DOLT-4 (Set 18) |
| | | 0.93 (0.86 - 1.00) | - | 0.81 | No | 88% | - | 08B CRM DOLT-4 (Set 19) |
| | | 0.93 (0.86 - 1.00) | - | 0.81 | No | 87% | - | 10B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.82 | No | 88% | - | 12B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.84 | No | 91% | - | 14B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.83 | No | 89% | - | 16B CRM DOLT-4 |
| Sodium (Na) | µg/g dw | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,300 | Yes | 95% | 96% | 01B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,150 | No | 88% | 90% | 03B SRM 1577 (Set 18) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,130 | No | 88% | 89% | 03B SRM 1577 (Set 19) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,260 | No | 93% | 95% | 05B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,740 | No | 113% | 115% | 06B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,300 | Yes | 95% | 96% | 07B SRM 1577 (Set 18) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,290 | No | 94% | 96% | 07B SRM 1577 (Set 19) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,400 | Yes | 99% | 100% | 09B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,270 | No | 93% | 95% | 11B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,210 | No | 91% | 92% | 13B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,240 | No | 92% | 94% | 15B SRM 1577 |
| | | - | 6,800 | 6,170 | - | - | 91% | 02B CRM DOLT-4 |
| | | - | 6,800 | 6,490 | - | - | 95% | 04B CRM DOLT-4 (Set 18) |
| | | - | 6,800 | 6,130 | - | - | 90% | 04B CRM DOLT-4 (Set 19) |
| | | - | 6,800 | 6,000 | - | - | 88% | 06B CRM DOLT-4 |
| | | - | 6,800 | 6,150 | - | - | 90% | 08B CRM DOLT-4 (Set 18) |
| | | - | 6,800 | 6,250 | - | - | 92% | 08B CRM DOLT-4 (Set 19) |
| | | - | 6,800 | 6,520 | - | - | 96% | 10B CRM DOLT-4 |
| | | - | 6,800 | 6,350 | - | - | 93% | 12B CRM DOLT-4 |
| | | - | 6,800 | 6,270 | - | - | 92% | 14B CRM DOLT-4 |
| | | - | 6,800 | 6,350 | - | - | 93% | 16B CRM DOLT-4 |
| Strontium (Sr) | µg/g dw | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 89% | 01B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 94% | 03B SRM 1577 (Set 18) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 90% | 03B SRM 1577 (Set 19) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 89% | 05B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.17 | Yes | - | 108% | 06B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 07B SRM 1577 (Set 18) |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 91% | 07B SRM 1577 (Set 19) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 89% | 09B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.16 | Yes | - | 100% | 11B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 87% | 13B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 90% | 15B SRM 1577 |
| | | - | 5.5 | 5.1 | - | - | 93% | 02B CRM DOLT-4 |
| | | - | 5.5 | 5.5 | - | - | 100% | 04B CRM DOLT-4 (Set 18) |
| | | - | 5.5 | 4.8 | - | - | 87% | 04B CRM DOLT-4 (Set 19) |
| | | - | 5.5 | 5.0 | - | - | 91% | 06B CRM DOLT-4 |
| | | - | 5.5 | 5.1 | - | - | 93% | 08B CRM DOLT-4 (Set 18) |
| | | - | 5.5 | 5.1 | - | - | 92% | 08B CRM DOLT-4 (Set 19) |
| | | - | 5.5 | 4.8 | - | - | 88% | 10B CRM DOLT-4 |
| | | - | 5.5 | 4.9 | - | - | 89% | 12B CRM DOLT-4 |
| | | - | 5.5 | 4.7 | - | - | 86% | 14B CRM DOLT-4 |
| | | - | 5.5 | 5.1 | - | - | 93% | 16B CRM DOLT-4 |
| Tin (Sn) | µg/g dw | - | 0.016 (0.012 - 0.020) | 0.013 | Yes | - | 82% | 01B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.011 | No | - | 70% | 03B SRM 1577 (Set 18) |
| | | - | 0.016 (0.012 - 0.020) | 0.012 | Yes | - | 77% | 03B SRM 1577 (Set 19) |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 55% | 05B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.051 | No | - | 316% | 06B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.019 | Yes | - | 121% | 07B SRM 1577 (Set 18) |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 58% | 07B SRM 1577 (Set 19) |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 56% | 09B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.008 | No | - | 53% | 11B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.015 | Yes | - | 94% | 13B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.012 | Yes | - | 77% | 15B SRM 1577 |
| | | - | 0.17 | 0.19 | - | - | 111% | 02B CRM DOLT-4 |
| | | - | 0.17 | 0.16 | - | - | 92% | 04B CRM DOLT-4 (Set 18) |
| | | - | 0.17 | 0.16 | - | - | 92% | 04B CRM DOLT-4 (Set 19) |
| | | - | 0.17 | 0.15 | - | - | 88% | 06B CRM DOLT-4 |
| | | - | 0.17 | 0.15 | - | - | 86% | 08B CRM DOLT-4 (Set 18) |
| | | - | 0.17 | 0.11 | - | - | 65% | 08B CRM DOLT-4 (Set 19) |
| | | - | 0.17 | 0.15 | - | - | 90% | 10B CRM DOLT-4 |
| | | - | 0.17 | 0.16 | - | - | 91% | 12B CRM DOLT-4 |
| | | - | 0.17 | 0.15 | - | - | 91% | 14B CRM DOLT-4 |
| | | - | 0.17 | 0.16 | - | - | 95% | 16B CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20a: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2014

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Vanadium (V) | µg/g dw | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 105% | 01B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 104% | 03B SRM 1577 (Set 18) |
| | | - | 0.058 (0.052 - 0.064) | 0.058 | Yes | - | 100% | 03B SRM 1577 (Set 19) |
| | | - | 0.058 (0.052 - 0.064) | 0.062 | Yes | - | 106% | 05B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.070 | No | - | 120% | 06B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.060 | Yes | - | 104% | 07B SRM 1577 (Set 18) |
| | | - | 0.058 (0.052 - 0.064) | 0.060 | Yes | - | 104% | 07B SRM 1577 (Set 19) |
| | | - | 0.058 (0.052 - 0.064) | 0.059 | Yes | - | 101% | 09B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 105% | 11B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.056 | Yes | - | 97% | 13B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.065 | No | - | 113% | 15B SRM 1577 |
| | | - | 0.60 | 0.57 | - | - | 95% | 02B CRM DOLT-4 |
| | | - | 0.60 | 0.58 | - | - | 97% | 04B CRM DOLT-4 (Set 18) |
| | | - | 0.60 | 0.47 | - | - | 78% | 04B CRM DOLT-4 (Set 19) |
| | | - | 0.60 | 0.48 | - | - | 80% | 06B CRM DOLT-4 |
| | | - | 0.60 | 0.56 | - | - | 94% | 08B CRM DOLT-4 (Set 18) |
| | | - | 0.60 | 0.54 | - | - | 90% | 08B CRM DOLT-4 (Set 19) |
| | | - | 0.60 | 0.44 | - | - | 73% | 10B CRM DOLT-4 |
| | | - | 0.60 | 0.49 | - | - | 81% | 12B CRM DOLT-4 |
| | | - | 0.60 | 0.43 | - | - | 71% | 14B CRM DOLT-4 |
| | | - | 0.60 | 0.53 | - | - | 88% | 16B CRM DOLT-4 |
| Zinc (Zn) | µg/g dw | 130 (117 - 143) | 131 (123 - 139) | 122 | Yes | 94% | 93% | 01B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 123 | Yes | 95% | 94% | 03B SRM 1577 (Set 18) |
| | | 130 (117 - 143) | 131 (123 - 139) | 119 | Yes | 92% | 91% | 03B SRM 1577 (Set 19) |
| | | 130 (117 - 143) | 131 (123 - 139) | 122 | Yes | 94% | 93% | 05B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 161 | No | 124% | 123% | 06B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 121 | Yes | 93% | 92% | 07B SRM 1577 (Set 18) |
| | | 130 (117 - 143) | 131 (123 - 139) | 121 | Yes | 93% | 92% | 07B SRM 1577 (Set 19) |
| | | 130 (117 - 143) | 131 (123 - 139) | 121 | Yes | 93% | 92% | 09B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 130 | Yes | 100% | 99% | 11B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 156 | No | 120% | 119% | 13B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 164 | No | 126% | 125% | 15B SRM 1577 |
| | | 116 (110 - 122) | - | 103 | No | 89% | - | 02B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 101 | No | 87% | - | 04B CRM DOLT-4 (Set 18) |
| | | 116 (110 - 122) | - | 95 | No | 82% | - | 04B CRM DOLT-4 (Set 19) |
| | | 116 (110 - 122) | - | 101 | No | 87% | - | 06B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 101 | No | 87% | - | 08B CRM DOLT-4 (Set 18) |
| | | 116 (110 - 122) | - | 99 | No | 86% | - | 08B CRM DOLT-4 (Set 19) |
| | | 116 (110 - 122) | - | 103 | No | 89% | - | 10B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 104 | No | 90% | - | 12B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 123 | No | 106% | - | 14B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 108 | No | 93% | - | 16B CRM DOLT-4 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20b: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2015

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Aluminum (Al) | µg/g dw | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 101% | 01B SRM 1577 (Set 21) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 100% | 05B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.3 | Yes | - | 109% | 07B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.4 | Yes | - | 118% | 09B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.6 | Yes | - | 133% | 11B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.5 | Yes | - | 122% | 01B SRM 1577 (Set 26) |
| | | - | 1.2 (0.7 - 1.7) | 1.3 | Yes | - | 106% | 03B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 103% | 13B SRM 1577 |
| | | - | 1.2 (0.7 - 1.7) | 1.5 | Yes | - | 122% | 15B SRM 1577 |
| | | - | 200 | 130 | - | - | 65% | 01B CRM DOLT-4 |
| | | - | 200 | 57 | - | - | 29% | 02A CRM DOLT-4 |
| | | - | 200 | 49 | - | - | 25% | 04B CRM DOLT-4 |
| | | - | 200 | 48 | - | - | 24% | 06B CRM DOLT-4 |
| | | - | 200 | 48 | - | - | 24% | 08B CRM DOLT-4 |
| | | - | - | 13 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 16 | - | - | - | 12B CRM DOLT-5 |
| | | - | - | 14 | - | - | - | 14B CRM DOLT-5 |
| | | - | - | 14 | - | - | - | 16B CRM DOLT-5 |
| | | - | - | 18 | - | - | - | 04B CRM DOLT-5 |
| | | - | - | 16 | - | - | - | 06B CRM DOLT-5 |
| | | - | - | 14 | - | - | - | 08B CRM DOLT-5 |
| | | - | - | 14 | - | - | - | 10B CRM DOLT-5 |
| | | - | - | 15 | - | - | - | 17B CRM DOLT-5 |
| Antimony (Sb) | µg/g dw | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 93% | 01B SRM 1577 (Set 21) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 73% | 05B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 76% | 07B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 76% | 09B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 74% | 11B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 85% | 01B SRM 1577 (Set 26) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 76% | 03B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 84% | 13B SRM 1577 |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 77% | 15B SRM 1577 |
| | | - | - | 0.014 | - | - | - | 01B CRM DOLT-4 |
| | | - | - | 0.011 | - | - | - | 02A CRM DOLT-4 |
| | | - | - | 0.012 | - | - | - | 04B CRM DOLT-4 |
| | | - | - | 0.010 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 0.014 | - | - | - | 08B CRM DOLT-4 |
| | | - | 0.013 | 0.012 | - | - | 89% | 02B CRM DOLT-5 |
| | | - | 0.013 | 0.017 | - | - | 132% | 12B CRM DOLT-5 |
| | | - | 0.013 | 0.013 | - | - | 98% | 14B CRM DOLT-5 |
| | | - | 0.013 | 0.019 | - | - | 144% | 16B CRM DOLT-5 |
| | | - | 0.013 | 0.011 | - | - | 85% | 04B CRM DOLT-5 |
| | | - | 0.013 | 0.013 | - | - | 97% | 06B CRM DOLT-5 |
| | | - | 0.013 | 0.013 | - | - | 103% | 08B CRM DOLT-5 |
| | | - | 0.013 | 0.012 | - | - | 89% | 10B CRM DOLT-5 |
| | | - | 0.013 | 0.012 | - | - | 88% | 17B CRM DOLT-5 |
| Arsenic (As) | µg/g dw | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.067 | No | 121% | 123% | 01B SRM 1577 (Set 21) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.050 | Yes | 91% | 93% | 05B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.057 | Yes | 104% | 106% | 07B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.061 | No | 110% | 112% | 09B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.050 | Yes | 92% | 93% | 11B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.049 | No | 89% | 91% | 01B SRM 1577 (Set 26) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.040 | No | 73% | 74% | 03B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.057 | Yes | 103% | 105% | 13B SRM 1577 |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.050 | Yes | 90% | 92% | 15B SRM 1577 |
| | | 9.66 (9.04 - 10.28) | - | 9.03 | No | 93% | - | 01B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.92 | No | 92% | - | 02A CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.77 | No | 91% | - | 04B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.81 | No | 91% | - | 06B CRM DOLT-4 |
| | | 9.66 (9.04 - 10.28) | - | 8.70 | No | 90% | - | 08B CRM DOLT-4 |
| | | 34.6 (32.2 - 37.0) | - | 31.4 | No | 91% | - | 02B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 31.8 | No | 92% | - | 12B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 32.9 | Yes | 95% | - | 14B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 31.1 | No | 90% | - | 16B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 32.9 | Yes | 95% | - | 04B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 32.3 | Yes | 93% | - | 06B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 32.4 | Yes | 94% | - | 08B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 33.9 | Yes | 98% | - | 10B CRM DOLT-5 |
| | | 34.6 (32.2 - 37.0) | - | 31.6 | No | 91% | - | 17B CRM DOLT-5 |
| Cadmium (Cd) | µg/g dw | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.343 | No | 127% | 121% | 01B SRM 1577 (Set 21) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.295 | Yes | 109% | 104% | 05B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.305 | Yes | 113% | 108% | 07B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.288 | Yes | 107% | 102% | 09B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.276 | Yes | 102% | 98% | 11B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.295 | Yes | 109% | 104% | 01B SRM 1577 (Set 26) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.301 | Yes | 111% | 106% | 03B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.296 | Yes | 110% | 105% | 13B SRM 1577 |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.283 | Yes | 105% | 100% | 15B SRM 1577 |
| | | 24.3 (23.5 - 25.1) | - | 23.3 | No | 96% | - | 01B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 22.8 | No | 94% | - | 02A CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 22.2 | No | 91% | - | 04B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 22.2 | No | 91% | - | 06B CRM DOLT-4 |
| | | 24.3 (23.5 - 25.1) | - | 22.7 | No | 93% | - | 08B CRM DOLT-4 |
| | | 14.5 (13.9 - 15.1) | - | 13.0 | No | 90% | - | 02B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 12.7 | No | 88% | - | 12B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 13.3 | No | 92% | - | 14B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 13.0 | No | 90% | - | 16B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 13.3 | No | 92% | - | 04B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 13.0 | No | 90% | - | 06B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 13.6 | No | 94% | - | 08B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 13.1 | No | 90% | - | 10B CRM DOLT-5 |
| | | 14.5 (13.9 - 15.1) | - | 13.1 | No | 90% | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

**Table A.20b: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2015**

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Calcium (Ca) | µg/g dw | 124 (118 - 130) | 121 (107 - 135) | 127 | Yes | 102% | 105% | 01B SRM 1577 (Set 21) |
| | | 124 (118 - 130) | 121 (107 - 135) | 120 | Yes | 97% | 99% | 05B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 130 | Yes | 105% | 107% | 07B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 120 | Yes | 97% | 99% | 09B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 127 | Yes | 102% | 105% | 11B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 129 | Yes | 104% | 107% | 01B SRM 1577 (Set 26) |
| | | 124 (118 - 130) | 121 (107 - 135) | 124 | Yes | 100% | 102% | 03B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 122 | Yes | 98% | 101% | 13B SRM 1577 |
| | | 124 (118 - 130) | 121 (107 - 135) | 118 | Yes | 95% | 98% | 15B SRM 1577 |
| | | - | 680 | 710 | - | - | 104% | 01B CRM DOLT-4 |
| | | - | 680 | 625 | - | - | 92% | 02A CRM DOLT-4 |
| | | - | 680 | 632 | - | - | 93% | 04B CRM DOLT-4 |
| | | - | 680 | 638 | - | - | 94% | 06B CRM DOLT-4 |
| | | - | 680 | 641 | - | - | 94% | 08B CRM DOLT-4 |
| | | 550 (470 - 630) | - | 612 | Yes | 111% | - | 02B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 598 | Yes | 109% | - | 12B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 646 | No | 117% | - | 14B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 569 | Yes | 103% | - | 16B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 527 | Yes | 96% | - | 04B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 548 | Yes | 100% | - | 06B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 548 | Yes | 100% | - | 08B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 590 | Yes | 107% | - | 10B CRM DOLT-5 |
| | | 550 (470 - 630) | - | 560 | Yes | 102% | - | 17B CRM DOLT-5 |
| Cesium (Cs) | µg/g dw | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 83% | 01B SRM 1577 (Set 21) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 82% | 05B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 87% | 07B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 87% | 09B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 80% | 11B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 88% | 01B SRM 1577 (Set 26) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 89% | 03B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.014 | Yes | - | 91% | 13B SRM 1577 |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 86% | 15B SRM 1577 |
| | | - | - | 0.090 | - | - | - | 01B CRM DOLT-4 |
| | | - | - | 0.100 | - | - | - | 02A CRM DOLT-4 |
| | | - | - | 0.099 | - | - | - | 04B CRM DOLT-4 |
| | | - | - | 0.101 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 0.105 | - | - | - | 08B CRM DOLT-4 |
| | | - | - | 0.074 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 0.071 | - | - | - | 12B CRM DOLT-5 |
| | | - | - | 0.075 | - | - | - | 14B CRM DOLT-5 |
| | | - | - | 0.074 | - | - | - | 16B CRM DOLT-5 |
| | | - | - | 0.073 | - | - | - | 04B CRM DOLT-5 |
| | | - | - | 0.072 | - | - | - | 06B CRM DOLT-5 |
| | | - | - | 0.072 | - | - | - | 08B CRM DOLT-5 |
| | | - | - | 0.072 | - | - | - | 10B CRM DOLT-5 |
| | | - | - | 0.069 | - | - | - | 17B CRM DOLT-5 |
| Chromium (Cr) | µg/g dw | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.17 | No | 194% | 155% | 01B SRM 1577 (Set 21) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.15 | No | 173% | 138% | 05B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.11 | No | 124% | 99% | 07B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.13 | No | 144% | 115% | 09B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.14 | No | 164% | 131% | 11B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.13 | No | 149% | 119% | 01B SRM 1577 (Set 26) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.09 | Yes | 107% | 86% | 03B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.12 | No | 134% | 107% | 13B SRM 1577 |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.11 | No | 124% | 99% | 15B SRM 1577 |
| | | - | 1.40 | 1.05 | - | - | 75% | 01B CRM DOLT-4 |
| | | - | 1.40 | 1.54 | - | - | 110% | 02A CRM DOLT-4 |
| | | - | 1.40 | 1.13 | - | - | 81% | 04B CRM DOLT-4 |
| | | - | 1.40 | 1.22 | - | - | 87% | 06B CRM DOLT-4 |
| | | - | 1.40 | 1.08 | - | - | 77% | 08B CRM DOLT-4 |
| | | - | - | 1.80 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 3.03 | - | - | - | 12B CRM DOLT-5 |
| | | - | - | 1.89 | - | - | - | 14B CRM DOLT-5 |
| | | - | - | 1.96 | - | - | - | 16B CRM DOLT-5 |
| | | - | - | 2.34 | - | - | - | 04B CRM DOLT-5 |
| | | - | - | 1.90 | - | - | - | 06B CRM DOLT-5 |
| | | - | - | 2.10 | - | - | - | 08B CRM DOLT-5 |
| | | - | - | 2.04 | - | - | - | 10B CRM DOLT-5 |
| | | - | - | 2.13 | - | - | - | 17B CRM DOLT-5 |
| Cobalt (Co) | µg/g dw | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 110% | 01B SRM 1577 (Set 21) |
| | | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 114% | 05B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 111% | 07B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 110% | 09B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 106% | 11B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.22 | Yes | - | 100% | 01B SRM 1577 (Set 26) |
| | | - | 0.22 (0.18 - 0.26) | 0.22 | Yes | - | 101% | 03B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 107% | 13B SRM 1577 |
| | | - | 0.22 (0.18 - 0.26) | 0.22 | Yes | - | 102% | 15B SRM 1577 |
| | | - | 0.25 | 0.20 | - | - | 80% | 01B CRM DOLT-4 |
| | | - | 0.25 | 0.21 | - | - | 86% | 02A CRM DOLT-4 |
| | | - | 0.25 | 0.22 | - | - | 86% | 04B CRM DOLT-4 |
| | | - | 0.25 | 0.21 | - | - | 86% | 06B CRM DOLT-4 |
| | | - | 0.25 | 0.21 | - | - | 83% | 08B CRM DOLT-4 |
| | | 0.267 (0.241 - 0.293) | - | 0.22 | No | 84% | - | 02B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.25 | Yes | 94% | - | 12B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.25 | Yes | 94% | - | 14B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.23 | No | 87% | - | 16B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.26 | Yes | 98% | - | 04B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.26 | Yes | 96% | - | 06B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.25 | Yes | 93% | - | 08B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.24 | Yes | 91% | - | 10B CRM DOLT-5 |
| | | 0.267 (0.241 - 0.293) | - | 0.24 | Yes | 90% | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20b: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2015

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Copper (Cu) | µg/g dw | 193 (183 - 203) | 190 (180 - 200) | 185 | Yes | 96% | 97% | 01B SRM 1577 (Set 21) |
| | | 193 (183 - 203) | 190 (180 - 200) | 187 | Yes | 97% | 98% | 05B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 174 | No | 90% | 92% | 07B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 176 | No | 91% | 93% | 09B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 169 | No | 88% | 89% | 11B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 164 | No | 85% | 86% | 01B SRM 1577 (Set 26) |
| | | 193 (183 - 203) | 190 (180 - 200) | 166 | No | 86% | 87% | 03B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 175 | No | 91% | 92% | 13B SRM 1577 |
| | | 193 (183 - 203) | 190 (180 - 200) | 175 | No | 91% | 92% | 15B SRM 1577 |
| | | 31.2 (30.1 - 32.3) | - | 28.2 | No | 90% | - | 01B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 28.3 | No | 91% | - | 02A CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 29.5 | No | 95% | - | 04B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 29.2 | No | 94% | - | 06B CRM DOLT-4 |
| | | 31.2 (30.1 - 32.3) | - | 28.9 | No | 93% | - | 08B CRM DOLT-4 |
| | | 35.0 (32.6 - 37.4) | - | 28.5 | No | 81% | - | 02B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 28.7 | No | 82% | - | 12B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 32.3 | No | 92% | - | 14B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 30.8 | No | 88% | - | 16B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 31.7 | No | 91% | - | 04B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 32.2 | No | 92% | - | 06B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 31 | No | 89% | - | 08B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 30.1 | No | 86% | - | 10B CRM DOLT-5 |
| | | 35.0 (32.6 - 37.4) | - | 29.9 | No | 85% | - | 17B CRM DOLT-5 |
| Iron (Fe) | µg/g dw | 268 (260 - 276) | 263 (241 - 285) | 266 | Yes | 99% | 101% | 01B SRM 1577 (Set 21) |
| | | 268 (260 - 276) | 263 (241 - 285) | 266 | Yes | 99% | 101% | 05B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 251 | No | 94% | 95% | 07B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 253 | No | 94% | 96% | 09B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 248 | No | 93% | 94% | 11B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 250 | No | 93% | 95% | 01B SRM 1577 (Set 26) |
| | | 268 (260 - 276) | 263 (241 - 285) | 249 | No | 93% | 95% | 03B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 262 | Yes | 98% | 100% | 13B SRM 1577 |
| | | 268 (260 - 276) | 263 (241 - 285) | 252 | No | 94% | 96% | 15B SRM 1577 |
| | | 1,833 (1,758 - 1,908) | - | 1,670 | No | 91% | - | 01B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,700 | No | 93% | - | 02A CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,730 | No | 94% | - | 04B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,740 | No | 95% | - | 06B CRM DOLT-4 |
| | | 1,833 (1,758 - 1,908) | - | 1,700 | No | 93% | - | 08B CRM DOLT-4 |
| | | 1,070 (990 - 1,150) | - | 991 | Yes | 93% | - | 02B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,020 | Yes | 95% | - | 12B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,090 | Yes | 102% | - | 14B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,010 | Yes | 94% | - | 16B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,080 | Yes | 101% | - | 04B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,110 | Yes | 104% | - | 06B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,060 | Yes | 99% | - | 08B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,040 | Yes | 97% | - | 10B CRM DOLT-5 |
| | | 1,070 (990 - 1,150) | - | 1,040 | Yes | 97% | - | 17B CRM DOLT-5 |
| Lead (Pb) | µg/g dw | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.36 | Yes | 105% | 105% | 01B SRM 1577 (Set 21) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.46 | No | 136% | 136% | 05B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.33 | Yes | 97% | 97% | 07B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.34 | Yes | 99% | 99% | 09B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.36 | Yes | 106% | 106% | 11B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.37 | Yes | 107% | 107% | 01B SRM 1577 (Set 26) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.37 | Yes | 108% | 108% | 03B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.39 | Yes | 114% | 114% | 13B SRM 1577 |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.38 | Yes | 112% | 112% | 15B SRM 1577 |
| | | 0.16 (0.12 - 0.20) | - | 0.13 | Yes | 81% | - | 01B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.12 | Yes | 77% | - | 02A CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.15 | Yes | 91% | - | 04B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.14 | Yes | 88% | - | 06B CRM DOLT-4 |
| | | 0.16 (0.12 - 0.20) | - | 0.12 | Yes | 73% | - | 08B CRM DOLT-4 |
| | | 0.16 (0.13 - 0.19) | - | 0.15 | Yes | 96% | - | 02B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.29 | No | 183% | - | 12B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.21 | No | 133% | - | 14B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.16 | Yes | 101% | - | 16B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.20 | No | 125% | - | 04B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.16 | Yes | 100% | - | 06B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.16 | Yes | 101% | - | 08B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.16 | Yes | 100% | - | 10B CRM DOLT-5 |
| | | 0.16 (0.13 - 0.19) | - | 0.16 | Yes | 98% | - | 17B CRM DOLT-5 |
| Magnesium (Mg) | µg/g dw | 604 (595 - 613) | 608 (577 - 639) | 625 | No | 103% | 103% | 01B SRM 1577 (Set 21) |
| | | 604 (595 - 613) | 608 (577 - 639) | 591 | No | 98% | 97% | 05B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 580 | No | 96% | 95% | 07B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 594 | No | 98% | 98% | 09B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 585 | No | 97% | 96% | 11B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 570 | No | 94% | 94% | 01B SRM 1577 (Set 26) |
| | | 604 (595 - 613) | 608 (577 - 639) | 573 | No | 95% | 94% | 03B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 596 | Yes | 99% | 98% | 13B SRM 1577 |
| | | 604 (595 - 613) | 608 (577 - 639) | 572 | No | 95% | 94% | 15B SRM 1577 |
| | | - | 1,500 | 1,270 | - | - | 85% | 01B CRM DOLT-4 |
| | | - | 1,500 | 1,310 | - | - | 87% | 02A CRM DOLT-4 |
| | | - | 1,500 | 1,300 | - | - | 87% | 04B CRM DOLT-4 |
| | | - | 1,500 | 1,290 | - | - | 86% | 06B CRM DOLT-4 |
| | | - | 1,500 | 1,330 | - | - | 89% | 08B CRM DOLT-4 |
| | | 940 (840 - 1,040) | - | 845 | Yes | 90% | - | 02B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 843 | Yes | 90% | - | 12B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 941 | Yes | 100% | - | 14B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 840 | Yes | 89% | - | 16B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 868 | Yes | 92% | - | 04B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 887 | Yes | 94% | - | 06B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 885 | Yes | 94% | - | 08B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 877 | Yes | 93% | - | 10B CRM DOLT-5 |
| | | 940 (840 - 1,040) | - | 868 | Yes | 92% | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20b: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2015

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Manganese (Mn) | µg/g dw | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.3 | Yes | 100% | 101% | 01B SRM 1577 (Set 21) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.2 | Yes | 99% | 100% | 05B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 9.8 | Yes | 95% | 96% | 07B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 9.9 | Yes | 96% | 97% | 09B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.3 | Yes | 100% | 101% | 11B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.4 | Yes | 101% | 102% | 01B SRM 1577 (Set 26) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.5 | Yes | 102% | 103% | 03B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.3 | Yes | 100% | 101% | 13B SRM 1577 |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.1 | Yes | 98% | 99% | 15B SRM 1577 |
| | | - | - | 10.6 | - | - | - | 01B CRM DOLT-4 |
| | | - | - | 9.3 | - | - | - | 02A CRM DOLT-4 |
| | | - | - | 9.1 | - | - | - | 04B CRM DOLT-4 |
| | | - | - | 9.1 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 9.0 | - | - | - | 08B CRM DOLT-4 |
| | | - | - | 8.9 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 9.5 | - | - | - | 12B CRM DOLT-5 |
| | | - | - | 9.3 | - | - | - | 14B CRM DOLT-5 |
| | | - | - | 8.6 | - | - | - | 16B CRM DOLT-5 |
| | | - | - | 8.5 | - | - | - | 04B CRM DOLT-5 |
| | | - | - | 8.7 | - | - | - | 06B CRM DOLT-5 |
| | | - | - | 8.4 | - | - | - | 08B CRM DOLT-5 |
| | | - | - | 8.9 | - | - | - | 10B CRM DOLT-5 |
| | | - | - | 8.9 | - | - | - | 17B CRM DOLT-5 |
| Mercury (Hg) | µg/g dw | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.031 | No | 194% | 194% | 01B SRM 1577 (Set 21) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.025 | No | 153% | 153% | 05B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.023 | No | 143% | 143% | 07B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 138% | 138% | 09B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 137% | 137% | 11B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.025 | No | 158% | 158% | 01B SRM 1577 (Set 26) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.023 | No | 143% | 143% | 03B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 138% | 138% | 13B SRM 1577 |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 134% | 134% | 15B SRM 1577 |
| | | 2.58 (2.36 - 2.80) | - | 2.51 | Yes | 97% | - | 01B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.45 | Yes | 95% | - | 02A CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.63 | Yes | 102% | - | 04B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.55 | Yes | 99% | - | 06B CRM DOLT-4 |
| | | 2.58 (2.36 - 2.80) | - | 2.55 | Yes | 99% | - | 08B CRM DOLT-4 |
| | | 0.44 (0.26 - 0.62) | - | 0.38 | Yes | 87% | - | 02B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.40 | Yes | 92% | - | 12B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.40 | Yes | 91% | - | 14B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.39 | Yes | 89% | - | 16B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.39 | Yes | 88% | - | 04B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.42 | Yes | 96% | - | 06B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.40 | Yes | 92% | - | 08B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.38 | Yes | 87% | - | 10B CRM DOLT-5 |
| | | 0.44 (0.26 - 0.62) | - | 0.41 | Yes | 92% | - | 17B CRM DOLT-5 |
| Molybdenum (Mo) | µg/g dw | - | 3.2 (2.8 - 3.6) | 3.7 | No | - | 116% | 01B SRM 1577 (Set 21) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 113% | 05B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.7 | No | - | 117% | 07B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.8 | No | - | 117% | 09B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 112% | 11B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.5 | Yes | - | 110% | 01B SRM 1577 (Set 26) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 111% | 03B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 114% | 13B SRM 1577 |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 112% | 15B SRM 1577 |
| | | - | 1 | 1.0 | - | - | 101% | 01B CRM DOLT-4 |
| | | - | 1 | 1.1 | - | - | 110% | 02A CRM DOLT-4 |
| | | - | 1 | 1.1 | - | - | 107% | 04B CRM DOLT-4 |
| | | - | 1 | 1.1 | - | - | 108% | 06B CRM DOLT-4 |
| | | - | 1 | 1.1 | - | - | 110% | 08B CRM DOLT-4 |
| | | 1.41 (1.19 - 1.63) | - | 1.4 | Yes | 98% | - | 02B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.5 | Yes | 108% | - | 12B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.4 | Yes | 101% | - | 14B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.4 | Yes | 99% | - | 16B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.4 | Yes | 102% | - | 04B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.4 | Yes | 101% | - | 06B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.5 | Yes | 106% | - | 08B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.4 | Yes | 101% | - | 10B CRM DOLT-5 |
| | | 1.41 (1.19 - 1.63) | - | 1.4 | Yes | 97% | - | 17B CRM DOLT-5 |
| Nickel (Ni) | µg/g dw | - | 0.18 (0.10 - 0.26) | 0.08 | No | - | 43% | 01B SRM 1577 (Set 21) |
| | | - | 0.18 (0.10 - 0.26) | 0.05 | No | - | 30% | 05B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 17% | 07B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 17% | 09B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 25% | 11B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 17% | 01B SRM 1577 (Set 26) |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 18% | 03B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 21% | 13B SRM 1577 |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 18% | 15B SRM 1577 |
| | | 0.97 (0.86 - 1.08) | - | 0.71 | No | 73% | - | 01B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 1.10 | No | 113% | - | 02A CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.90 | Yes | 92% | - | 04B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.87 | Yes | 89% | - | 06B CRM DOLT-4 |
| | | 0.97 (0.86 - 1.08) | - | 0.98 | Yes | 101% | - | 08B CRM DOLT-4 |
| | | - | - | 1.18 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 1.71 | - | - | - | 12B CRM DOLT-5 |
| | | - | - | 1.32 | - | - | - | 14B CRM DOLT-5 |
| | | - | - | 1.31 | - | - | - | 16B CRM DOLT-5 |
| | | - | - | 1.61 | - | - | - | 04B CRM DOLT-5 |
| | | - | - | 1.35 | - | - | - | 06B CRM DOLT-5 |
| | | - | - | 1.43 | - | - | - | 08B CRM DOLT-5 |
| | | - | - | 1.34 | - | - | - | 10B CRM DOLT-5 |
| | | - | - | 1.39 | - | - | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

**Table A.20b: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2015**

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Phosphorus (P) | µg/g dw | - | 11,200 (10,100 - 12,300) | 13,600 | No | - | 121% | 01B SRM 1577 (Set 21) |
| | | - | 11,200 (10,100 - 12,300) | 11,100 | Yes | - | 99% | 05B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,700 | Yes | - | 104% | 07B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,400 | Yes | - | 102% | 09B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,600 | Yes | - | 104% | 11B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 12,000 | Yes | - | 107% | 01B SRM 1577 (Set 26) |
| | | - | 11,200 (10,100 - 12,300) | 11,800 | Yes | - | 105% | 03B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,900 | Yes | - | 106% | 13B SRM 1577 |
| | | - | 11,200 (10,100 - 12,300) | 11,800 | Yes | - | 105% | 15B SRM 1577 |
| | | - | - | 12,800 | - | - | - | 01B CRM DOLT-4 |
| | | - | - | 12,100 | - | - | - | 02A CRM DOLT-4 |
| | | - | - | 11,700 | - | - | - | 04B CRM DOLT-4 |
| | | - | - | 11,400 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 12,300 | - | - | - | 08B CRM DOLT-4 |
| | | - | 11,500 | 11,200 | - | - | 97% | 02B CRM DOLT-5 |
| | | - | 11,500 | 11,500 | - | - | 100% | 12B CRM DOLT-5 |
| | | - | 11,500 | 12,000 | - | - | 104% | 14B CRM DOLT-5 |
| | | - | 11,500 | 11,700 | - | - | 102% | 16B CRM DOLT-5 |
| | | - | 11,500 | 11,000 | - | - | 96% | 04B CRM DOLT-5 |
| | | - | 11,500 | 10,700 | - | - | 93% | 06B CRM DOLT-5 |
| | | - | 11,500 | 11,400 | - | - | 99% | 08B CRM DOLT-5 |
| | | - | 11,500 | 12,100 | - | - | 105% | 10B CRM DOLT-5 |
| | | - | 11,500 | 11,400 | - | - | 99% | 17B CRM DOLT-5 |
| Potassium (K) | µg/g dw | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,400 | No | 107% | 107% | 01B SRM 1577 (Set 21) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,400 | No | 107% | 107% | 05B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,100 | Yes | 104% | 104% | 07B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,200 | Yes | 105% | 105% | 09B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,500 | No | 108% | 108% | 11B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,600 | No | 109% | 109% | 01B SRM 1577 (Set 26) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,400 | No | 107% | 107% | 03B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,900 | No | 112% | 112% | 13B SRM 1577 |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,300 | Yes | 106% | 106% | 15B SRM 1577 |
| | | - | 9,800 | 8,610 | - | - | 88% | 01B CRM DOLT-4 |
| | | - | 9,800 | 9,200 | - | - | 94% | 02A CRM DOLT-4 |
| | | - | 9,800 | 9,430 | - | - | 96% | 04B CRM DOLT-4 |
| | | - | 9,800 | 9,320 | - | - | 95% | 06B CRM DOLT-4 |
| | | - | 9,800 | 9,580 | - | - | 98% | 08B CRM DOLT-4 |
| | | 14,400 (11,400 - 17,400) | - | 15,000 | Yes | 104% | - | 02B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 15,800 | Yes | 110% | - | 12B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 16,900 | Yes | 117% | - | 14B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 15,800 | Yes | 110% | - | 16B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 16,200 | Yes | 113% | - | 04B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 16,100 | Yes | 112% | - | 06B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 15,500 | Yes | 108% | - | 08B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 16,600 | Yes | 115% | - | 10B CRM DOLT-5 |
| | | 14,400 (11,400 - 17,400) | - | 15,000 | Yes | 104% | - | 17B CRM DOLT-5 |
| Rubidium (Rb) | µg/g dw | - | 18.3 (17.3 - 19.3) | 19.2 | Yes | - | 105% | 01B SRM 1577 (Set 21) |
| | | - | 18.3 (17.3 - 19.3) | 19.2 | Yes | - | 105% | 05B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.8 | Yes | - | 103% | 07B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.9 | Yes | - | 103% | 09B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 19.0 | Yes | - | 104% | 11B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.6 | Yes | - | 102% | 01B SRM 1577 (Set 26) |
| | | - | 18.3 (17.3 - 19.3) | 18.7 | Yes | - | 102% | 03B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 19.3 | Yes | - | 105% | 13B SRM 1577 |
| | | - | 18.3 (17.3 - 19.3) | 18.7 | Yes | - | 102% | 15B SRM 1577 |
| | | - | - | 2.9 | - | - | - | 01B CRM DOLT-4 |
| | | - | - | 3.2 | - | - | - | 02A CRM DOLT-4 |
| | | - | - | 3.3 | - | - | - | 04B CRM DOLT-4 |
| | | - | - | 3.3 | - | - | - | 06B CRM DOLT-4 |
| | | - | - | 3.2 | - | - | - | 08B CRM DOLT-4 |
| | | - | - | 4.9 | - | - | - | 02B CRM DOLT-5 |
| | | - | - | 5.1 | - | - | - | 12B CRM DOLT-5 |
| | | - | - | 5.3 | - | - | - | 14B CRM DOLT-5 |
| | | - | - | 5.0 | - | - | - | 16B CRM DOLT-5 |
| | | - | - | 5.2 | - | - | - | 04B CRM DOLT-5 |
| | | - | - | 5.1 | - | - | - | 06B CRM DOLT-5 |
| | | - | - | 5.2 | - | - | - | 08B CRM DOLT-5 |
| | | - | - | 5.2 | - | - | - | 10B CRM DOLT-5 |
| | | - | - | 5.0 | - | - | - | 17B CRM DOLT-5 |
| Selenium (Se) | µg/g dw | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.5 | No | 133% | 134% | 01B SRM 1577 (Set 21) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 111% | 112% | 05B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.1 | Yes | 100% | 101% | 07B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 109% | 110% | 09B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.0 | Yes | 95% | 95% | 11B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.3 | No | 114% | 115% | 01B SRM 1577 (Set 26) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.0 | No | 87% | 88% | 03B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.1 | Yes | 95% | 96% | 13B SRM 1577 |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.0 | Yes | 91% | 92% | 15B SRM 1577 |
| | | 8.30 (6.96 - 9.64) | - | 9.15 | Yes | 110% | - | 01B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 8.34 | Yes | 100% | - | 02A CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 7.92 | Yes | 95% | - | 04B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 7.62 | Yes | 92% | - | 06B CRM DOLT-4 |
| | | 8.30 (6.96 - 9.64) | - | 8.00 | Yes | 96% | - | 08B CRM DOLT-4 |
| | | 8.3 (6.5 - 10.1) | - | 6.8 | Yes | 82% | - | 02B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 7.1 | Yes | 85% | - | 12B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 7.2 | Yes | 87% | - | 14B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 7.3 | Yes | 87% | - | 16B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 7.3 | Yes | 88% | - | 04B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 7.1 | Yes | 86% | - | 06B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 7.5 | Yes | 91% | - | 08B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 8.2 | Yes | 98% | - | 10B CRM DOLT-5 |
| | | 8.3 (6.5 - 10.1) | - | 7.7 | Yes | 92% | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

**Table A.20b:** **Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2015**

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Silver (Ag) | µg/g dw | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 93% | 01B SRM 1577 (Set 21) |
| | | - | 0.062 (0.051 - 0.073) | 0.057 | Yes | - | 91% | 05B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.057 | Yes | - | 92% | 07B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 94% | 09B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 93% | 11B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.057 | Yes | - | 92% | 01B SRM 1577 (Set 26) |
| | | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 91% | 03B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 94% | 13B SRM 1577 |
| | | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 94% | 15B SRM 1577 |
| | | 0.93 (0.86 - 1.00) | - | 0.781 | No | 84% | - | 01B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.827 | No | 89% | - | 02A CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.827 | No | 89% | - | 04B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.825 | No | 89% | - | 06B CRM DOLT-4 |
| | | 0.93 (0.86 - 1.00) | - | 0.853 | No | 92% | - | 08B CRM DOLT-4 |
| | | 2.05 (1.97 - 2.13) | - | 1.820 | No | 89% | - | 02B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.830 | No | 89% | - | 12B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.860 | No | 91% | - | 14B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.830 | No | 89% | - | 16B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.690 | No | 82% | - | 04B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.550 | No | 76% | - | 06B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.910 | No | 93% | - | 08B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 0.109 | No | 5% | - | 10B CRM DOLT-5 |
| | | 2.05 (1.97 - 2.13) | - | 1.750 | No | 85% | - | 17B CRM DOLT-5 |
| Sodium (Na) | µg/g dw | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,240 | No | 92% | 94% | 01B SRM 1577 (Set 21) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,090 | No | 86% | 87% | 05B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,030 | No | 84% | 85% | 07B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,020 | No | 83% | 85% | 09B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,020 | No | 83% | 85% | 11B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 1,870 | No | 77% | 78% | 01B SRM 1577 (Set 26) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 1,850 | No | 76% | 77% | 03B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,020 | No | 83% | 85% | 13B SRM 1577 |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 1,900 | No | 78% | 79% | 15B SRM 1577 |
| | | - | 6,800 | 5,480 | - | - | 81% | 01B CRM DOLT-4 |
| | | - | 6,800 | 6,290 | - | - | 93% | 02A CRM DOLT-4 |
| | | - | 6,800 | 6,240 | - | - | 92% | 04B CRM DOLT-4 |
| | | - | 6,800 | 6,240 | - | - | 92% | 06B CRM DOLT-4 |
| | | - | 6,800 | 6,180 | - | - | 91% | 08B CRM DOLT-4 |
| | | 9,900 (8,300 - 11,500) | - | 8,970 | Yes | 91% | - | 02B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 9,120 | Yes | 92% | - | 12B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 10,300 | Yes | 104% | - | 14B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 9,230 | Yes | 93% | - | 16B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 9,640 | Yes | 97% | - | 04B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 9,930 | Yes | 100% | - | 06B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 9,820 | Yes | 99% | - | 08B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 9,530 | Yes | 96% | - | 10B CRM DOLT-5 |
| | | 9,900 (8,300 - 11,500) | - | 10,300 | Yes | 104% | - | 17B CRM DOLT-5 |
| Strontium (Sr) | µg/g dw | - | 0.16 (0.13 - 0.19) | 0.16 | Yes | - | 98% | 01B SRM 1577 (Set 21) |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 91% | 05B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 90% | 07B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 89% | 09B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 91% | 11B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 01B SRM 1577 (Set 26) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 89% | 03B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 91% | 13B SRM 1577 |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 86% | 15B SRM 1577 |
| | | - | 5.5 | 5.8 | - | - | 106% | 01B CRM DOLT-4 |
| | | - | 5.5 | 5.2 | - | - | 95% | 02A CRM DOLT-4 |
| | | - | 5.5 | 5.2 | - | - | 95% | 04B CRM DOLT-4 |
| | | - | 5.5 | 5.2 | - | - | 95% | 06B CRM DOLT-4 |
| | | - | 5.5 | 5.1 | - | - | 92% | 08B CRM DOLT-4 |
| | | 3.73 (3.47 - 3.99) | - | 3.7 | Yes | 100% | - | 02B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.9 | Yes | 106% | - | 12B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 4.0 | No | 108% | - | 14B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.6 | Yes | 97% | - | 16B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.8 | Yes | 101% | - | 04B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.8 | Yes | 101% | - | 06B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.7 | Yes | 99% | - | 08B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.9 | Yes | 105% | - | 10B CRM DOLT-5 |
| | | 3.73 (3.47 - 3.99) | - | 3.7 | Yes | 99% | - | 17B CRM DOLT-5 |
| Tin (Sn) | µg/g dw | - | 0.016 (0.012 - 0.020) | 0.019 | Yes | - | 116% | 01B SRM 1577 (Set 21) |
| | | - | 0.016 (0.012 - 0.020) | 0.065 | No | - | 405% | 05B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 57% | 07B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.029 | No | - | 182% | 09B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.010 | No | - | 64% | 11B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.008 | No | - | 49% | 01B SRM 1577 (Set 26) |
| | | - | 0.016 (0.012 - 0.020) | 0.010 | No | - | 59% | 03B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.013 | Yes | - | 79% | 13B SRM 1577 |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 59% | 15B SRM 1577 |
| | | - | 0.17 | 0.16 | - | - | 95% | 01B CRM DOLT-4 |
| | | - | 0.17 | 0.16 | - | - | 92% | 02A CRM DOLT-4 |
| | | - | 0.17 | 0.15 | - | - | 90% | 04B CRM DOLT-4 |
| | | - | 0.17 | 0.15 | - | - | 91% | 06B CRM DOLT-4 |
| | | - | 0.17 | 0.16 | - | - | 96% | 08B CRM DOLT-4 |
| | | 0.069 (0.033 - 0.105) | - | 0.07 | Yes | 98% | - | 02B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.06 | Yes | 84% | - | 12B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.06 | Yes | 82% | - | 14B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.06 | Yes | 88% | - | 16B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.07 | Yes | 96% | - | 04B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.06 | Yes | 92% | - | 06B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.06 | Yes | 89% | - | 08B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.06 | Yes | 82% | - | 10B CRM DOLT-5 |
| | | 0.069 (0.033 - 0.105) | - | 0.06 | Yes | 88% | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20b: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2015

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Vanadium (V) | µg/g dw | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 105% | 01B SRM 1577 (Set 21) |
| | | - | 0.058 (0.052 - 0.064) | 0.060 | Yes | - | 104% | 05B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.060 | Yes | - | 103% | 07B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.059 | Yes | - | 101% | 09B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.063 | Yes | - | 108% | 11B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.054 | Yes | - | 94% | 01B SRM 1577 (Set 26) |
| | | - | 0.058 (0.052 - 0.064) | 0.060 | Yes | - | 103% | 03B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.059 | Yes | - | 102% | 13B SRM 1577 |
| | | - | 0.058 (0.052 - 0.064) | 0.055 | Yes | - | 95% | 15B SRM 1577 |
| | | - | 0.6 | 0.662 | - | - | 110% | 01B CRM DOLT-4 |
| | | - | 0.6 | 0.476 | - | - | 79% | 02A CRM DOLT-4 |
| | | - | 0.6 | 0.459 | - | - | 77% | 04B CRM DOLT-4 |
| | | - | 0.6 | 0.469 | - | - | 78% | 06B CRM DOLT-4 |
| | | - | 0.6 | 0.441 | - | - | 74% | 08B CRM DOLT-4 |
| | | 0.51 (0.45 - 0.57) | - | 0.461 | Yes | 90% | - | 02B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.499 | Yes | 98% | - | 12B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.496 | Yes | 97% | - | 14B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.468 | Yes | 92% | - | 16B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.517 | Yes | 101% | - | 04B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.496 | Yes | 97% | - | 06B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.488 | Yes | 96% | - | 08B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.500 | Yes | 98% | - | 10B CRM DOLT-5 |
| | | 0.51 (0.45 - 0.57) | - | 0.490 | Yes | 96% | - | 17B CRM DOLT-5 |
| Zinc (Zn) | µg/g dw | 130 (117 - 143) | 131 (123 - 139) | 157 | No | 121% | 120% | 01B SRM 1577 (Set 21) |
| | | 130 (117 - 143) | 131 (123 - 139) | 125 | Yes | 96% | 95% | 05B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 123 | Yes | 95% | 94% | 07B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 120 | Yes | 92% | 92% | 09B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 118 | Yes | 91% | 90% | 11B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 123 | Yes | 95% | 94% | 01B SRM 1577 (Set 26) |
| | | 130 (117 - 143) | 131 (123 - 139) | 119 | Yes | 92% | 91% | 03B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 120 | Yes | 92% | 92% | 13B SRM 1577 |
| | | 130 (117 - 143) | 131 (123 - 139) | 120 | Yes | 92% | 92% | 15B SRM 1577 |
| | | 116 (110 - 122) | - | 121 | Yes | 104% | - | 01B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 106 | No | 91% | - | 02A CRM DOLT-4 |
| | | 116 (110 - 122) | - | 108 | No | 93% | - | 04B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 104 | No | 90% | - | 06B CRM DOLT-4 |
| | | 116 (110 - 122) | - | 102 | No | 88% | - | 08B CRM DOLT-4 |
| | | 105.3 (99.9 - 110.7) | - | 88 | No | 84% | - | 02B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 95 | No | 91% | - | 12B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 92 | No | 88% | - | 14B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 92 | No | 87% | - | 16B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 95 | No | 90% | - | 04B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 92 | No | 87% | - | 06B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 91 | No | 87% | - | 08B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 101 | Yes | 96% | - | 10B CRM DOLT-5 |
| | | 105.3 (99.9 - 110.7) | - | 94 | No | 89% | - | 17B CRM DOLT-5 |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20c: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2016

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Aluminum (Al) | µg/g dw | - | 1.2 (0.7 - 1.7) | 1.3 | Yes | - | 104% | 01B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 103% | 03B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 2.1 | No | - | 173% | 05B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.0 | Yes | - | 83% | 08B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 103% | 10B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 100% | 14B SRM 1577 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 14 | No | - | 43% | 02B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 16 | No | - | 50% | 04B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 17 | No | - | 54% | 06B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 14 | No | - | 44% | 07B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 14 | No | - | 44% | 09B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 15 | No | - | 48% | 11B CRM DOLT-5 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 102% | 12B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 98% | 16B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 97% | 18B SRM 1577 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.4 | Yes | - | 117% | 20B SRM 1577 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 17 | No | - | 53% | 13B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 17 | No | - | 53% | 15B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 45 | No | - | 140% | 17B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 14 | No | - | 44% | 19B CRM DOLT-5 (Set 33) |
| | | - | 31.7 (27.5 - 35.7) | 15 | No | - | 46% | 21B CRM DOLT-5 (Set 33) |
| | | - | 1.2 (0.7 - 1.7) | 1.2 | Yes | - | 96% | 01B SRM 1577 (Set 34) |
| | | - | 1.2 (0.7 - 1.7) | 1.1 | Yes | - | 88% | 04B SRM 1577 (Set 34) |
| | | - | 31.7 (27.5 - 35.7) | 14 | No | - | 43% | 02B CRM DOLT-5 (Set 34) |
| | | - | 31.7 (27.5 - 35.7) | 13 | No | - | 40% | 05B CRM DOLT-5 (Set 34) |
| Antimony (Sb) | µg/g dw | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 69% | 01B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 85% | 03B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 91% | 05B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 71% | 08B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 73% | 10B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 74% | 14B SRM 1577 (Set 33) |
| | | - | 0.013 | 0.013 | - | - | 99% | 02B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.012 | - | - | 92% | 04B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.014 | - | - | 105% | 06B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.011 | - | - | 86% | 07B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.012 | - | - | 88% | 09B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.011 | - | - | 86% | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 85% | 12B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 85% | 16B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 69% | 18B SRM 1577 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.007 | Yes | - | 75% | 20B SRM 1577 (Set 33) |
| | | - | 0.013 | 0.011 | - | - | 87% | 13B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.014 | - | - | 105% | 15B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.013 | - | - | 98% | 17B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.011 | - | - | 87% | 19B CRM DOLT-5 (Set 33) |
| | | - | 0.013 | 0.012 | - | - | 95% | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.009 (0.004 - 0.014) | 0.008 | Yes | - | 88% | 01B SRM 1577 (Set 34) |
| | | - | 0.009 (0.004 - 0.014) | 0.006 | Yes | - | 68% | 04B SRM 1577 (Set 34) |
| | | - | 0.013 | 0.012 | - | - | 134% | 02B CRM DOLT-5 (Set 34) |
| | | - | 0.013 | 0.017 | - | - | 189% | 05B CRM DOLT-5 (Set 34) |
| Arsenic (As) | µg/g dw | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.056 | Yes | 101% | 103% | 01B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.057 | Yes | 103% | 105% | 03B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.062 | No | 112% | 114% | 05B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.074 | No | 134% | 137% | 08B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.050 | Yes | 91% | 93% | 10B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.052 | Yes | 94% | 96% | 14B SRM 1577 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 33.1 | Yes | 96% | - | 02B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 30.7 | No | 89% | - | 04B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 30.3 | No | 88% | - | 06B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 33.0 | Yes | 95% | - | 07B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 34.7 | Yes | 100% | - | 09B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 31.6 | No | 91% | - | 11B CRM DOLT-5 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.058 | Yes | 105% | 107% | 12B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.052 | Yes | 95% | 97% | 16B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.044 | No | 80% | 81% | 18B SRM 1577 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.055 | Yes | 100% | 101% | 20B SRM 1577 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 30.9 | No | 89% | - | 13B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 31.6 | No | 91% | - | 15B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 30.9 | No | 89% | - | 17B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 30.9 | No | 89% | - | 19B CRM DOLT-5 (Set 33) |
| | | 34.6 (32.2 - 37) | - | 31.1 | No | 90% | - | 21B CRM DOLT-5 (Set 33) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.055 | Yes | 101% | 103% | 01B SRM 1577 (Set 34) |
| | | 0.055 (0.050 - 0.060) | 0.054 (0.048 - 0.060) | 0.061 | No | 110% | 112% | 04B SRM 1577 (Set 34) |
| | | 34.6 (32.2 - 37) | - | 32.3 | Yes | 93% | - | 02B CRM DOLT-5 (Set 34) |
| | | 34.6 (32.2 - 37) | - | 35.7 | Yes | 103% | - | 05B CRM DOLT-5 (Set 34) |
| Cadmium (Cd) | µg/g dw | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 112% | 107% | 01B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.29 | Yes | 106% | 101% | 03B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.31 | Yes | 114% | 108% | 05B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.32 | No | 119% | 114% | 08B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.31 | Yes | 114% | 108% | 10B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.29 | Yes | 109% | 104% | 14B SRM 1577 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 13.9 | Yes | 96% | - | 02B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 13.2 | No | 91% | - | 04B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 12.8 | No | 88% | - | 06B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 14.0 | Yes | 97% | - | 07B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 14.1 | Yes | 97% | - | 09B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 12.9 | No | 89% | - | 11B CRM DOLT-5 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.29 | Yes | 106% | 101% | 12B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.29 | Yes | 106% | 101% | 16B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.27 | Yes | 100% | 95% | 18B SRM 1577 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 109% | 104% | 20B SRM 1577 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 12.7 | No | 88% | - | 13B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 12.9 | No | 89% | - | 15B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 12.9 | No | 89% | - | 17B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 12.8 | No | 88% | - | 19B CRM DOLT-5 (Set 33) |
| | | 14.5 (13.9 - 15.1) | - | 12.8 | No | 88% | - | 21B CRM DOLT-5 (Set 33) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.28 | Yes | 104% | 99% | 01B SRM 1577 (Set 34) |
| | | 0.27 (0.23 - 0.31) | 0.283 (0.26 - 0.306) | 0.30 | Yes | 111% | 106% | 04B SRM 1577 (Set 34) |
| | | 14.5 (13.9 - 15.1) | - | 13.0 | No | 90% | - | 02B CRM DOLT-5 (Set 34) |
| | | 14.5 (13.9 - 15.1) | - | 14.9 | Yes | 103% | - | 05B CRM DOLT-5 (Set 34) |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20c: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2016

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Calcium (Ca) | µg/g dw | 124 (118 - 130) | 121 (107 - 135) | 119 | Yes | 96% | 98% | 01B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 124 | Yes | 100% | 102% | 03B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 126 | Yes | 102% | 104% | 05B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 119 | Yes | 96% | 98% | 08B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 116 | No | 94% | 96% | 10B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 115 | No | 93% | 95% | 14B SRM 1577 (Set 33) |
| | | 550 (470 - 630) | - | 519 | Yes | 94% | - | 02B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 581 | Yes | 106% | - | 04B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 619 | Yes | 113% | - | 06B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 514 | Yes | 93% | - | 07B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 551 | Yes | 100% | - | 09B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 551 | Yes | 100% | - | 11B CRM DOLT-5 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 127 | Yes | 102% | 105% | 12B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 126 | Yes | 102% | 104% | 16B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 114 | No | 92% | 94% | 18B SRM 1577 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 117 | No | 94% | 97% | 20B SRM 1577 (Set 33) |
| | | 550 (470 - 630) | - | 568 | Yes | 103% | - | 13B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 542 | Yes | 99% | - | 15B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 544 | Yes | 99% | - | 17B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 554 | Yes | 101% | - | 19B CRM DOLT-5 (Set 33) |
| | | 550 (470 - 630) | - | 593 | Yes | 108% | - | 21B CRM DOLT-5 (Set 33) |
| | | 124 (118 - 130) | 121 (107 - 135) | 126 | Yes | 102% | 104% | 01B SRM 1577 (Set 34) |
| | | 124 (118 - 130) | 121 (107 - 135) | 111 | No | 90% | 92% | 04B SRM 1577 (Set 34) |
| | | 550 (470 - 630) | - | 554 | Yes | 101% | - | 02B CRM DOLT-5 (Set 34) |
| | | 550 (470 - 630) | - | 540 | Yes | 98% | - | 05B CRM DOLT-5 (Set 34) |
| Cesium (Cs) | µg/g dw | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 82% | 01B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 83% | 03B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 88% | 05B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 79% | 08B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 87% | 10B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 86% | 14B SRM 1577 (Set 33) |
| | | - | - | 0.07 | - | - | - | 02B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 04B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 06B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 07B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 09B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 81% | 12B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 79% | 16B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 81% | 18B SRM 1577 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 86% | 20B SRM 1577 (Set 33) |
| | | - | - | 0.07 | - | - | - | 13B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 15B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 17B CRM DOLT-5 (Set 33) |
| | | - | - | 0.07 | - | - | - | 19B CRM DOLT-5 (Set 33) |
| | | - | - | 0.06 | - | - | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.015 (0.011 - 0.019) | 0.013 | Yes | - | 84% | 01B SRM 1577 (Set 34) |
| | | - | 0.015 (0.011 - 0.019) | 0.012 | Yes | - | 81% | 04B SRM 1577 (Set 34) |
| | | - | - | 0.07 | - | - | - | 02B CRM DOLT-5 (Set 34) |
| | | - | - | 0.07 | - | - | - | 05B CRM DOLT-5 (Set 34) |
| Chromium (Cr) | µg/g dw | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.099 | Yes | 112% | 90% | 01B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.165 | No | 188% | 150% | 03B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.133 | No | 151% | 121% | 05B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.124 | No | 141% | 113% | 08B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.108 | No | 123% | 98% | 10B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.122 | No | 139% | 111% | 14B SRM 1577 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 2.05 | Yes | - | 87% | 02B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 2.39 | Yes | - | 102% | 04B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 2.16 | Yes | - | 92% | 06B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 1.68 | No | - | 71% | 07B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 1.81 | Yes | - | 77% | 09B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 2.66 | Yes | - | 113% | 11B CRM DOLT-5 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.109 | No | 124% | 99% | 12B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.113 | No | 128% | 103% | 16B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.191 | No | 217% | 174% | 18B SRM 1577 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.111 | No | 126% | 101% | 20B SRM 1577 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 1.78 | Yes | - | 76% | 13B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 1.92 | Yes | - | 82% | 15B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 2.16 | Yes | - | 92% | 17B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 2.08 | Yes | - | 89% | 19B CRM DOLT-5 (Set 33) |
| | | - | 2.35 (1.77 - 2.93) | 2.01 | Yes | - | 86% | 21B CRM DOLT-5 (Set 33) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.116 | No | 132% | 105% | 01B SRM 1577 (Set 34) |
| | | 0.088 (0.076 - 0.10) | 0.11 (0.06 - 0.16) | 0.127 | No | 144% | 115% | 04B SRM 1577 (Set 34) |
| | | - | 2.35 (1.77 - 2.93) | 2.21 | Yes | - | 94% | 02B CRM DOLT-5 (Set 34) |
| | | - | 2.35 (1.77 - 2.93) | 1.82 | Yes | - | 77% | 05B CRM DOLT-5 (Set 34) |
| Cobalt (Co) | µg/g dw | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 112% | 01B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 111% | 03B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.26 | Yes | - | 118% | 05B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 113% | 08B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 110% | 10B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 109% | 14B SRM 1577 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.248 | Yes | 93% | - | 02B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.248 | Yes | 93% | - | 04B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.254 | Yes | 95% | - | 06B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.254 | Yes | 95% | - | 07B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.250 | Yes | 94% | - | 09B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.249 | Yes | 93% | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 107% | 12B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 109% | 16B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 105% | 18B SRM 1577 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.24 | Yes | - | 110% | 20B SRM 1577 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.242 | Yes | 91% | - | 13B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.241 | Yes | 90% | - | 15B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.251 | Yes | 94% | - | 17B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.241 | Yes | 90% | - | 19B CRM DOLT-5 (Set 33) |
| | | 0.267 (0.241 - 0.293) | - | 0.245 | Yes | 92% | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.22 (0.18 - 0.26) | 0.23 | Yes | - | 105% | 01B SRM 1577 (Set 34) |
| | | - | 0.22 (0.18 - 0.26) | 0.25 | Yes | - | 113% | 04B SRM 1577 (Set 34) |
| | | 0.267 (0.241 - 0.293) | - | 0.229 | No | 86% | - | 02B CRM DOLT-5 (Set 34) |
| | | 0.267 (0.241 - 0.293) | - | 0.266 | Yes | 100% | - | 05B CRM DOLT-5 (Set 34) |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20c: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2016

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Copper (Cu) | µg/g dw | 193 (183 - 203) | 190 (180 - 200) | 180 | No | 93% | 95% | 01B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 173 | No | 90% | 91% | 03B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 188 | Yes | 97% | 99% | 05B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 184 | Yes | 95% | 97% | 08B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 176 | No | 91% | 93% | 10B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 175 | No | 91% | 92% | 14B SRM 1577 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 31.6 | No | 90% | - | 02B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 30.2 | No | 86% | - | 04B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 31.8 | No | 91% | - | 06B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 33.0 | Yes | 94% | - | 07B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 33.2 | Yes | 95% | - | 09B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 31.0 | No | 89% | - | 11B CRM DOLT-5 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 169 | No | 88% | 89% | 12B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 167 | No | 87% | 88% | 16B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 163 | No | 84% | 86% | 18B SRM 1577 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 177 | No | 92% | 93% | 20B SRM 1577 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 29.3 | No | 84% | - | 13B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 29.8 | No | 85% | - | 15B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 30.0 | No | 86% | - | 17B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 30.0 | No | 86% | - | 19B CRM DOLT-5 (Set 33) |
| | | 35.0 (32.6 - 37.4) | - | 30.6 | No | 87% | - | 21B CRM DOLT-5 (Set 33) |
| | | 193 (183 - 203) | 190 (180 - 200) | 168 | No | 87% | 88% | 01B SRM 1577 (Set 34) |
| | | 193 (183 - 203) | 190 (180 - 200) | 172 | No | 89% | 91% | 04B SRM 1577 (Set 34) |
| | | 35.0 (32.6 - 37.4) | - | 29.5 | No | 84% | - | 02B CRM DOLT-5 (Set 34) |
| | | 35.0 (32.6 - 37.4) | - | 33.8 | Yes | 97% | - | 05B CRM DOLT-5 (Set 34) |
| Iron (Fe) | µg/g dw | 268 (260 - 276) | 263 (241 - 285) | 252 | No | 94% | 96% | 01B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 260 | Yes | 97% | 99% | 03B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 283 | No | 106% | 108% | 05B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 262 | Yes | 98% | 100% | 08B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 253 | No | 94% | 96% | 10B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 261 | Yes | 97% | 99% | 14B SRM 1577 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,020 | Yes | 95% | - | 02B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,060 | Yes | 99% | - | 04B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 961 | No | 90% | - | 06B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,010 | Yes | 94% | - | 07B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,060 | Yes | 99% | - | 09B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 995 | Yes | 93% | - | 11B CRM DOLT-5 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 260 | Yes | 97% | 99% | 12B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 260 | Yes | 97% | 99% | 16B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 254 | No | 95% | 97% | 18B SRM 1577 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 265 | Yes | 99% | 101% | 20B SRM 1577 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,010 | Yes | 94% | - | 13B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,020 | Yes | 95% | - | 15B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,010 | Yes | 94% | - | 17B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,000 | Yes | 93% | - | 19B CRM DOLT-5 (Set 33) |
| | | 1,070 (990 - 1,150) | - | 1,050 | Yes | 98% | - | 21B CRM DOLT-5 (Set 33) |
| | | 268 (260 - 276) | 263 (241 - 285) | 258 | No | 96% | 98% | 01B SRM 1577 (Set 34) |
| | | 268 (260 - 276) | 263 (241 - 285) | 266 | Yes | 99% | 101% | 04B SRM 1577 (Set 34) |
| | | 1,070 (990 - 1,150) | - | 995 | Yes | 93% | - | 02B CRM DOLT-5 (Set 34) |
| | | 1,070 (990 - 1,150) | - | 1,110 | Yes | 104% | - | 05B CRM DOLT-5 (Set 34) |
| Lead (Pb) | µg/g dw | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.34 | Yes | 101% | 101% | 01B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.34 | Yes | 99% | 99% | 03B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.39 | Yes | 114% | 114% | 05B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.36 | Yes | 104% | 104% | 08B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.36 | Yes | 106% | 106% | 10B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.35 | Yes | 104% | 104% | 14B SRM 1577 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.155 | Yes | 96% | - | 02B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.140 | Yes | 86% | - | 04B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.253 | No | 156% | - | 06B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.162 | Yes | 100% | - | 07B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.135 | Yes | 83% | - | 09B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.179 | Yes | 110% | - | 11B CRM DOLT-5 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.34 | Yes | 99% | 99% | 12B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.33 | Yes | 98% | 98% | 16B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.32 | Yes | 93% | 93% | 18B SRM 1577 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.34 | Yes | 101% | 101% | 20B SRM 1577 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.130 | Yes | 80% | - | 13B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.164 | Yes | 101% | - | 15B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.142 | Yes | 88% | - | 17B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.154 | Yes | 95% | - | 19B CRM DOLT-5 (Set 33) |
| | | 0.162 (0.130 - 0.194) | - | 0.151 | Yes | 93% | - | 21B CRM DOLT-5 (Set 33) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.33 | Yes | 97% | 97% | 01B SRM 1577 (Set 34) |
| | | 0.34 (0.26 - 0.42) | 0.34 (0.30 - 0.38) | 0.38 | Yes | 111% | 111% | 04B SRM 1577 (Set 34) |
| | | 0.162 (0.130 - 0.194) | - | 0.147 | Yes | 91% | - | 02B CRM DOLT-5 (Set 34) |
| | | 0.162 (0.130 - 0.194) | - | 0.167 | Yes | 103% | - | 05B CRM DOLT-5 (Set 34) |
| Magnesium (Mg) | µg/g dw | 604 (595 - 613) | 608 (577 - 639) | 569 | No | 94% | 94% | 01B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 579 | No | 96% | 95% | 03B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 647 | No | 107% | 106% | 05B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 622 | No | 103% | 102% | 08B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 596 | Yes | 99% | 98% | 10B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 594 | No | 98% | 98% | 14B SRM 1577 (Set 33) |
| | | 940 (840 - 1,040) | - | 828 | No | 88% | - | 02B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 852 | Yes | 91% | - | 04B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 879 | Yes | 94% | - | 06B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 875 | Yes | 93% | - | 07B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 909 | Yes | 97% | - | 09B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 883 | Yes | 94% | - | 11B CRM DOLT-5 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 605 | Yes | 100% | 100% | 12B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 580 | No | 96% | 95% | 16B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 554 | No | 92% | 91% | 18B SRM 1577 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 617 | No | 102% | 101% | 20B SRM 1577 (Set 33) |
| | | 940 (840 - 1,040) | - | 866 | Yes | 92% | - | 13B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 857 | Yes | 91% | - | 15B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 819 | No | 87% | - | 17B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 871 | Yes | 93% | - | 19B CRM DOLT-5 (Set 33) |
| | | 940 (840 - 1,040) | - | 869 | Yes | 92% | - | 21B CRM DOLT-5 (Set 33) |
| | | 604 (595 - 613) | 608 (577 - 639) | 577 | No | 96% | 95% | 01B SRM 1577 (Set 34) |
| | | 604 (595 - 613) | 608 (577 - 639) | 593 | No | 98% | 98% | 04B SRM 1577 (Set 34) |
| | | 940 (840 - 1,040) | - | 815 | No | 87% | - | 02B CRM DOLT-5 (Set 34) |
| | | 940 (840 - 1,040) | - | 947 | Yes | 101% | - | 05B CRM DOLT-5 (Set 34) |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20c: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2016

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Manganese (Mn) | µg/g dw | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.1 | Yes | 98% | 99% | 01B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.2 | Yes | 99% | 100% | 03B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 11.6 | No | 113% | 114% | 05B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.2 | Yes | 99% | 100% | 08B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.0 | Yes | 97% | 98% | 10B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.4 | Yes | 101% | 102% | 14B SRM 1577 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.52 | Yes | - | 96% | 02B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.63 | Yes | - | 97% | 04B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.88 | Yes | - | 100% | 06B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 9.25 | Yes | - | 104% | 07B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 9.11 | Yes | - | 102% | 09B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.65 | Yes | - | 97% | 11B CRM DOLT-5 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.4 | Yes | 101% | 102% | 12B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.1 | Yes | 98% | 99% | 16B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 9.93 | Yes | 96% | 97% | 18B SRM 1577 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.5 | Yes | 102% | 103% | 20B SRM 1577 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.70 | Yes | - | 98% | 13B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.82 | Yes | - | 99% | 15B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 9.26 | Yes | - | 104% | 17B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.76 | Yes | - | 98% | 19B CRM DOLT-5 (Set 33) |
| | | - | 8.91 (8.21 - 9.61) | 8.94 | Yes | - | 100% | 21B CRM DOLT-5 (Set 33) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.5 | Yes | 102% | 103% | 01B SRM 1577 (Set 34) |
| | | 10.3 (9.3 - 11.3) | 10.2 (9.5 - 10.9) | 10.6 | Yes | 103% | 104% | 04B SRM 1577 (Set 34) |
| | | - | 8.91 (8.21 - 9.61) | 8.84 | Yes | - | 99% | 02B CRM DOLT-5 (Set 34) |
| | | - | 8.91 (8.21 - 9.61) | 9.50 | Yes | - | 107% | 05B CRM DOLT-5 (Set 34) |
| Mercury (Hg) | µg/g dw | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 135% | 135% | 01B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.023 | No | 141% | 141% | 03B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.024 | No | 148% | 148% | 05B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.023 | No | 144% | 144% | 08B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.024 | No | 147% | 147% | 10B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 139% | 139% | 14B SRM 1577 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.37 | Yes | 84% | - | 02B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.38 | Yes | 85% | - | 04B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.34 | Yes | 78% | - | 06B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.40 | Yes | 90% | - | 07B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.40 | Yes | 91% | - | 09B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.38 | Yes | 87% | - | 11B CRM DOLT-5 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 138% | 138% | 12B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.021 | No | 130% | 130% | 16B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.022 | No | 139% | 139% | 18B SRM 1577 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.023 | No | 142% | 142% | 20B SRM 1577 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.41 | Yes | 92% | - | 13B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.39 | Yes | 88% | - | 15B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.40 | Yes | 90% | - | 17B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.38 | Yes | 87% | - | 19B CRM DOLT-5 (Set 33) |
| | | 0.44 (0.26 - 0.62) | - | 0.38 | Yes | 86% | - | 21B CRM DOLT-5 (Set 33) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.024 | No | 149% | 149% | 01B SRM 1577 (Set 34) |
| | | 0.016 (0.014 - 0.018) | 0.016 (0.015 - 0.017) | 0.025 | No | 154% | 154% | 04B SRM 1577 (Set 34) |
| | | 0.44 (0.26 - 0.62) | - | 0.39 | Yes | 88% | - | 02B CRM DOLT-5 (Set 34) |
| | | 0.44 (0.26 - 0.62) | - | 0.42 | Yes | 96% | - | 05B CRM DOLT-5 (Set 34) |
| Molybdenum (Mo) | µg/g dw | - | 3.2 (2.8 - 3.6) | 3.7 | No | - | 116% | 01B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 111% | 03B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.7 | No | - | 114% | 05B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.7 | No | - | 115% | 08B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 113% | 10B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.5 | Yes | - | 110% | 14B SRM 1577 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.42 | Yes | 101% | - | 02B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.43 | Yes | 101% | - | 04B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.31 | Yes | 93% | - | 06B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.33 | Yes | 94% | - | 07B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.37 | Yes | 97% | - | 09B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.42 | Yes | 101% | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.5 | Yes | - | 108% | 12B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 113% | 16B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.3 | Yes | - | 104% | 18B SRM 1577 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.7 | No | - | 114% | 20B SRM 1577 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.35 | Yes | 96% | - | 13B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.33 | Yes | 94% | - | 15B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.37 | Yes | 97% | - | 17B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.40 | Yes | 99% | - | 19B CRM DOLT-5 (Set 33) |
| | | 1.41 (1.19 - 1.63) | - | 1.35 | Yes | 96% | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 3.2 (2.8 - 3.6) | 3.5 | Yes | - | 109% | 01B SRM 1577 (Set 34) |
| | | - | 3.2 (2.8 - 3.6) | 3.6 | Yes | - | 112% | 04B SRM 1577 (Set 34) |
| | | 1.41 (1.19 - 1.63) | - | 1.35 | Yes | 96% | - | 02B CRM DOLT-5 (Set 34) |
| | | 1.41 (1.19 - 1.63) | - | 1.40 | Yes | 99% | - | 05B CRM DOLT-5 (Set 34) |
| Nickel (Ni) | µg/g dw | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 20% | 01B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.06 | No | - | 32% | 03B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 22% | 05B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.05 | No | - | 26% | 08B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 19% | 10B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 23% | 14B SRM 1577 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.42 | Yes | - | 83% | 02B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.46 | Yes | - | 85% | 04B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.43 | Yes | - | 84% | 06B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.42 | Yes | - | 83% | 07B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.30 | Yes | - | 76% | 09B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.76 | Yes | - | 103% | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 20% | 12B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 21% | 16B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 17% | 18B SRM 1577 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.03 | No | - | 16% | 20B SRM 1577 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.18 | Yes | - | 69% | 13B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.27 | Yes | - | 74% | 15B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.57 | Yes | - | 92% | 17B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.62 | Yes | - | 95% | 19B CRM DOLT-5 (Set 33) |
| | | - | 1.71 (1.15 - 2.27) | 1.41 | Yes | - | 82% | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 20% | 01B SRM 1577 (Set 34) |
| | | - | 0.18 (0.10 - 0.26) | 0.04 | No | - | 23% | 04B SRM 1577 (Set 34) |
| | | - | 1.71 (1.15 - 2.27) | 1.40 | Yes | - | 82% | 02B CRM DOLT-5 (Set 34) |
| | | - | 1.71 (1.15 - 2.27) | 1.18 | Yes | - | 69% | 05B CRM DOLT-5 (Set 34) |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20c: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2016

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Phosphorus (P) | µg/g dw | - | 11,200 (10,100 - 12,300) | 12,000 | Yes | - | 107% | 01B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,000 | Yes | - | 98% | 03B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 12,500 | No | - | 112% | 05B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 12,700 | No | - | 113% | 08B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,300 | Yes | - | 101% | 10B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,300 | Yes | - | 101% | 14B SRM 1577 (Set 33) |
| | | - | 11,500 | 11,300 | - | - | 98% | 02B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 10,500 | - | - | 91% | 04B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 10,900 | - | - | 95% | 06B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 11,900 | - | - | 103% | 07B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 12,100 | - | - | 105% | 09B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 10,700 | - | - | 93% | 11B CRM DOLT-5 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,600 | Yes | - | 104% | 12B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,500 | Yes | - | 103% | 16B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,000 | Yes | - | 98% | 18B SRM 1577 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,900 | Yes | - | 106% | 20B SRM 1577 (Set 33) |
| | | - | 11,500 | 10,500 | - | - | 91% | 13B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 10,500 | - | - | 91% | 15B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 10,500 | - | - | 91% | 17B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 10,600 | - | - | 92% | 19B CRM DOLT-5 (Set 33) |
| | | - | 11,500 | 10,800 | - | - | 94% | 21B CRM DOLT-5 (Set 33) |
| | | - | 11,200 (10,100 - 12,300) | 11,100 | Yes | - | 99% | 01B SRM 1577 (Set 34) |
| | | - | 11,200 (10,100 - 12,300) | 11,500 | Yes | - | 103% | 04B SRM 1577 (Set 34) |
| | | - | 11,500 | 10,600 | - | - | 92% | 02B CRM DOLT-5 (Set 34) |
| | | - | 11,500 | 12,600 | - | - | 110% | 05B CRM DOLT-5 (Set 34) |
| Potassium (K) | µg/g dw | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,100 | Yes | 104% | 104% | 01B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,700 | No | 110% | 110% | 03B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,400 | No | 107% | 107% | 05B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,200 | Yes | 105% | 105% | 08B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 9,880 | Yes | 102% | 102% | 10B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,200 | Yes | 105% | 105% | 14B SRM 1577 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 14,600 | Yes | 101% | - | 02B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 15,300 | Yes | 106% | - | 04B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 13,400 | Yes | 93% | - | 06B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 13,900 | Yes | 97% | - | 07B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 15,300 | Yes | 106% | - | 09B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 14,500 | Yes | 101% | - | 11B CRM DOLT-5 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,500 | No | 108% | 108% | 12B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,100 | Yes | 104% | 104% | 16B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 9,530 | Yes | 98% | 98% | 18B SRM 1577 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,400 | No | 107% | 107% | 20B SRM 1577 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 14,700 | Yes | 102% | - | 13B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 14,500 | Yes | 101% | - | 15B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 13,800 | Yes | 96% | - | 17B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 14,400 | Yes | 100% | - | 19B CRM DOLT-5 (Set 33) |
| | | 14,400 (11,400 - 17,400) | - | 14,300 | Yes | 99% | - | 21B CRM DOLT-5 (Set 33) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 10,200 | Yes | 105% | 105% | 01B SRM 1577 (Set 34) |
| | | 9,700 (9,100 - 10,300) | 9,700 (9,100 - 10,300) | 9,870 | Yes | 102% | 102% | 04B SRM 1577 (Set 34) |
| | | 14,400 (11,400 - 17,400) | - | 14,500 | Yes | 101% | - | 02B CRM DOLT-5 (Set 34) |
| | | 14,400 (11,400 - 17,400) | - | 15,500 | Yes | 108% | - | 05B CRM DOLT-5 (Set 34) |
| Rubidium (Rb) | µg/g dw | - | 18.3 (17.3 - 19.3) | 19.1 | Yes | - | 104% | 01B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.5 | Yes | - | 101% | 03B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.9 | Yes | - | 103% | 05B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.9 | Yes | - | 103% | 08B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.8 | Yes | - | 103% | 10B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.7 | Yes | - | 102% | 14B SRM 1577 (Set 33) |
| | | - | - | 5.0 | - | - | - | 02B CRM DOLT-5 (Set 33) |
| | | - | - | 4.8 | - | - | - | 04B CRM DOLT-5 (Set 33) |
| | | - | - | 4.7 | - | - | - | 06B CRM DOLT-5 (Set 33) |
| | | - | - | 4.8 | - | - | - | 07B CRM DOLT-5 (Set 33) |
| | | - | - | 5.0 | - | - | - | 09B CRM DOLT-5 (Set 33) |
| | | - | - | 4.9 | - | - | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.7 | Yes | - | 102% | 12B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.6 | Yes | - | 102% | 16B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 17.7 | Yes | - | 97% | 18B SRM 1577 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 19.1 | Yes | - | 104% | 20B SRM 1577 (Set 33) |
| | | - | - | 5.0 | - | - | - | 13B CRM DOLT-5 (Set 33) |
| | | - | - | 5.0 | - | - | - | 15B CRM DOLT-5 (Set 33) |
| | | - | - | 4.9 | - | - | - | 17B CRM DOLT-5 (Set 33) |
| | | - | - | 5.0 | - | - | - | 19B CRM DOLT-5 (Set 33) |
| | | - | - | 4.8 | - | - | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 18.3 (17.3 - 19.3) | 18.4 | Yes | - | 101% | 01B SRM 1577 (Set 34) |
| | | - | 18.3 (17.3 - 19.3) | 18.5 | Yes | - | 101% | 04B SRM 1577 (Set 34) |
| | | - | - | 4.9 | - | - | - | 02B CRM DOLT-5 (Set 34) |
| | | - | - | 5.2 | - | - | - | 05B CRM DOLT-5 (Set 34) |
| Selenium (Se) | µg/g dw | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 112% | 113% | 01B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.1 | Yes | 97% | 98% | 03B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 105% | 106% | 05B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.3 | No | 120% | 121% | 08B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 108% | 109% | 10B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.0 | Yes | 93% | 94% | 14B SRM 1577 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 8.78 | Yes | 106% | - | 02B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 6.71 | Yes | 81% | - | 04B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 7.38 | Yes | 89% | - | 06B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 8.13 | Yes | 98% | - | 07B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 8.82 | Yes | 106% | - | 09B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 7.56 | Yes | 91% | - | 11B CRM DOLT-5 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 111% | 112% | 12B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 112% | 113% | 16B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.1 | Yes | 98% | 99% | 18B SRM 1577 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.0 | Yes | 95% | 95% | 20B SRM 1577 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 7.48 | Yes | 90% | - | 13B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 7.04 | Yes | 85% | - | 15B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 7.30 | Yes | 88% | - | 17B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 7.00 | Yes | 84% | - | 19B CRM DOLT-5 (Set 33) |
| | | 8.3 (6.5 - 10.1) | - | 7.41 | Yes | 89% | - | 21B CRM DOLT-5 (Set 33) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 107% | 108% | 01B SRM 1577 (Set 34) |
| | | 1.1 (1.0 - 1.2) | 1.09 (1.02 - 1.16) | 1.2 | Yes | 105% | 106% | 04B SRM 1577 (Set 34) |
| | | 8.3 (6.5 - 10.1) | - | 7.34 | Yes | 88% | - | 02B CRM DOLT-5 (Set 34) |
| | | 8.3 (6.5 - 10.1) | - | 8.55 | Yes | 103% | - | 05B CRM DOLT-5 (Set 34) |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20c: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2016

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Silver (Ag) | µg/g dw | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 91% | 01B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.055 | Yes | - | 88% | 03B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.059 | Yes | - | 95% | 05B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.059 | Yes | - | 95% | 08B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.058 | Yes | - | 94% | 10B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 90% | 14B SRM 1577 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.83 | No | 89% | - | 02B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.78 | No | 87% | - | 04B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.79 | No | 87% | - | 06B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.92 | No | 94% | - | 07B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.90 | No | 93% | - | 09B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.82 | No | 89% | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 90% | 12B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 91% | 16B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.053 | Yes | - | 85% | 18B SRM 1577 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.057 | Yes | - | 93% | 20B SRM 1577 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.80 | No | 88% | - | 13B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.74 | No | 85% | - | 15B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.76 | No | 86% | - | 17B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.76 | No | 86% | - | 19B CRM DOLT-5 (Set 33) |
| | | 2.05 (1.97 - 2.13) | - | 1.78 | No | 87% | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.062 (0.051 - 0.073) | 0.056 | Yes | - | 90% | 01B SRM 1577 (Set 34) |
| | | - | 0.062 (0.051 - 0.073) | 0.057 | Yes | - | 92% | 04B SRM 1577 (Set 34) |
| | | 2.05 (1.97 - 2.13) | - | 1.79 | No | 87% | - | 02B CRM DOLT-5 (Set 34) |
| | | 2.05 (1.97 - 2.13) | - | 1.99 | Yes | 97% | - | 05B CRM DOLT-5 (Set 34) |
| Sodium (Na) | µg/g dw | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,030 | No | 84% | 85% | 01B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,290 | No | 94% | 96% | 03B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,490 | Yes | 102% | 104% | 05B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,340 | Yes | 96% | 98% | 08B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,270 | No | 93% | 95% | 10B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,320 | Yes | 95% | 97% | 14B SRM 1577 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 9,370 | Yes | 95% | - | 02B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 9,750 | Yes | 98% | - | 04B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 9,840 | Yes | 99% | - | 06B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 9,640 | Yes | 97% | - | 07B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 10,100 | Yes | 102% | - | 09B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 9,990 | Yes | 101% | - | 11B CRM DOLT-5 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,340 | Yes | 96% | 98% | 12B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,200 | No | 91% | 92% | 16B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,150 | No | 88% | 90% | 18B SRM 1577 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,420 | Yes | 100% | 101% | 20B SRM 1577 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 10,200 | Yes | 103% | - | 13B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 9,820 | Yes | 99% | - | 15B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 9,620 | Yes | 97% | - | 17B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 10,300 | Yes | 104% | - | 19B CRM DOLT-5 (Set 33) |
| | | 9,900 (8,300 - 11,500) | - | 10,100 | Yes | 102% | - | 21B CRM DOLT-5 (Set 33) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,230 | No | 92% | 93% | 01B SRM 1577 (Set 34) |
| | | 2,430 (2,300 - 2,560) | 2,390 (2,230 - 2,550) | 2,290 | No | 94% | 96% | 04B SRM 1577 (Set 34) |
| | | 9,900 (8,300 - 11,500) | - | 9,380 | Yes | 95% | - | 02B CRM DOLT-5 (Set 34) |
| | | 9,900 (8,300 - 11,500) | - | 10,600 | Yes | 107% | - | 05B CRM DOLT-5 (Set 34) |
| Strontium (Sr) | µg/g dw | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 91% | 01B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 03B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 92% | 05B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 08B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 89% | 10B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 91% | 14B SRM 1577 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.79 | Yes | 102% | - | 02B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.74 | Yes | 100% | - | 04B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 4.22 | No | 113% | - | 06B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.53 | Yes | 95% | - | 07B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.54 | Yes | 95% | - | 09B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.69 | Yes | 99% | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 12B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 16B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 85% | 18B SRM 1577 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.15 | Yes | - | 91% | 20B SRM 1577 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.78 | Yes | 101% | - | 13B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.68 | Yes | 99% | - | 15B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.72 | Yes | 100% | - | 17B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.67 | Yes | 98% | - | 19B CRM DOLT-5 (Set 33) |
| | | 3.73 (3.47 - 3.99) | - | 3.85 | Yes | 103% | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 01B SRM 1577 (Set 34) |
| | | - | 0.16 (0.13 - 0.19) | 0.14 | Yes | - | 88% | 04B SRM 1577 (Set 34) |
| | | 3.73 (3.47 - 3.99) | - | 3.66 | Yes | 98% | - | 02B CRM DOLT-5 (Set 34) |
| | | 3.73 (3.47 - 3.99) | - | 3.79 | Yes | 102% | - | 05B CRM DOLT-5 (Set 34) |
| Tin (Sn) | µg/g dw | - | 0.016 (0.012 - 0.020) | 0.010 | No | - | 64% | 01B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.008 | No | - | 51% | 03B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.010 | No | - | 61% | 05B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.011 | No | - | 69% | 08B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.014 | Yes | - | 88% | 10B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.017 | Yes | - | 104% | 14B SRM 1577 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.061 | Yes | 89% | - | 02B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.059 | Yes | 85% | - | 04B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.058 | Yes | 84% | - | 06B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.070 | Yes | 101% | - | 07B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.050 | Yes | 72% | - | 09B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.067 | Yes | 97% | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.015 | Yes | - | 91% | 12B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.012 | Yes | - | 74% | 16B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 53% | 18B SRM 1577 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 54% | 20B SRM 1577 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.056 | Yes | 81% | - | 13B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.058 | Yes | 84% | - | 15B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.068 | Yes | 99% | - | 17B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.067 | Yes | 98% | - | 19B CRM DOLT-5 (Set 33) |
| | | 0.069 (0.033 - 0.105) | - | 0.064 | Yes | 92% | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.016 (0.012 - 0.020) | 0.009 | No | - | 57% | 01B SRM 1577 (Set 34) |
| | | - | 0.016 (0.012 - 0.020) | 0.012 | Yes | - | 72% | 04B SRM 1577 (Set 34) |
| | | 0.069 (0.033 - 0.105) | - | 0.059 | Yes | 85% | - | 02B CRM DOLT-5 (Set 34) |
| | | 0.069 (0.033 - 0.105) | - | 0.052 | Yes | 75% | - | 05B CRM DOLT-5 (Set 34) |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

## Table A.20c: Laboratory Analyses of Certified Reference Materials Associated with Fish and Benthic Invertebrate Tissue Chemistry Samples, 2016

| Analyte | Units | Certified Reference Material | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Certified Value | Informational Value | Measured | Value within Certified or Informational Range?[1] | % Recovery Relative to Certified Value | % Recovery Relative to Informational Value | Reference Material |
| Vanadium (V) | µg/g dw | - | 0.058 (0.052 - 0.064) | 0.062 | Yes | - | 106% | 01B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 105% | 03B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.063 | Yes | - | 108% | 05B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.058 | Yes | - | 100% | 08B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.060 | Yes | - | 103% | 10B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.058 | Yes | - | 99% | 14B SRM 1577 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.49 | Yes | 95% | - | 02B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.49 | Yes | 96% | - | 04B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.48 | Yes | 95% | - | 06B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.47 | Yes | 93% | - | 07B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.47 | Yes | 92% | - | 09B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.49 | Yes | 95% | - | 11B CRM DOLT-5 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.057 | Yes | - | 99% | 12B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.058 | Yes | - | 100% | 16B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.058 | Yes | - | 99% | 18B SRM 1577 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 106% | 20B SRM 1577 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.47 | Yes | 92% | - | 13B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.49 | Yes | 95% | - | 15B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.50 | Yes | 99% | - | 17B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.48 | Yes | 93% | - | 19B CRM DOLT-5 (Set 33) |
| | | 0.51 (0.45 - 0.57) | - | 0.49 | Yes | 97% | - | 21B CRM DOLT-5 (Set 33) |
| | | - | 0.058 (0.052 - 0.064) | 0.057 | Yes | - | 99% | 01B SRM 1577 (Set 34) |
| | | - | 0.058 (0.052 - 0.064) | 0.061 | Yes | - | 105% | 04B SRM 1577 (Set 34) |
| | | 0.51 (0.45 - 0.57) | - | 0.46 | Yes | 89% | - | 02B CRM DOLT-5 (Set 34) |
| | | 0.51 (0.45 - 0.57) | - | 0.50 | Yes | 98% | - | 05B CRM DOLT-5 (Set 34) |
| Zinc (Zn) | µg/g dw | 130 (117 - 143) | 131 (123 - 139) | 136 | Yes | 105% | 104% | 01B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 120 | Yes | 92% | 92% | 03B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 135 | Yes | 104% | 103% | 05B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 150 | No | 115% | 115% | 08B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 127 | Yes | 98% | 97% | 10B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 123 | Yes | 95% | 94% | 14B SRM 1577 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 101.0 | Yes | 96% | - | 02B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 92.5 | No | 88% | - | 04B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 92.0 | No | 87% | - | 06B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 104.0 | Yes | 99% | - | 07B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 111.0 | No | 105% | - | 09B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 91.2 | No | 87% | - | 11B CRM DOLT-5 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 119 | Yes | 92% | 91% | 12B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 121 | Yes | 93% | 92% | 16B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 115 | Yes | 88% | 88% | 18B SRM 1577 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 123 | Yes | 95% | 94% | 20B SRM 1577 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 85.9 | No | 82% | - | 13B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 93.0 | No | 88% | - | 15B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 92.9 | No | 88% | - | 17B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 87.8 | No | 83% | - | 19B CRM DOLT-5 (Set 33) |
| | | 105.3 (99.9 - 110.7) | - | 91.3 | No | 87% | - | 21B CRM DOLT-5 (Set 33) |
| | | 130 (117 - 143) | 131 (123 - 139) | 121 | Yes | 93% | 92% | 01B SRM 1577 (Set 34) |
| | | 130 (117 - 143) | 131 (123 - 139) | 126 | Yes | 97% | 96% | 04B SRM 1577 (Set 34) |
| | | 105.3 (99.9 - 110.7) | - | 93 | No | 89% | - | 02B CRM DOLT-5 (Set 34) |
| | | 105.3 (99.9 - 110.7) | - | 114 | No | 108% | - | 05B CRM DOLT-5 (Set 34) |

Note: Highlighted values did not achieve the data quality objective of recovery between 70% and 130% of certified values.

[1] If both a certified and an informational value, only compaired measured value to certified range.

**Table A.21a: Laboratory Matrix Spike Recoveries Associated with Fish Tissue Samples, 2014**

| Analyte | Units | Matrix Spike (% Recovery) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Whole Body | Ovary | | | | | Muscle | | | | | | | | | |
| | | SC-PC-01W | SC-PC-02G | GC-PC-15G | ML-08G | SC-KO-7 Ovary | KOSC1-PM-10G | ER-PC-08M | KOSC1-RT1M | GC-KO-1 | GC-YP-5 | SC-PM-1 | SC-KO-10 | ER-PM-6 | SCPM-01M | ERPM-7M | GCPM-07M |
| Aluminum (Al) | µg/g dw | † | † | 51% | 103% | § | § | † | ‡ | 97% | § | § | § | § | § | § | § |
| Antimony (Sb) | µg/g dw | 92% | 99% | 96% | 104% | 99% | 98% | 102% | 98% | 97% | 95% | 98% | 99% | 100% | 97% | 98% | 95% |
| Arsenic (As) | µg/g dw | 99% | 97% | 93% | 105% | 96% | 91% | 97% | 93% | 98% | 95% | 97% | 96% | 98% | 95% | 99% | 95% |
| Barium (Ba) | µg/g dw | † | 83% | 97% | 111% | 108% | 109% | 108% | 114% | 98% | 101% | 106% | 103% | 104% | 93% | 107% | 103% |
| Beryllium (Be) | µg/g dw | 94% | 83% | 81% | 90% | 78% | 71% | 86% | 71% | 86% | 86% | 87% | 86% | 95% | 88% | 86% | 86% |
| Bismuth (Bi) | µg/g dw | 89% | 106% | 104% | 105% | 95% | 93% | 104% | 91% | 100% | 94% | 96% | 98% | 101% | 99% | 99% | 98% |
| Boron (B) | µg/g dw | 97% | 82% | 78% | 87% | 75% | 72% | 79% | 78% | 80% | 86% | 85% | 86% | 86% | 85% | 85% | 85% |
| Cadmium (Cd) | µg/g dw | 92% | 99% | 95% | 101% | 96% | 94% | 99% | 95% | 96% | 94% | 95% | 96% | 97% | 95% | 96% | 94% |
| Calcium (Ca) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Cesium (Cs) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Chromium (Cr) | µg/g dw | 92% | 98% | 95% | 101% | 95% | 91% | 96% | 91% | 93% | 93% | 93% | 93% | 95% | 94% | 97% | 96% |
| Cobalt (Co) | µg/g dw | 93% | 102% | 97% | 100% | 96% | 91% | 94% | 94% | 94% | 94% | 93% | 93% | 93% | 92% | 97% | 95% |
| Copper (Cu) | µg/g dw | 84% | 100% | 87% | 91% | † | 87% | 83% | 84% | 89% | 86% | 88% | 85% | 87% | 82% | 88% | 88% |
| Gallium (Ga) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Iron (Fe) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Lead (Pb) | µg/g dw | 94% | 108% | 107% | 108% | 97% | 95% | 109% | 95% | 103% | 97% | 100% | 102% | 104% | 103% | 102% | 101% |
| Lithium (Li) | µg/g dw | 102% | 89% | 90% | 97% | 84% | 80% | 89% | 78% | 95% | 95% | 91% | 93% | 94% | 94% | 94% | 94% |
| Magnesium (Mg) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Manganese (Mn) | µg/g dw | † | † | † | 104% | 110% | 107% | 105% | 107% | 91% | 96% | 101% | 95% | 101% | 93% | 106% | 100% |
| Molybdenum (Mo) | µg/g dw | 105% | 103% | 98% | 108% | 98% | 98% | 107% | 104% | 101% | 101% | 100% | 101% | 102% | 100% | 102% | 99% |
| Nickel (Ni) | µg/g dw | 84% | 96% | 93% | 97% | 92% | 89% | 91% | 89% | 94% | 91% | 91% | 91% | 91% | 91% | 94% | 92% |
| Phosphorus (P) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Potassium (K) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Rhenium (Re) | µg/g dw | 109% | 110% | 107% | 113% | 101% | 100% | 115% | 110% | 106% | 103% | 103% | 105% | 109% | 107% | 111% | 109% |
| Rubidium (Rb) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Selenium (Se) | µg/g dw | 93% | 97% | † | 120% | † | 93% | 90% | 92% | 101% | 91% | 101% | 107% | 86% | 85% | 97% | 98% |
| Silver (Ag) | µg/g dw | 88% | 98% | 93% | 100% | 95% | 94% | 95% | 95% | 95% | 92% | 92% | 94% | 93% | 91% | 94% | 93% |
| Sodium (Na) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Strontium (Sr) | µg/g dw | † | 92% | 102% | 108% | 102% | 101% | † | 110% | 80% | 96% | 98% | 95% | 98% | 63% | ‡ | 98% |
| Thallium (Tl) | µg/g dw | 99% | 110% | 108% | 110% | 99% | 98% | 110% | 99% | 103% | 99% | 101% | 104% | 105% | 104% | 104% | 104% |
| Thorium (Th) | µg/g dw | 94% | 104% | 104% | 114% | 102% | 96% | 118% | 93% | 108% | 100% | 103% | 107% | 110% | 107% | 108% | 106% |
| Tin (Sn) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Titanium (Ti) | µg/g dw | 97% | 81% | 103% | 107% | 102% | 97% | 102% | 110% | 102% | 99% | 98% | 98% | 97% | 97% | 97% | 90% |
| Uranium (U) | µg/g dw | 108% | 114% | 113% | 117% | 106% | 106% | 120% | 104% | 109% | 104% | 107% | 110% | 112% | 110% | 111% | 110% |
| Vanadium (V) | µg/g dw | 101% | 101% | 100% | 106% | 100% | 96% | 102% | 98% | 98% | 99% | 99% | 99% | 98% | 97% | 101% | 98% |
| Yttrium (Y) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Zinc (Zn) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Zirconium (Zr) | µg/g dw | 66% | 142% | 122% | 162% | 70% | 63% | 112% | 95% | 77% | 83% | 79% | 84% | 81% | 76% | 67% | 82% |

Note: Highlighted values did not meet the data quality objective of 70 - 130% recovery.

* Not spiked (the element was not included in the multi-element spike solution).

† Spike too small (the concentration of the element spiked into sample was less than 50% of the average concentration measured in the replicates).

‡ High variability in replicates (the spike level was less than 2x the standard deviation of replicates).

§ Only one unspiked replicate was used for this element because the second replicate was digested in a vessel with known, significantly high background levels of this element. Thus the standard deviation of the replicates could not be accurately determined.

## Table A.21b: Laboratory Matrix Spike Recoveries Associated with Fish Tissue Samples, 2015

| Analyte | Units | Matrix Spike (% Recovery) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Whole Body | Ovary | | | | | Muscle | | | | | | | | | |
| | | SC-PCC-12-APR | SC-NSC-46-APR | SC-PCC-08-APR | GC-NSC-49-APR | ER-PCC-02-APR | ER-YP-02-APR | SC-CSU-02-APR | SC-NSC-46-APR-1 | SC-NSC-46-APR-2 | SC-PCC-08-APR | SC-NSC-06 | GC-YP-06-APR | GC-NSC-49-APR-1 | GC-NSC-49-APR-2 | GC-PCC-05-APR | GC-NSC-02 |
| Aluminum (Al) | µg/g dw | † | § | § | § | § | 105% | † | 109% | § | § | § | 77% | 121% | § | 78% | § |
| Antimony (Sb) | µg/g dw | 85% | 101% | 98% | 98% | 96% | 100% | 98% | 101% | 101% | 98% | 108% | 96% | 100% | 98% | 98% | 104% |
| Arsenic (As) | µg/g dw | 96% | 107% | 100% | 100% | 96% | 98% | 102% | 103% | 107% | 100% | 103% | 100% | 103% | 100% | 99% | 99% |
| Barium (Ba) | µg/g dw | † | 114% | 108% | 111% | 220% | 113% | 88% | 107% | 114% | 108% | 129% | 123% | 110% | 111% | 94% | 115% |
| Beryllium (Be) | µg/g dw | 87% | 75% | 72% | 72% | 70% | 74% | 76% | 78% | 75% | 72% | 78% | 78% | 79% | 72% | 76% | 74% |
| Bismuth (Bi) | µg/g dw | 85% | 110% | 108% | 108% | 106% | 106% | 103% | 107% | 110% | 108% | 102% | 101% | 98% | 108% | 94% | 104% |
| Boron (B) | µg/g dw | 90% | 78% | 78% | 77% | 77% | 76% | 75% | 78% | 78% | 78% | 74% | 79% | 85% | 77% | 81% | 72% |
| Cadmium (Cd) | µg/g dw | 91% | 99% | 95% | 95% | 93% | 93% | 96% | 98% | 99% | 95% | 99% | 94% | 98% | 95% | 95% | 96% |
| Calcium (Ca) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Cesium (Cs) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Chromium (Cr) | µg/g dw | 95% | 95% | 93% | 94% | 92% | 91% | 96% | 97% | 95% | 93% | 93% | 93% | 95% | 94% | 92% | 89% |
| Cobalt (Co) | µg/g dw | 90% | 98% | 96% | 96% | 90% | 90% | 98% | 102% | 98% | 96% | 91% | 98% | 97% | 96% | 95% | 89% |
| Copper (Cu) | µg/g dw | 70% | 86% | 90% | 95% | 95% | 84% | 90% | 95% | 86% | 90% | 96% | 90% | 81% | 95% | 88% | 77% |
| Gallium (Ga) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Iron (Fe) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Lead (Pb) | µg/g dw | 95% | 111% | 111% | 111% | 112% | 110% | 108% | 113% | 111% | 111% | 104% | 107% | 100% | 111% | 98% | 106% |
| Lithium (Li) | µg/g dw | 101% | 73% | 74% | 74% | 75% | 74% | 85% | 90% | 73% | 74% | 76% | 88% | 81% | 74% | 80% | 71% |
| Magnesium (Mg) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Manganese (Mn) | µg/g dw | † | † | † | 104% | † | 98% | 54% | 98% | † | † | 109% | 119% | 95% | 104% | 80% | 97% |
| Molybdenum (Mo) | µg/g dw | 102% | 106% | 102% | 103% | 97% | 100% | 103% | 104% | 106% | 102% | 102% | 104% | 105% | 103% | 105% | 101% |
| Nickel (Ni) | µg/g dw | 85% | 95% | 94% | 93% | 102% | 85% | 94% | 97% | 95% | 94% | 87% | 94% | 94% | 93% | 91% | 86% |
| Phosphorus (P) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Potassium (K) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Rhenium (Re) | µg/g dw | 104% | 118% | 113% | 114% | 113% | 117% | 114% | 114% | 118% | 113% | 110% | 114% | 106% | 114% | 104% | 112% |
| Rubidium (Rb) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Selenium (Se) | µg/g dw | 75% | † | † | 90% | † | 93% | 99% | 98% | † | † | 108% | 92% | 101% | 90% | 98% | 96% |
| Silver (Ag) | µg/g dw | 80% | 98% | 96% | 88% | 91% | 91% | 92% | 96% | 98% | 96% | 75% | 92% | 88% | 88% | 93% | 93% |
| Sodium (Na) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Strontium (Sr) | µg/g dw | † | 109% | 104% | 104% | 149% | 100% | 28% | 103% | 109% | 104% | 110% | 206% | 115% | 104% | ‡ | 101% |
| Thallium (Tl) | µg/g dw | 97% | 114% | 111% | 112% | 110% | 110% | 110% | 113% | 114% | 111% | 105% | 109% | 101% | 112% | 98% | 107% |
| Thorium (Th) | µg/g dw | 104% | 119% | 114% | 112% | 114% | 119% | 116% | 119% | 119% | 114% | 115% | 116% | 107% | 112% | 106% | 116% |
| Tin (Sn) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Titanium (Ti) | µg/g dw | 107% | 99% | 95% | 94% | 114% | 97% | 97% | 103% | 99% | 95% | 93% | 103% | 97% | 94% | 94% | 93% |
| Uranium (U) | µg/g dw | 104% | 123% | 118% | 120% | 121% | 125% | 120% | 122% | 123% | 118% | 115% | 119% | 114% | 120% | 112% | 117% |
| Vanadium (V) | µg/g dw | 102% | 104% | 100% | 100% | 98% | 96% | 101% | 103% | 104% | 100% | 99% | 101% | 100% | 100% | 98% | 98% |
| Yttrium (Y) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Zinc (Zn) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Zirconium (Zr) | µg/g dw | 96% | 57% | 66% | 62% | 64% | 61% | 142% | 148% | 57% | 66% | 59% | 120% | 86% | 62% | 64% | 76% |

Note: Highlighted values did not meet the data quality objective of 70 - 130% recovery.

* Not spiked (the element was not included in the multi-element spike solution).

† Spike too small (the concentration of the element spiked into sample was less than 50% of the average concentration measured in the replicates).

‡ High variability in replicates (the spike level was less than 2x the standard deviation of replicates).

§ Only one unspiked replicate was used for this element because the second replicate was digested in a vessel with known, significantly high background levels of this element. Thus the standard deviation of the replicates could not be accurately determined.

## Table A.21b: Laboratory Matrix Spike Recoveries Associated with Fish Tissue Samples, 2015

| Analyte | Units | Matrix Spike (% Recovery) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Muscle | | | | | |
| | | ER-CSU-17-APR | ER-CSU-09-APR | ER-NSC-13-APR | ER-PCC-02-APR | ER-YP-02-APR | ER-NSC-03 |
| Aluminum (Al) | µg/g dw | † | § | 92% | § | 105% | † |
| Antimony (Sb) | µg/g dw | 97% | 99% | 96% | 96% | 100% | 103% |
| Arsenic (As) | µg/g dw | 101% | 105% | 100% | 96% | 98% | 100% |
| Barium (Ba) | µg/g dw | 63% | 23% | 87% | 220% | 113% | 113% |
| Beryllium (Be) | µg/g dw | 79% | 70% | 68% | 70% | 74% | 70% |
| Bismuth (Bi) | µg/g dw | 94% | 106% | 100% | 106% | 106% | 103% |
| Boron (B) | µg/g dw | 82% | 74% | 73% | 77% | 76% | 71% |
| Cadmium (Cd) | µg/g dw | 97% | 96% | 91% | 93% | 93% | 95% |
| Calcium (Ca) | µg/g dw | * | * | * | * | * | * |
| Cesium (Cs) | µg/g dw | * | * | * | * | * | * |
| Chromium (Cr) | µg/g dw | 93% | 93% | 89% | 92% | 91% | 87% |
| Cobalt (Co) | µg/g dw | 94% | 94% | 90% | 90% | 90% | 87% |
| Copper (Cu) | µg/g dw | 81% | 88% | 83% | 95% | 84% | 81% |
| Gallium (Ga) | µg/g dw | * | * | * | * | * | * |
| Iron (Fe) | µg/g dw | † | † | † | † | † | † |
| Lead (Pb) | µg/g dw | 97% | 108% | 103% | 112% | 110% | 104% |
| Lithium (Li) | µg/g dw | 79% | 69% | 66% | 75% | 74% | 71% |
| Magnesium (Mg) | µg/g dw | † | † | † | † | † | † |
| Manganese (Mn) | µg/g dw | 20% | † | 76% | † | 98% | 86% |
| Molybdenum (Mo) | µg/g dw | 106% | 104% | 99% | 97% | 100% | 98% |
| Nickel (Ni) | µg/g dw | 91% | 90% | 88% | 102% | 85% | 83% |
| Phosphorus (P) | µg/g dw | † | † | † | † | † | † |
| Potassium (K) | µg/g dw | * | * | * | * | * | * |
| Rhenium (Re) | µg/g dw | 104% | 117% | 112% | 113% | 117% | 112% |
| Rubidium (Rb) | µg/g dw | * | * | * | * | * | * |
| Selenium (Se) | µg/g dw | † | 102% | † | † | 93% | 99% |
| Silver (Ag) | µg/g dw | 50% | 70% | 89% | 91% | 91% | 94% |
| Sodium (Na) | µg/g dw | † | † | † | † | † | † |
| Strontium (Sr) | µg/g dw | -4% | † | ‡ | 149% | 100% | 99% |
| Thallium (Tl) | µg/g dw | 98% | 111% | 105% | 110% | 110% | 107% |
| Thorium (Th) | µg/g dw | 107% | 122% | 116% | 114% | 119% | 113% |
| Tin (Sn) | µg/g dw | * | * | * | * | * | * |
| Titanium (Ti) | µg/g dw | 83% | 98% | 98% | 114% | 97% | 83% |
| Uranium (U) | µg/g dw | 111% | 123% | 115% | 121% | 125% | 117% |
| Vanadium (V) | µg/g dw | 99% | 102% | 98% | 98% | 96% | 93% |
| Yttrium (Y) | µg/g dw | * | * | * | * | * | * |
| Zinc (Zn) | µg/g dw | † | † | † | † | † | † |
| Zirconium (Zr) | µg/g dw | 68% | 73% | 77% | 64% | 61% | 74% |

Note: Highlighted values did not meet the data quality objective of 70 - 130% recovery.

* Not spiked (the element was not included in the multi-element spike solution).
† Spike too small (the concentration of the element spiked into sample was less than 50% of the average concentration measured in the replicates).
‡ High variability in replicates (the spike level was less than 2x the standard deviation of replicates).
§ Only one unspiked replicate was used for this element because the second replicate was digested in a vessel with known, significantly high background levels of this element. Thus the standard deviation of the replicates could not be accurately determined.

## **Table A.21c:** Laboratory Matrix Spike Recoveries Associated with fish Tissue Samples, 2016

| Analyte | Units | Matrix Spike (% Recovery) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Whole Body | | Ovary | | | | | | | | Muscle | | | | | |
| | | SC-RSC-18 | ER-PCC-13 | GC-YP-33 | GC-CSU-31 | ER-YP-05 | ER-CSU-04 | SC-YP-10 | SC-NSC-09 | SC-RT-04 | ER-PCC-06 | SC-NSC-01A | ER-PCC-01 | SC-PCC-06 | GC-BT-02 | ER-YP-02 | ER-CSU-34 |
| Aluminum (Al) | µg/g dw | † | † | 96% | § | § | § | § | § | 96% | § | § | § | § | § | 109% | § |
| Antimony (Sb) | µg/g dw | 94% | 90% | 98% | 96% | 95% | 98% | 99% | 96% | 96% | 105% | 97% | 99% | 101% | 98% | 99% | 102% |
| Arsenic (As) | µg/g dw | 100% | 95% | 98% | 99% | 97% | 97% | 100% | 104% | 99% | 110% | 98% | 106% | 105% | 98% | 97% | 102% |
| Barium (Ba) | µg/g dw | † | † | 108% | 96% | 101% | 106% | 107% | 111% | 104% | 118% | 95% | 122% | 94% | 105% | 102% | 109% |
| Beryllium (Be) | µg/g dw | 90% | 77% | 79% | 93% | 86% | 93% | 87% | 92% | 85% | 97% | 89% | 89% | 90% | 85% | 82% | 85% |
| Bismuth (Bi) | µg/g dw | 91% | 100% | 96% | 100% | 95% | 100% | 97% | 99% | 100% | 116% | 92% | 100% | 101% | 96% | 98% | 102% |
| Boron (B) | µg/g dw | 85% | 76% | 79% | 95% | 93% | 96% | 87% | 88% | 83% | 101% | 98% | 83% | 78% | 86% | 78% | 83% |
| Cadmium (Cd) | µg/g dw | 93% | 88% | 94% | 95% | 95% | 96% | 96% | 96% | 98% | 108% | 92% | 102% | 101% | 97% | 95% | 96% |
| Calcium (Ca) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Cesium (Cs) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Chromium (Cr) | µg/g dw | 95% | 84% | 92% | 98% | 96% | 95% | 91% | 100% | 96% | 105% | 88% | 97% | 94% | 95% | 99% | 95% |
| Cobalt (Co) | µg/g dw | 94% | 89% | 95% | 100% | 98% | 97% | 93% | 100% | 98% | 109% | 90% | 97% | 98% | 96% | 92% | 96% |
| Copper (Cu) | µg/g dw | 86% | 66% | 86% | 100% | 89% | 95% | 87% | 86% | † | 121% | 79% | 69% | 111% | 89% | 94% | 74% |
| Gallium (Ga) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Iron (Fe) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Lead (Pb) | µg/g dw | 97% | 101% | 100% | 103% | 101% | 101% | 101% | 100% | 103% | 115% | 94% | 103% | 103% | 100% | 102% | 106% |
| Lithium (Li) | µg/g dw | 96% | 80% | 84% | 100% | 99% | 96% | 88% | 95% | 92% | 100% | 98% | 90% | 89% | 92% | 84% | 89% |
| Magnesium (Mg) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Manganese (Mn) | µg/g dw | † | † | 96% | † | 105% | † | 97% | 92% | 101% | † | 94% | 112% | 90% | 95% | 94% | 105% |
| Molybdenum (Mo) | µg/g dw | 103% | 95% | 103% | 99% | 101% | 102% | 102% | 102% | 102% | 108% | 97% | 105% | 105% | 104% | 101% | 106% |
| Nickel (Ni) | µg/g dw | 87% | 78% | 90% | 96% | 93% | 93% | 87% | 100% | 92% | 105% | 88% | 95% | 94% | 91% | 89% | 93% |
| Phosphorus (P) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Potassium (K) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Rhenium (Re) | µg/g dw | 103% | 114% | 105% | 106% | 107% | 103% | 107% | 102% | 103% | 119% | 99% | 110% | 108% | 107% | 107% | 111% |
| Rubidium (Rb) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Selenium (Se) | µg/g dw | 101% | 83% | 98% | † | 94% | 91% | 91% | † | † | † | 86% | 115% | 111% | 93% | 101% | † |
| Silver (Ag) | µg/g dw | 88% | 83% | 55% | 101% | 90% | 89% | 90% | 96% | 91% | 83% | 90% | 90% | 95% | 93% | 90% | 95% |
| Sodium (Na) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Strontium (Sr) | µg/g dw | † | † | 103% | 102% | 104% | 105% | 93% | 104% | 101% | 110% | 82% | 206% | 63% | 100% | ‡ | 106% |
| Thallium (Tl) | µg/g dw | 101% | 107% | 101% | 104% | 102% | 103% | 102% | 101% | 103% | 117% | 96% | 104% | 104% | 101% | 103% | 108% |
| Thorium (Th) | µg/g dw | 107% | 108% | 107% | 103% | 105% | 106% | 109% | 102% | 104% | 112% | 102% | 104% | 104% | 103% | 106% | 113% |
| Tin (Sn) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Titanium (Ti) | µg/g dw | 81% | 81% | 97% | 101% | 97% | 101% | 98% | 96% | 97% | 105% | 98% | 94% | 96% | 96% | 93% | 93% |
| Uranium (U) | µg/g dw | 108% | 114% | 111% | 105% | 106% | 110% | 112% | 106% | 107% | 122% | 105% | 110% | 108% | 107% | 113% | 117% |
| Vanadium (V) | µg/g dw | 100% | 94% | 97% | 103% | 102% | 102% | 99% | 105% | 101% | 108% | 94% | 101% | 101% | 100% | 96% | 101% |
| Yttrium (Y) | µg/g dw | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Zinc (Zn) | µg/g dw | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † | † |
| Zirconium (Zr) | µg/g dw | 64% | 66% | 71% | 70% | 73% | 75% | 76% | 61% | 49% | 88% | 81% | 67% | 54% | 76% | 67% | 50% |

Note: Highlighted values did not meet the data quality objective of 70 - 130% recovery.

* Not spiked (the element was not included in the multi-element spike solution).

† Spike too small (the concentration of the element spiked into sample was less than 50% of the average concentration measured in the replicates).

‡ High variability in replicates (the spike level was less than 2x the standard deviation of replicates).

§ Only one unspiked replicate was used for this element because the second replicate was digested in a vessel with known, significantly high background levels of this element. Thus the standard deviation of the replicates could not be accurately determined.

## Table A.21c: Laboratory Matrix Spike Recoveries Associated with fish Tissue Samples, 2016

| Analyte | Units | Matrix Spike (% Recovery) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Muscle | | | | | |
| | | GC-CSU-09 | ER-NSC-01A | ER-NSC-02A | SC-CSU-36 | SC-NSC-34 | GC-NSC-01 |
| Aluminum (Al) | µg/g dw | 84% | 86% | 80% | § | § | § |
| Antimony (Sb) | µg/g dw | 78% | 102% | 101% | 97% | 97% | 101% |
| Arsenic (As) | µg/g dw | 77% | 106% | 97% | 97% | 99% | 104% |
| Barium (Ba) | µg/g dw | † | 107% | 101% | 106% | 108% | ‡ |
| Beryllium (Be) | µg/g dw | † | 93% | 93% | 78% | 77% | 86% |
| Bismuth (Bi) | µg/g dw | 111% | 99% | 100% | 94% | 97% | 100% |
| Boron (B) | µg/g dw | † | 97% | 92% | 82% | 81% | 83% |
| Cadmium (Cd) | µg/g dw | * | 94% | 98% | 96% | 97% | 98% |
| Calcium (Ca) | µg/g dw | * | * | * | * | * | * |
| Cesium (Cs) | µg/g dw | 100% | * | * | * | * | * |
| Chromium (Cr) | µg/g dw | 99% | 90% | 95% | 95% | 93% | 96% |
| Cobalt (Co) | µg/g dw | 95% | 93% | 99% | 95% | 96% | 97% |
| Copper (Cu) | µg/g dw | ‡ | 112% | 85% | 89% | 87% | 158% |
| Gallium (Ga) | µg/g dw | † | * | * | * | * | * |
| Iron (Fe) | µg/g dw | 99% | † | † | † | † | † |
| Lead (Pb) | µg/g dw | 95% | 99% | 105% | 98% | 100% | 101% |
| Lithium (Li) | µg/g dw | 94% | 101% | 95% | 85% | 84% | 88% |
| Magnesium (Mg) | µg/g dw | † | † | † | † | † | † |
| Manganese (Mn) | µg/g dw | * | 105% | 107% | 103% | 105% | 80% |
| Molybdenum (Mo) | µg/g dw | 101% | 99% | 102% | 103% | 101% | 103% |
| Nickel (Ni) | µg/g dw | 98% | 92% | 96% | 92% | 91% | 93% |
| Phosphorus (P) | µg/g dw | * | † | † | † | † | † |
| Potassium (K) | µg/g dw | ‡ | * | * | * | * | * |
| Rhenium (Re) | µg/g dw | * | 100% | 105% | 104% | 106% | 105% |
| Rubidium (Rb) | µg/g dw | 54% | * | * | * | * | * |
| Selenium (Se) | µg/g dw | 104% | 105% | 124% | 108% | 104% | 103% |
| Silver (Ag) | µg/g dw | 96% | 93% | 96% | 94% | 95% | 85% |
| Sodium (Na) | µg/g dw | 97% | † | † | † | † | † |
| Strontium (Sr) | µg/g dw | * | 100% | 97% | 104% | 126% | ‡ |
| Thallium (Tl) | µg/g dw | 100% | 102% | 105% | 100% | 102% | 103% |
| Thorium (Th) | µg/g dw | * | 107% | 109% | 101% | 102% | 106% |
| Tin (Sn) | µg/g dw | 82% | * | * | * | * | * |
| Titanium (Ti) | µg/g dw | 109% | 100% | 95% | 100% | 93% | 98% |
| Uranium (U) | µg/g dw | 106% | 108% | 110% | 108% | 108% | 111% |
| Vanadium (V) | µg/g dw | 105% | 96% | 99% | 99% | 97% | 101% |
| Yttrium (Y) | µg/g dw | 102% | * | * | * | * | * |
| Zinc (Zn) | µg/g dw | 111% | † | † | † | † | † |
| Zirconium (Zr) | µg/g dw | 115% | 86% | 92% | 76% | 56% | 64% |

Note: Highlighted values did not meet the data quality objective of 70 - 130% recovery.

* Not spiked (the element was not included in the multi-element spike solution).
† Spike too small (the concentration of the element spiked into sample was less than 50% of the average concentration measured in the replicates).
‡ High variability in replicates (the spike level was less than 2x the standard deviation of replicates).
§ Only one unspiked replicate was used for this element because the second replicate was digested in a vessel with known, significantly high background levels of this element. Thus the standard deviation of the replicates could not be accurately determined.

# APPENDIX B
# WATER QUALITY DATA

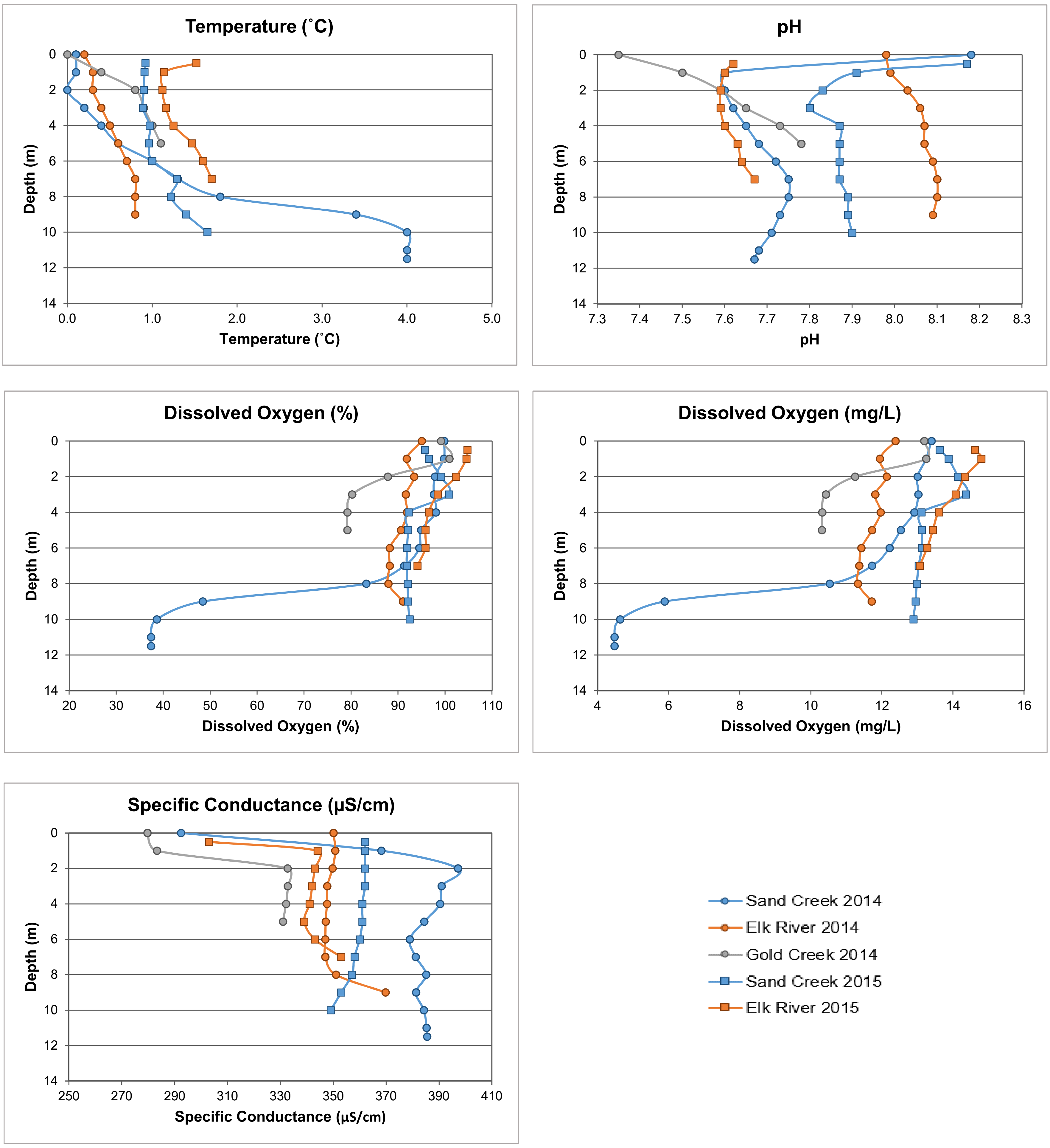

**Figure B.1:** *In situ* Water Quality Profiles Conducted at Sand Creek, Elk River, and Gold Creek Areas in Koocanusa Reservoir, February 2014 and 2015

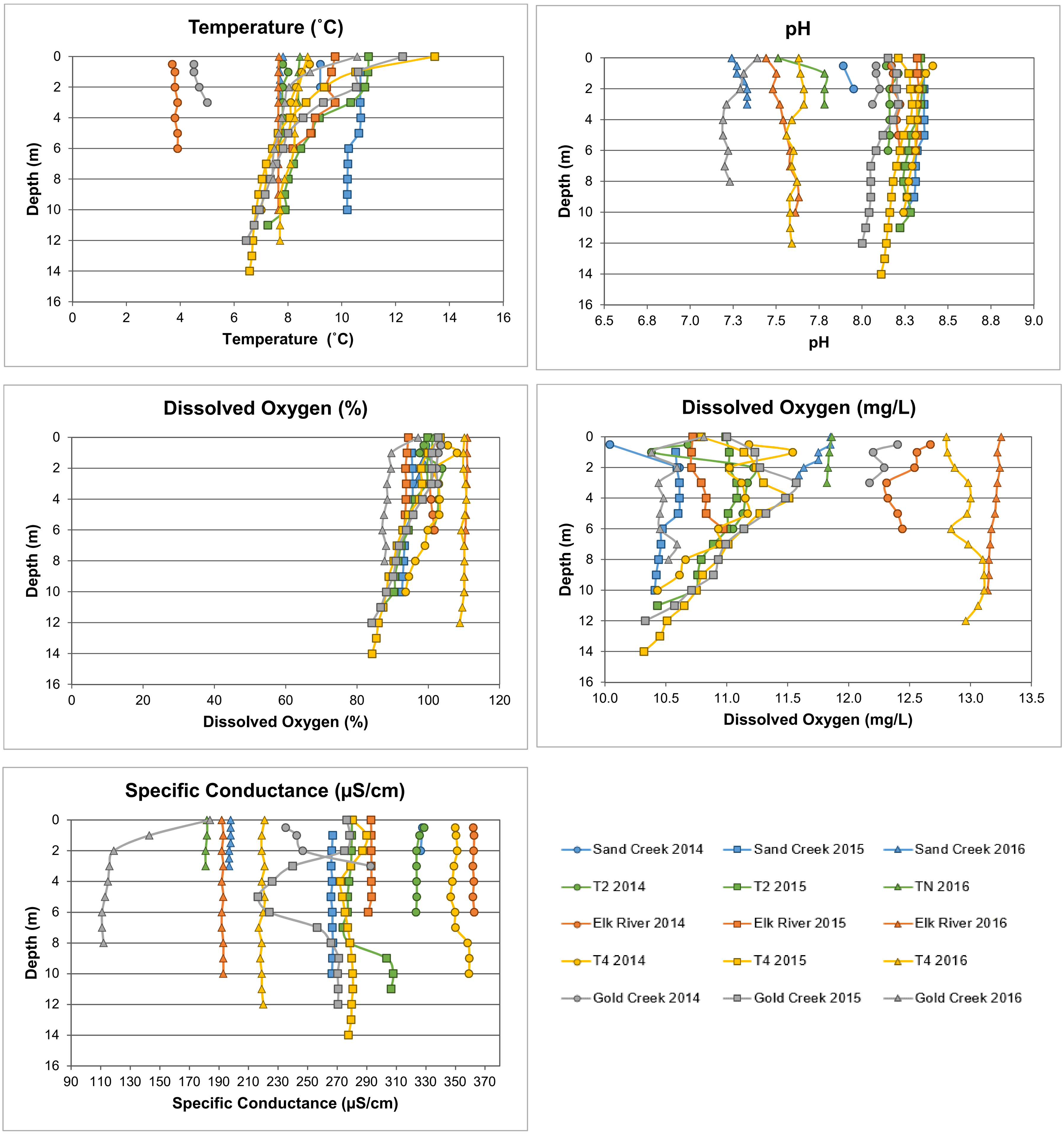

**Figure B.2:** ***In situ W*ater Quality Profiles Conducted at Sand Creek, Elk River, and Gold Creek Areas and at the Upstream (T2/TN) and Downstream (T4) Sampling Stations in Koocanusa Reservoir, April 2014, 2015 and 2016**

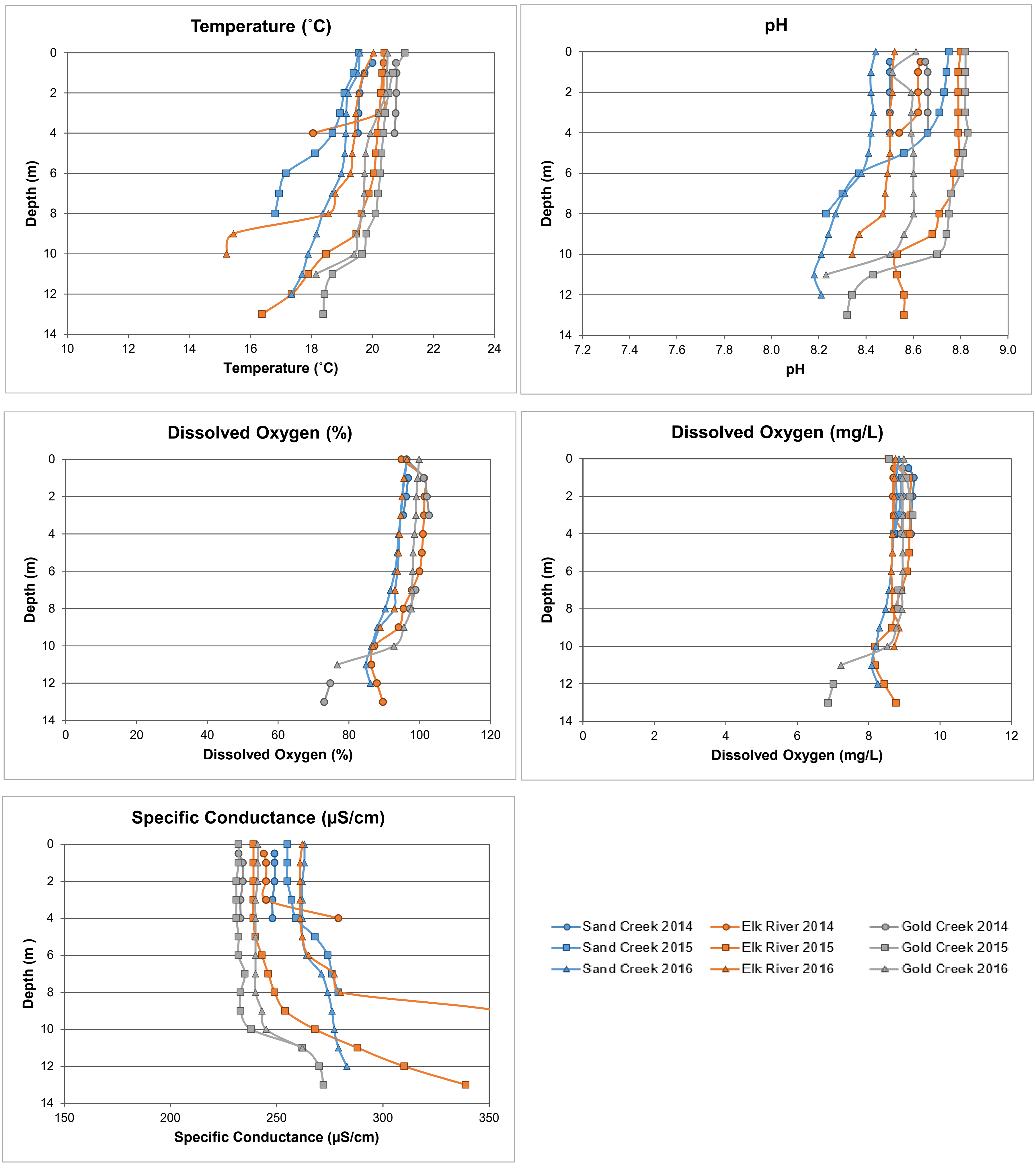

**Figure B.3:** *In situ* **Water Quality Profiles Conducted at Sand Creek, Elk River, and Gold Creek Areas in Koocanusa Reservoir, August 2014, 2015 and 2016**

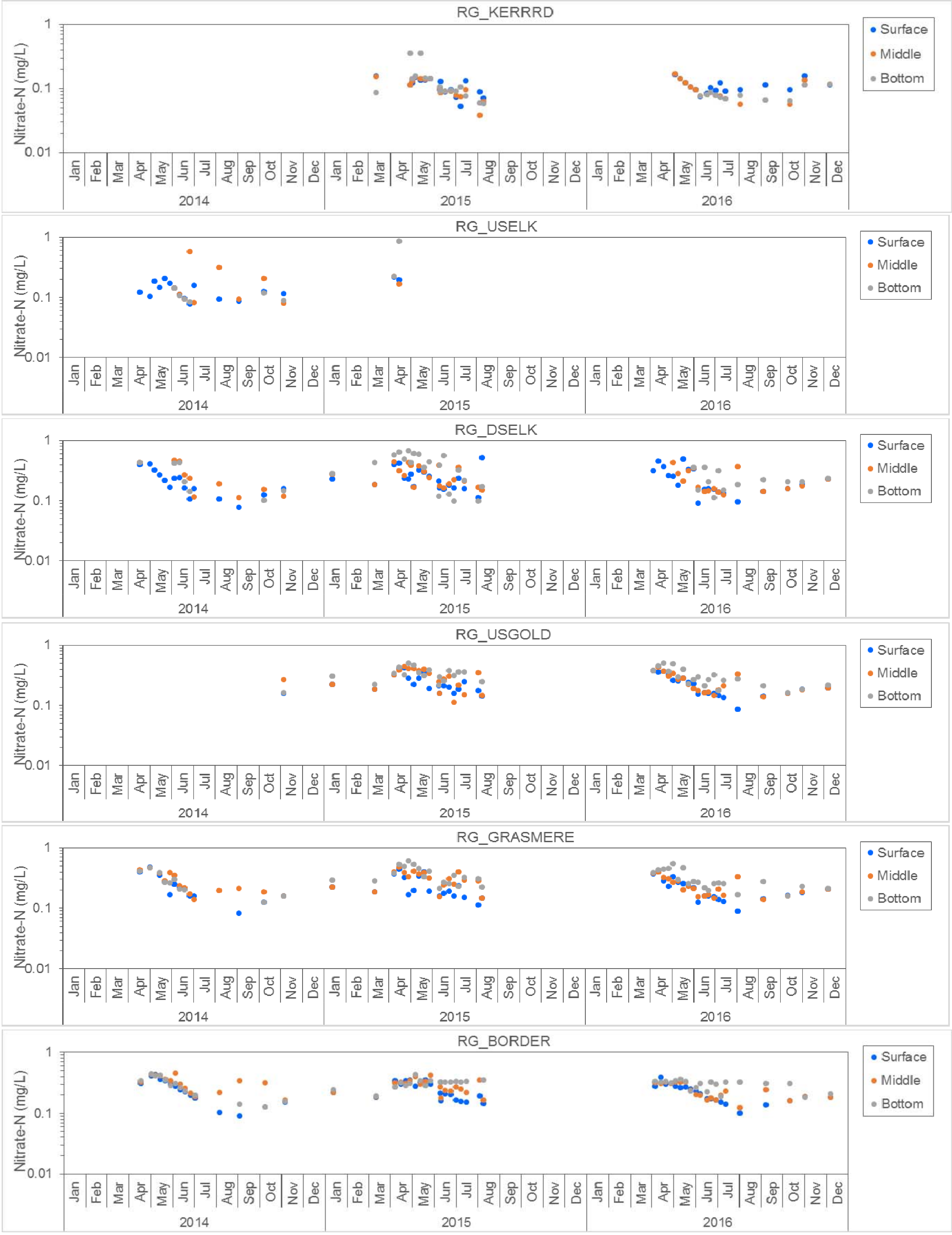

**Figure B.4:** **Aqueous Nitrate-Nitrogen Concentrations at the Surface, Middle and Bottom of the Water Column in Koocanusa Reservoir, 2014 to 2016**

Note: Stations RG_KERRRD and RG_USELK are upstream of the Elk River. Stations RG_DSELK, RG_USGOLD, RG_GRASMERE, and RG_BORDER are downstream of the Elk River.

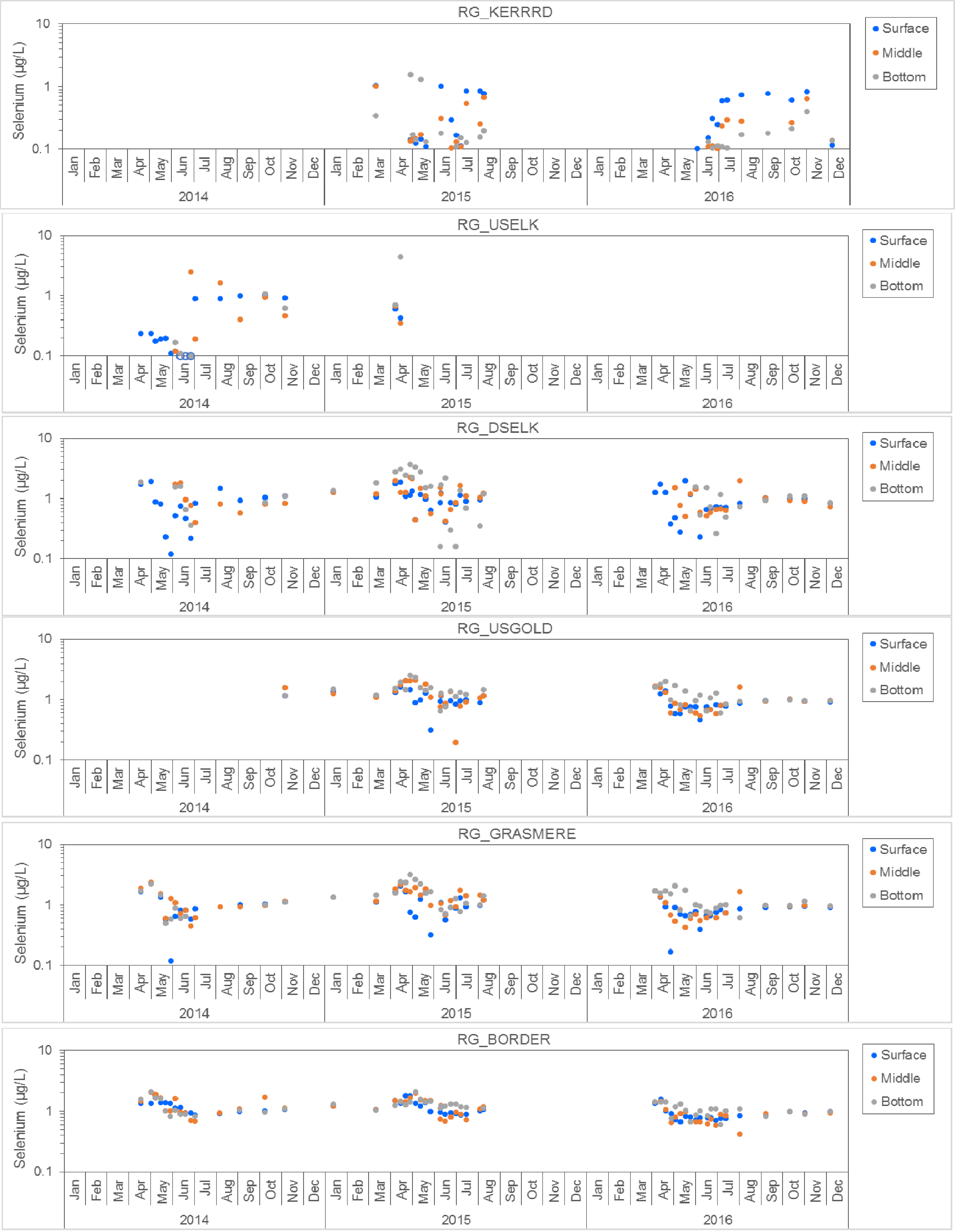

**Figure B.5:** **Aqueous Total Selenium Concentrations at the Surface, Middle and Bottom of the Water Column in Koocanusa Reservoir, 2014 to 2016**

Note: Stations RG_KERRRD and RG_USELK are upstream of the Elk River. Stations RG_DSELK, RG_USGOLD, RG_GRASMERE, and RG_BORDER are downstream of the Elk River.

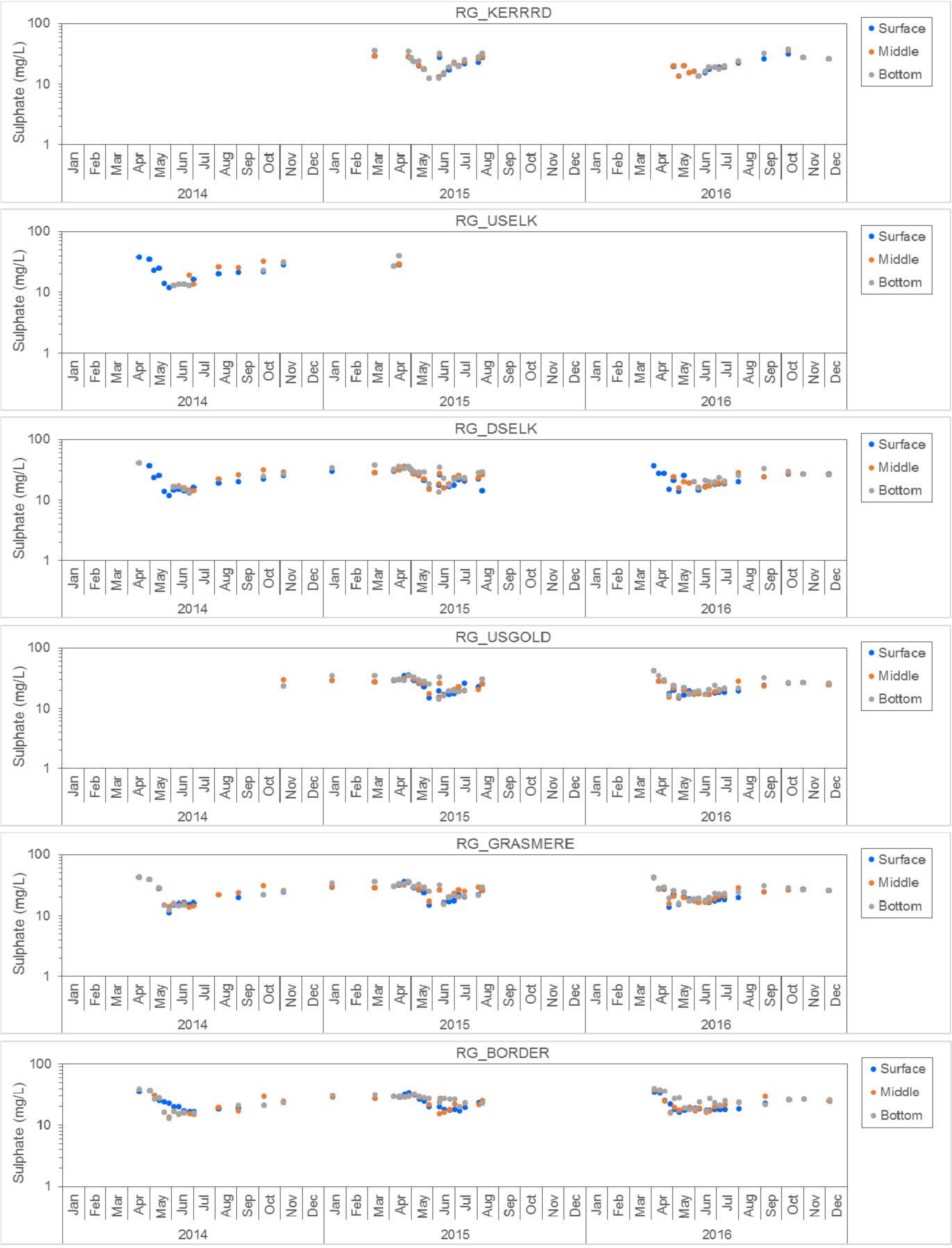

**Figure B.6:** **Aqueous Sulphate Concentrations at the Surface, Middle and Bottom of the Water Column in Koocanusa Reservoir, 2014 to 2016**

Note: Stations RG_KERRRD and RG_USELK are upstream of the Elk River. Stations RG_DSELK, RG_USGOLD, RG_GRASMERE, and RG_BORDER are downstream of the Elk River.

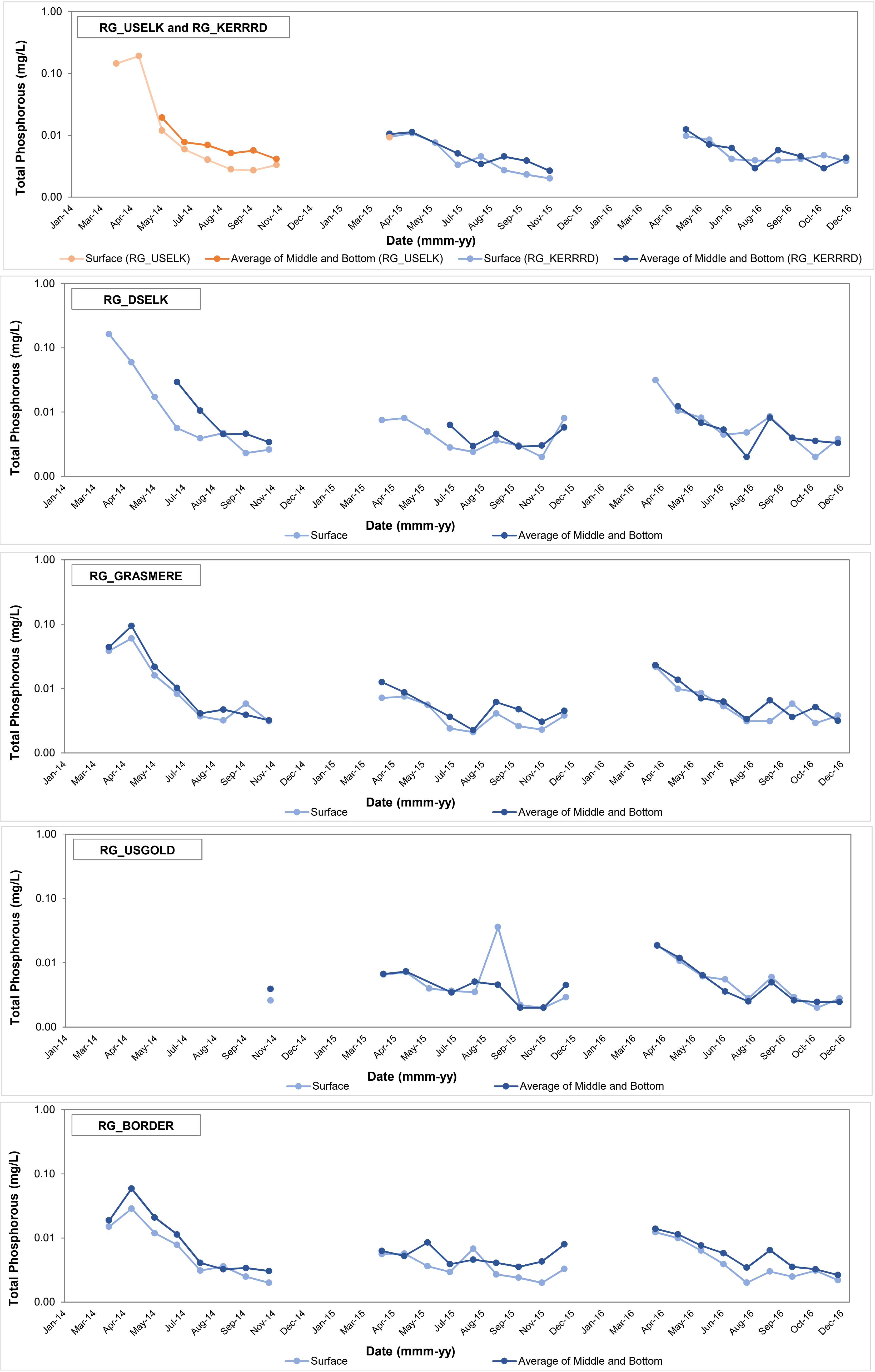

**Figure B.7:** **Mean Monthly Total Phosphorous Concentrations in Koocanusa Reservoir, 2014 to 2016**

Notes: Stations RG_USELK and RG_KERRRD are located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream. RG_USELK was only sampled in 2014, as the station was moved further upstream for the 2015 sampling program to RG_KERRRD.

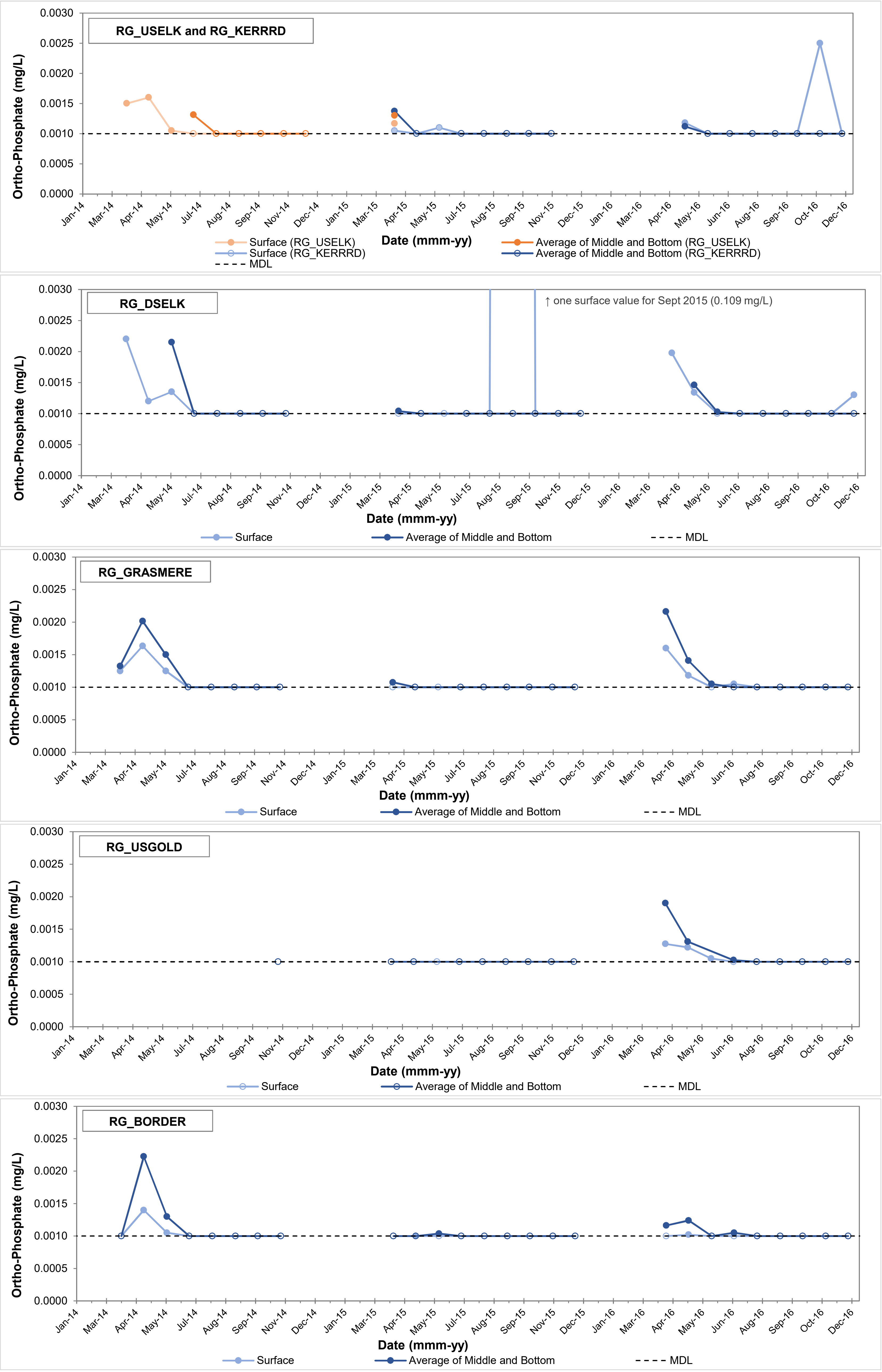

**Figure B.8:** **Mean Monthly Ortho-Phosphate Concentrations in Koocanusa Reservoir, 2014 to 2016**

Notes: Stations RG_USELK and RG_KERRRD are located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream. RG_USELK was only sampled in 2014, as the station was moved further upstream for the 2015 sampling program to RG_KERRRD. Open markers represent values at the method detection limit (MDL).

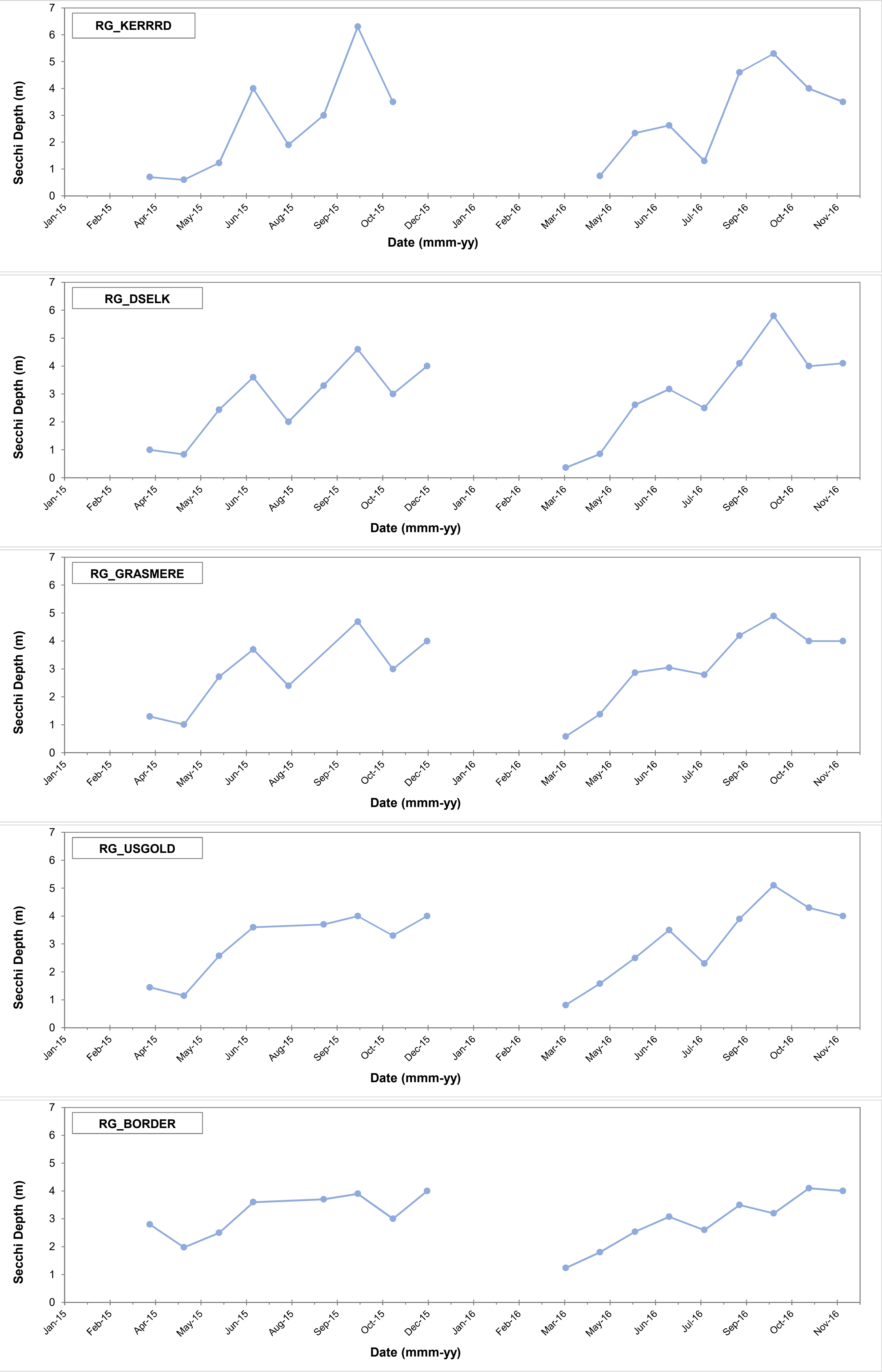

**Figure B.9:** **Mean Monthly Secchi Depths in Koocanusa Reservoir, 2015 to 2016**

Notes: No data for Secchi depth were collected in 2014. RG_KERRRD is located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream.

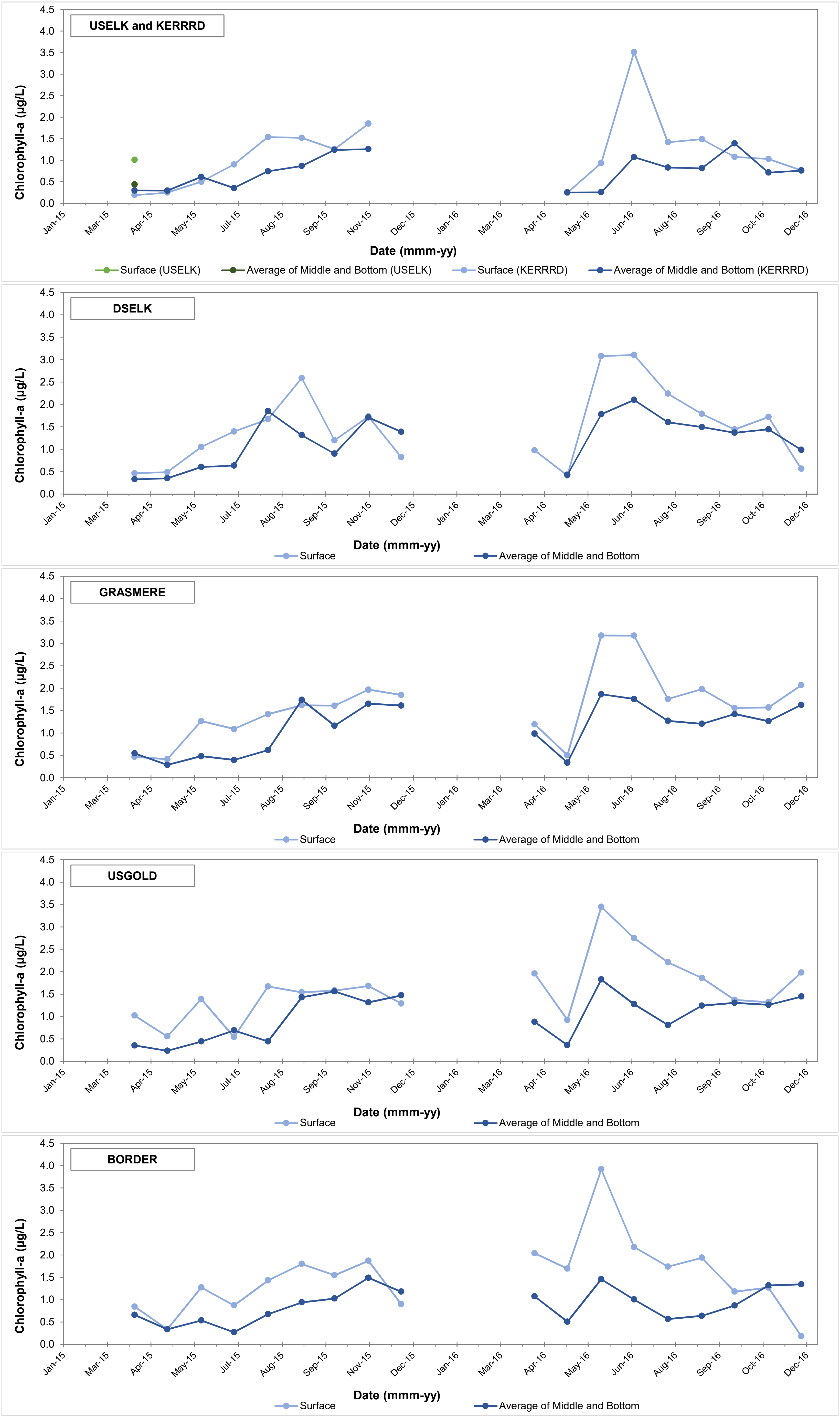

**Figure B.10:** **Chlorophyll-a Concentrations (in µg/L) at Water Quality Monitoring Stations in Koocanusa Reservoir Upstream (USELK and KERRRD) and Downstream (DSELK, GRASMERE, USGOLD, BORDER) from the Elk River, 2015 and 2016**

Note: Chlorophyll-a was not monitored in 2014.

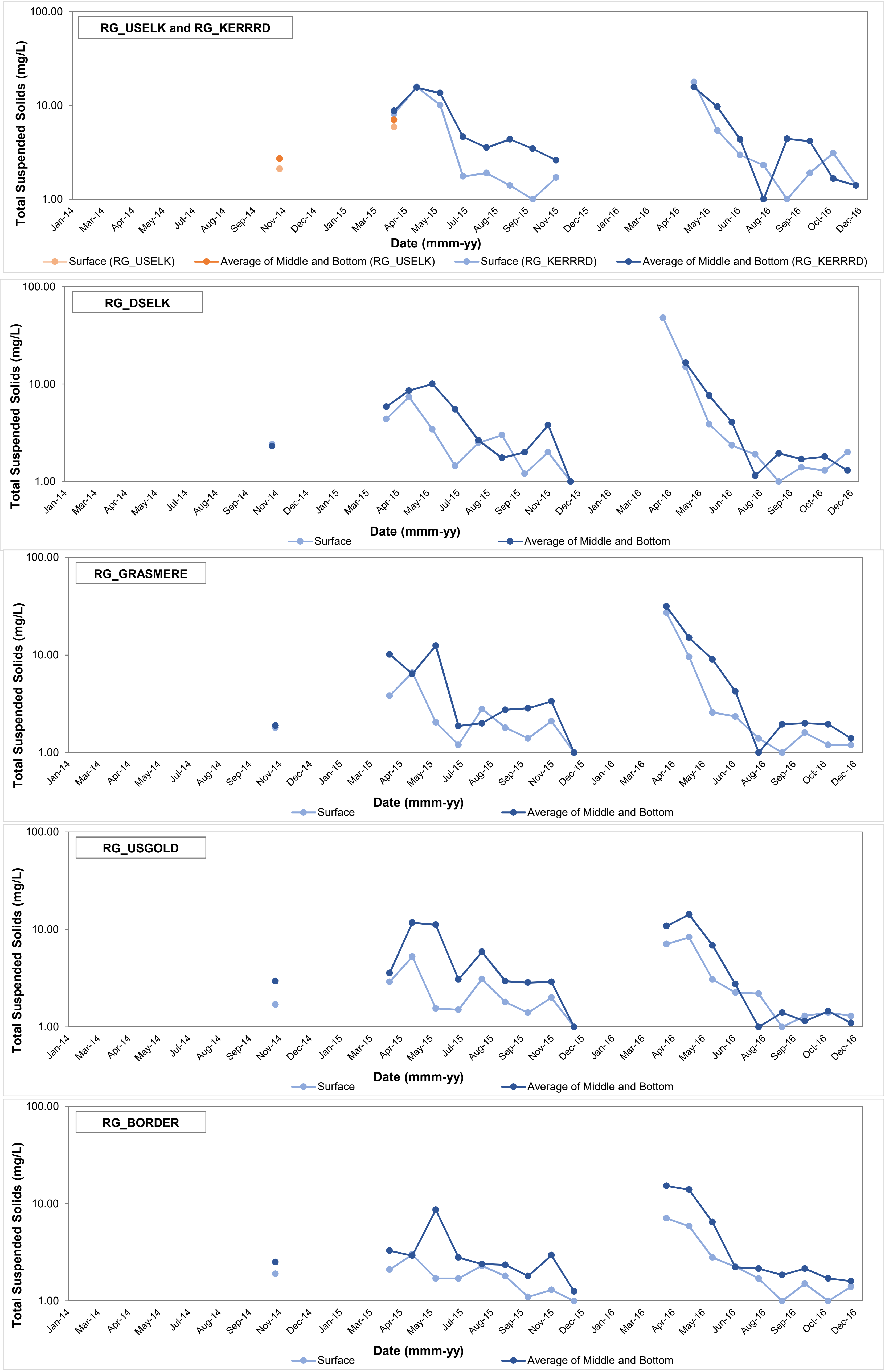

**Figure B.11:** Mean Monthly Total Suspended Solids Concentrations in Koocanusa Reservoir, 2014 to 2016

Notes: Stations RG_USELK and RG_KERRRD are located upstream of the Elk River and stations RG_DSELK, RG_GRASMERE, RG_USGOLD, and RG_BORDER are located downstream. RG_USELK was only sampled in 2014, as the station was moved further upstream for the 2015 sampling program to RG_KERRRD.

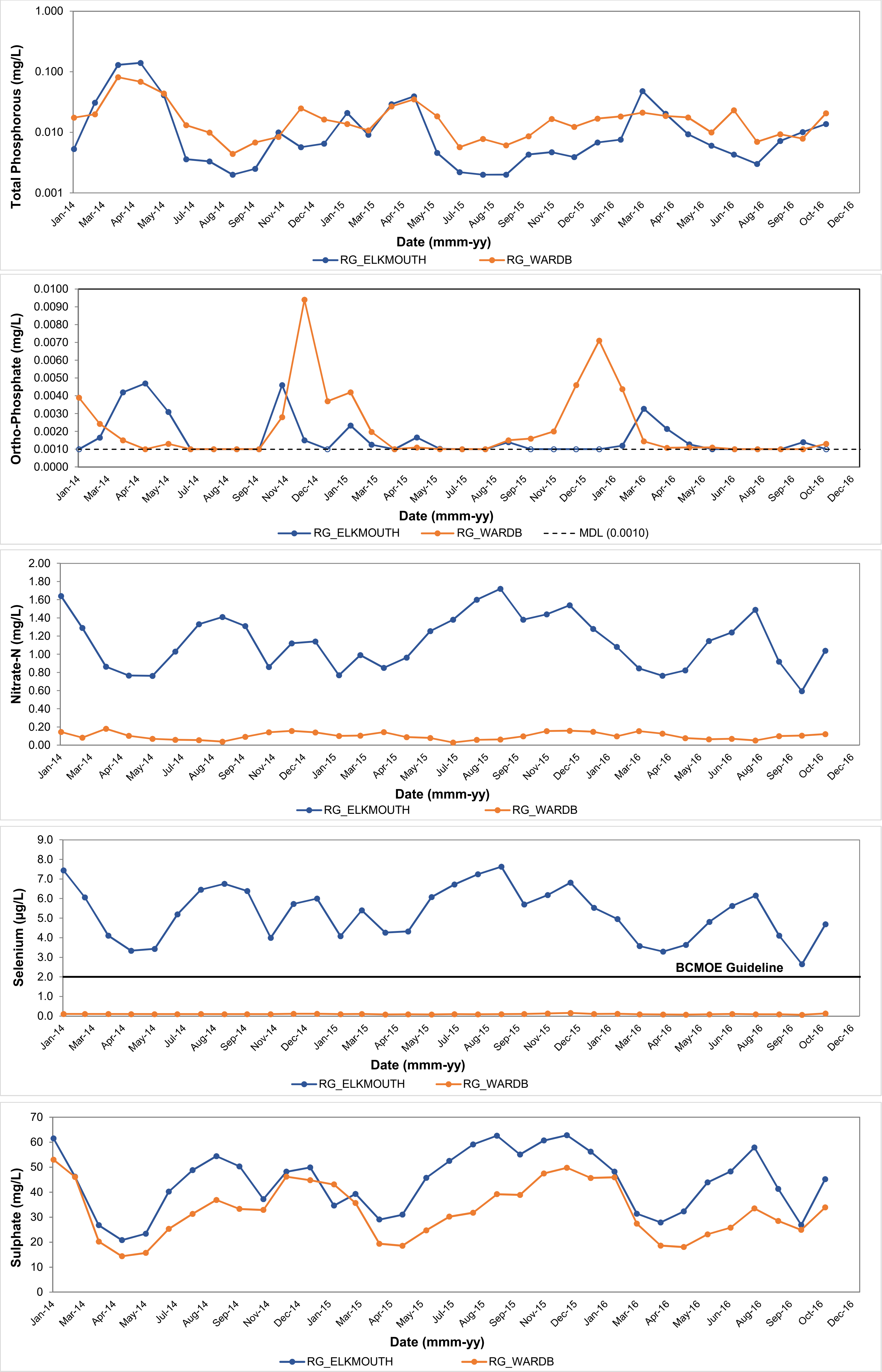

**Figure B.12:** **Mean Monthly Total Phosphorous, Ortho-Phosphate, Nitrate-Nitrogen, Selenium, and Sulphate Concentrations in the Kootenay River (RG_WARDB) and the Elk River (RG_ELKMOUTH), 2014 to 2016**

Note: Open markers represent values at the method detection limit (MDL).

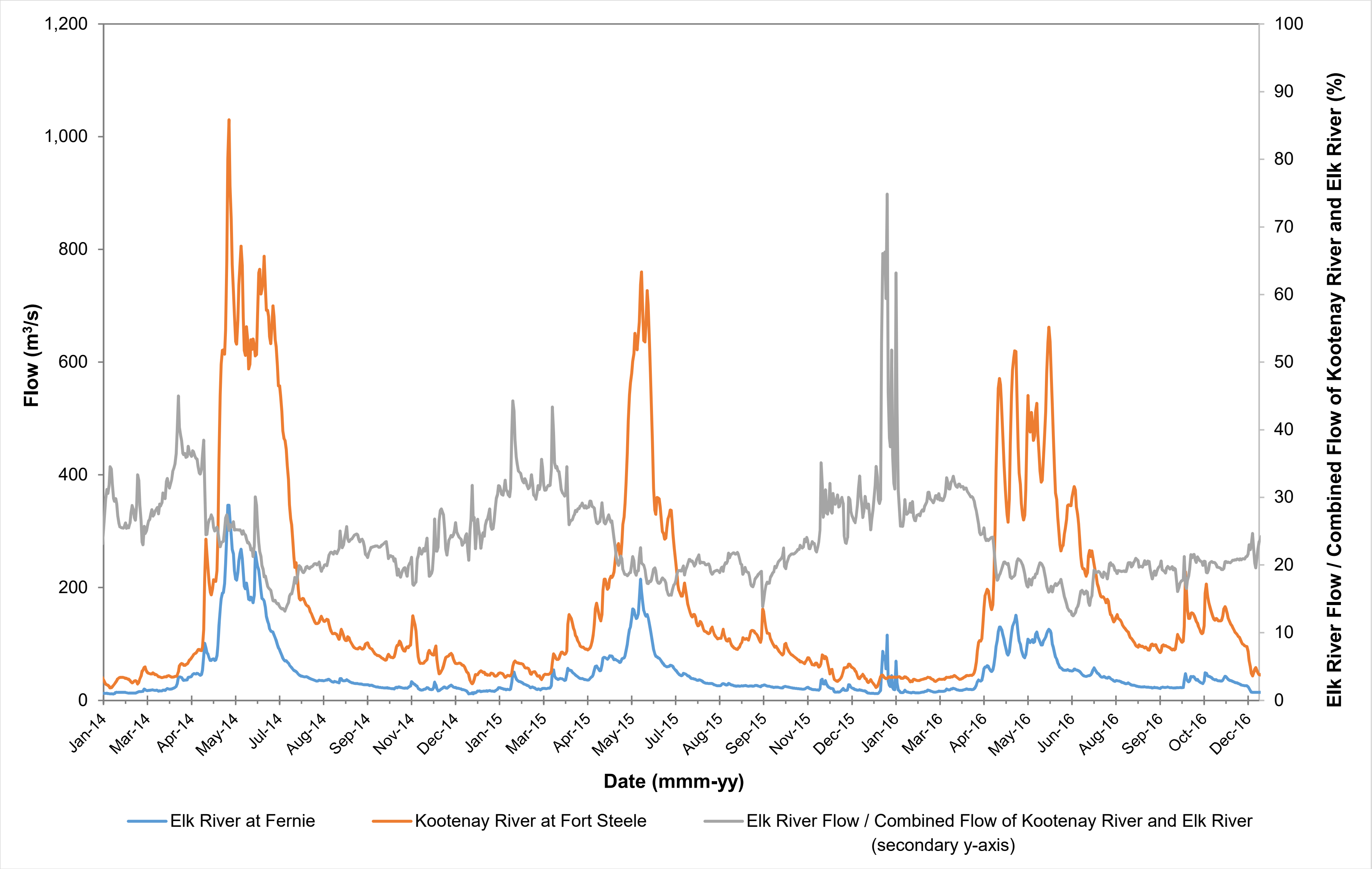

**Figure B.13:** **Flow Measurements at the Elk River (Station No. 08NK002) and Kootenay River (Station No. 08NG065) Water Survey of Canada Stations, 2014 to 2016**

## Table B.1: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2014

| Station | Sampling Date | Location (11U, NAD83) | | Weather Notes | Station Depth (m) | Depth (m) | Temperature (°C) | Dissolved oxygen | | pH | Specific conductivity (µS/cm) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | (mg/L) | (%) | | | |
| Sand Creek | 14-Feb-14 | 625570 | 5460281 | sunny, 1°C | 11.8 | surface | 0.1 | 13.4 | 99.8 | 8.18 | 292 | first measurement taken at bottom of ice augered hole, reservoir was ice covered (at least 20 cm thick) |
| | | | | | | 1 | 0.1 | 13.2 | 99.7 | 7.60 | 368 | |
| | | | | | | 2 | 0.0 | 13.0 | 97.8 | 7.60 | 397 | |
| | | | | | | 3 | 0.2 | 13.0 | 97.6 | 7.62 | 391 | |
| | | | | | | 4 | 0.4 | 12.9 | 98.0 | 7.65 | 390 | |
| | | | | | | 5 | 0.6 | 12.5 | 94.9 | 7.68 | 384 | |
| | | | | | | 6 | 1.0 | 12.2 | 94.5 | 7.72 | 379 | |
| | | | | | | 7 | 1.3 | 11.7 | 91.3 | 7.75 | 381 | |
| | | | | | | 8 | 1.8 | 10.5 | 83.2 | 7.75 | 385 | |
| | | | | | | 9 | 3.4 | 5.88 | 48.4 | 7.73 | 381 | |
| | | | | | | 10 | 4.0 | 4.63 | 38.6 | 7.71 | 384 | |
| | | | | | | 11 | 4.0 | 4.47 | 37.4 | 7.68 | 385 | |
| | | | | | | 11.5 | 4.0 | 4.47 | 37.4 | 7.67 | 386 | |
| | 11-Apr-14 | 625306 | 5460936 | clear, 10°C | 2.2 | 0.5 | 9.2 | 10.0 | 99.3 | 7.89 | 328 | measurement taken at SC-SH-6 |
| | | | | | | 2 | 9.2 | 10.6 | 101 | 7.95 | 327 | |
| | 23-Aug-14 | 623651 | 5462816 | sunny, 10% cloud cover | 4.0 | 0.5 | 20.0 | 9.11 | 100 | 8.50 | 249 | - |
| | | | | | | 1 | 19.7 | 9.26 | 101 | 8.50 | 249 | - |
| | | | | | | 2 | 19.6 | 9.23 | 101 | 8.50 | 249 | - |
| | | | | | | 3 | 19.5 | 9.19 | 100 | 8.50 | 248 | - |
| | | | | | | 4 | 19.5 | 9.18 | 100 | 8.50 | 248 | - |
| T-2 | 15-Apr-14 | 629295 | 5450863 | clear, 8°C | 6.0 | 0.5 | 7.8 | 10.7 | 98.7 | 8.14 | 329 | taken at transect 2, upstream of the Elk River inlet in Koocanusa Reservoir |
| | | | | | | 1 | 8.0 | 10.4 | 97.5 | 8.21 | 326 | |
| | | | | | | 2 | 7.8 | 11.2 | 104 | 8.16 | 324 | |
| | | | | | | 3 | 7.8 | 11.2 | 103 | 8.16 | 324 | |
| | | | | | | 4 | 7.8 | 11.2 | 103 | 8.16 | 324 | |
| | | | | | | 5 | 7.8 | 11.1 | 103 | 8.16 | 324 | |
| | | | | | | 6 | 7.6 | 11.1 | 101 | 8.15 | 323 | |
| T2-2 | 19-Aug-14 | 629650 | 5450400 | windy, sunny with intermittent cloudy periods, 50% cloud cover | 30.1 | 0.5 | 22.0 | 8.73 | 99.9 | 8.54 | 240 | - |
| | | | | | | 1 | 22.0 | 8.74 | 100 | 8.55 | 239 | - |
| | | | | | | 2 | 21.9 | 8.75 | 100 | 8.55 | 237 | - |
| | | | | | | 3 | 21.8 | 8.79 | 100 | 8.58 | 235 | - |
| | | | | | | 4 | 21.8 | 8.77 | 100 | 8.57 | 236 | - |
| | | | | | | 5 | 21.8 | 8.75 | 99.7 | 8.57 | 237 | - |
| | | | | | | 6 | 21.6 | 8.93 | 101 | 8.58 | 237 | - |
| | | | | | | 7 | 21.4 | 8.94 | 101 | 8.57 | 240 | - |
| | | | | | | 8 | 21.3 | 8.83 | 99.7 | 8.55 | 244 | - |
| | | | | | | 9 | 20.8 | 8.77 | 98.2 | 8.50 | 255 | - |
| | | | | | | 10 | 20.3 | 8.86 | 98.2 | 8.42 | 257 | - |
| | | | | | | 11 | 20.1 | 8.78 | 96.8 | 8.37 | 252 | - |
| | | | | | | 12 | 18.2 | 8.66 | 92.1 | 8.25 | 275 | - |
| | | | | | | 13 | 17.7 | 8.50 | 89.2 | 8.19 | 272 | - |
| | | | | | | 14 | 17.0 | 8.18 | 84.8 | 8.08 | 264 | - |
| | | | | | | 15 | 17.0 | 8.46 | 87.9 | 8.10 | 269 | - |
| | | | | | | 16 | 16.7 | 8.21 | 84.5 | 8.05 | 271 | - |
| | | | | | | 17 | 16.3 | 7.72 | 78.7 | 7.98 | 266 | - |
| | | | | | | 18 | 16.1 | 7.41 | 75.2 | 7.94 | 263 | - |
| | | | | | | 19 | 15.6 | 6.94 | 69.8 | 7.88 | 260 | - |
| | | | | | | 20 | 15.2 | 6.16 | 61.3 | 7.74 | 259 | - |
| | | | | | | 21 | 14.5 | 5.40 | 53.2 | 7.66 | 257 | - |
| | | | | | | 22 | 14.1 | 4.92 | 47.8 | 7.64 | 255 | - |
| | | | | | | 23 | 13.9 | 4.77 | 46.3 | 7.63 | 255 | - |
| | | | | | | 24 | 13.9 | 4.72 | 45.7 | 7.63 | 254 | - |
| | | | | | | 25 | 13.5 | 4.44 | 42.9 | 7.62 | 254 | - |
| | | | | | | 26 | 13.1 | 4.08 | 38.9 | 7.59 | 251 | - |
| | | | | | | 27 | 13.1 | 3.79 | 36.1 | 7.56 | 251 | - |
| | | | | | | 28 | 12.9 | 3.29 | 31.2 | 7.52 | 252 | - |
| | | | | | | 29 | 12.6 | 2.13 | 20.0 | 7.46 | 253 | - |
| | | | | | | 30 | 12.5 | 1.34 | 12.6 | 7.42 | 254 | - |
| T2-3 | 19-Aug-14 | 629417 | 5450394 | some wind, light drizzle, 90% cloud cover | 19.2 | 0 | 22.1 | 9.12 | 105 | 8.54 | 242 | - |
| | | | | | | 1 | 22.1 | 9.03 | 104 | 8.54 | 242 | - |
| | | | | | | 2 | 22.1 | 8.99 | 103 | 8.55 | 242 | - |
| | | | | | | 3 | 22.0 | 8.94 | 102 | 8.56 | 241 | - |
| | | | | | | 4 | 21.8 | 9.00 | 103 | 8.58 | 239 | - |
| | | | | | | 5 | 21.6 | 9.09 | 103 | 8.58 | 241 | - |
| | | | | | | 6 | 21.5 | 9.11 | 103 | 8.58 | 241 | - |
| | | | | | | 7 | 21.3 | 9.11 | 103 | 8.56 | 244 | - |
| | | | | | | 8 | 21.2 | 9.03 | 102 | 8.54 | 247 | - |
| | | | | | | 9 | 20.7 | 8.95 | 99.9 | 8.48 | 258 | - |
| | | | | | | 10 | 20.0 | 8.99 | 98.9 | 8.38 | 258 | - |
| | | | | | | 11 | 19.0 | 8.93 | 96.4 | 8.31 | 267 | - |
| | | | | | | 12 | 18.5 | 8.75 | 93.5 | 8.26 | 273 | - |
| | | | | | | 13 | 17.9 | 8.56 | 90.4 | 8.19 | 274 | - |
| | | | | | | 14 | 17.0 | 8.18 | 84.6 | 8.09 | 276 | - |
| | | | | | | 15 | 16.9 | 8.08 | 83.6 | 8.07 | 276 | - |
| | | | | | | 16 | 16.8 | 7.96 | 82.1 | 8.05 | 275 | - |
| | | | | | | 17 | 15.9 | 6.78 | 68.7 | 7.91 | 268 | - |
| | | | | | | 18 | 15.0 | 6.32 | 62.9 | 7.85 | 272 | - |
| | | | | | | 19 | 15.0 | 6.04 | 59.9 | 7.80 | 272 | - |
| T2-4 | 19-Aug-14 | 629237 | 5450445 | sun and 50% cloud cover | 19.5 | 0 | 22.1 | 8.82 | 101 | 8.57 | 241 | - |
| | | | | | | 1 | 22.1 | 8.81 | 101 | 8.57 | 241 | - |
| | | | | | | 2 | 22.1 | 8.80 | 101 | 8.58 | 241 | - |
| | | | | | | 3 | 22.1 | 8.78 | 101 | 8.58 | 241 | - |
| | | | | | | 4 | 22.0 | 8.79 | 101 | 8.58 | 240 | - |
| | | | | | | 5 | 21.7 | 8.87 | 101 | 8.60 | 239 | - |
| | | | | | | 6 | 21.6 | 8.97 | 102 | 8.59 | 241 | - |
| | | | | | | 7 | 21.5 | 8.98 | 102 | 8.59 | 242 | - |
| | | | | | | 8 | 21.4 | 8.97 | 101 | 8.58 | 243 | - |
| | | | | | | 9 | 21.0 | 8.90 | 99.9 | 8.51 | 257 | - |
| | | | | | | 10 | 20.0 | 8.91 | 97.9 | 8.41 | 261 | - |
| | | | | | | 11 | 19.4 | 8.79 | 95.5 | 8.34 | 260 | - |
| | | | | | | 12 | 18.5 | 8.61 | 92.0 | 8.26 | 268 | - |
| | | | | | | 13 | 17.7 | 8.41 | 88.2 | 8.18 | 275 | - |
| | | | | | | 14 | 17.1 | 8.17 | 84.7 | 8.11 | 277 | - |
| | | | | | | 15 | 17.0 | 8.02 | 83.1 | 8.09 | 276 | - |
| | | | | | | 16 | 17.0 | 8.01 | 82.9 | 8.09 | 276 | - |
| | | | | | | 17 | 16.8 | 7.88 | 81.2 | 8.07 | 275 | - |
| | | | | | | 18 | 14.8 | 4.54 | 44.2 | 7.73 | 264 | - |

## Table B.1: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2014

| Station | Sampling Date | Location (11U, NAD83) | | Weather Notes | Station Depth (m) | Depth (m) | Temperature (°C) | Dissolved oxygen | | pH | Specific conductivity (µS/cm) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | (mg/L) | (%) | | | |
| T2-5 | 19-Aug-14 | 629059 | 5450389 | sun, rain, and 70% cloud cover | 20.0 | 0 | 22.2 | 8.85 | 102 | 8.55 | 240 | - |
| | | | | | | 1 | 22.2 | 8.77 | 101 | 8.56 | 240 | - |
| | | | | | | 2 | 22.2 | 8.71 | 100 | 8.57 | 240 | - |
| | | | | | | 3 | 22.1 | 8.67 | 99.5 | 8.57 | 240 | - |
| | | | | | | 4 | 22.0 | 8.66 | 99.2 | 8.58 | 239 | - |
| | | | | | | 5 | 21.9 | 8.70 | 99.4 | 8.59 | 239 | - |
| | | | | | | 6 | 21.9 | 8.73 | 99.3 | 8.59 | 240 | - |
| | | | | | | 7 | 21.6 | 8.74 | 99.2 | 8.59 | 241 | - |
| | | | | | | 8 | 21.5 | 8.70 | 98.5 | 8.58 | 241 | - |
| | | | | | | 9 | 21.0 | 8.79 | 98.5 | 8.52 | 252 | - |
| | | | | | | 10 | 20.5 | 8.75 | 97.3 | 8.43 | 251 | - |
| | | | | | | 11 | 18.9 | 8.64 | 93.2 | 8.30 | 264 | - |
| | | | | | | 12 | 18.4 | 8.49 | 90.7 | 8.25 | 270 | - |
| | | | | | | 13 | 17.4 | 8.26 | 86.5 | 8.16 | 275 | - |
| | | | | | | 14 | 17.2 | 8.07 | 83.9 | 8.12 | 275 | - |
| | | | | | | 15 | 17.1 | 8.00 | 83.0 | 8.11 | 275 | - |
| | | | | | | 16 | 17.1 | 7.49 | 82.4 | 8.09 | 275 | - |
| | | | | | | 17 | 17.0 | 7.85 | 81.4 | 8.08 | 275 | - |
| | | | | | | 18 | 15.7 | 7.00 | 70.5 | 7.90 | 262 | - |
| | | | | | | 19 | 14.8 | 5.70 | 58.4 | 7.80 | 264 | - |
| T2-6 | 21-Aug-14 | 628883 | 5450370 | 13°C, cool, 90% cloud cover | 18.3 | 0 | 21.0 | 8.77 | 98.5 | 8.59 | 241 | - |
| | | | | | | 1 | 21.0 | 8.91 | 100 | 8.60 | 241 | - |
| | | | | | | 2 | 21.0 | 8.94 | 100 | 8.60 | 241 | - |
| | | | | | | 3 | 21.0 | 8.94 | 100 | 8.61 | 241 | - |
| | | | | | | 4 | 21.0 | 8.92 | 100 | 8.60 | 241 | - |
| | | | | | | 5 | 21.0 | 8.90 | 99.9 | 8.60 | 241 | - |
| | | | | | | 6 | 21.0 | 8.87 | 99.5 | 8.60 | 241 | - |
| | | | | | | 7 | 21.0 | 8.85 | 99.3 | 8.59 | 242 | - |
| | | | | | | 8 | 20.9 | 8.85 | 99.0 | 8.58 | 244 | - |
| | | | | | | 9 | 17.7 | 8.81 | 92.4 | 8.21 | 273 | - |
| | | | | | | 10 | 17.5 | 8.58 | 89.8 | 8.18 | 272 | - |
| | | | | | | 11 | 17.3 | 8.50 | 88.6 | 8.16 | 274 | - |
| | | | | | | 12 | 17.2 | 8.40 | 87.4 | 8.15 | 273 | - |
| | | | | | | 13 | 17.2 | 8.37 | 87.0 | 8.15 | 274 | - |
| | | | | | | 14 | 17.1 | 8.28 | 86.0 | 8.14 | 273 | - |
| | | | | | | 15 | 17.1 | 8.24 | 85.5 | 8.13 | 272 | - |
| | | | | | | 16 | 17.0 | 8.18 | 84.7 | 8.12 | 272 | - |
| | | | | | | 17 | 16.3 | 7.50 | 76.5 | 8.02 | 268 | - |
| | | | | | | 18 | 15.1 | 5.89 | 58.5 | 7.81 | 262 | - |
| Elk River | 12-Feb-14 | 627746 | 5447354 | warmer, south wind, 5°C | 9.2 | surface | 0.2 | 12.4 | 95.0 | 7.98 | 350 | first measurement taken at bottom of ice augered hole, reservoir was ice covered (at least 30 cm thick) |
| | | | | | | 1 | 0.3 | 11.9 | 91.8 | 7.99 | 351 | |
| | | | | | | 2 | 0.3 | 12.1 | 93.4 | 8.03 | 350 | |
| | | | | | | 3 | 0.4 | 11.8 | 91.6 | 8.06 | 348 | |
| | | | | | | 4 | 0.5 | 12.0 | 91.9 | 8.07 | 348 | |
| | | | | | | 5 | 0.6 | 11.7 | 90.6 | 8.07 | 347 | |
| | | | | | | 6 | 0.7 | 11.4 | 88.2 | 8.09 | 347 | |
| | | | | | | 7 | 0.8 | 11.4 | 88.2 | 8.10 | 347 | |
| | | | | | | 8 | 0.8 | 11.3 | 87.9 | 8.10 | 351 | |
| | | | | | | 9 | 0.8 | 11.7 | 91.0 | 8.09 | 370 | |
| | 13-Apr-14 | 628997 | 5447711 | sunny, clear, 3°C | 6.0 | 0.5 | 3.7 | 12.7 | 103 | 8.17 | 362 | did not have an anchor so had to move the boat slightly during measurements to remain positioned correctly |
| | | | | | | 1 | 3.8 | 12.6 | 103 | 8.18 | 363 | |
| | | | | | | 2 | 3.8 | 12.5 | 102 | 8.18 | 362 | |
| | | | | | | 3 | 3.9 | 12.3 | 101 | 8.22 | 362 | |
| | | | | | | 4 | 3.8 | 12.3 | 101 | 8.20 | 363 | |
| | | | | | | 5 | 3.9 | 12.4 | 101 | 8.21 | 362 | |
| | | | | | | 6 | 3.9 | 12.4 | 102 | 8.22 | 363 | |
| | 22-Aug-14 | 632036 | 5447159 | cloudy with intermittent rain, 100% cloud cover | 4.2 | 0.5 | 20.4 | 8.71 | 96.5 | 8.63 | 244 | - |
| | | | | | | 1 | 20.4 | 8.69 | 96.4 | 8.62 | 245 | - |
| | | | | | | 2 | 20.4 | 8.68 | 96.2 | 8.62 | 245 | - |
| | | | | | | 3 | 20.2 | 8.70 | 96.2 | 8.62 | 245 | - |
| | | | | | | 4 | 18.1 | 8.99 | 95.5 | 8.54 | 279 | - |
| T-4 | 16-Apr-14 | 629318 | 5442130 | cloudy with sunny periods, 6°C | 10.2 | 0.5 | 8.8 | 11.2 | 105 | 8.41 | 350 | taken at transect 4, downstream of the Elk River inlet in Koocanusa Reservoir |
| | | | | | | 1 | 8.5 | 11.5 | 108 | 8.37 | 350 | |
| | | | | | | 2 | 8.3 | 11.0 | 102 | 8.33 | 351 | |
| | | | | | | 3 | 8.1 | 11.1 | 103 | 8.32 | 349 | |
| | | | | | | 4 | 8.1 | 11.2 | 103 | 8.32 | 348 | |
| | | | | | | 5 | 8.0 | 11.2 | 103 | 8.31 | 347 | |
| | | | | | | 6 | 7.6 | 10.9 | 99.8 | 8.31 | 350 | |
| | | | | | | 7 | 7.2 | 10.9 | 99.0 | 8.29 | 350 | |
| | | | | | | 8 | 7.2 | 10.7 | 96.3 | 8.27 | 358 | |
| | | | | | | 9 | 7.1 | 10.6 | 94.5 | 8.26 | 359 | |
| | | | | | | 10 | 7.0 | 10.4 | 93.6 | 8.24 | 359 | |
| T4-2 | 20-Aug-14 | 630076 | 5441806 | cool, very little wind, 100% cloud cover | 27.8 | 0 | 21.3 | 8.91 | 101 | 8.66 | 231 | - |
| | | | | | | 1 | 21.3 | 9.10 | 103 | 8.67 | 231 | - |
| | | | | | | 2 | 21.3 | 9.10 | 103 | 8.67 | 231 | - |
| | | | | | | 3 | 21.3 | 9.10 | 103 | 8.67 | 231 | - |
| | | | | | | 4 | 21.3 | 9.08 | 103 | 8.67 | 231 | - |
| | | | | | | 5 | 21.2 | 9.02 | 102 | 8.66 | 232 | - |
| | | | | | | 6 | 21.2 | 9.02 | 102 | 8.66 | 232 | - |
| | | | | | | 7 | 21.2 | 9.01 | 102 | 8.65 | 232 | - |
| | | | | | | 8 | 20.9 | 9.03 | 102 | 8.62 | 235 | - |
| | | | | | | 9 | 20.0 | 9.20 | 101 | 8.52 | 247 | - |
| | | | | | | 10 | 19.6 | 9.17 | 100 | 8.48 | 248 | - |
| | | | | | | 11 | 18.9 | 8.87 | 95.6 | 8.37 | 262 | - |
| | | | | | | 12 | 18.5 | 8.74 | 93.3 | 8.32 | 273 | - |
| | | | | | | 13 | 18.0 | 8.53 | 90.1 | 8.26 | 272 | - |
| | | | | | | 14 | 17.7 | 8.42 | 88.4 | 8.21 | 272 | - |
| | | | | | | 15 | 17.1 | 8.21 | 85.1 | 8.15 | 273 | - |
| | | | | | | 16 | 16.9 | 8.16 | 84.3 | 8.21 | 289 | - |
| | | | | | | 17 | 16.7 | 8.00 | 82.3 | 8.15 | 277 | - |
| | | | | | | 18 | 16.6 | 7.94 | 81.7 | 8.14 | 278 | - |
| | | | | | | 19 | 16.0 | 7.73 | 78.3 | 8.08 | 270 | - |
| | | | | | | 20 | 15.1 | 7.50 | 74.6 | 7.97 | 254 | - |
| | | | | | | 21 | 14.7 | 7.55 | 74.4 | 7.95 | 246 | - |
| | | | | | | 22 | 13.7 | 7.85 | 75.7 | 7.93 | 229 | - |
| | | | | | | 23 | 13.3 | 7.90 | 75.6 | 7.91 | 227 | - |
| | | | | | | 24 | 13.0 | 7.83 | 74.4 | 7.89 | 227 | - |
| | | | | | | 25 | 12.6 | 7.90 | 74.4 | 7.87 | 224 | - |
| | | | | | | 26 | 12.4 | 7.80 | 73.2 | 7.82 | 225 | - |
| | | | | | | 27 | 12.4 | 7.76 | 72.6 | 7.84 | 225 | - |

**Table B.1:** ***In situ*** **Water Quality Measurements in Koocanusa Reservoir, 2014**

| Station | Sampling Date | Location (11U, NAD83) | | Weather Notes | Station Depth (m) | Depth (m) | Temperature (°C) | Dissolved oxygen | | pH | Specific conductivity (µS/cm) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | (mg/L) | (%) | | | |
| T4-3 | 20-Aug-14 | 629798 | 5441984 | breezy, 100% cloud cover | 27.4 | 0 | 21.3 | 8.98 | 101 | 8.66 | 231 | - |
| | | | | | | 1 | 21.3 | 9.06 | 102 | 8.65 | 231 | - |
| | | | | | | 2 | 21.2 | 9.03 | 101 | 8.65 | 231 | - |
| | | | | | | 3 | 21.2 | 8.99 | 101 | 8.64 | 232 | - |
| | | | | | | 4 | 21.1 | 8.95 | 101 | 8.64 | 232 | - |
| | | | | | | 5 | 21.1 | 8.85 | 99.6 | 8.64 | 233 | - |
| | | | | | | 6 | 21.1 | 8.87 | 99.6 | 8.63 | 233 | - |
| | | | | | | 7 | 21.0 | 8.85 | 99.5 | 8.63 | 233 | - |
| | | | | | | 8 | 20.2 | 9.09 | 100 | 8.54 | 241 | - |
| | | | | | | 9 | 19.8 | 8.97 | 98.6 | 8.50 | 246 | - |
| | | | | | | 10 | 19.2 | 8.86 | 96.0 | 8.41 | 252 | - |
| | | | | | | 11 | 18.8 | 8.69 | 93.3 | 8.35 | 263 | - |
| | | | | | | 12 | 18.6 | 8.55 | 91.6 | 8.34 | 267 | - |
| | | | | | | 13 | 18.3 | 8.52 | 90.7 | 8.30 | 275 | - |
| | | | | | | 14 | 17.9 | 8.41 | 88.7 | 8.23 | 270 | - |
| | | | | | | 15 | 17.4 | 8.22 | 85.6 | 8.26 | 292 | - |
| | | | | | | 16 | 16.9 | 8.14 | 84.1 | 8.18 | 282 | - |
| | | | | | | 17 | 16.9 | 7.99 | 82.5 | 8.20 | 288 | - |
| | | | | | | 18 | 16.9 | 7.94 | 82.0 | 8.18 | 284 | - |
| | | | | | | 19 | 16.4 | 7.70 | 78.6 | 8.13 | 279 | - |
| | | | | | | 20 | 15.6 | 7.63 | 76.5 | 8.05 | 278 | - |
| | | | | | | 21 | 15.5 | 7.37 | 74.0 | 8.00 | 257 | - |
| | | | | | | 22 | 14.7 | 7.27 | 71.8 | 7.94 | 247 | - |
| | | | | | | 23 | 13.7 | 7.46 | 71.9 | 7.92 | 233 | - |
| | | | | | | 24 | 13.3 | 7.52 | 71.9 | 7.88 | 230 | - |
| | | | | | | 25 | 12.9 | 7.61 | 72.1 | 7.87 | 226 | - |
| | | | | | | 26 | 12.9 | 7.65 | 72.4 | 7.86 | 226 | - |
| | | | | | | 27 | 12.5 | 7.71 | 72.5 | 7.86 | 224 | - |
| T4-4 | 20-Aug-14 | 629703 | 5441675 | sunny, 75% cloud cover | 26.4 | 0 | 21.4 | 9.04 | 102 | 8.65 | 231 | - |
| | | | | | | 1 | 21.4 | 8.96 | 101 | 8.65 | 231 | - |
| | | | | | | 2 | 21.3 | 8.94 | 101 | 8.65 | 232 | - |
| | | | | | | 3 | 21.2 | 8.93 | 101 | 8.65 | 232 | - |
| | | | | | | 4 | 21.2 | 8.91 | 100 | 8.65 | 232 | - |
| | | | | | | 5 | 21.2 | 8.88 | 99.8 | 8.64 | 232 | - |
| | | | | | | 6 | 21.0 | 8.85 | 99.3 | 8.63 | 233 | - |
| | | | | | | 7 | 20.8 | 8.89 | 99.4 | 8.60 | 237 | - |
| | | | | | | 8 | 20.4 | 8.99 | 99.7 | 8.56 | 242 | - |
| | | | | | | 9 | 19.7 | 8.91 | 97.5 | 8.48 | 249 | - |
| | | | | | | 10 | 19.1 | 8.78 | 94.7 | 8.41 | 256 | - |
| | | | | | | 11 | 18.8 | 8.61 | 92.5 | 8.33 | 267 | - |
| | | | | | | 12 | 18.5 | 8.50 | 90.8 | 8.31 | 271 | - |
| | | | | | | 13 | 18.2 | 8.38 | 88.9 | 8.27 | 272 | - |
| | | | | | | 14 | 17.8 | 8.28 | 87.0 | 8.23 | 271 | - |
| | | | | | | 15 | 17.4 | 8.22 | 85.8 | 8.22 | 295 | - |
| | | | | | | 16 | 16.8 | 8.02 | 82.8 | 8.19 | 282 | - |
| | | | | | | 17 | 16.7 | 7.85 | 80.7 | 8.19 | 288 | - |
| | | | | | | 18 | 16.6 | 7.80 | 79.9 | 8.16 | 281 | - |
| | | | | | | 19 | 16.2 | 7.63 | 77.6 | 8.12 | 273 | - |
| | | | | | | 20 | 15.3 | 7.21 | 72.0 | 7.97 | 256 | - |
| | | | | | | 21 | 14.2 | 7.40 | 72.3 | 7.93 | 241 | - |
| | | | | | | 22 | 13.5 | 7.54 | 72.4 | 7.90 | 232 | - |
| | | | | | | 23 | 13.0 | 7.59 | 72.1 | 7.87 | 228 | - |
| | | | | | | 24 | 12.9 | 7.60 | 72.0 | 7.86 | 227 | - |
| | | | | | | 25 | 12.6 | 7.69 | 72.3 | 7.86 | 226 | - |
| | | | | | | 26 | 12.5 | 7.67 | 71.9 | 7.85 | 226 | - |
| T4-5 | 20-Aug-14 | 629487 | 5441751 | sunny, 70% cloud cover | 25.8 | 0 | 21.1 | 9.08 | 103 | 8.62 | 235 | - |
| | | | | | | 1 | 21.4 | 9.04 | 102 | 8.62 | 235 | - |
| | | | | | | 2 | 21.4 | 9.00 | 102 | 8.62 | 235 | - |
| | | | | | | 3 | 21.3 | 8.97 | 101 | 8.63 | 234 | - |
| | | | | | | 4 | 21.3 | 8.94 | 101 | 8.63 | 234 | - |
| | | | | | | 5 | 21.3 | 8.86 | 99.9 | 8.63 | 234 | - |
| | | | | | | 6 | 21.2 | 8.74 | 98.6 | 8.63 | 234 | - |
| | | | | | | 7 | 21.2 | 8.74 | 98.5 | 8.63 | 235 | - |
| | | | | | | 8 | 20.8 | 8.84 | 98.8 | 8.58 | 240 | - |
| | | | | | | 9 | 19.5 | 8.96 | 97.6 | 8.44 | 256 | - |
| | | | | | | 10 | 19.2 | 8.81 | 95.4 | 8.40 | 259 | - |
| | | | | | | 11 | 18.9 | 8.64 | 93.0 | 8.35 | 263 | - |
| | | | | | | 12 | 18.0 | 8.45 | 89.0 | 8.27 | 276 | - |
| | | | | | | 13 | 17.6 | 8.26 | 86.6 | 8.22 | 273 | - |
| | | | | | | 14 | 17.2 | 8.11 | 84.3 | 8.17 | 276 | - |
| | | | | | | 15 | 16.9 | 7.91 | 81.8 | 8.14 | 278 | - |
| | | | | | | 16 | 16.8 | 7.84 | 80.9 | 8.15 | 282 | - |
| | | | | | | 17 | 16.7 | 7.81 | 80.4 | 8.17 | 288 | - |
| | | | | | | 18 | 16.6 | 7.76 | 79.4 | 8.16 | 286 | - |
| | | | | | | 19 | 16.2 | 7.54 | 76.4 | 8.11 | 276 | - |
| | | | | | | 20 | 14.6 | 7.36 | 72.4 | 7.98 | 253 | - |
| | | | | | | 21 | 13.4 | 7.30 | 69.6 | 7.89 | 235 | - |
| | | | | | | 22 | 12.9 | 7.49 | 70.9 | 7.88 | 229 | - |
| | | | | | | 23 | 12.7 | 7.59 | 71.6 | 7.88 | 227 | - |
| | | | | | | 24 | 12.6 | 7.57 | 71.1 | 7.86 | 227 | - |
| | | | | | | 25 | 12.5 | 7.49 | 70.2 | 7.85 | 227 | - |
| T4-6 | 20-Aug-14 | 629403 | 5441477 | rain, 100% cloud cover | 30.5 | 0 | 21.7 | 8.66 | 98.4 | 8.63 | 235 | - |
| | | | | | | 1 | 21.7 | 8.61 | 97.9 | 8.63 | 235 | - |
| | | | | | | 2 | 21.7 | 8.59 | 97.7 | 8.63 | 235 | - |
| | | | | | | 3 | 21.6 | 8.57 | 97.4 | 8.63 | 236 | - |
| | | | | | | 4 | 21.6 | 8.54 | 97.0 | 8.63 | 236 | - |
| | | | | | | 5 | 21.5 | 8.56 | 97.0 | 8.63 | 237 | - |
| | | | | | | 6 | 21.5 | 8.55 | 96.9 | 8.63 | 237 | - |
| | | | | | | 7 | 21.4 | 8.54 | 96.6 | 8.62 | 238 | - |
| | | | | | | 8 | 21.3 | 8.51 | 96.0 | 8.61 | 239 | - |
| | | | | | | 9 | 19.7 | 8.83 | 96.6 | 8.49 | 253 | - |
| | | | | | | 10 | 19.4 | 8.72 | 94.7 | 8.45 | 257 | - |
| | | | | | | 11 | 18.5 | 8.48 | 90.5 | 8.32 | 268 | - |
| | | | | | | 12 | 17.6 | 8.12 | 85.3 | 8.22 | 273 | - |
| | | | | | | 13 | 17.5 | 8.01 | 83.7 | 8.20 | 277 | - |
| | | | | | | 14 | 17.3 | 7.89 | 82.2 | 8.17 | 273 | - |
| | | | | | | 15 | 17.2 | 7.81 | 81.2 | 8.16 | 274 | - |
| | | | | | | 16 | 17.0 | 7.79 | 80.5 | 8.15 | 278 | - |
| | | | | | | 17 | 16.7 | 7.70 | 79.3 | 8.16 | 283 | - |
| | | | | | | 18 | 16.5 | 7.63 | 78.3 | 8.16 | 286 | - |

### Table B.1: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2014

| Station | Sampling Date | Location (11U, NAD83) | | Weather Notes | Station Depth (m) | Depth (m) | Temperature (°C) | Dissolved oxygen | | pH | Specific conductivity (µS/cm) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | (mg/L) | (%) | | | |
| T4-6 | 20-Aug-14 | 629403 | 5441477 | rain, 100% cloud cover | 30.5 | 19 | 16.0 | 7.46 | 75.6 | 8.09 | 273 | - |
| | | | | | | 20 | 14.8 | 7.24 | 71.0 | 7.97 | 254 | - |
| | | | | | | 21 | 13.8 | 7.21 | 69.8 | 7.93 | 238 | - |
| | | | | | | 22 | 13.4 | 7.33 | 70.2 | 7.90 | 233 | - |
| | | | | | | 23 | 13.0 | 6.88 | 65.2 | 7.87 | 234 | - |
| | | | | | | 24 | 12.8 | 6.86 | 64.9 | 7.83 | 232 | - |
| | | | | | | 25 | 12.6 | 7.25 | 68.4 | 7.85 | 228 | - |
| | | | | | | 26 | 12.4 | 7.31 | 68.5 | 7.84 | 230 | - |
| | | | | | | 27 | 12.3 | 7.00 | 65.4 | 7.83 | 230 | - |
| | | | | | | 28 | 12.1 | 6.70 | 62.2 | 7.80 | 232 | - |
| | | | | | | 29 | 11.8 | 6.37 | 58.5 | 7.78 | 233 | - |
| | | | | | | 30 | 11.6 | 6.00 | 55.1 | 7.75 | 234 | - |
| Gold Creek | 11-Feb-14 | 629438 | 5436997 | cool, -7°C, sunny periods | 5.3 | surface | 0.0 | 13.2 | 99.1 | 7.35 | 280 | first measurement taken at bottom of ice augered hole, reservoir was ice covered (at least 20 cm thick) |
| | | | | | | 1 | 0.4 | 13.2 | 101 | 7.50 | 283 | |
| | | | | | | 2 | 0.8 | 11.2 | 87.8 | 7.59 | 333 | |
| | | | | | | 3 | 0.9 | 10.4 | 80.2 | 7.65 | 333 | |
| | | | | | | 4 | 1.0 | 10.3 | 79.2 | 7.73 | 332 | |
| | | | | | | 5 | 1.1 | 10.3 | 79.2 | 7.78 | 331 | |
| | 13-Apr-14 | 629715 | 5437011 | sunny, clear, cool (7°C) | 3.1 | 0.5 | 4.5 | 12.4 | 104 | 8.08 | 235 | did not have an anchor but wind was very light, so the boat remained in the same position |
| | | | | | | 1 | 4.5 | 12.2 | 103 | 8.08 | 243 | |
| | | | | | | 2 | 4.7 | 12.3 | 102 | 8.10 | 247 | |
| | | | | | | 3 | 5.0 | 12.2 | 103 | 8.06 | 293 | |
| | 22-Aug-14 | 628556 | 5436916 | cloudy, light rain, 100% cloud cover | 4.6 | 0.5 | 20.8 | 8.94 | 99.8 | 8.65 | 232 | - |
| | | | | | | 1 | 20.8 | 8.94 | 100 | 8.66 | 234 | - |
| | | | | | | 2 | 20.8 | 8.95 | 100 | 8.66 | 234 | - |
| | | | | | | 3 | 20.8 | 8.94 | 99.9 | 8.66 | 233 | - |
| | | | | | | 4 | 20.7 | 8.90 | 99.5 | 8.66 | 233 | - |

## Table B.2: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2015

| Station | Sampling Date | Location (11U, NAD83) | | Time | Weather Notes | Total Depth | Secchi Depth | Depth | Temperature | Dissolved Oxygen | | pH | Specific Conductivity | Chlorophyll-a | BGA-PC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | (m) | (m) | (m) | (˚C) | (mg/L) | (% sat) | (pH units) | (µS/cm) | (µg/L) | (µg/L) |
| Sand Creek | 27-Feb-15 | 625561 | 5460052 | 11:50 | sunny, clear, (-5˚C) | 10.6 | - | surface | 0.92 | 13.6 | 95.7 | 8.17 | 362 | - | - |
| | | | | | | | | 1 | 0.91 | 13.9 | 96.5 | 7.91 | 362 | - | - |
| | | | | | | | | 2 | 0.90 | 14.1 | 99.1 | 7.83 | 362 | - | - |
| | | | | | | | | 3 | 0.89 | 14.4 | 101 | 7.80 | 362 | - | - |
| | | | | | | | | 4 | 0.97 | 13.1 | 92.2 | 7.87 | 361 | - | - |
| | | | | | | | | 5 | 0.96 | 13.1 | 92.1 | 7.87 | 361 | - | - |
| | | | | | | | | 6 | 1.00 | 13.1 | 91.9 | 7.87 | 360 | - | - |
| | | | | | | | | 7 | 1.29 | 13.0 | 91.8 | 7.87 | 358 | - | - |
| | | | | | | | | 8 | 1.22 | 13.0 | 92.0 | 7.89 | 357 | - | - |
| | | | | | | | | 9 | 1.40 | 12.9 | 92.1 | 7.89 | 353 | - | - |
| | | | | | | | | 10 | 1.65 | 12.9 | 92.4 | 7.90 | 349 | - | - |
| | 1-Apr-15 | 625582 | 5459794 | - | - | - | - | 1 | 10.7 | 10.6 | 95.3 | 8.36 | 267 | 0.35 | 0.25 |
| | | | | | | | | 2 | 10.7 | 10.6 | 95.5 | 8.36 | 266 | 0.52 | 0.020 |
| | | | | | | | | 3 | 10.7 | 10.6 | 95.6 | 8.36 | 266 | 0.55 | 0.020 |
| | | | | | | | | 4 | 10.7 | 10.6 | 95.6 | 8.36 | 267 | 0.60 | 0.020 |
| | | | | | | | | 5 | 10.6 | 10.6 | 95.4 | 8.36 | 266 | 0.65 | 0.020 |
| | | | | | | | | 6 | 10.3 | 10.5 | 93.5 | 8.32 | 267 | 0.57 | 0.030 |
| | | | | | | | | 7 | 10.2 | 10.5 | 93.3 | 8.31 | 267 | 0.67 | 0.030 |
| | | | | | | | | 8 | 10.2 | 10.4 | 93.1 | 8.31 | 267 | 0.61 | 0.030 |
| | | | | | | | | 9 | 10.2 | 10.4 | 92.8 | 8.30 | 267 | 0.79 | 0.070 |
| | | | | | | | | 10 | 10.2 | 10.4 | 92.6 | 8.25 | 267 | 0.79 | 0.080 |
| | 1-Aug-15 | 624284 | 5461692 | - | - | - | 2.60 | 0 | 19.6 | NR | NR | 8.75 | 255 | 14.6 | - |
| | | | | | | | | 1 | 19.4 | 8.92 | 96.7 | 8.74 | 255 | 23.2 | - |
| | | | | | | | | 2 | 19.1 | 8.89 | 96.1 | 8.73 | 255 | 52.1 | - |
| | | | | | | | | 3 | 18.9 | 8.84 | 95.3 | 8.71 | 257 | 21.5 | - |
| | | | | | | | | 4 | 18.7 | 8.71 | NR | 8.66 | 259 | 74.2 | - |
| | | | | | | | | 5 | 18.1 | NR | NR | 8.56 | 268 | 14.3 | - |
| | | | | | | | | 6 | 17.2 | NR | NR | 8.37 | 274 | 1.80 | - |
| | | | | | | | | 7 | 16.9 | NR | NR | 8.30 | 276 | 6.80 | - |
| | | | | | | | | 8 | 16.8 | NR | NR | 8.23 | 279 | 4.30 | - |
| T2 | 1-Apr-15 | 629295 | 5450863 | - | - | - | - | 0 | 11.0 | 11.0 | 99.8 | 8.34 | 280 | 0.10 | 0.030 |
| | | | | | | | | 1 | 11.0 | 11.0 | 99.9 | 8.35 | 280 | 0.14 | 0.020 |
| | | | | | | | | 2 | 10.9 | 11.0 | 99.6 | 8.35 | 280 | 0.24 | 0.020 |
| | | | | | | | | 3 | 10.3 | 11.1 | 99.5 | 8.34 | 279 | 0.35 | 0.010 |
| | | | | | | | | 4 | 9.17 | 11.1 | 96.3 | 8.32 | 278 | 1.07 | 0.030 |
| | | | | | | | | 5 | 8.87 | 11.0 | 94.8 | 8.28 | 277 | 0.76 | 0.040 |
| | | | | | | | | 6 | 8.48 | 11.0 | 94.4 | 8.27 | 277 | 1.21 | 0.030 |
| | | | | | | | | 7 | 8.21 | 10.9 | 92.4 | 8.25 | 274 | 1.42 | 0.020 |
| | | | | | | | | 8 | 8.01 | 10.8 | 91.5 | 8.24 | 279 | 0.85 | 0.020 |
| | | | | | | | | 9 | 7.87 | 10.8 | 90.6 | 8.26 | 304 | 0.33 | 0.040 |
| | | | | | | | | 10 | 7.90 | 10.7 | 90.3 | 8.28 | 308 | 0.31 | 0.020 |
| | | | | | | | | 11 | 7.25 | 10.4 | 86.9 | 8.22 | 307 | 0.29 | 0.030 |
| TN-1 | 1-Aug-15 | 626912 | 5453999 | - | - | - | 2.15 | 0 | 21.1 | 9.15 | 103 | 8.71 | 236 | 0.90 | - |
| | | | | | | | | 1 | 21.1 | 9.18 | 103 | 8.70 | 236 | 0.10 | - |
| | | | | | | | | 2 | 21.0 | 9.20 | 103 | 8.70 | 236 | 0.60 | - |
| | | | | | | | | 3 | 21.0 | 9.21 | 103 | 8.70 | 236 | 1.20 | - |
| | | | | | | | | 4 | 20.9 | 9.22 | 103 | 8.70 | 235 | 0.80 | - |
| | | | | | | | | 5 | 20.9 | 9.21 | 103 | 8.69 | 236 | 1.70 | - |
| | | | | | | | | 6 | 20.9 | 9.20 | 103 | 8.69 | 236 | 2.40 | - |
| | | | | | | | | 7 | 20.2 | 9.00 | 99.4 | 8.60 | 251 | 1.30 | - |
| | | | | | | | | 8 | 19.3 | 8.68 | 94.1 | 8.47 | 265 | 1.10 | - |
| | | | | | | | | 9 | 18.3 | 8.41 | 89.4 | 8.38 | 271 | 0.60 | - |
| | | | | | | | | 10 | 17.9 | 8.24 | 86.8 | 8.32 | 273 | 0.30 | - |
| | | | | | | | | 11 | 17.8 | 8.18 | 86.0 | 8.32 | 273 | 1.10 | - |
| TN-2 | 1-Aug-15 | 627088 | 5454009 | - | - | - | 2.20 | 0 | 21.2 | 9.15 | 113 | 8.71 | 235 | 0.70 | - |
| | | | | | | | | 1 | 21.2 | 9.17 | 103 | 8.71 | 235 | 0.30 | - |
| | | | | | | | | 2 | 21.1 | 9.21 | 103 | 8.70 | 235 | 0.50 | - |
| | | | | | | | | 3 | 21.0 | 9.23 | 104 | 8.70 | 235 | 1.70 | - |
| | | | | | | | | 4 | 20.9 | 9.23 | 103 | 8.70 | 235 | 0.70 | - |
| | | | | | | | | 5 | 20.8 | 9.24 | 103 | 8.69 | 235 | 2.10 | - |
| | | | | | | | | 6 | 20.8 | 9.21 | 103 | 8.69 | 237 | 2.30 | - |
| | | | | | | | | 7 | 20.2 | 9.03 | 99.7 | 8.59 | 250 | 1.70 | - |
| | | | | | | | | 8 | 19.4 | 8.67 | 94.2 | 8.49 | 262 | 1.30 | - |
| | | | | | | | | 9 | 18.9 | 8.47 | 91.2 | 8.44 | 266 | 2.00 | - |
| | | | | | | | | 10 | 17.9 | 8.29 | 87.3 | 8.33 | 272 | 0.60 | - |
| | | | | | | | | 11 | 17.8 | 8.20 | 86.1 | 8.32 | 273 | 0.30 | - |
| | | | | | | | | 12 | 17.7 | 8.04 | 84.5 | 8.30 | 273 | 0.60 | - |
| TN-3 | 1-Aug-15 | 627281 | 5453928 | - | - | - | 2.05 | 0 | 21.5 | 9.08 | 103 | 8.68 | 235 | 0.30 | - |
| | | | | | | | | 1 | 21.3 | 9.16 | 103 | 8.67 | 235 | 0.30 | - |
| | | | | | | | | 2 | 21.2 | 9.23 | 104 | 8.68 | 235 | 0.40 | - |
| | | | | | | | | 3 | 21.1 | 9.26 | 104 | 8.68 | 235 | 0.70 | - |
| | | | | | | | | 4 | 21.0 | 9.27 | 104 | 8.68 | 235 | 1.30 | - |
| | | | | | | | | 5 | 20.9 | 9.22 | 103 | 8.67 | 237 | 2.20 | - |
| | | | | | | | | 6 | 20.7 | 9.11 | 102 | 8.64 | 241 | 1.10 | - |
| | | | | | | | | 7 | 20.3 | 9.04 | 100 | 8.58 | 248 | 1.50 | - |
| | | | | | | | | 8 | 19.7 | 8.92 | 97.8 | 8.52 | 255 | 1.40 | - |
| | | | | | | | | 9 | 18.6 | 8.50 | 91.0 | 8.40 | 265 | 0.80 | - |
| | | | | | | | | 10 | 17.9 | 8.26 | 87.0 | 8.31 | 272 | 0.00 | - |
| | | | | | | | | 11 | 17.8 | 8.14 | 85.7 | 8.30 | 272 | 0.00 | - |
| | | | | | | | | 12 | 17.7 | 7.94 | 83.3 | 8.28 | 271 | 0.30 | - |
| TN-4 | 1-Aug-15 | 627477 | 5453664 | - | - | - | 2.20 | 0 | 21.6 | 9.06 | 103 | 8.68 | 235 | 0.00 | - |
| | | | | | | | | 1 | 21.3 | 9.17 | 104 | 8.68 | 235 | 0.00 | - |
| | | | | | | | | 2 | 21.2 | 9.24 | 104 | 8.69 | 235 | 0.20 | - |
| | | | | | | | | 3 | 21.1 | 9.26 | 104 | 8.69 | 235 | 0.30 | - |
| | | | | | | | | 4 | 21.1 | 9.28 | 104 | 8.69 | 235 | 0.70 | - |
| | | | | | | | | 5 | 21.0 | 9.28 | 104 | 8.69 | 236 | 0.50 | - |
| | | | | | | | | 6 | 20.9 | 9.21 | 103 | 8.68 | 237 | 1.60 | - |
| | | | | | | | | 7 | 20.5 | 9.09 | 101 | 8.61 | 245 | 1.60 | - |
| | | | | | | | | 8 | 19.8 | 8.92 | 97.8 | 8.54 | 254 | 1.80 | - |
| | | | | | | | | 9 | 18.2 | 8.34 | 88.5 | 8.35 | 267 | 0.60 | - |
| | | | | | | | | 10 | 17.8 | 8.22 | 86.5 | 8.31 | 271 | 0.50 | - |
| | | | | | | | | 11 | 17.7 | 8.16 | 85.8 | 8.30 | 271 | 0.20 | - |
| | | | | | | | | 12 | 17.6 | 7.91 | 83.0 | 8.26 | 270 | 0.20 | - |
| | | | | | | | | 13 | 17.3 | 6.34 | 66.5 | 8.10 | 273 | 0.50 | - |

[1] Gold Creek was not sampled in February 2015, as ice was too thin to traverse safely.

* BGA-PC - blue-green algae phycocyanin - a measurement of the amount of cyanobacteria in the water column.

* NR - Readings were not reliable (NR), as oxygen optical probe was malfunctioning. Manufacturer indicated that values provided by meter were reliable and representative of the conditions, as malfunction was related to water fowling of internal components and would not impede the accuracy of the readings.

## Table B.2: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2015

| Station | Sampling Date | Location (11U, NAD83) | | Time | Weather Notes | Total Depth | Secchi Depth | Depth | Temperature | Dissolved Oxygen | | pH | Specific Conductivity | Chlorophyll-a | BGA-PC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | (m) | (m) | (m) | (˚C) | (mg/L) | (% sat) | (pH units) | (µS/cm) | (µg/L) | (µg/L) |
| TN-5 | 1-Aug-15 | 627398 | 5453506 | - | - | - | 2.25 | 0 | 21.9 | 9.09 | 104 | 8.69 | 235 | 0.00 | - |
| | | | | | | | | 1 | 21.4 | 9.23 | 104 | 8.69 | 235 | 0.00 | - |
| | | | | | | | | 2 | 21.3 | 9.28 | 105 | 8.69 | 235 | 0.40 | - |
| | | | | | | | | 3 | 21.2 | 9.30 | 105 | 8.70 | 236 | 0.30 | - |
| | | | | | | | | 4 | 21.2 | 9.31 | 105 | 8.70 | 236 | 0.90 | - |
| | | | | | | | | 5 | 21.0 | 9.32 | 105 | 8.70 | 236 | 1.30 | - |
| | | | | | | | | 6 | 20.9 | 9.30 | 104 | 8.69 | 236 | 1.80 | - |
| | | | | | | | | 7 | 20.6 | 9.17 | 102 | 8.63 | 246 | 1.30 | - |
| | | | | | | | | 8 | 19.8 | 8.94 | 98.0 | 8.54 | 254 | 1.90 | - |
| | | | | | | | | 9 | 18.2 | 8.39 | 89.1 | 8.36 | 270 | 1.10 | - |
| | | | | | | | | 10 | 17.9 | 8.25 | 87.0 | 8.32 | 272 | 1.10 | - |
| | | | | | | | | 11 | 17.8 | 8.21 | 86.4 | 8.31 | 272 | 0.40 | - |
| | | | | | | | | 12 | 17.8 | 8.11 | 85.3 | 8.29 | 272 | 0.20 | - |
| Elk River | 26-Feb-15 | 628299 | 5447798 | 13:15 | mainly sunny, light clouds (2.0˚C) | 7.2 | - | surface | 1.52 | 14.6 | 105 | 7.62 | 303 | - | - |
| | | | | | | | | 1 | 1.14 | 14.8 | 105 | 7.60 | 344 | - | - |
| | | | | | | | | 2 | 1.12 | 14.3 | 102 | 7.59 | 343 | - | - |
| | | | | | | | | 3 | 1.16 | 14.1 | 98.4 | 7.59 | 342 | - | - |
| | | | | | | | | 4 | 1.25 | 13.6 | 96.5 | 7.60 | 341 | - | - |
| | | | | | | | | 5 | 1.47 | 13.4 | 95.8 | 7.63 | 339 | - | - |
| | | | | | | | | 6 | 1.60 | 13.3 | 95.8 | 7.64 | 343 | - | - |
| | | | | | | | | 7 | 1.70 | 13.1 | 94.1 | 7.67 | 353 | - | - |
| | 1-Apr-15 | 629172 | 5447826 | - | - | - | - | 0 | 9.75 | 10.7 | 94.4 | 8.32 | 293 | 0.11 | 0.020 |
| | | | | | | | | 1 | 9.61 | 10.7 | 94.0 | 8.32 | 293 | 0.14 | 0.040 |
| | | | | | | | | 2 | 9.43 | 10.7 | 93.6 | 8.33 | 293 | 0.21 | 0.030 |
| | | | | | | | | 3 | 9.75 | 10.8 | 93.8 | 8.32 | 293 | 0.31 | 0.020 |
| | | | | | | | | 4 | 9.01 | 10.8 | 93.7 | 8.32 | 293 | 0.36 | 0.020 |
| | | | | | | | | 5 | 8.84 | 10.8 | 93.5 | 8.32 | 293 | 0.38 | 0.010 |
| | | | | | | | | 6 | 8.17 | 11.0 | 93.2 | 8.31 | 291 | 0.50 | 0.030 |
| | 1-Aug-15 | 628458 | 5447973 | - | - | - | 2.08 | 0 | 20.4 | 8.55 | 94.8 | 8.80 | 239 | 0.30 | - |
| | | | | | | | | 1 | 20.3 | 9.13 | 101 | 8.79 | 239 | 0.80 | - |
| | | | | | | | | 2 | 20.3 | 9.15 | 101 | 8.79 | 239 | 0.80 | - |
| | | | | | | | | 3 | 20.2 | 9.16 | 101 | 8.79 | 239 | 0.90 | - |
| | | | | | | | | 4 | 20.2 | 9.14 | 101 | 8.79 | 239 | 1.80 | - |
| | | | | | | | | 5 | 20.1 | 9.13 | 101 | 8.79 | 240 | 2.10 | - |
| | | | | | | | | 6 | 20.1 | 9.07 | 99.9 | 8.77 | 243 | 2.70 | - |
| | | | | | | | | 7 | 19.9 | 8.91 | 97.8 | 8.76 | 246 | 3.40 | - |
| | | | | | | | | 8 | 19.6 | 8.73 | 95.4 | 8.71 | 249 | 1.80 | - |
| | | | | | | | | 9 | 19.5 | 8.64 | 94.0 | 8.68 | 254 | 1.90 | - |
| | | | | | | | | 10 | 18.5 | 8.17 | 87.2 | 8.53 | 268 | 1.40 | - |
| | | | | | | | | 11 | 17.9 | 8.18 | 86.3 | 8.53 | 288 | 0.70 | - |
| | | | | | | | | 12 | 17.4 | 8.43 | 87.9 | 8.56 | 310 | 1.40 | - |
| | | | | | | | | 13 | 16.4 | 8.76 | 89.6 | 8.56 | 339 | 2.50 | - |
| T4 | 1-Apr-15 | 630241 | 5441285 | - | - | - | - | 0 | 13.5 | 10.8 | 103 | 8.21 | 281 | 0.09 | 0.00 |
| | | | | | | | | 1 | 10.5 | 11.1 | 99.9 | 8.27 | 290 | 0.27 | 0.010 |
| | | | | | | | | 2 | 9.34 | 11.2 | 98.0 | 8.28 | 287 | 0.88 | 0.020 |
| | | | | | | | | 3 | 8.67 | 11.3 | 98.2 | 8.29 | 279 | 2.45 | 0.050 |
| | | | | | | | | 4 | 8.07 | 11.5 | 97.4 | 8.28 | 272 | 2.74 | 0.040 |
| | | | | | | | | 5 | 7.63 | 11.3 | 94.4 | 8.24 | 274 | 2.63 | 0.050 |
| | | | | | | | | 6 | 7.42 | 11.1 | 92.8 | 8.22 | 275 | 2.07 | 0.040 |
| | | | | | | | | 7 | 7.19 | 11.0 | 91.2 | 8.20 | 277 | 1.15 | 0.040 |
| | | | | | | | | 8 | 7.04 | 10.9 | 90.3 | 8.18 | 279 | 0.85 | 0.040 |
| | | | | | | | | 9 | 6.91 | 10.8 | 88.9 | 8.17 | 280 | 0.62 | 0.040 |
| | | | | | | | | 10 | 6.82 | 10.8 | 88.2 | 8.16 | 281 | 0.51 | 0.040 |
| | | | | | | | | 11 | 6.74 | 10.7 | 87.3 | 8.15 | 281 | 0.40 | 0.030 |
| | | | | | | | | 12 | 6.69 | 10.5 | 86.0 | 8.14 | 280 | 0.41 | 0.020 |
| | | | | | | | | 13 | 6.66 | 10.5 | 85.4 | 8.13 | 280 | 0.38 | 0.040 |
| | | | | | | | | 14 | 6.57 | 10.3 | 84.2 | 8.11 | 278 | 0.28 | 0.010 |
| T4-2 | 1-Aug-15 | 629591 | 5441618 | - | - | - | 2.05 | 0 | 21.2 | 9.45 | 106 | 8.78 | 231 | 1.00 | - |
| | | | | | | | | 1 | 21.1 | 9.48 | 107 | 8.77 | 231 | 0.90 | - |
| | | | | | | | | 2 | 21.1 | 9.47 | 107 | 8.77 | 231 | 1.50 | - |
| | | | | | | | | 3 | 21.1 | 9.46 | 107 | 8.77 | 231 | 1.50 | - |
| | | | | | | | | 4 | 21.1 | 9.45 | 106 | 8.76 | 231 | 1.60 | - |
| | | | | | | | | 5 | 21.1 | 9.42 | 106 | 8.76 | 231 | 1.90 | - |
| | | | | | | | | 6 | 21.1 | 9.39 | 106 | 8.75 | 232 | 2.10 | - |
| | | | | | | | | 7 | 21.0 | 9.39 | 106 | 8.75 | 231 | 2.00 | - |
| | | | | | | | | 8 | 21.0 | 9.33 | 105 | 8.74 | 233 | 1.90 | - |
| | | | | | | | | 9 | 20.2 | 8.88 | 97.7 | 8.61 | 253 | 0.90 | - |
| | | | | | | | | 10 | 18.7 | 8.28 | 88.6 | 8.43 | 276 | 0.90 | - |
| | | | | | | | | 11 | 18.2 | 8.07 | 85.6 | 8.38 | 278 | 0.40 | - |
| | | | | | | | | 12 | 18.0 | 7.90 | 83.4 | 8.36 | 280 | 0.80 | - |
| | | | | | | | | 13 | 17.8 | 7.68 | 80.4 | 8.31 | 277 | 0.40 | - |
| | | | | | | | | 14 | 17.6 | 7.41 | 77.6 | 8.27 | 273 | 0.60 | - |
| | | | | | | | | 15 | 17.2 | 7.23 | 75.0 | 8.24 | 272 | 0.00 | - |
| | | | | | | | | 16 | 16.7 | 6.90 | 70.5 | 8.17 | 268 | 0.70 | - |
| | | | | | | | | 17 | 15.5 | 6.74 | 67.6 | 8.08 | 250 | 1.00 | - |
| | | | | | | | | 18 | 14.8 | 6.96 | 68.7 | 8.05 | 237 | 0.00 | - |
| | | | | | | | | 19 | 14.5 | 7.16 | 70.4 | 8.04 | 231 | 0.70 | - |
| | | | | | | | | 20 | 14.3 | 7.18 | 70.2 | 8.04 | 230 | 0.20 | - |
| | | | | | | | | 21 | 13.8 | 6.42 | 61.3 | 7.98 | 235 | 1.80 | - |
| T4-3 | 1-Aug-15 | 629542 | 5441747 | - | - | - | 2.05 | 0 | 21.2 | 9.40 | 106 | 8.77 | 232 | 1.40 | - |
| | | | | | | | | 1 | 21.3 | 9.47 | 107 | 8.78 | 231 | 1.40 | - |
| | | | | | | | | 2 | 21.1 | 9.49 | 107 | 8.77 | 231 | 1.20 | - |
| | | | | | | | | 3 | 21.1 | 9.48 | 107 | 8.77 | 231 | 1.40 | - |
| | | | | | | | | 4 | 21.1 | 9.47 | 106 | 8.77 | 231 | 0.40 | - |
| | | | | | | | | 5 | 21.0 | 9.43 | 106 | 8.76 | 231 | 2.40 | - |
| | | | | | | | | 6 | 21.0 | 9.42 | 106 | 8.76 | 231 | 2.10 | - |
| | | | | | | | | 7 | 21.0 | 9.40 | 106 | 8.76 | 231 | 2.40 | - |
| | | | | | | | | 8 | 21.0 | 9.37 | 105 | 8.76 | 232 | 2.20 | - |
| | | | | | | | | 9 | 20.1 | 8.80 | 97.0 | 8.62 | 249 | 1.70 | - |
| | | | | | | | | 10 | 18.5 | 8.30 | 88.5 | 8.43 | 279 | 0.30 | - |
| | | | | | | | | 11 | 18.2 | 8.14 | 86.4 | 8.36 | 277 | 2.00 | - |
| | | | | | | | | 12 | 18.1 | 8.02 | 84.9 | 8.39 | 283 | 1.10 | - |
| | | | | | | | | 13 | 17.7 | 7.57 | 79.3 | 8.29 | 276 | 0.00 | - |
| | | | | | | | | 14 | 17.5 | 7.37 | 77.0 | 8.27 | 273 | 0.00 | - |
| | | | | | | | | 15 | 17.1 | 7.15 | 74.2 | 8.23 | 272 | 0.80 | - |
| | | | | | | | | 16 | 16.6 | 7.02 | 72.0 | 8.19 | 269 | 0.50 | - |
| | | | | | | | | 17 | 15.5 | 6.98 | 69.9 | 8.10 | 247 | 0.70 | - |
| | | | | | | | | 18 | 14.8 | 7.01 | 69.2 | 8.05 | 237 | 0.00 | - |
| | | | | | | | | 19 | 14.5 | 7.08 | 69.4 | 8.04 | 232 | 0.20 | - |
| | | | | | | | | 20 | 14.2 | 6.97 | 67.8 | 8.02 | 231 | 0.00 | - |
| | | | | | | | | 21 | 13.9 | 6.14 | 59.9 | 7.98 | 235 | 0.30 | - |

[1] Gold Creek was not sampled in February 2015, as ice was too thin to traverse safely.

* BGA-PC - blue-green algae phycocyanin - a measurement of the amount of cyanobacteria in the water column.

* NR - Readings were not reliable (NR), as oxygen optical probe was malfunctioning. Manufacturer indicated that values provided by meter were reliable and representative of the conditions, as malfunction was related to water fowling of internal components and would not impede the accuracy of the readings.

## Table B.2: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2015

| Station | Sampling Date | Location (11U, NAD83) | | Time | Weather Notes | Total Depth | Secchi Depth | Depth | Temperature | Dissolved Oxygen | | pH | Specific Conductivity | Chlorophyll-a | BGA-PC* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | (m) | (m) | (m) | (˚C) | (mg/L) | (% sat) | (pH units) | (µS/cm) | (µg/L) | (µg/L) |
| T4-4 | 1-Aug-15 | 629749 | 5441822 | - | - | - | 2.10 | 0 | 21.5 | 9.38 | 106 | 8.76 | 231 | 0.00 | - |
| | | | | | | | | 1 | 21.3 | 9.50 | 107 | 8.76 | 231 | 0.00 | - |
| | | | | | | | | 2 | 21.2 | 9.51 | 107 | 8.76 | 231 | 0.60 | - |
| | | | | | | | | 3 | 21.1 | 9.52 | 107 | 8.76 | 231 | 0.60 | - |
| | | | | | | | | 4 | 21.1 | 9.53 | 107 | 8.76 | 231 | 0.90 | - |
| | | | | | | | | 5 | 21.1 | 9.54 | 107 | 8.76 | 231 | 2.00 | - |
| | | | | | | | | 6 | 21.0 | 9.54 | 107 | 8.76 | 231 | 2.20 | - |
| | | | | | | | | 7 | 21.0 | 9.49 | 107 | 8.76 | 231 | 2.00 | - |
| | | | | | | | | 8 | 20.8 | 9.20 | 103 | 8.70 | 237 | 2.60 | - |
| | | | | | | | | 9 | 20.2 | 8.78 | 97.0 | 8.59 | 253 | 2.30 | - |
| | | | | | | | | 10 | 18.8 | 8.22 | 88.4 | 8.41 | 273 | 0.90 | - |
| | | | | | | | | 11 | 18.5 | 8.04 | 85.8 | 8.38 | 273 | 1.20 | - |
| | | | | | | | | 12 | 18.0 | 7.74 | 81.7 | 8.32 | 275 | 0.60 | - |
| | | | | | | | | 13 | 17.8 | 7.55 | 79.6 | 8.30 | 275 | 1.00 | - |
| | | | | | | | | 14 | 17.5 | 7.37 | 77.2 | 8.26 | 273 | 0.00 | - |
| | | | | | | | | 15 | 17.2 | 7.14 | 74.2 | 8.22 | 272 | 0.70 | - |
| | | | | | | | | 16 | 16.1 | 6.75 | 68.6 | 8.11 | 260 | 0.10 | - |
| | | | | | | | | 17 | 15.2 | 7.00 | 69.7 | 8.07 | 243 | 0.50 | - |
| | | | | | | | | 18 | 14.9 | 7.05 | 69.8 | 8.05 | 239 | 0.30 | - |
| | | | | | | | | 19 | 14.6 | 7.06 | 69.4 | 8.04 | 235 | 0.80 | - |
| | | | | | | | | 20 | 14.3 | 7.10 | 69.4 | 8.02 | 231 | 0.60 | - |
| | | | | | | | | 21 | 14.0 | 6.12 | 59.7 | 7.98 | 234 | 0.90 | - |
| | | | | | | | | 22 | 13.4 | 5.18 | 49.9 | 7.90 | 239 | 1.10 | - |
| | | | | | | | | 23 | 13.3 | 4.81 | 45.9 | 7.89 | 240 | 1.80 | - |
| T4-5 | 1-Aug-15 | 629840 | 5441937 | - | - | - | 2.15 | 0 | 21.7 | 9.57 | 109 | 8.77 | 231 | 0.90 | - |
| | | | | | | | | 1 | 21.3 | 9.60 | 108 | 8.78 | 231 | 0.90 | - |
| | | | | | | | | 2 | 21.2 | 9.64 | 109 | 8.79 | 230 | 1.60 | - |
| | | | | | | | | 3 | 21.1 | 9.68 | 109 | 8.79 | 230 | 0.20 | - |
| | | | | | | | | 4 | 21.1 | 9.66 | 109 | 8.79 | 230 | 1.20 | - |
| | | | | | | | | 5 | 21.1 | 9.65 | 108 | 8.79 | 230 | 1.80 | - |
| | | | | | | | | 6 | 21.0 | 9.61 | 108 | 8.78 | 230 | 1.70 | - |
| | | | | | | | | 7 | 21.0 | 9.58 | 107 | 8.78 | 230 | 2.20 | - |
| | | | | | | | | 8 | 20.8 | 9.22 | 103 | 8.72 | 234 | 2.60 | - |
| | | | | | | | | 9 | 20.1 | 8.75 | 96.5 | 8.58 | 256 | 1.60 | - |
| | | | | | | | | 10 | 19.2 | 8.38 | 90.7 | 8.48 | 270 | 0.70 | - |
| | | | | | | | | 11 | 18.5 | 8.10 | 86.7 | 8.42 | 272 | 0.20 | - |
| | | | | | | | | 12 | 17.9 | 7.79 | 82.7 | 8.33 | 275 | 0.70 | - |
| | | | | | | | | 13 | 17.7 | 7.56 | 79.6 | 8.30 | 274 | 0.40 | - |
| | | | | | | | | 14 | 17.5 | 7.43 | 77.8 | 8.27 | 272 | 1.00 | - |
| | | | | | | | | 15 | 17.0 | 7.07 | 73.2 | 8.21 | 271 | 0.40 | - |
| | | | | | | | | 16 | 16.1 | 6.72 | 68.4 | 8.12 | 260 | 0.00 | - |
| | | | | | | | | 17 | 15.5 | 6.75 | 67.8 | 8.08 | 249 | 0.90 | - |
| | | | | | | | | 18 | 15.1 | 6.97 | 69.1 | 8.05 | 240 | 0.00 | - |
| | | | | | | | | 19 | 14.8 | 6.95 | 68.8 | 8.01 | 238 | 0.40 | - |
| | | | | | | | | 20 | 14.5 | 6.94 | 68.2 | 8.02 | 234 | 0.40 | - |
| | | | | | | | | 21 | 14.0 | 6.37 | 61.8 | 7.95 | 234 | 1.20 | - |
| | | | | | | | | 22 | 13.3 | 5.97 | 57.6 | 7.93 | 235 | 1.60 | - |
| T4-6 | 1-Aug-15 | 630002 | 5441956 | - | - | - | 2.25 | 0 | 22.0 | 9.53 | 109 | 8.79 | 231 | 0.90 | - |
| | | | | | | | | 1 | 21.4 | 9.66 | 109 | 8.79 | 230 | 0.00 | - |
| | | | | | | | | 2 | 21.2 | 9.73 | 110 | 8.79 | 230 | 1.00 | - |
| | | | | | | | | 3 | 21.2 | 9.73 | 110 | 8.79 | 230 | 0.50 | - |
| | | | | | | | | 4 | 21.1 | 9.70 | 109 | 8.79 | 230 | 1.30 | - |
| | | | | | | | | 5 | 21.1 | 9.68 | 109 | 8.79 | 230 | 1.40 | - |
| | | | | | | | | 6 | 21.0 | 9.61 | 108 | 8.78 | 230 | 2.10 | - |
| | | | | | | | | 7 | 21.0 | 9.45 | 106 | 8.76 | 231 | 2.10 | - |
| | | | | | | | | 8 | 20.7 | 9.12 | 102 | 8.67 | 240 | 2.30 | - |
| | | | | | | | | 9 | 20.2 | 8.77 | 96.9 | 8.59 | 254 | 1.50 | - |
| | | | | | | | | 10 | 19.5 | 8.48 | 92.4 | 8.51 | 265 | 1.60 | - |
| | | | | | | | | 11 | 18.5 | 8.10 | 86.5 | 8.41 | 274 | 0.90 | - |
| | | | | | | | | 12 | 18.1 | 7.84 | 83.4 | 8.34 | 276 | 0.30 | - |
| | | | | | | | | 13 | 17.8 | 7.59 | 79.8 | 8.31 | 274 | 0.80 | - |
| | | | | | | | | 14 | 17.5 | 7.32 | 76.5 | 8.26 | 273 | 0.70 | - |
| | | | | | | | | 15 | 16.3 | 7.06 | 72.1 | 8.16 | 264 | 0.50 | - |
| | | | | | | | | 16 | 16.1 | 6.95 | 70.5 | 8.12 | 257 | 0.70 | - |
| | | | | | | | | 17 | 15.6 | 7.03 | 70.6 | 8.10 | 248 | 0.00 | - |
| Gold Creek [1] | 1-Apr-15 | 630503 | 5437033 | - | - | - | - | 0 | 12.3 | 11.0 | 103 | 8.15 | 277 | 0.44 | 0.00 |
| | | | | | | | | 1 | 10.6 | 11.2 | 101 | 8.20 | 279 | 0.87 | 0.020 |
| | | | | | | | | 2 | 10.5 | 11.3 | 101 | 8.20 | 275 | 1.19 | 0.030 |
| | | | | | | | | 3 | 9.31 | 11.6 | 101 | 8.21 | 240 | 2.60 | 0.050 |
| | | | | | | | | 4 | 8.56 | 11.5 | 98.3 | 8.18 | 226 | 3.80 | 0.070 |
| | | | | | | | | 5 | 8.00 | 11.3 | 95.7 | 8.12 | 217 | 3.49 | 0.050 |
| | | | | | | | | 6 | 7.82 | 11.1 | 93.8 | 8.08 | 224 | 2.65 | 0.030 |
| | | | | | | | | 7 | 7.55 | 11.0 | 91.8 | 8.05 | 257 | 1.89 | 0.050 |
| | | | | | | | | 8 | 7.35 | 10.9 | 90.9 | 8.05 | 266 | 1.45 | 0.050 |
| | | | | | | | | 9 | 7.15 | 10.9 | 90.1 | 8.05 | 271 | 1.16 | 0.040 |
| | | | | | | | | 10 | 6.94 | 10.7 | 88.2 | 8.04 | 270 | 0.85 | 0.020 |
| | | | | | | | | 11 | 6.74 | 10.6 | 86.6 | 8.02 | 271 | 0.76 | 0.030 |
| | | | | | | | | 12 | 6.45 | 10.3 | 84.1 | 8.00 | 271 | 0.60 | 0.040 |
| | 1-Aug-15 | 629852 | 5437292 | - | - | - | 1.95 | 0 | 21.1 | 8.57 | 96.3 | 8.82 | 232 | 0.10 | - |
| | | | | | | | | 1 | 20.7 | 9.03 | 101 | 8.82 | 232 | 0.00 | - |
| | | | | | | | | 2 | 20.5 | 9.14 | 102 | 8.82 | 231 | 3.40 | - |
| | | | | | | | | 3 | 20.4 | 9.23 | 103 | 8.82 | 231 | 4.30 | - |
| | | | | | | | | 4 | 20.4 | NR | NR | 8.83 | 231 | 1.20 | - |
| | | | | | | | | 5 | 20.3 | NR | NR | 8.81 | 232 | 11.1 | - |
| | | | | | | | | 6 | 20.3 | NR | NR | 8.80 | 232 | 7.10 | - |
| | | | | | | | | 7 | 20.2 | 8.82 | 98.8 | 8.76 | 235 | 32.1 | - |
| | | | | | | | | 8 | 20.1 | 8.81 | 97.2 | 8.75 | 233 | 37.0 | - |
| | | | | | | | | 9 | 19.8 | NR | NR | 8.74 | 233 | 12.3 | - |
| | | | | | | | | 10 | 19.7 | NR | NR | 8.70 | 238 | 12.5 | - |
| | | | | | | | | 11 | 18.7 | NR | NR | 8.43 | 262 | 11.4 | - |
| | | | | | | | | 12 | 18.4 | 7.01 | 74.7 | 8.34 | 270 | 10.5 | - |
| | | | | | | | | 13 | 18.4 | 6.86 | 73.0 | 8.32 | 272 | 2.80 | - |

[1] Gold Creek was not sampled in February 2015, as ice was too thin to traverse safely.

* BGA-PC - blue-green algae phycocyanin - a measurement of the amount of cyanobacteria in the water column.

* NR - Readings were not reliable (NR), as oxygen optical probe was malfunctioning. Manufacturer indicated that values provided by meter were reliable and representative of the conditions, as malfunction was related to water fowling of internal components and would not impede the accuracy of the readings.

## **Table B.3:** ***In situ*** **Water Quality Measurements in Koocanusa Reservoir, 2016**

| Station | Sampling Date | Location (11U, NAD83) | | Secchi Depth | Depth | Temperature | pH | Dissolved Oxygen | | Specific Conductivity |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | (m) | (m) | (˚C) | | (mg/L) | (%) | (µS/cm) |
| Sand Creek | 1-Apr-16 | 625736 | 5458469 | - | 0 | 7.81 | 7.24 | 11.9 | 99.9 | 198 |
| | | | | | 0.5 | 7.71 | 7.27 | 11.9 | 99.4 | 198 |
| | | | | | 1.0 | 7.70 | 7.27 | 11.8 | 98.6 | 198 |
| | | | | | 1.5 | 7.70 | 7.31 | 11.8 | 98.5 | 198 |
| | | | | | 2.0 | 7.68 | 7.33 | 11.6 | 97.5 | 197 |
| | | | | | 2.5 | 7.69 | 7.33 | 11.6 | 97.4 | 197 |
| | | | | | 3.0 | 7.69 | 7.33 | 11.6 | 97.1 | 197 |
| | 1-Aug-16 | 625899 | 5458194 | - | 0 | 19.6 | 8.44 | 8.84 | 96.4 | 263 |
| | | | | | 1 | 19.5 | 8.42 | 8.77 | 95.7 | 263 |
| | | | | | 2 | 19.2 | 8.42 | 8.78 | 95.1 | 262 |
| | | | | | 3 | 19.1 | 8.43 | 8.75 | 94.7 | 262 |
| | | | | | 4 | 19.1 | 8.42 | 8.70 | 94.0 | 262 |
| | | | | | 5 | 19.1 | 8.41 | 8.66 | 93.6 | 262 |
| | | | | | 6 | 19.0 | 8.38 | 8.63 | 93.0 | 264 |
| | | | | | 7 | 18.7 | 8.31 | 8.56 | 91.7 | 271 |
| | | | | | 8 | 18.4 | 8.27 | 8.47 | 90.2 | 274 |
| | | | | | 9 | 18.2 | 8.24 | 8.30 | 88.0 | 276 |
| | | | | | 10 | 17.9 | 8.21 | 8.20 | 86.4 | 277 |
| | | | | | 11 | 17.7 | 8.18 | 8.08 | 84.8 | 279 |
| | | | | | 12 | 17.3 | 8.21 | 8.25 | 86.0 | 283 |
| TN-1 | 1-Apr-16 | 627377 | 5453471 | - | 0 | 8.44 | 7.51 | 11.9 | 101 | 182 |
| | | | | | 1 | 8.39 | 7.78 | 11.8 | 101 | 182 |
| | | | | | 2 | 8.38 | 7.78 | 11.8 | 101 | 181 |
| | | | | | 3 | 8.38 | 7.78 | 11.8 | 101 | 181 |
| | 1-Aug-16 | 627369 | 5453492 | 4.9 | 0 | 19.0 | 8.51 | 8.62 | 93.1 | 262 |
| | | | | | 1 | 19.0 | 8.52 | 8.57 | 92.6 | 262 |
| | | | | | 2 | 19.1 | 8.52 | 8.56 | 92.5 | 262 |
| | | | | | 3 | 19.0 | 8.53 | 8.55 | 92.3 | 262 |
| | | | | | 4 | 19.0 | 8.54 | 8.56 | 92.3 | 262 |
| | | | | | 5 | 19.0 | 8.53 | 8.56 | 92.3 | 262 |
| | | | | | 6 | 19.0 | 8.53 | 8.55 | 92.2 | 262 |
| | | | | | 7 | 19.0 | 8.53 | 8.54 | 92.2 | 262 |
| | | | | | 8 | 19.0 | 8.54 | 8.54 | 92.2 | 262 |
| | | | | | 9 | 19.0 | 8.53 | 8.53 | 92.0 | 262 |
| | | | | | 10 | 18.8 | 8.48 | 8.43 | 90.8 | 264 |
| | | | | | 11 | 18.0 | 8.33 | 8.02 | 84.8 | 276 |
| | | | | | 12 | 17.9 | 8.28 | 7.93 | 83.7 | 276 |
| | | | | | 13 | 17.2 | 8.15 | 7.47 | 77.6 | 279 |
| | | | | | 14 | 17.1 | 8.08 | 6.96 | 72.2 | 279 |
| | | | | | 15 | 16.8 | 8.00 | 6.49 | 66.9 | 279 |
| TN-2 | 1-Aug-16 | 627256 | 5453672 | 5.3 | 0 | 19.1 | 8.49 | 8.60 | 93.0 | 262 |
| | | | | | 1 | 19.1 | 8.49 | 8.58 | 92.8 | 262 |
| | | | | | 2 | 19.1 | 8.49 | 8.56 | 92.6 | 262 |
| | | | | | 3 | 19.1 | 8.49 | 8.56 | 92.6 | 262 |
| | | | | | 4 | 19.1 | 8.49 | 8.55 | 92.4 | 262 |
| | | | | | 5 | 19.1 | 8.49 | 8.54 | 92.3 | 262 |
| | | | | | 6 | 19.1 | 8.50 | 8.52 | 92.0 | 262 |
| | | | | | 7 | 19.0 | 8.51 | 8.51 | 91.9 | 261 |
| | | | | | 8 | 19.0 | 8.52 | 8.52 | 92.0 | 261 |
| | | | | | 9 | 19.0 | 8.50 | 8.49 | 91.4 | 263 |
| | | | | | 10 | 18.7 | 8.45 | 8.36 | 89.7 | 268 |
| | | | | | 11 | 18.4 | 8.38 | 8.21 | 87.5 | 274 |
| | | | | | 12 | 17.6 | 8.24 | 7.61 | 79.7 | 278 |
| | | | | | 13 | 17.1 | 8.12 | 7.26 | 75.3 | 279 |
| | | | | | 14 | 16.9 | 8.06 | 6.55 | 67.7 | 280 |
| TN-3 | 1-Aug-16 | 627367 | 5453710 | 5.0 | 0 | 19.2 | 8.49 | 8.60 | 93.1 | 262 |
| | | | | | 1 | 19.2 | 8.49 | 8.56 | 92.7 | 262 |
| | | | | | 2 | 19.1 | 8.49 | 8.54 | 92.4 | 262 |
| | | | | | 3 | 19.1 | 8.50 | 8.52 | 92.1 | 262 |
| | | | | | 4 | 19.1 | 8.51 | 8.53 | 92.1 | 262 |
| | | | | | 5 | 19.0 | 8.51 | 8.51 | 91.9 | 262 |
| | | | | | 6 | 19.0 | 8.52 | 8.50 | 91.7 | 262 |
| | | | | | 7 | 19.0 | 8.52 | 8.47 | 91.4 | 262 |
| | | | | | 8 | 19.0 | 8.52 | 8.45 | 91.2 | 262 |
| | | | | | 9 | 19.0 | 8.52 | 8.44 | 91.0 | 262 |
| | | | | | 10 | 18.7 | 8.43 | 8.29 | 88.8 | 268 |
| | | | | | 11 | 18.1 | 8.33 | 8.05 | 85.3 | 276 |
| | | | | | 12 | 18.0 | 8.30 | 7.89 | 83.3 | 277 |
| | | | | | 13 | 17.2 | 8.10 | 7.06 | 73.2 | 279 |
| | | | | | 14 | 16.9 | 8.04 | 6.63 | 68.4 | 279 |
| TN-4 | 1-Aug-16 | 627333 | 5453882 | 4.9 | 0 | 19.4 | 8.48 | 8.69 | 94.6 | 262 |
| | | | | | 1 | 19.3 | 8.48 | 8.64 | 93.7 | 262 |
| | | | | | 2 | 19.1 | 8.50 | 8.62 | 93.3 | 262 |
| | | | | | 3 | 19.1 | 8.50 | 8.61 | 93.0 | 262 |
| | | | | | 4 | 19.1 | 8.50 | 8.58 | 92.7 | 262 |
| | | | | | 5 | 19.0 | 8.49 | 8.54 | 92.2 | 262 |
| | | | | | 6 | 19.0 | 8.49 | 8.52 | 91.9 | 262 |
| | | | | | 7 | 19.0 | 8.49 | 8.50 | 91.7 | 262 |
| | | | | | 8 | 19.0 | 8.50 | 8.50 | 91.6 | 262 |
| | | | | | 9 | 19.0 | 8.50 | 8.48 | 91.4 | 262 |
| | | | | | 10 | 18.6 | 8.42 | 8.30 | 88.8 | 271 |
| | | | | | 11 | 18.2 | 8.32 | 8.08 | 85.7 | 276 |
| | | | | | 12 | 18.1 | 8.29 | 7.97 | 84.4 | 277 |
| | | | | | 13 | 17.3 | 8.13 | 7.29 | 76.0 | 279 |
| | | | | | 14 | 16.9 | 8.06 | 6.82 | 70.5 | 280 |

## Table B.3: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2016

| Station | Sampling Date | Location (11U, NAD83) | | Secchi Depth | Depth | Temperature | pH | Dissolved Oxygen | | Specific Conductivity |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | (m) | (m) | (˚C) | | (mg/L) | (%) | (µS/cm) |
| TN-5 | 1-Aug-16 | 627200 | 5454005 | 4.9 | 0 | 19.6 | 8.49 | 8.92 | 97.4 | 262 |
| | | | | | 1 | 19.3 | 8.47 | 8.89 | 96.5 | 261 |
| | | | | | 2 | 19.2 | 8.47 | 8.85 | 95.8 | 261 |
| | | | | | 3 | 19.1 | 8.47 | 8.81 | 95.4 | 261 |
| | | | | | 4 | 19.1 | 8.48 | 8.79 | 95.0 | 261 |
| | | | | | 5 | 19.1 | 8.47 | 8.75 | 94.6 | 261 |
| | | | | | 6 | 19.0 | 8.47 | 8.69 | 93.8 | 261 |
| | | | | | 7 | 19.0 | 8.47 | 8.67 | 96.6 | 261 |
| | | | | | 8 | 19.0 | 8.47 | 8.65 | 93.3 | 261 |
| | | | | | 9 | 19.0 | 8.46 | 8.62 | 93.0 | 261 |
| | | | | | 10 | 18.9 | 8.43 | 8.57 | 92.2 | 264 |
| | | | | | 11 | 18.3 | 8.30 | 8.23 | 87.5 | 275 |
| | | | | | 12 | 18.0 | 8.23 | 8.05 | 85.0 | 276 |
| | | | | | 13 | 17.0 | 8.07 | 7.42 | 76.8 | 280 |
| | | | | | 14 | 16.9 | 8.00 | 6.90 | 71.3 | 279 |
| Elk River | 1-Apr-16 | 628044 | 5447695 | - | 0 | 7.66 | 7.44 | 13.3 | 111 | 192 |
| | | | | | 1 | 7.64 | 7.50 | 13.2 | 111 | 193 |
| | | | | | 2 | 7.64 | 7.48 | 13.2 | 111 | 192 |
| | | | | | 3 | 7.64 | 7.52 | 13.2 | 111 | 193 |
| | | | | | 4 | 7.64 | 7.54 | 13.2 | 111 | 192 |
| | | | | | 5 | 7.64 | 7.56 | 13.2 | 111 | 193 |
| | | | | | 6 | 7.64 | 7.58 | 13.2 | 110 | 192 |
| | | | | | 7 | 7.64 | 7.58 | 13.2 | 110 | 192 |
| | | | | | 8 | 7.64 | 7.62 | 13.2 | 110 | 193 |
| | | | | | 9 | 7.64 | 7.63 | 13.2 | 110 | 193 |
| | | | | | 10 | 7.64 | 7.61 | 13.1 | 110 | 193 |
| | 1-Aug-16 | 630434 | 5447592 | - | 0 | 20.0 | 8.52 | 8.75 | 96.4 | 262 |
| | | | | | 1 | 19.7 | 8.51 | 8.72 | 95.5 | 261 |
| | | | | | 2 | 19.6 | 8.51 | 8.71 | 95.0 | 261 |
| | | | | | 3 | 19.5 | 8.50 | 8.69 | 94.6 | 261 |
| | | | | | 4 | 19.4 | 8.50 | 8.66 | 94.2 | 261 |
| | | | | | 5 | 19.3 | 8.50 | 8.66 | 94.0 | 262 |
| | | | | | 6 | 19.3 | 8.49 | 8.63 | 93.7 | 265 |
| | | | | | 7 | 18.8 | 8.48 | 8.66 | 93.0 | 277 |
| | | | | | 8 | 18.6 | 8.47 | 8.66 | 92.8 | 280 |
| | | | | | 9 | 15.4 | 8.37 | 8.85 | 88.8 | 354 |
| | | | | | 10 | 15.2 | 8.34 | 8.71 | 86.8 | 362 |
| T4-4 | 1-Apr-16 | 629716 | 5441648 | - | 0 | 8.73 | 7.63 | 12.8 | 110 | 221 |
| | | | | | 1 | 8.55 | 7.64 | 12.8 | 110 | 219 |
| | | | | | 2 | 8.40 | 7.66 | 12.9 | 110 | 219 |
| | | | | | 3 | 8.29 | 7.66 | 13.0 | 110 | 221 |
| | | | | | 4 | 8.26 | 7.59 | 13.0 | 111 | 219 |
| | | | | | 5 | 8.25 | 7.56 | 13.0 | 110 | 221 |
| | | | | | 6 | 8.22 | 7.60 | 12.8 | 109 | 220 |
| | | | | | 7 | 8.09 | 7.59 | 13.0 | 110 | 217 |
| | | | | | 8 | 7.87 | 7.62 | 13.1 | 110 | 219 |
| | | | | | 9 | 7.72 | 7.58 | 13.1 | 110 | 218 |
| | | | | | 10 | 7.71 | 7.58 | 13.1 | 110 | 219 |
| | | | | | 11 | 7.70 | 7.58 | 13.1 | 110 | 219 |
| | | | | | 12 | 7.70 | 7.59 | 13.0 | 109 | 220 |
| T4-2 | 1-Aug-16 | 630115 | 5441812 | 4.4 | 0 | 20.3 | 8.54 | 8.74 | 96.6 | 247 |
| | | | | | 1 | 20.2 | 8.54 | 8.73 | 96.4 | 246 |
| | | | | | 2 | 19.8 | 8.56 | 8.80 | 96.5 | 246 |
| | | | | | 3 | 19.7 | 8.56 | 8.81 | 96.4 | 246 |
| | | | | | 4 | 19.7 | 8.55 | 8.80 | 96.2 | 246 |
| | | | | | 5 | 19.6 | 8.55 | 8.76 | 95.8 | 247 |
| | | | | | 6 | 19.6 | 8.54 | 8.73 | 95.4 | 246 |
| | | | | | 7 | 19.6 | 8.55 | 8.71 | 95.1 | 246 |
| | | | | | 8 | 19.5 | 8.55 | 8.70 | 94.9 | 246 |
| | | | | | 9 | 19.5 | 8.55 | 8.69 | 94.7 | 246 |
| | | | | | 10 | 19.5 | 8.55 | 8.65 | 94.2 | 245 |
| | | | | | 11 | 19.3 | 8.50 | 8.50 | 92.3 | 250 |
| | | | | | 12 | 19.0 | 8.41 | 8.28 | 89.4 | 258 |
| | | | | | 13 | 18.2 | 8.28 | 7.93 | 84.3 | 271 |
| | | | | | 14 | 17.5 | 8.18 | 7.47 | 78.1 | 282 |
| | | | | | 15 | 17.2 | 8.14 | 7.35 | 76.4 | 280 |
| | | | | | 16 | 16.7 | 8.08 | 7.17 | 73.8 | 279 |
| | | | | | 17 | 16.4 | 8.05 | 6.99 | 71.6 | 278 |
| | | | | | 18 | 16.2 | 8.02 | 6.88 | 70.2 | 277 |
| | | | | | 19 | 16.0 | 7.99 | 6.75 | 68.4 | 276 |
| | | | | | 20 | 15.0 | 7.91 | 6.44 | 63.9 | 267 |
| | | | | | 21 | 14.6 | 7.87 | 6.26 | 61.6 | 264 |
| | | | | | 22 | 14.2 | 7.83 | 6.08 | 59.2 | 260 |
| | | | | | 23 | 13.9 | 7.81 | 5.91 | 57.1 | 257 |
| T4-3 | 1-Aug-16 | 629831 | 5442006 | 4.3 | 0 | 20.2 | 8.56 | 8.86 | 97.8 | 248 |
| | | | | | 1 | 20.1 | 8.56 | 8.83 | 97.4 | 248 |
| | | | | | 2 | 20.0 | 8.57 | 8.81 | 97.3 | 248 |
| | | | | | 3 | 19.8 | 8.57 | 8.86 | 97.1 | 249 |
| | | | | | 4 | 19.7 | 8.56 | 8.87 | 97.0 | 250 |
| | | | | | 5 | 19.6 | 8.56 | 8.84 | 96.6 | 250 |
| | | | | | 6 | 19.6 | 8.56 | 8.82 | 96.3 | 250 |
| | | | | | 7 | 19.6 | 8.55 | 8.77 | 95.7 | 250 |
| | | | | | 8 | 19.5 | 8.55 | 8.78 | 95.7 | 249 |
| | | | | | 9 | 19.5 | 8.57 | 8.78 | 95.6 | 247 |
| | | | | | 10 | 19.4 | 8.55 | 8.73 | 94.9 | 249 |
| | | | | | 11 | 19.3 | 8.49 | 8.47 | 91.9 | 253 |
| | | | | | 12 | 18.9 | 8.41 | 8.31 | 89.6 | 262 |
| | | | | | 13 | 17.9 | 8.27 | 7.80 | 82.2 | 281 |
| | | | | | 14 | 17.2 | 8.17 | 7.33 | 76.2 | 282 |
| | | | | | 15 | 17.1 | 8.13 | 7.29 | 75.6 | 281 |
| | | | | | 16 | 16.6 | 8.08 | 7.12 | 73.2 | 281 |
| | | | | | 17 | 16.3 | 8.05 | 7.00 | 71.4 | 280 |
| | | | | | 18 | 16.1 | 8.02 | 6.87 | 69.7 | 279 |
| | | | | | 19 | 15.8 | 7.98 | 6.68 | 67.4 | 277 |
| | | | | | 20 | 15.3 | 7.96 | 6.56 | 65.6 | 273 |
| | | | | | 21 | 14.5 | 7.91 | 6.35 | 62.6 | 264 |
| | | | | | 22 | 14.1 | 7.87 | 6.21 | 60.4 | 261 |
| | | | | | 23 | 13.8 | 7.83 | 5.93 | 57.3 | 259 |
| | | | | | 24 | 13.7 | 7.81 | 5.72 | 55.2 | 259 |

## Table B.3: *In situ* Water Quality Measurements in Koocanusa Reservoir, 2016

| Station | Sampling Date | Location (11U, NAD83) | | Secchi Depth | Depth | Temperature | pH | Dissolved Oxygen | | Specific Conductivity |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | (m) | (m) | (˚C) | | (mg/L) | (%) | (µS/cm) |
| T4-4 | 1-Aug-16 | 629695 | 5441699 | 4.2 | 0 | 20.1 | 8.58 | 8.79 | 96.8 | 246 |
| | | | | | 1 | 20.1 | 8.58 | 8.76 | 96.5 | 246 |
| | | | | | 2 | 20.0 | 8.58 | 8.75 | 96.3 | 246 |
| | | | | | 3 | 19.9 | 8.58 | 8.77 | 96.3 | 247 |
| | | | | | 4 | 19.7 | 8.59 | 8.78 | 96.2 | 247 |
| | | | | | 5 | 19.7 | 8.58 | 8.78 | 96.0 | 248 |
| | | | | | 6 | 19.6 | 8.58 | 8.75 | 95.6 | 248 |
| | | | | | 7 | 19.6 | 8.57 | 8.72 | 95.3 | 248 |
| | | | | | 8 | 19.5 | 8.56 | 8.68 | 94.6 | 248 |
| | | | | | 9 | 19.5 | 8.57 | 8.65 | 94.3 | 246 |
| | | | | | 10 | 19.5 | 8.55 | 8.59 | 93.6 | 248 |
| | | | | | 11 | 19.4 | 8.52 | 8.46 | 92.0 | 250 |
| | | | | | 12 | 19.2 | 8.46 | 8.37 | 90.6 | 260 |
| | | | | | 13 | 18.3 | 8.33 | 7.92 | 84.2 | 275 |
| | | | | | 14 | 17.4 | 8.19 | 7.50 | 78.2 | 282 |
| | | | | | 15 | 17.2 | 8.16 | 7.32 | 76.1 | 283 |
| | | | | | 16 | 17.0 | 8.14 | 7.21 | 74.7 | 280 |
| | | | | | 17 | 16.6 | 8.10 | 7.09 | 72.8 | 278 |
| | | | | | 18 | 16.0 | 8.04 | 6.85 | 69.4 | 276 |
| | | | | | 19 | 14.8 | 7.94 | 6.53 | 64.4 | 264 |
| | | | | | 20 | 14.7 | 7.91 | 6.28 | 62.1 | 264 |
| | | | | | 21 | 14.5 | 7.87 | 5.93 | 58.2 | 264 |
| | | | | | 22 | 14.2 | 7.86 | 5.94 | 58.0 | 261 |
| | | | | | 23 | 13.8 | 7.82 | 5.62 | 54.3 | 259 |
| | | | | | 24 | 13.6 | 7.78 | 5.11 | 49.2 | 258 |
| T4-5 | 1-Aug-16 | 629494 | 5441783 | 4.8 | 0 | 20.1 | 8.58 | 8.90 | 98.2 | 250 |
| | | | | | 1 | 20.1 | 8.57 | 8.86 | 97.5 | 250 |
| | | | | | 2 | 20.0 | 8.57 | 8.84 | 97.2 | 249 |
| | | | | | 3 | 19.9 | 8.57 | 8.81 | 96.7 | 248 |
| | | | | | 4 | 19.7 | 8.57 | 8.82 | 96.5 | 248 |
| | | | | | 5 | 19.7 | 8.57 | 8.80 | 96.3 | 249 |
| | | | | | 6 | 19.6 | 8.57 | 8.78 | 95.9 | 248 |
| | | | | | 7 | 19.6 | 8.57 | 8.74 | 95.5 | 249 |
| | | | | | 8 | 19.6 | 8.56 | 8.68 | 94.8 | 249 |
| | | | | | 9 | 19.5 | 8.50 | 8.48 | 92.4 | 254 |
| | | | | | 10 | 19.5 | 8.49 | 8.39 | 91.3 | 253 |
| | | | | | 11 | 19.2 | 8.45 | 8.32 | 90.1 | 262 |
| | | | | | 12 | 18.1 | 8.29 | 7.94 | 84.0 | 278 |
| | | | | | 13 | 17.4 | 8.17 | 7.38 | 77.2 | 285 |
| | | | | | 14 | 17.0 | 8.08 | 7.37 | 76.5 | 280 |
| | | | | | 15 | 16.8 | 8.06 | 7.14 | 73.6 | 278 |
| | | | | | 16 | 16.4 | 8.03 | 6.96 | 71.4 | 277 |
| | | | | | 17 | 15.1 | 7.95 | 6.67 | 66.4 | 271 |
| | | | | | 18 | 14.9 | 7.89 | 6.40 | 63.4 | 269 |
| | | | | | 19 | 14.8 | 7.86 | 6.25 | 61.7 | 269 |
| | | | | | 20 | 14.6 | 7.82 | 5.87 | 57.7 | 266 |
| | | | | | 21 | 14.3 | 7.80 | 5.62 | 55.0 | 265 |
| | | | | | 22 | 13.8 | 7.77 | 5.26 | 51.0 | 259 |
| | | | | | 23 | 13.6 | 7.74 | 5.03 | 48.6 | 258 |
| T4-6 | 1-Aug-16 | 629430 | 5441547 | 5.0 | 0 | 20.1 | 8.52 | 8.86 | 97.8 | 253 |
| | | | | | 1 | 20.0 | 8.52 | 8.82 | 97.1 | 253 |
| | | | | | 2 | 19.7 | 8.53 | 8.84 | 96.6 | 253 |
| | | | | | 3 | 19.6 | 8.53 | 8.79 | 96.0 | 254 |
| | | | | | 4 | 19.6 | 8.53 | 8.74 | 95.4 | 253 |
| | | | | | 5 | 19.5 | 8.54 | 8.68 | 94.7 | 254 |
| | | | | | 6 | 19.5 | 8.54 | 8.65 | 94.3 | 254 |
| | | | | | 7 | 19.5 | 8.54 | 8.66 | 94.3 | 254 |
| | | | | | 8 | 19.5 | 8.54 | 8.66 | 94.3 | 254 |
| | | | | | 9 | 19.5 | 8.53 | 8.65 | 94.1 | 254 |
| | | | | | 10 | 19.2 | 8.50 | 8.49 | 92.0 | 257 |
| | | | | | 11 | 18.9 | 8.42 | 8.22 | 88.5 | 269 |
| | | | | | 12 | 18.6 | 8.36 | 8.05 | 86.2 | 270 |
| | | | | | 13 | 17.4 | 8.17 | 7.34 | 76.5 | 283 |
| | | | | | 14 | 17.0 | 8.09 | 7.21 | 74.6 | 280 |
| | | | | | 15 | 16.8 | 8.05 | 7.01 | 72.3 | 280 |
| | | | | | 16 | 16.5 | 8.02 | 6.90 | 70.7 | 279 |
| | | | | | 17 | 15.9 | 7.95 | 6.62 | 67.1 | 277 |
| | | | | | 18 | 15.6 | 7.92 | 6.45 | 64.8 | 275 |
| | | | | | 19 | 15.3 | 7.90 | 6.42 | 64.0 | 272 |
| | | | | | 20 | 14.6 | 7.85 | 6.05 | 59.5 | 266 |
| | | | | | 21 | 14.1 | 7.80 | 5.83 | 56.7 | 262 |
| | | | | | 22 | 13.7 | 7.78 | 5.76 | 55.5 | 257 |
| | | | | | 23 | 13.3 | 7.76 | 5.71 | 54.6 | 254 |
| | | | | | 24 | 13.0 | 7.72 | 5.43 | 51.5 | 252 |
| | | | | | 25 | 12.5 | 7.72 | 5.48 | 51.4 | 247 |
| | | | | | 26 | 12.4 | 7.71 | 5.49 | 51.4 | 247 |
| | | | | | 27 | 12.3 | 7.70 | 5.39 | 50.5 | 247 |
| | | | | | 28 | 12.3 | 7.70 | 5.40 | 50.5 | 247 |
| | | | | | 29 | 12.3 | 7.70 | 5.37 | 50.2 | 248 |
| Gold Creek | 1-Apr-16 | 630332 | 5437062 | - | 0 | 10.6 | 7.39 | 10.8 | 97.1 | 184 |
| | | | | | 1 | 8.82 | 7.31 | 10.4 | 89.6 | 143 |
| | | | | | 2 | 8.03 | 7.29 | 10.6 | 89.5 | 119 |
| | | | | | 3 | 7.88 | 7.21 | 10.4 | 88.4 | 116 |
| | | | | | 4 | 7.77 | 7.19 | 10.5 | 88.5 | 115 |
| | | | | | 5 | 7.66 | 7.19 | 10.5 | 87.5 | 113 |
| | | | | | 6 | 7.49 | 7.22 | 10.5 | 87.1 | 111 |
| | | | | | 7 | 7.43 | 7.20 | 10.6 | 88.1 | 111 |
| | | | | | 8 | 7.44 | 7.23 | 10.5 | 87.7 | 112 |
| | 1-Aug-16 | 629404 | 5437115 | - | 0 | 20.5 | 8.61 | 8.98 | 99.8 | 241 |
| | | | | | 1 | 20.5 | 8.51 | 8.94 | 99.4 | 241 |
| | | | | | 2 | 20.4 | 8.59 | 8.92 | 99.0 | 241 |
| | | | | | 3 | 20.2 | 8.59 | 8.95 | 98.9 | 240 |
| | | | | | 4 | 19.9 | 8.59 | 8.97 | 98.5 | 240 |
| | | | | | 5 | 19.8 | 8.60 | 8.95 | 98.1 | 240 |
| | | | | | 6 | 19.7 | 8.60 | 8.95 | 98.0 | 240 |
| | | | | | 7 | 19.7 | 8.60 | 8.93 | 97.8 | 240 |
| | | | | | 8 | 19.7 | 8.60 | 8.93 | 97.6 | 240 |
| | | | | | 9 | 19.5 | 8.56 | 8.77 | 95.5 | 243 |
| | | | | | 10 | 19.4 | 8.50 | 8.52 | 92.7 | 245 |
| | | | | | 11 | 18.2 | 8.23 | 7.22 | 76.7 | 262 |

## Table B.4: Selected Water Quality Data for the RG_USELK Water Quality Monitoring Station in Koocanusa Reservoir Upstream of the Elk River, 2014 and 2015

| Date | | Dissolved Oxygen | | | | pH (Lab) | | Specific Conductivity (25 °C) | | Total Hardness ($CaCO_3$) | | Total Suspended Solids | | Turbidity (Lab) | | Total Phosphorus | | Ortho-phosphate | | Dissolved Cadmium (Cd) | | Nitrate-Nitrogen ($NO_3$) | | Nitrite-Nitrogen ($NO_2$) | | Ammonia-Nitrogen ($NO_3$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | | % | | pH units | | µS/cm | | mg/L | | mg/L | | NTU | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | |
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom |
| 2014 | 16-Apr-14 | - | - | - | - | 8.34 | - | - | - | 171 | - | - | - | 56.0 | - | 0.027 | - | < 0.0010 | - | < 0.000010 | - | 0.12 | - | - | - | - | - |
| | 30-Apr-14 | - | - | - | - | 8.19 | - | - | - | 159 | - | - | - | 233 | - | 0.26 | - | 0.0020 | - | < 0.000010 | - | 0.10 | - | - | - | - | - |
| | 7-May-14 | - | - | - | - | 8.24 | - | - | - | 118 | - | - | - | 149 | - | 0.38 | - | < 0.0011 | - | < 0.000010 | - | 0.18 | - | - | - | - | - |
| | 14-May-14 | - | - | - | - | 8.21 | - | - | - | 132 | - | - | - | 89.4 | - | 0.088 | - | 0.0015 | - | < 0.000010 | - | 0.15 | - | - | - | - | - |
| | 21-May-14 | - | - | - | - | 8.19 | - | - | - | 112 | - | - | - | 172 | - | 0.24 | - | 0.0025 | - | < 0.000010 | - | 0.21 | - | - | - | - | - |
| | 28-May-14 | - | - | - | - | 8.13 | - | - | - | 103 | - | - | - | 120 | - | 0.056 | - | 0.0013 | - | < 0.000010 | - | 0.17 | - | - | - | - | - |
| | 4-Jun-14 | - | - | - | - | 8.16 | 8.16 | - | - | 109 | 109 | - | - | 24.1 | 53.3 | 0.012 | 0.023 | < 0.0011 | 0.0013 | < 0.000010 | < 0.000013 | 0.14 | 0.14 | - | - | - | - |
| | 11-Jun-14 | - | - | - | - | 8.24 | 8.25 | - | - | 105 | 102 | - | - | 17.8 | 18.3 | 0.014 | 0.016 | < 0.0010 | 0.0010 | < 0.000010 | < 0.000010 | 0.11 | 0.11 | - | - | - | - |
| | 18-Jun-14 | - | - | - | - | 8.23 | 8.22 | - | - | 96.3 | 102 | - | - | 9.05 | 14.3 | 0.011 | 0.013 | 0.0011 | < 0.0010 | < 0.000010 | < 0.000010 | 0.096 | 0.094 | - | - | - | - |
| | 25-Jun-14 | - | - | - | - | 8.20 | 8.25 | - | - | 93.4 | 113 | - | - | 23.2 | 31.6 | 0.011 | 0.024 | < 0.0010 | 0.0020 | < 0.000010 | < 0.000010 | 0.079 | 0.33 | - | - | - | - |
| | 2-Jul-14 | - | - | - | - | 8.21 | 8.13 | - | - | 113 | 100 | - | - | 2.03 | 12.5 | 0.0059 | 0.0077 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.16 | 0.081 | - | - | - | - |
| | 6-Aug-14 | - | - | - | - | 8.36 | 8.33 | - | - | 121 | 140 | - | - | 0.79 | 1.26 | 0.0040 | 0.0069 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.093 | 0.31 | - | - | - | - |
| | 3-Sep-14 | - | - | - | - | 8.26 | 8.30 | - | - | 128 | 136 | - | - | 1.26 | 2.92 | 0.0028 | 0.0051 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.087 | 0.095 | - | - | - | - |
| | 8-Oct-14 | - | - | - | - | 8.15 | 8.27 | - | - | 131 | 142 | - | - | 0.96 | 2.42 | 0.0027 | 0.0057 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.12 | 0.16 | - | - | - | - |
| | 5-Nov-14 | - | - | - | - | 8.32 | 8.31 | - | - | 142 | 142 | 2.1 | 2.7 | 1.27 | 1.99 | 0.0033 | 0.0041 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.12 | 0.085 | 0.0020 | 0.0014 | < 0.0050 | 0.0081 |
| 2015 | 7-Apr-15 | 11.7 | 10.3 | 95.0 | 84.1 | 8.23 | 8.29 | 272 | 273 | 133 | 131 | 10.2 | 9.9 | 13.1 | 14.4 | 0.011 | 0.010 | 0.0015 | 0.0018 | 0.00024 | 0.0000065 | 0.22 | 0.22 | < 0.0010 | < 0.0010 | 0.0092 | 0.0058 |
| | 14-Apr-15 | - | - | - | - | 8.21 | 8.29 | - | - | 139 | 161 | 4.9 | 7.7 | 6.25 | 6.48 | 0.0094 | 0.010 | < 0.0010 | 0.0012 | < 0.0000050 | 0.0000064 | 0.20 | 0.51 | < 0.0010 | 0.0012 | < 0.0050 | 0.0056 |
| | 21-Apr-15 | 10.0 | 9.21 | 89.7 | 78.0 | 8.34 | 8.33 | 306 | 314 | 151 | 164 | 2.6 | 3.6 | 5.11 | 5.51 | 0.0068 | 0.0061 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000064 | 0.11 | 0.40 | 0.0013 | 0.0014 | < 0.0050 | 0.0071 |

Note: Monitoring was discontinued at this station in 2015 because it was found to be influenced by inflow from the Elk River. Upstream monitoring was moved to RG_KERRRD, farther upstream, in April 2015.

## Table B.4: Selected Water Quality Data for the RG_USELK Water Quality Monitoring Station in Koocanusa Reservoir Upstream of the Elk River, 2014 and 2015

| Date | | Total Kjeldahl Nitrogen | | Total Selenium (Se) | | Sulphate ($SO_4$) | |
|---|---|---|---|---|---|---|---|
| | | mg/L | | mg/L | | mg/L | |
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom |
| 2014 | 16-Apr-14 | - | - | 0.24 | - | 38.1 | - |
| | 30-Apr-14 | - | - | 0.24 | - | 35.2 | - |
| | 7-May-14 | - | - | 0.18 | - | 23.1 | - |
| | 14-May-14 | - | - | 0.19 | - | 24.7 | - |
| | 21-May-14 | - | - | 0.20 | - | 13.8 | - |
| | 28-May-14 | - | - | 0.11 | - | 11.9 | - |
| | 4-Jun-14 | - | - | 0.12 | 0.15 | 12.9 | 12.9 |
| | 11-Jun-14 | - | - | 0.10 | 0.11 | 13.7 | 13.7 |
| | 18-Jun-14 | - | - | 0.10 | 0.10 | 13.5 | 13.6 |
| | 25-Jun-14 | - | - | 0.10 | 1.29 | 12.8 | 15.9 |
| | 2-Jul-14 | - | - | 0.88 | 0.19 | 16.5 | 13.6 |
| | 6-Aug-14 | - | - | 0.88 | 1.63 | 20.1 | 26.0 |
| | 3-Sep-14 | - | - | 0.99 | 0.40 | 21.4 | 25.5 |
| | 8-Oct-14 | - | - | 1.01 | 1.01 | 21.9 | 27.7 |
| | 5-Nov-14 | < 0.050 | 0.058 | 0.91 | 0.54 | 28.4 | 31.6 |
| 2015 | 7-Apr-15 | 0.30 | 0.14 | 0.61 | 0.69 | 26.8 | 27.1 |
| | 14-Apr-15 | 0.11 | 0.11 | 0.43 | 2.39 | 28.6 | 34.8 |
| | 21-Apr-15 | 0.11 | 0.13 | 0.32 | 1.95 | 34.1 | 35.5 |

Note: Monitoring was discontinued at this station in 2015 because it was found to be influenced by inflow from the Elk River. Upstream monitoring was moved to RG_KERRRD, farther upstream, in April 2015.

## Table B.5: Selected Water Quality Data for the RG_KERRRD Water Quality Monitoring Station in Koocanusa Reservoir Upstream of the Elk River, 2015 and 2016

| Date | | Temperature (Field) | | Dissolved Oxygen | | Dissolved Oxygen | | pH (Field) | | Conductivity | | Specific Conductivity (25 °C) | | Total Hardness ($CaCO_3$) | | Total Suspended Solids | | Turbidity (Lab) | | Secchi Depth | Chlorophyll-a | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | °C | | mg/L | | % | | pH units | | µS/cm | | µS/cm | | mg/L | | mg/L | | NTU | | m | µg/L | |
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Surface | Average of Middle and Bottom |
| | 14-Apr-15 | - | - | 10.1 | 10.3 | 81.0 | 85.2 | 8.35 | 8.23 | - | - | 349 | 1,524* | - | - | - | - | - | - | - | - | - |
| | 27-Apr-15 | - | - | 10.5 | 10.3 | 94.2 | 89.0 | 7.94 | 8.06 | 260 | 291 | 274 | 291 | 129 | 140 | 8.8 | 9.8 | 6.45 | 6.26 | 0.70 | 0.37 | 0.46 |
| | 30-Apr-15 | - | - | - | - | - | - | - | - | 250 | 253 | - | - | 132 | 135 | 7.4 | 7.7 | 8.78 | 9.74 | - | < 0.010 | 0.14 |
| | 5-May-15 | - | - | 11.0 | 11.0 | 99.1 | 98.0 | 8.32 | 8.32 | 237 | 246 | 247 | 247 | 116 | 118 | 8.2 | 8.7 | 10.6 | 13.0 | 0.70 | 0.16 | 0.40 |
| | 12-May-15 | - | - | 11.0 | 10.9 | 98.7 | 100 | 8.36 | 8.38 | 228 | 236 | 251 | 233 | 115 | 122 | 9.3 | 7.5 | 6.65 | 5.33 | 0.70 | 0.25 | 0.21 |
| | 19-May-15 | - | - | 10.1 | 10.0 | 93.4 | 91.7 | 8.16 | 8.14 | 187 | 181 | 215 | 212 | 105 | 105 | 11.1 | 11.4 | 3.66 | 8.13 | 0.70 | 0.20 | 0.24 |
| | 26-May-15 | - | - | 9.71 | 9.63 | 89.2 | 88.7 | 8.21 | 8.21 | 187 | 186 | 182 | 182 | 89.1 | 90.2 | 34.4 | 34.5 | 35.8 | 34.4 | 0.30 | 0.39 | 0.33 |
| | 2-Jun-15 | - | - | 10.0 | 9.88 | 90.9 | 89.2 | 8.26 | 8.24 | - | - | 172 | 173 | - | - | - | - | - | - | 0.30 | - | - |
| | 9-Jun-15 | - | - | 180 | 176 | 97.6 | 88.5 | 8.22 | 8.23 | 188 | 186 | 180 | 176 | 89.4 | 86.6 | 27.8 | 29.1 | 21.8 | 26.6 | 0.35 | 0.057 | 0.098 |
| | 16-Jun-15 | - | - | 11.6 | 11.3 | 110 | 108 | 8.18 | 8.18 | 171 | 171 | 183 | 182 | 91.3 | 91.8 | 7.1 | 12.2 | 17.6 | 24.7 | 0.75 | 0.075 | 0.12 |
| | 23-Jun-15 | - | - | - | - | - | - | - | - | 213 | 217 | - | - | 107 | 112 | 2.3 | 8.7 | 3.81 | 9.33 | - | 1.28 | 1.57 |
| | 30-Jun-15 | - | - | 9.49 | 9.48 | 104 | 98.7 | 8.18 | 8.10 | 230 | 230 | 220 | 221 | 111 | 113 | 3.1 | 4.3 | 2.73 | 4.17 | 3.50 | 0.59 | 0.68 |
| | 7-Jul-15 | - | - | - | - | - | - | - | - | 216 | 220 | - | - | 110 | 113 | 1.7 | 4.5 | 2.70 | 4.48 | - | 0.27 | 0.25 |
| | 15-Jul-15 | - | - | 8.37 | 8.07 | 96.3 | 89.3 | 8.56 | 8.32 | 223 | 236 | 229 | 240 | 118 | 120 | 1.8 | 4.8 | 0.68 | 2.79 | 4.00 | 1.54 | 0.46 |
| | 4-Aug-15 | - | - | 8.92 | 8.58 | 102 | 93.6 | 8.75 | 8.45 | 232 | 255 | 239 | 259 | 119 | 131 | 1.9 | 3.6 | 1.65 | 4.14 | 1.90 | 1.54 | 0.74 |
| | 8-Sep-15 | 16.4 | 15.3 | 8.72 | 8.75 | - | - | 8.52 | 8.44 | 260 | 274 | 262 | 275 | 131 | 138 | 1.4 | 4.4 | 1.23 | 3.81 | 3.00 | 1.52 | 0.87 |
| | 6-Oct-15 | 14.2 | 12.7 | 10.5 | 10.7 | 102 | 101 | 8.55 | 8.42 | 264 | 285 | 263 | 274 | 136 | 144 | < 1 | 3.5 | 0.59 | 2.15 | 6.30 | 1.26 | 1.24 |
| | 3-Nov-15 | - | - | 10.1 | 10.5 | 91.2 | 92.2 | 8.49 | 8.42 | 270 | 288 | 269 | 287 | 143 | 151 | 1.7 | 2.6 | 1.04 | 1.82 | 3.50 | 1.85 | 1.26 |
| 2016 | 3-May-16 | 10.7 | 10.4 | 10.5 | 10.3 | 95.0 | 92.2 | 8.13 | 8.16 | 229 | 227 | 228 | 229 | 120 | 120 | 12.6 | 9.4 | 6.39 | 5.96 | 0.90 | 0.21 | 0.23 |
| | 10-May-16 | 8.90 | 8.90 | 11.7 | 11.6 | 101 | 99.6 | 8.18 | 8.21 | 180 | 180 | 180 | 180 | 92.9 | 94.1 | 40.6 | 33.4 | 19.9 | 26.4 | 0.30 | 0.37 | 0.33 |
| | 17-May-16 | 11.5 | - | 10.9 | - | 100 | - | 8.15 | - | 211 | 215 | 217 | - | 113 | 114 | 8.1 | 9.6 | 6.83 | 6.83 | 1.00 | 0.20 | 0.19 |
| | 24-May-16 | 8.50 | 8.30 | 11.1 | 11.1 | 95.4 | 95.8 | 8.21 | 8.16 | 182 | 182 | 181 | 181 | 87.8 | 87.7 | 16.4 | 16.9 | 13.1 | 9.12 | 0.60 | 0.26 | 0.26 |
| | 31-May-16 | 10.6 | 10.3 | 10.9 | 10.6 | 98.0 | 95.3 | 8.21 | 8.22 | 200 | 201 | 199 | 199 | 103 | 103 | 10.8 | 9.1 | 8.81 | 6.33 | 0.90 | 0.19 | 0.24 |
| | 7-Jun-16 | 15.1 | 11.2 | 10.3 | 9.59 | 103 | 87.9 | 8.02 | 7.94 | 174 | 174 | 216 | 237 | 88.4 | 89.7 | 10.8 | 10.7 | 6.13 | 6.65 | 4.25 | 0.23 | 0.26 |
| | 16-Jun-16 | 12.1 | 11.6 | 9.84 | 9.83 | 91.5 | 90.2 | 8.14 | 8.14 | 189 | 194 | 193 | 196 | 102 | 106 | 5.1 | 11.8 | 6.58 | 12.3 | 0.80 | 1.00 | 0.26 |
| | 21-Jun-16 | 14.2 | 11.8 | 9.79 | 10.1 | 95.4 | 94.0 | 8.22 | 8.13 | 209 | 219 | 208 | 244 | 107 | 111 | 3.3 | 8.9 | 3.82 | 6.84 | 1.40 | 1.20 | 0.25 |
| | 28-Jun-16 | 16.3 | 12.7 | 10.4 | 10.9 | 106 | 101 | 8.25 | 8.20 | 214 | 206 | 216 | 208 | 112 | 107 | 2.4 | 7.3 | 2.32 | 6.48 | 2.90 | 1.33 | 0.27 |
| | 5-Jul-16 | 19.5 | 16.7 | 8.95 | 8.94 | 98.0 | 92.0 | 8.54 | 8.29 | 215 | 201 | 218 | 204 | 112 | 106 | 2.6 | 4.2 | 1.75 | 4.02 | 2.50 | 3.10 | 0.81 |
| | 12-Jul-16 | 19.2 | 16.2 | 9.23 | 9.55 | 98.8 | 97.5 | 8.60 | 8.35 | 215 | 215 | 216 | 216 | 114 | 114 | 3.3 | 4.5 | 1.55 | 2.80 | 2.75 | 3.93 | 1.34 |
| | 2-Aug-16 | 21.3 | 17.9 | 8.79 | 8.76 | 98.5 | 98.2 | 8.51 | 8.28 | 235 | 243 | 237 | 247 | 121 | 124 | 2.3 | < 1 | 5.22 | 3.02 | 1.30 | 1.42 | 0.83 |
| | 7-Sep-16 | 18.3 | 17.4 | 8.90 | 8.61 | 94.6 | 89.7 | 8.50 | 8.33 | 256 | 287 | 260 | 276 | 124 | 135 | < 1 | 4.4 | 0.57 | 2.73 | 4.60 | 1.49 | 0.81 |
| | 11-Oct-16 | 12.6 | 11.8 | 8.37 | 8.99 | 87.9 | 90.9 | 8.42 | 8.36 | 270 | 287 | 277 | 290 | 135 | 143 | 1.9 | 4.2 | 0.69 | 2.14 | 5.30 | 1.08 | 1.40 |
| | 1-Nov-16 | 5.70 | 4.90 | 13.3 | 13.8 | 106 | 109 | 8.40 | 8.35 | 238 | 240 | 294 | 293 | 129 | 129 | 3.1 | 1.7 | 1.15 | 1.38 | 4.00 | 1.03 | 0.72 |
| | 6-Dec-16 | 1.80 | 1.80 | 11.9 | 11.7 | 85.5 | 84.9 | 8.08 | 8.06 | 268 | 269 | 270 | 271 | 133 | 135 | 1.4 | 1.4 | 1.31 | 1.11 | 3.50 | 0.77 | 0.76 |

Note: Monitoring upstream of the Elk River began in 2014 at RG_USELK and then was moved to RG_KERRRD, farther upstream, in April 2015.

* Suspect value, not included in summary tables or plots.

## Table B.5: Selected Water Quality Data for the RG_KERRRD Water Quality Monitoring Station in Koocanusa Reservoir Upstream of the Elk River, 2015 and 2016

| Date | | Total Phosphorus | | Orthophosphate | | Dissolved Cadmium (Cd) | | Nitrate-Nitrogen ($NO_3$) | | Nitrite-Nitrogen ($NO_2$) | | Ammonia-Nitrogen ($NH_3$) | | Total Kjeldahl Nitrogen | | Total Selenium (Se) | | Sulphate ($SO_4$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | |
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom |
| | 14-Apr-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 27-Apr-15 | 0.010 | 0.012 | < 0.0010 | 0.0015 | < 0.0000050 | < 0.0000050 | 0.11 | 0.23 | < 0.0010 | 0.0012 | < 0.0050 | 0.0092 | 0.10 | 0.090 | 0.14 | 0.84 | 28.4 | 31.8 |
| | 30-Apr-15 | 0.0086 | 0.0089 | 0.0011 | 0.0013 | < 0.0000050 | < 0.0000050 | 0.12 | 0.14 | < 0.0010 | 0.0017 | < 0.0050 | < 0.0050 | 0.093 | 0.12 | 0.14 | 0.16 | 27.1 | 27.3 |
| | 5-May-15 | 0.0075 | 0.0084 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.15 | 0.16 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.076 | 0.076 | 0.13 | 0.14 | 23.6 | 23.8 |
| | 12-May-15 | 0.0084 | 0.0082 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.25 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.14 | 0.14 | 0.15 | 0.74 | 20.4 | 22.4 |
| | 19-May-15 | 0.0086 | 0.0091 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.14 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.11 | 0.11 | 0.11 | 0.12 | 17.9 | 18.0 |
| | 26-May-15 | 0.018 | 0.019 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.14 | < 0.0010 | < 0.0010 | 0.0078 | 0.0079 | 0.13 | 0.13 | 0.083 | 0.085 | 12.5 | 12.5 |
| | 2-Jun-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9-Jun-15 | 0.014 | 0.016 | 0.0014 | 0.0017 | < 0.0000050 | < 0.0000050 | 0.096 | 0.10 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0052 | 0.096 | 0.11 | 0.080 | 0.092 | 13.3 | 12.9 |
| | 16-Jun-15 | 0.0082 | 0.0097 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.089 | 0.091 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0050 | 0.081 | 0.067 | 0.079 | 0.073 | 14.8 | 15.2 |
| | 23-Jun-15 | 0.0044 | 0.0060 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.097 | 0.092 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.092 | 0.077 | 0.30 | 0.094 | 17.2 | 19.2 |
| | 30-Jun-15 | 0.0040 | 0.0044 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.074 | 0.086 | 0.0013 | 0.0011 | < 0.0050 | 0.0054 | 0.081 | 0.072 | 0.17 | 0.12 | 22.3 | 22.3 |
| | 7-Jul-15 | 0.0046 | 0.0060 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.054 | 0.090 | < 0.0010 | < 0.0010 | < 0.0050 | 0.010 | 0.11 | 0.11 | 0.11 | 0.13 | 20.4 | 19.9 |
| | 15-Jul-15 | 0.0020 | 0.0042 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.13 | 0.086 | 0.0019 | 0.0014 | < 0.0050 | 0.0058 | 0.086 | 0.070 | 0.86 | 0.33 | 21.7 | 24.8 |
| | 4-Aug-15 | 0.0045 | 0.0034 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.089 | 0.049 | 0.0021 | 0.0013 | < 0.0050 | 0.0055 | 0.11 | 0.097 | 0.86 | 0.21 | 22.9 | 27.5 |
| | 8-Sep-15 | 0.0027 | 0.0045 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.072 | 0.061 | 0.0015 | < 0.0010 | 0.0054 | 0.0068 | 0.11 | 0.087 | 0.78 | 0.44 | 27.8 | 30.2 |
| | 6-Oct-15 | 0.0023 | 0.0039 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.13 | 0.088 | 0.0017 | 0.0011 | 0.014 | 0.0055 | 0.10 | 0.089 | 1.01 | 0.25 | 27.6 | 31.5 |
| | 3-Nov-15 | 0.0020 | 0.0027 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.12 | 0.0021 | 0.0016 | 0.0054 | 0.0061 | 0.14 | 0.13 | 1.04 | 0.68 | 29.2 | 32.9 |
| 2016 | 3-May-16 | 0.0065 | 0.0076 | 0.0014 | 0.0016 | < 0.0000050 | < 0.0000050 | 0.17 | 0.17 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.062 | 0.062 | 0.17 | 0.094 | 19.9 | 20.0 |
| | 10-May-16 | 0.022 | 0.028 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.14 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.072 | 0.098 | 0.14 | 0.091 | 13.5 | 13.4 |
| | 17-May-16 | 0.0070 | 0.011 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.12 | 0.12 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | < 0.050 | 0.053 | 0.12 | 0.090 | 20.1 | 20.2 |
| | 24-May-16 | 0.0068 | 0.0085 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.11 | 0.11 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.060 | 0.058 | 0.11 | 0.085 | 15.5 | 15.5 |
| | 31-May-16 | 0.0064 | 0.0063 | 0.0015 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.096 | 0.096 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.054 | 0.056 | 0.096 | 0.097 | 16.4 | 16.4 |
| | 7-Jun-16 | 0.011 | 0.0082 | < 0.0010 | < 0.0010 | < 0.0000055 | < 0.0000050 | 0.076 | 0.076 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.083 | 0.083 | 0.076 | 0.088 | 13.4 | 13.4 |
| | 16-Jun-16 | 0.0073 | 0.0076 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000092 | 0.085 | 0.081 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0059 | 0.059 | 0.070 | 0.081 | 0.12 | 15.3 | 16.3 |
| | 21-Jun-16 | 0.0074 | 0.0068 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.10 | 0.086 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.097 | 0.067 | 0.086 | 0.11 | 17.7 | 19.3 |
| | 28-Jun-16 | 0.0080 | 0.0056 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000064 | 0.093 | 0.078 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.21 | 0.053 | 0.078 | 0.11 | 19.2 | 18.9 |
| | 5-Jul-16 | 0.0057 | 0.0070 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.12 | 0.075 | 0.0012 | < 0.0010 | < 0.0050 | < 0.0050 | 0.12 | 0.084 | 0.074 | 0.17 | 19.1 | 18.0 |
| | 12-Jul-16 | 0.0025 | 0.0054 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.091 | 0.070 | 0.0013 | < 0.0010 | < 0.0050 | < 0.0050 | 0.069 | < 0.050 | 0.069 | 0.20 | 18.9 | 20.0 |
| | 2-Aug-16 | 0.0039 | 0.0029 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.097 | 0.068 | 0.0015 | 0.0011 | < 0.0050 | 0.0077 | 0.10 | 0.073 | 0.073 | 0.23 | 22.4 | 24.1 |
| | 7-Sep-16 | 0.0039 | 0.0057 | < 0.0010 | 0.0010 | < 0.0000050 | < 0.0000050 | 0.11 | 0.067 | 0.0015 | 0.0012 | < 0.0050 | 0.012 | 0.10 | 0.096 | 0.067 | 0.18 | 26.6 | 32.1 |
| | 11-Oct-16 | 0.0041 | 0.0046 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.097 | 0.060 | 0.0010 | < 0.0010 | 0.0084 | 0.0075 | 0.13 | 0.068 | 0.062 | 0.24 | 31.3 | 37.4 |
| | 1-Nov-16 | 0.0047 | 0.0029 | 0.0025 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.12 | 0.0021 | 0.0015 | 0.0053 | 0.0074 | 0.10 | 0.091 | 0.12 | 0.52 | 27.5 | 27.8 |
| | 6-Dec-16 | 0.0038 | 0.0043 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.12 | 0.12 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.079 | 0.074 | 0.12 | 0.14 | 26.5 | 26.5 |

Note: Monitoring upstream of the Elk River began in 2014 at RG_USELK and then was moved to RG_KERRRD, farther upstream, in April 2015.

* Suspect value, not included in summary tables or plots.

## **Table B.6:** Selected Water Quality Data for the RG_DSELK Water Quality Monitoring Station in Koocanusa Reservoir Downstream of the Elk River, 2014 to 2016

| Date | | Temperature (Field) | | Dissolved Oxygen | | Dissolved Oxygen | | pH (Field) | | Conductivity | | Specific Conductivity (25 °C) | | Total Hardness ($CaCO_3$) | | Total Suspended Solids | | Turbidity (Lab) | | Secchi Depth | Chlorophyll-a | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Surface | Average of Middle and Bottom |
| | | °C | | mg/L | | % | | pH units | | µS/cm | | µS/cm | | mg/L | | mg/L | | NTU | | m | µg/L | |
| 2014 | 16-Apr-14 | - | - | - | - | - | - | - | - | 343 | 346 | - | - | 176 | 177 | - | - | 44.7 | 53.5 | - | - | - |
| | 30-Apr-14 | - | - | - | - | - | - | - | - | 340 | - | - | - | 185 | - | - | - | 347 | - | - | - | - |
| | 7-May-14 | - | - | - | - | - | - | - | - | 300 | - | - | - | 149 | - | - | - | 78.8 | - | - | - | - |
| | 14-May-14 | - | - | - | - | - | - | - | - | 277 | - | - | - | 140 | - | - | - | 40.6 | - | - | - | - |
| | 14-May-14 | - | - | - | - | - | - | - | - | 181 | - | - | - | 102 | - | - | - | 110 | - | - | - | - |
| | 21-May-14 | - | - | - | - | - | - | - | - | 208 | - | - | - | 115 | - | - | - | 138 | - | - | - | - |
| | 4-Jun-14 | - | - | - | - | - | - | - | - | 206 | 222 | - | - | 114 | 124 | - | - | 43.2 | 67.1 | - | - | - |
| | 11-Jun-14 | - | - | - | - | - | - | - | - | 204 | 222 | - | - | 109 | 121 | - | - | 30.3 | 44.9 | - | - | - |
| | 18-Jun-14 | - | - | - | - | - | - | - | - | 195 | 201 | - | - | 106 | 111 | - | - | 17.9 | 10.5 | - | - | - |
| | 25-Jun-14 | - | - | - | - | - | - | - | - | 185 | 195 | - | - | 102 | 105 | - | - | 20.8 | 22.1 | - | - | - |
| | 2-Jul-14 | - | - | - | - | - | - | - | - | 215 | 196 | - | - | 108 | 100 | - | - | 1.75 | 9.06 | - | - | - |
| | 6-Aug-14 | - | - | - | - | - | - | - | - | 223 | 238 | - | - | 121 | 128 | - | - | 0.86 | 1.61 | - | - | - |
| | 3-Sep-14 | - | - | - | - | - | - | - | - | 232 | 261 | - | - | 126 | 136 | - | - | 0.88 | 2.37 | - | - | - |
| | 8-Oct-14 | - | - | - | - | - | - | - | - | 247 | 274 | - | - | 130 | 143 | - | - | 0.99 | 1.68 | - | - | - |
| | 5-Nov-14 | - | - | - | - | - | - | - | - | 261 | 270 | - | - | 134 | 141 | 2.4 | 2.3 | 1.05 | 1.31 | - | - | - |
| 2015 | 7-Apr-15 | - | - | 11.6 | 11.6 | 94.4 | 93.7 | 8.27 | 8.29 | 295 | 305 | 293 | 305 | 156 | 154 | 6.3 | 7.4 | 11.0 | 11.5 | - | - | - |
| | 14-Apr-15 | - | - | 9.29 | 10.1 | 76.4 | 84.5 | 8.27 | 8.27 | 296 | 290 | 320 | 294 | 149 | 158 | 5.3 | 8.5 | 5.10 | 6.60 | - | - | - |
| | 21-Apr-15 | - | - | 9.72 | 9.25 | 88.3 | 78.9 | 8.05 | 8.02 | 298 | 298 | 309 | 320 | 152 | 154 | 2.5 | 2.6 | 6.13 | 4.91 | 1.00 | 0.78 | 0.49 |
| | 27-Apr-15 | - | - | 10.5 | 10.9 | 94.5 | 94.4 | 8.40 | 8.36 | 308 | 309 | 306 | 315 | 147 | 154 | 3.9 | 5.6 | 3.18 | 4.47 | 1.00 | 0.11 | 0.25 |
| | 30-Apr-15 | - | - | - | - | - | - | - | - | 281 | 282 | - | - | 149 | 154 | 3.9 | 5.2 | 4.31 | 6.28 | - | 0.50 | 0.25 |
| | 5-May-15 | - | - | 10.9 | 11.2 | 99.8 | 100.2 | 8.37 | 8.41 | 265 | 279 | 265 | 278 | 130 | 136 | 4.0 | 3.5 | 6.21 | 7.21 | 1.05 | 0.81 | 0.39 |
| | 12-May-15 | - | - | 10.7 | 10.8 | 98.2 | 97.5 | 8.38 | 8.38 | 249 | 265 | 255 | 267 | 127 | 137 | 4.3 | 5.0 | 3.47 | 3.99 | 1.00 | 0.38 | 0.32 |
| | 19-May-15 | - | - | 10.1 | 10.2 | 92.4 | 90.1 | 8.16 | 8.10 | 210 | 260 | 238 | 260 | 120 | 134 | 5.0 | 5.4 | 4.72 | 4.69 | 0.90 | < 0.01 | 0.20 |
| | 26-May-15 | - | - | 9.60 | 9.75 | 91.0 | 90.8 | 8.21 | 8.21 | 205 | 215 | 202 | 206 | 104 | 114 | 16.3 | 20.4 | 20.8 | 22.9 | 0.40 | 0.28 | 0.50 |
| | 2-Jun-15 | - | - | 9.43 | 9.62 | 91.3 | 87.7 | 8.25 | 8.24 | - | - | 205 | 189 | - | - | - | - | - | - | 0.85 | - | - |
| | 9-Jun-15 | - | - | 221 | 225 | 98.8 | 91.9 | 8.49 | 8.29 | 226 | 213 | 221 | 225 | 111 | 103 | 3.7 | 23.0 | 2.60 | 14.5 | 2.50 | 0.57 | 0.12 |
| | 16-Jun-15 | - | - | 11.5 | 11.0 | 109 | 110 | 8.22 | 8.23 | 180 | 205 | 256 | 190 | 101 | 118 | 7.1 | 8.1 | 10.6 | 13.8 | 1.20 | 0.99 | 0.19 |
| | 23-Jun-15 | - | - | - | - | - | - | - | - | 219 | 222 | - | - | 113 | 114 | 1.4 | 6.0 | 1.84 | 7.39 | - | 1.25 | 1.46 |
| | 30-Jun-15 | - | - | 8.66 | 9.79 | 99.7 | 101.0 | 8.34 | 8.09 | 224 | 235 | 215 | 227 | 111 | 118 | 1.5 | 3.1 | 1.09 | 3.66 | 5.20 | 1.39 | 0.66 |
| | 7-Jul-15 | - | - | - | - | - | - | - | - | 238 | 254 | - | - | 123 | 134 | < 1 | 6.7 | 0.89 | 4.71 | - | 1.34 | 0.41 |
| | 15-Jul-15 | - | - | 8.52 | 7.93 | 96.1 | 86.3 | 8.58 | 8.31 | 223 | 235 | 229 | 239 | 120 | 122 | 1.9 | 4.3 | 0.79 | 1.98 | 3.60 | 1.45 | 0.87 |
| | 4-Aug-15 | - | - | 8.81 | 8.57 | 102 | 92.7 | 8.73 | 8.52 | 228 | 255 | 238 | 255 | 122 | 132 | 2.5 | 2.7 | 1.66 | 2.82 | 2.00 | 1.67 | 1.85 |
| | 8-Sep-15 | 17.2 | 16.8 | 8.46 | 8.31 | - | - | 8.54 | 8.51 | 140 | 258 | 255 | 263 | 129 | 134 | < 3 | 1.8 | 1.77 | 1.65 | 3.30 | 2.59 | 1.32 |
| | 6-Oct-15 | 15.0 | 13.6 | 10.1 | 10.5 | 100 | 101 | 8.52 | 8.42 | 261 | 284 | 259 | 282 | 135 | 141 | 1.2 | 2.0 | 0.60 | 1.19 | 4.60 | 1.20 | 0.90 |
| | 3-Nov-15 | - | - | 9.86 | 10.2 | 91.6 | 92.1 | 8.50 | 8.39 | 266 | 286 | 266 | 287 | 142 | 152 | 2.0 | 3.8 | 1.37 | 3.81 | 3.00 | 1.73 | 1.71 |
| | 1-Dec-15 | - | - | 10.1 | 10.4 | 79.0 | 78.7 | 8.45 | 8.41 | 270 | 291 | 277 | 299 | 137 | 148 | < 1 | < 1 | 1.15 | 1.80 | 4.00 | 0.82 | 1.39 |
| 2016 | 5-Apr-16 | 7.90 | - | 9.70 | - | 81.8 | - | 8.21 | - | 320 | - | 324 | - | - | - | 33.2 | - | 36.8 | - | 0.40 | 1.27 | - |
| | 12-Apr-16 | 8.00 | - | 10.5 | - | 88.4 | - | 8.17 | - | 259 | - | 268 | - | - | - | 53.2 | - | 41.1 | - | 0.25 | 0.95 | - |
| | 19-Apr-16 | 9.60 | - | 10.8 | - | 95.5 | - | 8.21 | - | 278 | - | 271 | - | - | - | 41.4 | - | 31.3 | - | 0.50 | 0.91 | - |
| | 26-Apr-16 | 8.50 | - | 11.3 | - | 96.7 | - | 8.02 | - | 209 | - | 200 | - | - | - | 63.3 | - | 50.9 | - | 0.30 | 0.78 | - |
| | 3-May-16 | 9.90 | 9.30 | 10.3 | 10.3 | 91.5 | 89.9 | 8.14 | 8.16 | 235 | 251 | 231 | 246 | - | 135 | 16.6 | 19.7 | 14.0 | 13.0 | 0.75 | 0.38 | 0.43 |
| | 10-May-16 | 9.40 | 8.40 | 11.5 | 11.6 | 101 | 99.6 | 8.16 | 8.19 | 184 | 197 | 186 | 203 | - | 108 | 29.2 | 24.1 | 12.5 | 25.5 | 0.30 | 0.42 | 0.53 |
| | 17-May-16 | 10.8 | - | 10.7 | - | 97.2 | - | 8.16 | - | 247 | 218 | 235 | - | - | 116 | 6.6 | 16.0 | 5.82 | 10.6 | 0.80 | 0.23 | 0.23 |
| | 24-May-16 | 8.20 | 9.35 | 11.2 | 10.7 | 98.4 | 93.9 | 8.17 | 8.23 | 219 | 221 | 214 | 221 | 228 | 116 | 16.5 | 14.6 | 13.0 | 9.46 | 0.60 | 0.59 | 0.48 |
| | 31-May-16 | 10.9 | 11.6 | 10.4 | 10.4 | 94.1 | 95.6 | 8.27 | 8.22 | 224 | 212 | 222 | 226 | 227 | 112 | 6.3 | 8.1 | 5.41 | 6.85 | 1.80 | 0.46 | 0.36 |
| | 7-Jun-16 | 15.7 | 12.4 | 10.1 | 10.0 | 102 | 93.9 | 8.15 | 8.18 | 183 | 213 | 211 | 202 | 200 | 116 | 5.6 | 9.7 | 3.24 | 7.03 | 2.20 | 0.26 | 0.56 |
| | 16-Jun-16 | 16.1 | 13.8 | 9.30 | - | 95.0 | - | 8.42 | - | 204 | - | 208 | - | 224 | - | 3.8 | 6.7 | 2.91 | - | 2.10 | 4.66 | 2.32 |
| | 21-Jun-16 | 16.1 | 14.5 | 9.72 | - | 98.6 | - | 8.42 | - | 207 | - | 210 | - | 225 | - | 3.4 | 8.8 | 1.57 | - | 3.00 | 3.49 | 3.34 |
| | 28-Jun-16 | 17.0 | 15.7 | 10.5 | - | 107 | - | 8.51 | - | 212 | - | 214 | - | - | - | 2.7 | 5.3 | 1.39 | - | 3.15 | 3.90 | 2.45 |
| | 5-Jul-16 | 19.5 | 17.8 | 8.77 | - | 96.5 | - | 8.56 | - | 217 | - | 218 | - | 247 | - | 2.3 | 4.4 | 1.62 | - | 2.70 | 3.50 | 1.95 |
| | 12-Jul-16 | 19.1 | 16.7 | 9.35 | 9.35 | 99.8 | 96.3 | 8.55 | 8.36 | 218 | 217 | 220 | 223 | 227 | 116 | 2.4 | 3.8 | 0.89 | 1.98 | 3.65 | 2.71 | 2.25 |
| | 2-Aug-16 | 21.5 | 18.2 | 8.69 | 8.51 | 99.2 | 98.1 | 8.65 | 8.39 | 221 | 258 | 228 | 245 | 263 | 136 | 1.9 | 1.2 | 1.67 | 2.21 | 2.50 | 2.24 | 1.60 |
| | 7-Sep-16 | 18.6 | 18.4 | 8.76 | 8.85 | 93.7 | 94.3 | 8.52 | 8.51 | 245 | 268 | 249 | 255 | 260 | 130 | < 1 | 2.0 | 0.70 | 1.37 | 4.10 | 1.79 | 1.50 |
| | 11-Oct-16 | 14.1 | 13.5 | 8.73 | 8.48 | 88.7 | 87.9 | 8.45 | 8.44 | 247 | 259 | 260 | 268 | 273 | 133 | 1.4 | 1.7 | 0.62 | 1.17 | 5.80 | 1.44 | 1.37 |
| | 1-Nov-16 | 8.70 | 5.55 | 11.5 | 13.6 | 97.0 | 107.8 | 8.39 | 8.33 | 234 | 234 | 281 | 251 | 209 | 129 | 1.3 | 1.8 | 1.00 | 1.28 | 4.00 | 1.72 | 1.45 |
| | 6-Dec-16 | 3.10 | 3.15 | 11.6 | 11.1 | 88.8 | 82.3 | 8.06 | 8.09 | 271 | 271 | 271 | 269 | 269 | 139 | 2.0 | 1.3 | 1.00 | 1.02 | 4.10 | 0.56 | 0.99 |

## Table B.6: Selected Water Quality Data for the RG_DSELK Water Quality Monitoring Station in Koocanusa Reservoir Downstream of the Elk River, 2014 to 2016

| Date | | Total Phosphorus | | Ortho-phosphate | | Dissolved Cadmium (Cd) | | Nitrate-Nitrogen ($NO_3$) | | Nitrite-Nitrogen ($NO_2$) | | Ammonia-Nitrogen ($NH_3$) | | Total Kjeldahl Nitrogen | | Total Selenium (Se) | | Sulphate ($SO_4$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom |
| | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | |
| 2014 | 16-Apr-14 | 0.036 | 0.045 | 0.0015 | 0.0016 | < 0.000010 | < 0.000010 | 0.40 | 0.43 | - | - | - | - | - | - | 1.71 | 1.84 | 40.7 | 40.8 |
| | 30-Apr-14 | 0.29 | - | 0.0029 | - | < 0.000010 | - | 0.41 | - | - | - | - | - | - | - | 1.89 | - | 37.2 | - |
| | 7-May-14 | 0.071 | - | < 0.0010 | - | < 0.000014 | - | 0.33 | - | - | - | - | - | - | - | 0.88 | - | 23.8 | - |
| | 14-May-14 | 0.033 | - | < 0.0010 | - | < 0.000010 | - | 0.27 | - | - | - | - | - | - | - | 0.83 | - | 25.8 | - |
| | 14-May-14 | 0.038 | - | < 0.0010 | - | < 0.000010 | - | 0.17 | - | - | - | - | - | - | - | 0.12 | - | 11.8 | - |
| | 21-May-14 | 0.095 | - | 0.0018 | - | < 0.000010 | - | 0.22 | - | - | - | - | - | - | - | 0.23 | - | 14.0 | - |
| | 4-Jun-14 | 0.020 | 0.047 | 0.0016 | 0.0032 | < 0.000010 | < 0.000010 | 0.24 | 0.45 | - | - | - | - | - | - | 0.52 | 1.64 | 14.7 | 16.6 |
| | 11-Jun-14 | 0.022 | 0.036 | 0.0018 | 0.0029 | < 0.000010 | < 0.000010 | 0.24 | 0.44 | - | - | - | - | - | - | 0.75 | 1.72 | 14.9 | 17.1 |
| | 18-Jun-14 | 0.013 | 0.015 | < 0.0010 | 0.0013 | < 0.000010 | < 0.000010 | 0.16 | 0.24 | - | - | - | - | - | - | 0.47 | 0.82 | 14.5 | 15.4 |
| | 25-Jun-14 | 0.014 | 0.019 | < 0.0010 | < 0.0013 | < 0.000010 | < 0.000010 | 0.11 | 0.19 | - | - | - | - | - | - | 0.22 | 0.57 | 13.1 | 14.1 |
| | 2-Jul-14 | 0.0056 | 0.011 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.16 | 0.12 | - | - | - | - | - | - | 0.84 | 0.40 | 16.3 | 14.5 |
| | 6-Aug-14 | 0.0039 | 0.0045 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.11 | 0.19 | - | - | - | - | - | - | 1.48 | 0.82 | 19.3 | 22.2 |
| | 3-Sep-14 | 0.0047 | 0.0046 | < 0.0010 | < 0.0010 | < 0.000010 | 0.000097 | 0.079 | 0.11 | - | - | - | - | - | - | 0.94 | 0.58 | 20.3 | 26.3 |
| | 8-Oct-14 | 0.0023 | 0.0034 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.12 | 0.13 | - | - | - | - | - | - | 1.05 | 0.84 | 22.6 | 28.1 |
| | 5-Nov-14 | 0.0026 | 0.0040 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.16 | 0.13 | 0.0025 | 0.0023 | < 0.0050 | < 0.0050 | 0.11 | 0.10 | 1.11 | 0.97 | 25.3 | 28.0 |
| 2015 | 7-Apr-15 | 0.0083 | 0.0089 | < 0.0010 | 0.0011 | 0.000010 | 0.0000063 | 0.40 | 0.51 | 0.0013 | 0.0014 | < 0.0050 | < 0.0050 | 0.16 | 0.16 | 1.79 | 2.37 | 29.9 | 31.6 |
| | 14-Apr-15 | 0.0093 | 0.0094 | < 0.0010 | < 0.0012 | 0.0000051 | 0.0000059 | 0.42 | 0.48 | 0.0012 | 0.0013 | < 0.0050 | 0.0055 | 0.085 | 0.12 | 1.84 | 2.18 | 31.9 | 33.8 |
| | 21-Apr-15 | 0.0060 | 0.0050 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000058 | 0.24 | 0.38 | 0.0012 | 0.0014 | < 0.0050 | 0.0056 | 0.11 | 0.14 | 1.11 | 1.86 | 35.9 | 34.4 |
| | 27-Apr-15 | 0.0078 | 0.0084 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.23 | 0.55 | 0.0011 | 0.0011 | < 0.0050 | < 0.0050 | 0.093 | 0.083 | 1.14 | 2.97 | 34.9 | 36.1 |
| | 30-Apr-15 | 0.0059 | 0.0080 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000056 | 0.28 | 0.41 | < 0.0010 | 0.0011 | < 0.0050 | < 0.0050 | 0.075 | 0.094 | 1.33 | 2.18 | 32.8 | 32.4 |
| | 5-May-15 | 0.0060 | 0.0063 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000076 | 0.17 | 0.39 | < 0.0010 | 0.0012 | < 0.0050 | < 0.0050 | 0.086 | 0.11 | 0.45 | 1.87 | 27.3 | 28.4 |
| | 12-May-15 | 0.0066 | 0.0067 | < 0.0010 | < 0.0010 | 0.0000052 | 0.0000060 | 0.32 | 0.49 | 0.0010 | 0.0012 | < 0.0050 | < 0.0050 | 0.43 | 0.17 | 1.17 | 2.12 | 25.3 | 27.8 |
| | 19-May-15 | 0.0064 | 0.0065 | < 0.0010 | < 0.0010 | 0.0000086 | 0.0000077 | 0.30 | 0.33 | 0.0011 | 0.0016 | < 0.0050 | 0.012 | 0.11 | 0.11 | 0.98 | 1.30 | 21.5 | 25.8 |
| | 26-May-15 | 0.013 | 0.017 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000058 | 0.26 | 0.34 | < 0.0010 | 0.0011 | 0.0083 | 0.0092 | 0.10 | 0.13 | 0.66 | 1.07 | 15.5 | 16.8 |
| | 2-Jun-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9-Jun-15 | 0.0061 | 0.016 | < 0.0010 | < 0.0013 | < 0.0000050 | < 0.0000050 | 0.21 | 0.26 | 0.0019 | < 0.0010 | < 0.0050 | 0.0050 | 0.16 | 0.12 | 0.86 | 0.83 | 17.8 | 16.1 |
| | 16-Jun-15 | 0.0071 | 0.0087 | < 0.0010 | < 0.0011 | < 0.0000050 | < 0.0000050 | 0.16 | 0.36 | < 0.0010 | 0.0011 | < 0.0050 | 0.0067 | 0.13 | 0.084 | 0.42 | 1.32 | 15.7 | 19.5 |
| | 23-Jun-15 | 0.0034 | 0.0059 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.18 | 0.16 | 0.0016 | < 0.0010 | < 0.0050 | < 0.0050 | 0.10 | 0.085 | 0.87 | 0.48 | 16.8 | 18.3 |
| | 30-Jun-15 | 0.0032 | 0.0043 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.17 | 0.16 | 0.0019 | < 0.0010 | < 0.0050 | < 0.0050 | 0.12 | 0.082 | 0.82 | 0.51 | 17.8 | 22.5 |
| | 7-Jul-15 | 0.0035 | 0.0081 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.24 | 0.34 | 0.0017 | 0.0018 | < 0.0050 | 0.012 | 0.11 | 0.11 | 1.14 | 1.49 | 21.9 | 24.6 |
| | 15-Jul-15 | 0.0021 | 0.0045 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.22 | 0.0017 | 0.0029 | < 0.0050 | 0.0076 | 0.070 | 0.060 | 0.93 | 0.91 | 20.9 | 23.3 |
| | 4-Aug-15 | 0.0024 | 0.0030 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.11 | 0.13 | 0.0021 | 0.0019 | < 0.0050 | 0.0066 | 0.11 | 0.090 | 0.96 | 0.70 | 22.5 | 26.2 |
| | 8-Sep-15 | 0.0036 | 0.0046 | 0.11 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.52 | 0.16 | 0.0027 | 0.0021 | 0.0051 | 0.0060 | 0.11 | 0.15 | 1.18 | 1.21 | 14.2 | 28.0 |
| | 6-Oct-15 | 0.0030 | 0.0029 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.28 | 0.0022 | 0.0019 | 0.0082 | 0.012 | 0.22 | 0.12 | 1.23 | 1.45 | 26.6 | 31.2 |
| | 3-Nov-15 | 0.0020 | 0.0030 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.31 | 0.0026 | 0.0021 | < 0.0050 | 0.0071 | 0.13 | 0.13 | 1.07 | 1.50 | 28.1 | 32.9 |
| | 1-Dec-15 | 0.0080 | 0.0058 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.23 | 0.28 | 0.0024 | 0.0017 | 0.0057 | 0.0063 | 0.13 | 0.10 | 1.26 | 1.30 | 30.0 | 34.4 |
| 2016 | 5-Apr-16 | 0.028 | - | 0.0025 | - | < 0.0000080 | - | 0.32 | - | 0.0015 | - | 0.026 | - | 0.15 | - | 1.26 | - | 36.6 | - |
| | 12-Apr-16 | 0.032 | - | 0.0025 | - | < 0.0000050 | - | 0.46 | - | 0.0013 | - | 0.011 | - | 0.18 | - | 1.74 | - | 27.4 | - |
| | 19-Apr-16 | 0.025 | - | < 0.0016 | - | < 0.0000050 | - | 0.37 | - | < 0.0010 | - | 0.0074 | - | 0.20 | - | 1.27 | - | 27.6 | - |
| | 26-Apr-16 | 0.040 | - | < 0.0013 | - | < 0.0000050 | - | 0.27 | - | 0.0013 | - | 0.0061 | - | 0.15 | - | 0.38 | - | 15.0 | - |
| | 3-May-16 | 0.011 | 0.012 | 0.0019 | < 0.0023 | < 0.0000050 | < 0.0000050 | 0.26 | 0.44 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.069 | 0.076 | 0.48 | 1.51 | 21.1 | 24.0 |
| | 10-May-16 | 0.017 | 0.021 | < 0.0011 | < 0.0017 | < 0.0000050 | < 0.0000050 | 0.18 | 0.28 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.066 | 0.076 | 0.28 | 0.79 | 13.8 | 15.8 |
| | 17-May-16 | 0.0076 | 0.010 | < 0.0011 | < 0.0012 | < 0.0000050 | < 0.0000050 | 0.49 | 0.21 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.061 | 0.058 | 1.94 | 0.52 | 25.5 | 20.3 |
| | 24-May-16 | 0.011 | 0.0094 | < 0.0016 | < 0.0011 | < 0.0000050 | 0.0000085 | 0.34 | 0.34 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.087 | 0.083 | 1.15 | 1.37 | 19.3 | 19.7 |
| | 31-May-16 | 0.0066 | 0.0082 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000057 | 0.34 | 0.25 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.077 | 0.073 | 1.42 | 0.99 | 20.2 | 18.2 |
| | 7-Jun-16 | 0.0038 | 0.0067 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.000013 | 0.091 | 0.27 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | < 0.050 | 0.068 | 0.23 | 1.05 | 14.7 | 18.9 |
| | 16-Jun-16 | 0.0053 | 0.0069 | < 0.0010 | < 0.0011 | < 0.0000050 | < 0.0000050 | 0.15 | 0.18 | 0.0010 | 0.0010 | < 0.0050 | 0.0055 | 0.098 | 0.076 | 0.67 | 0.63 | 16.8 | 18.3 |
| | 21-Jun-16 | 0.018 | 0.0072 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.15 | 0.0011 | < 0.0010 | 0.0052 | 0.0058 | 0.13 | 0.084 | 0.69 | 0.60 | 17.0 | 17.0 |
| | 28-Jun-16 | 0.0055 | 0.0066 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.14 | 0.0015 | 0.0013 | < 0.0050 | < 0.0050 | 0.12 | 0.094 | 0.73 | 0.47 | 18.0 | 19.5 |
| | 5-Jul-16 | 0.0048 | 0.0073 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.23 | 0.0013 | 0.0016 | < 0.0050 | 0.0054 | 0.17 | 0.095 | 0.72 | 0.92 | 18.6 | 21.4 |
| | 12-Jul-16 | 0.0041 | 0.0034 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.13 | 0.14 | 0.0012 | 0.0013 | < 0.0050 | 0.0065 | 0.095 | 0.072 | 0.73 | 0.57 | 18.8 | 20.0 |
| | 2-Aug-16 | 0.0048 | - | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.095 | 0.28 | 0.0018 | 0.0019 | < 0.0050 | 0.0091 | 0.10 | 0.085 | 0.85 | 1.35 | 20.1 | 27.2 |
| | 7-Sep-16 | 0.0085 | 0.0082 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.18 | 0.0014 | 0.0021 | < 0.0050 | 0.010 | 0.11 | 0.10 | 1.01 | 0.97 | 24.4 | 29.0 |
| | 11-Oct-16 | 0.0040 | 0.0040 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.18 | 0.0016 | 0.0015 | < 0.0050 | 0.0061 | 0.11 | 0.11 | 1.00 | 1.02 | 27.1 | 28.8 |
| | 1-Nov-16 | < 0.0020 | 0.0036 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.19 | 0.0026 | 0.0022 | < 0.0050 | < 0.0050 | 0.093 | 0.10 | 1.00 | 1.01 | 26.8 | 26.8 |
| | 6-Dec-16 | 0.0038 | 0.0033 | < 0.0013 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.23 | 0.23 | 0.0015 | 0.0012 | 0.0069 | 0.0066 | 0.085 | 0.11 | 0.84 | 0.80 | 26.7 | 26.6 |

## Table B.7: Selected Water Quality Data for the Grasmere (RG_GRASMERE) Water Quality Monitoring Station in Koocanusa Reservoir Downstream of the Elk River, 2014 to 2016

| Date | | Temperature (Field) | | Dissolved Oxygen | | Dissolved Oxygen | | pH (Field) | | Conductivity | | Specific Conductivity (25 °C) | | Total Hardness ($CaCO_3$) | | Total Suspended Solids | | Turbidity (Lab) | | Secchi Depth | Chlorophyll-a | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Surface | Average of Middle and Bottom |
| | | °C | | mg/L | | % | | pH units | | µS/cm | | µS/cm | | mg/L | | mg/L | | NTU | | m | µg/L | |
| 2014 | 16-Apr-14 | - | - | - | - | - | - | - | - | 358 | 357 | - | - | 190 | 190 | - | - | 25.3 | 32.8 | - | - | - |
| | 30-Apr-14 | - | - | - | - | - | - | - | - | 325 | 314 | - | - | 168 | 168 | - | - | 61.9 | 63.9 | - | - | - |
| | 14-May-14 | - | - | - | - | - | - | - | - | 276 | 278 | - | - | 143 | 146 | - | - | 45.5 | 105 | - | - | - |
| | 21-May-14 | - | - | - | - | - | - | - | - | 212 | 212 | - | - | 117 | 116 | - | - | 94.5 | 111 | - | - | - |
| | 28-May-14 | - | - | - | - | - | - | - | - | 186 | 206 | - | - | 106 | 113 | - | - | 108 | 127 | - | - | - |
| | 4-Jun-14 | - | - | - | - | - | - | - | - | 209 | 215 | - | - | 115 | 120 | - | - | 47.1 | 55.1 | - | - | - |
| | 11-Jun-14 | - | - | - | - | - | - | - | - | 213 | 205 | - | - | 116 | 110 | - | - | 13.2 | 32.7 | - | - | - |
| | 18-Jun-14 | - | - | - | - | - | - | - | - | 214 | 205 | - | - | 115 | 111 | - | - | 4.95 | 9.81 | - | - | - |
| | 25-Jun-14 | - | - | - | - | - | - | - | - | 204 | 193 | - | - | 108 | 102 | - | - | 5.06 | 24.5 | - | - | - |
| | 2-Jul-14 | - | - | - | - | - | - | - | - | 215 | 200 | - | - | 112 | 105 | - | - | 2.21 | 10.6 | - | - | - |
| | 6-Aug-14 | - | - | - | - | - | - | - | - | 219 | 235 | - | - | 119 | 127 | - | - | 0.72 | 1.26 | - | - | - |
| | 3-Sep-14 | - | - | - | - | - | - | - | - | 230 | 253 | - | - | 121 | 133 | - | - | 0.87 | 2.49 | - | - | - |
| | 8-Oct-14 | - | - | - | - | - | - | - | - | 245 | 268 | - | - | 129 | 139 | - | - | 1.01 | 2.00 | - | - | - |
| | 5-Nov-14 | - | - | - | - | - | - | - | - | 257 | 259 | - | - | 137 | 137 | 1.8 | 1.9 | 0.85 | 0.97 | - | - | - |
| 2015 | 7-Apr-15 | - | - | 10.9 | 10.9 | 91.8 | 90.2 | 8.27 | 8.23 | 297 | 301 | 297 | 301 | 143 | 140 | 5.2 | 27.0 | 8.67 | 25.0 | - | - | - |
| | 14-Apr-15 | - | - | 10.5 | 10.4 | 87.6 | 85.7 | 8.25 | 8.24 | 295 | 303 | 298 | 304 | 150 | 154 | 5.0 | 6.7 | 5.10 | 5.95 | - | - | - |
| | 21-Apr-15 | - | - | 8.40 | 9.58 | 83.7 | 74.7 | 8.00 | 7.96 | 303 | 296 | 311 | 305 | 156 | 154 | 2.3 | 2.7 | 5.01 | 4.73 | 1.30 | 0.62 | 0.66 |
| | 27-Apr-15 | - | - | 11.2 | 10.7 | 103 | 94.0 | 8.41 | 8.36 | 309 | 314 | 311 | 312 | 146 | 151 | 2.8 | 4.4 | 3.06 | 3.84 | 1.30 | 0.33 | 0.44 |
| | 5-May-15 | - | - | 10.9 | 10.3 | 102 | 92.4 | 8.38 | 8.30 | 280 | 289 | 275 | 293 | 131 | 138 | 3.6 | 4.8 | 5.48 | 8.19 | 1.20 | 0.82 | 0.39 |
| | 12-May-15 | - | - | 10.8 | 10.6 | 98.6 | 93.9 | 8.38 | 8.25 | 251 | 273 | 259 | 281 | 129 | 140 | 3.1 | 3.5 | 3.62 | 2.88 | 1.10 | 0.37 | 0.20 |
| | 19-May-15 | - | - | 10.1 | 10.2 | 91.3 | 87.6 | 8.15 | 8.04 | 253 | 289 | 251 | 284 | 129 | 142 | 5.2 | 4.6 | 4.32 | 5.02 | 1.10 | 0.21 | 0.18 |
| | 26-May-15 | - | - | 9.52 | 9.74 | 90.2 | 88.9 | 8.19 | 8.17 | 200 | 242 | 198 | 241 | 100 | 122 | 14.6 | 12.9 | 18.2 | 16.0 | 0.65 | 0.26 | 0.39 |
| | 2-Jun-15 | - | - | 9.02 | 9.86 | 90.7 | 90.9 | 8.32 | 8.24 | - | - | 213 | 200 | - | - | - | - | - | - | 1.30 | - | - |
| | 9-Jun-15 | - | - | 217 | 197 | 99.0 | 93.7 | 8.48 | 8.26 | 226 | 205 | 217 | 197 | 110 | 97.9 | 2.7 | 28.9 | 1.53 | 20.9 | 2.90 | 1.02 | 0.15 |
| | 16-Jun-15 | - | - | 12.1 | 10.5 | 110 | 105 | 8.07 | 8.29 | 186 | 188 | 208 | 209 | 102 | 105 | 3.1 | 12.2 | 6.43 | 19.3 | 1.60 | 0.49 | 0.25 |
| | 23-Jun-15 | - | - | - | - | - | - | - | - | 225 | 235 | - | - | 116 | 123 | 1.2 | 6.1 | 1.70 | 7.06 | - | 2.42 | 0.94 |
| | 30-Jun-15 | - | - | 8.89 | 9.82 | 103 | 97.6 | 8.38 | 8.15 | 221 | 241 | 216 | 231 | 111 | 122 | 1.2 | 2.8 | 0.97 | 3.87 | 5.10 | 1.14 | 0.60 |
| | 7-Jul-15 | - | - | - | - | - | - | - | - | 239 | 244 | - | - | 125 | 128 | 1.0 | 1.8 | 1.08 | 1.56 | - | 0.42 | 0.35 |
| | 15-Jul-15 | - | - | 8.30 | 8.06 | 93.0 | 84.4 | 8.61 | 8.29 | 222 | 236 | 228 | 230 | 117 | 126 | 1.4 | 2.0 | 0.72 | 1.38 | 3.70 | 1.76 | 0.45 |
| | 4-Aug-15 | - | - | 8.87 | 7.21 | 103 | 74.3 | 8.74 | 8.24 | 228 | 247 | 236 | 253 | 121 | 132 | 2.8 | 2.0 | 1.91 | 1.01 | 2.40 | 1.42 | 0.62 |
| | 8-Sep-15 | - | 16.8 | - | 8.20 | - | - | - | 8.47 | 254 | 262 | - | 264 | 129 | 134 | 1.8 | 2.8 | 1.21 | 1.93 | - | 1.62 | 1.74 |
| | 6-Oct-15 | 15.1 | 14.0 | 9.68 | 10.0 | 95.7 | 96.7 | 8.51 | 8.40 | 261 | 274 | 258 | 270 | 130 | 137 | 1.4 | 2.9 | 0.62 | 1.91 | 4.70 | 1.61 | 1.17 |
| | 3-Nov-15 | - | - | 9.85 | 9.92 | 91.8 | 90.3 | 8.47 | 8.42 | 265 | 281 | 266 | 282 | 142 | 150 | 2.1 | 3.4 | 1.35 | 2.00 | 3.00 | 1.97 | 1.66 |
| | 1-Dec-15 | - | - | 9.76 | 9.93 | 78.0 | 77.5 | 8.46 | 8.43 | 268 | 281 | 274 | 286 | 138 | 144 | < 1 | < 1 | 1.00 | 1.73 | 4.00 | 1.85 | 1.62 |
| 2016 | 5-Apr-16 | 9.70 | 9.60 | 9.88 | 9.78 | 87.1 | 85.6 | 8.36 | 8.34 | 366 | 362 | 356 | 356 | 183 | 181 | 9.5 | 13.1 | 8.00 | 10.1 | 0.90 | 2.73 | 1.87 |
| | 12-Apr-16 | 8.80 | 8.80 | 10.3 | 10.2 | 88.5 | 88.4 | 8.14 | 8.14 | 265 | 265 | 268 | 270 | 148 | 150 | 33.0 | 40.1 | 30.6 | 38.3 | 0.30 | 0.89 | 0.87 |
| | 19-Apr-16 | 10.0 | 9.80 | 10.3 | 10.2 | 91.0 | 91.1 | 8.23 | 8.22 | 277 | 284 | 279 | 276 | 140 | 144 | 17.8 | 20.5 | 18.4 | 19.3 | 1.05 | 0.57 | 0.43 |
| | 26-Apr-16 | 8.60 | 8.00 | 11.2 | 11.2 | 96.2 | 95.1 | 7.99 | 8.01 | 205 | 227 | 196 | 214 | 107 | 121 | 48.5 | 52.7 | 48.7 | 48.5 | 0.10 | 0.60 | 0.77 |
| | 3-May-16 | 10.0 | 9.60 | 10.3 | 10.0 | 91.8 | 88.9 | 8.14 | 8.16 | 241 | 248 | 240 | 239 | 129 | 133 | 9.9 | 12.8 | 8.68 | 9.25 | 1.00 | 0.53 | 0.23 |
| | 10-May-16 | 9.70 | 10.2 | 11.2 | 10.0 | 98.7 | 90.9 | 8.16 | 8.08 | 196 | 198 | 198 | 200 | 107 | 109 | 20.6 | 26.6 | 22.9 | 28.0 | 0.40 | 0.45 | 0.55 |
| | 17-May-16 | 9.90 | 10.6 | 10.4 | 11.0 | 91.6 | 99.4 | 8.16 | 8.10 | 217 | 232 | 245 | 221 | 118 | 125 | 6.7 | 10.5 | 8.10 | 9.49 | 0.80 | 0.20 | 0.18 |
| | 24-May-16 | 10.0 | 9.10 | 10.6 | 11.1 | 94.0 | 97.6 | 8.23 | 8.20 | 201 | 204 | 206 | 200 | 106 | 104 | 8.6 | 14.8 | 6.64 | 11.3 | 1.10 | 0.75 | 0.43 |
| | 31-May-16 | 13.0 | 11.3 | 10.1 | 10.3 | 95.8 | 94.4 | 8.28 | 8.23 | 215 | 210 | 213 | 209 | 109 | 108 | 2.1 | 10.8 | 1.73 | 7.99 | 3.60 | 0.60 | 0.30 |
| | 7-Jun-16 | 16.3 | 13.3 | 9.61 | 10.5 | 98.2 | 101 | 8.21 | 8.19 | 200 | 205 | 206 | 218 | 106 | 113 | 2.9 | 10.9 | 3.46 | 6.42 | 3.10 | 0.92 | 0.22 |
| | 16-Jun-16 | 15.8 | 15.5 | 9.24 | 9.28 | 94.6 | 94.7 | 8.39 | 8.35 | 206 | 205 | 209 | 208 | 114 | 113 | 2.8 | 9.7 | 2.46 | 8.13 | 2.30 | 4.28 | 2.63 |
| | 21-Jun-16 | 16.4 | 13.7 | 9.62 | 9.75 | 98.1 | 93.5 | 8.43 | 8.30 | 212 | 215 | 211 | 213 | 109 | 111 | 2.2 | 10.4 | 1.37 | 6.73 | 2.90 | 3.76 | 2.47 |
| | 28-Jun-16 | 16.7 | 14.5 | 10.7 | 10.5 | 105 | 103 | 8.47 | 8.34 | 211 | 228 | 216 | 230 | 111 | 120 | 2.4 | 5.2 | 1.29 | 5.04 | 3.20 | 3.75 | 2.15 |
| | 5-Jul-16 | 19.4 | 17.2 | 8.68 | 8.93 | 95.4 | 92.8 | 8.57 | 8.36 | 215 | 227 | 219 | 231 | 112 | 119 | 2.6 | 4.9 | 1.54 | 3.43 | 2.70 | 3.54 | 1.79 |
| | 12-Jul-16 | 18.9 | 16.4 | 9.17 | 9.30 | 98.8 | 95.7 | 8.55 | 8.34 | 218 | 227 | 220 | 228 | 119 | 122 | 2.1 | 3.6 | 0.94 | 2.03 | 3.40 | 2.81 | 1.73 |
| | 2-Aug-16 | 21.7 | 16.8 | 8.41 | 8.58 | 96.8 | 96.4 | 8.62 | 8.23 | 217 | 250 | 226 | 260 | 117 | 131 | 1.4 | < 1 | 1.63 | 2.48 | 2.80 | 1.76 | 1.27 |
| | 7-Sep-16 | 18.6 | 17.5 | 8.95 | 8.78 | 96.0 | 91.7 | 8.51 | 8.38 | 241 | 262 | 248 | 273 | 119 | 128 | < 1 | 2.0 | 0.60 | 1.32 | 4.20 | 1.98 | 1.21 |
| | 11-Oct-16 | 14.2 | 14.1 | 8.87 | 8.36 | 89.5 | 87.3 | 8.44 | 8.43 | 251 | 254 | 259 | 263 | 130 | 128 | 1.6 | 2.0 | 0.79 | 1.07 | 4.90 | 1.56 | 1.43 |
| | 1-Nov-16 | 10.8 | 11.2 | 9.73 | 9.11 | 87.8 | 83.1 | 8.37 | 8.38 | 232 | 239 | 264 | 266 | 130 | 130 | 1.2 | 2.0 | 0.75 | 1.51 | 4.00 | 1.57 | 1.27 |
| | 6-Dec-16 | 5.60 | 5.45 | 10.2 | 10.9 | 81.4 | 86.2 | 8.12 | 8.10 | 262 | 262 | 257 | 261 | 131 | 131 | 1.2 | 1.4 | 0.82 | 0.90 | 4.00 | 2.07 | 1.63 |

## **Table B.7:** Selected Water Quality Data for the Grasmere (RG_GRASMERE) Water Quality Monitoring Station in Koocanusa Reservoir Downstream of the Elk River, 2014 to 2016

| Date | | Total Phosphorus | | Ortho-phosphate | | Dissolved Cadmium (Cd) | | Nitrate-Nitrogen ($NO_3$) | | Nitrite-Nitrogen ($NO_2$) | | Ammonia-Nitrogen ($NH_3$) | | Total Kjeldahl Nitrogen | | Total Selenium (Se) | | Sulphate ($SO_4$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom |
| | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | |
| 2014 | 16-Apr-14 | 0.025 | 0.028 | < 0.0010 | 0.0013 | < 0.000010 | < 0.000010 | 0.40 | 0.42 | - | - | - | - | - | - | 1.67 | 1.82 | 42.8 | 42.9 |
| | 30-Apr-14 | 0.052 | 0.060 | 0.0015 | 0.0014 | < 0.000010 | < 0.000010 | 0.48 | 0.47 | - | - | - | - | - | - | 2.28 | 2.33 | 39.3 | 39.0 |
| | 14-May-14 | 0.037 | 0.083 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.35 | 0.39 | - | - | - | - | - | - | 1.34 | 1.51 | 27.9 | 28.4 |
| | 21-May-14 | 0.094 | 0.11 | 0.0028 | 0.0030 | < 0.000010 | < 0.000010 | 0.28 | 0.28 | - | - | - | - | - | - | 0.58 | 0.55 | 14.9 | 15.1 |
| | 28-May-14 | 0.050 | 0.084 | 0.0011 | 0.0021 | < 0.000010 | < 0.000010 | 0.17 | 0.33 | - | - | - | - | - | - | 0.12 | 0.94 | 11.4 | 13.6 |
| | 4-Jun-14 | 0.028 | 0.033 | 0.0016 | 0.0024 | < 0.000010 | < 0.000010 | 0.25 | 0.33 | - | - | - | - | - | - | 0.64 | 1.00 | 14.9 | 15.6 |
| | 11-Jun-14 | 0.017 | 0.024 | < 0.0010 | 0.0012 | < 0.000010 | < 0.000010 | 0.23 | 0.22 | - | - | - | - | - | - | 0.82 | 0.66 | 15.8 | 14.8 |
| | 18-Jun-14 | 0.010 | 0.014 | 0.0014 | 0.0012 | < 0.000010 | < 0.000010 | 0.21 | 0.21 | - | - | - | - | - | - | 0.83 | 0.74 | 16.5 | 15.6 |
| | 25-Jun-14 | 0.0087 | 0.016 | < 0.0010 | 0.0013 | < 0.000010 | < 0.000010 | 0.16 | 0.17 | - | - | - | - | - | - | 0.59 | 0.45 | 15.4 | 14.1 |
| | 2-Jul-14 | 0.0083 | 0.010 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.16 | 0.14 | - | - | - | - | - | - | 0.86 | 0.61 | 16.4 | 14.8 |
| | 6-Aug-14 | 0.0037 | 0.0041 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.12 | 0.20 | - | - | - | - | - | - | 0.91 | 0.94 | 19.3 | 21.7 |
| | 3-Sep-14 | 0.0032 | 0.0047 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.081 | 0.21 | - | - | - | - | - | - | 1.01 | 0.93 | 19.5 | 23.8 |
| | 8-Oct-14 | 0.0058 | 0.0039 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.13 | 0.16 | - | - | - | - | - | - | 1.04 | 1.01 | 21.8 | 26.4 |
| | 5-Nov-14 | 0.0031 | 0.0032 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.16 | 0.16 | 0.0024 | 0.0023 | < 0.0050 | < 0.0050 | 0.066 | 0.059 | 1.13 | 1.15 | 24.4 | 25.2 |
| 2015 | 7-Apr-15 | 0.0085 | 0.028 | < 0.0010 | 0.0013 | 0.000012 | 0.0000066 | 0.37 | 0.39 | - | - | - | - | - | - | 1.65 | 1.74 | 29.9 | 30.1 |
| | 14-Apr-15 | 0.0078 | 0.0086 | < 0.0010 | < 0.0010 | 0.0000086 | 0.0000064 | 0.45 | 0.51 | - | - | - | - | - | - | 2.07 | 2.31 | 31.4 | 32.5 |
| | 21-Apr-15 | 0.0055 | 0.0055 | < 0.0010 | < 0.0010 | 0.0000076 | < 0.0000050 | 0.32 | 0.44 | - | - | - | - | - | - | 1.66 | 2.09 | 36.0 | 34.6 |
| | 27-Apr-15 | 0.0068 | 0.0078 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000055 | 0.17 | 0.47 | - | - | - | - | - | - | 0.77 | 2.42 | 35.4 | 35.7 |
| | 5-May-15 | 0.0066 | 0.011 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000062 | 0.20 | 0.47 | < 0.0010 | 0.0011 | < 0.0050 | 0.0057 | 0.11 | 0.34 | 0.64 | 2.31 | 28.2 | 29.1 |
| | 12-May-15 | 0.0060 | 0.0059 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.35 | 0.41 | 0.0011 | 0.0015 | < 0.0050 | 0.0088 | 0.17 | 0.16 | 1.26 | 1.87 | 26.2 | 29.2 |
| | 19-May-15 | 0.0065 | 0.0059 | < 0.0010 | < 0.0010 | 0.0000068 | < 0.0000050 | 0.40 | 0.36 | 0.0011 | 0.0021 | < 0.0050 | 0.014 | 0.099 | 0.11 | 1.59 | 1.72 | 23.9 | 26.5 |
| | 26-May-15 | 0.011 | 0.013 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.36 | < 0.0010 | 0.0016 | 0.0073 | 0.011 | 0.12 | 0.13 | 0.32 | 1.33 | 14.9 | 20.1 |
| | 2-Jun-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9-Jun-15 | 0.0050 | 0.018 | < 0.0010 | 0.0014 | < 0.0000050 | < 0.0000050 | 0.20 | 0.22 | 0.0018 | < 0.0010 | < 0.0050 | < 0.0050 | 0.13 | 0.12 | 0.82 | 0.64 | 17.5 | 16.4 |
| | 16-Jun-15 | 0.0063 | 0.011 | < 0.0010 | 0.0012 | < 0.0000050 | < 0.0000050 | 0.18 | 0.26 | 0.0011 | 0.0012 | < 0.0050 | 0.0063 | 0.077 | 0.084 | 0.57 | 0.70 | 16.2 | 15.9 |
| | 23-Jun-15 | 0.0088 | 0.0067 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.28 | 0.0017 | 0.0012 | < 0.0050 | < 0.0050 | 0.18 | 0.083 | 0.92 | 1.05 | 17.1 | 18.4 |
| | 30-Jun-15 | 0.0023 | 0.0045 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.30 | 0.0016 | 0.0026 | < 0.0050 | 0.0052 | 0.12 | 0.088 | 0.88 | 1.11 | 17.7 | 19.4 |
| | 7-Jul-15 | 0.0028 | 0.0039 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.24 | 0.31 | 0.0016 | 0.0022 | < 0.0050 | 0.010 | 0.099 | 0.11 | 1.32 | 1.26 | 21.9 | 21.1 |
| | 15-Jul-15 | < 0.0020 | 0.0034 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.15 | 0.31 | 0.0019 | 0.0022 | < 0.0050 | 0.0066 | 0.081 | 0.076 | 0.94 | 1.25 | 20.2 | 20.6 |
| | 4-Aug-15 | 0.0021 | 0.0023 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.11 | 0.30 | 0.0022 | 0.0017 | < 0.0050 | 0.0069 | 0.095 | 0.066 | 0.98 | 1.24 | 21.7 | 21.5 |
| | 8-Sep-15 | 0.0041 | 0.0062 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.15 | 0.19 | 0.0029 | 0.0025 | 0.0061 | 0.0073 | 0.15 | 0.14 | 1.22 | 1.33 | 25.8 | 27.6 |
| | 6-Oct-15 | 0.0026 | 0.0048 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.18 | 0.0026 | 0.0018 | 0.0063 | 0.0089 | 0.14 | 0.086 | 1.09 | 0.96 | 26.5 | 29.1 |
| | 3-Nov-15 | 0.0023 | 0.0031 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.23 | 0.0025 | 0.0020 | < 0.0050 | 0.0070 | 0.12 | 0.13 | 1.13 | 1.32 | 28.1 | 31.9 |
| | 1-Dec-15 | 0.0038 | 0.0045 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.23 | 0.26 | 0.0024 | 0.0023 | < 0.0050 | 0.0055 | 0.12 | 0.093 | 1.34 | 1.35 | 29.5 | 31.9 |
| 2016 | 5-Apr-16 | 0.018 | 0.013 | < 0.0010 | < 0.0010 | 0.0000054 | 0.0000056 | 0.37 | 0.38 | 0.0020 | 0.0021 | 0.0066 | 0.010 | 0.16 | 0.14 | 1.71 | 1.73 | 41.8 | 41.4 |
| | 12-Apr-16 | 0.026 | 0.030 | 0.0031 | 0.0033 | < 0.0000050 | 0.0000053 | 0.40 | 0.42 | 0.0014 | 0.0015 | 0.012 | 0.013 | 0.14 | 0.23 | 1.35 | 1.51 | 27.7 | 27.4 |
| | 19-Apr-16 | 0.014 | 0.016 | 0.0013 | 0.0015 | < 0.0000050 | < 0.0000050 | 0.29 | 0.38 | < 0.0010 | 0.0011 | 0.0059 | 0.0067 | 0.16 | 0.16 | 0.93 | 1.42 | 27.3 | 28.7 |
| | 26-Apr-16 | 0.030 | 0.033 | 0.0010 | 0.0030 | < 0.0000050 | < 0.0000050 | 0.23 | 0.38 | < 0.0010 | < 0.0010 | 0.0068 | 0.0069 | 0.14 | 0.15 | 0.17 | 1.11 | 13.9 | 17.5 |
| | 3-May-16 | 0.0070 | 0.0092 | 0.0014 | 0.0019 | < 0.0000050 | 0.0000056 | 0.33 | 0.41 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0053 | 0.069 | 0.081 | 0.91 | 1.31 | 22.1 | 23.3 |
| | 10-May-16 | 0.018 | 0.031 | 0.0014 | 0.0019 | < 0.0000050 | < 0.0000050 | 0.27 | 0.29 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.079 | 0.097 | 0.71 | 0.84 | 15.4 | 15.8 |
| | 17-May-16 | 0.0092 | 0.010 | < 0.0010 | 0.0013 | < 0.0000050 | < 0.0000050 | 0.26 | 0.34 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.055 | 0.064 | 0.67 | 1.09 | 20.2 | 22.1 |
| | 24-May-16 | 0.0063 | 0.0092 | < 0.0010 | 0.0010 | < 0.0000050 | < 0.0000050 | 0.25 | 0.24 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.076 | 0.077 | 0.70 | 0.63 | 18.5 | 17.8 |
| | 31-May-16 | 0.0088 | 0.0088 | 0.0011 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.22 | 0.25 | 0.0014 | < 0.0010 | 0.0083 | < 0.0050 | 0.14 | 0.072 | 0.78 | 0.86 | 18.3 | 18.2 |
| | 7-Jun-16 | 0.0033 | 0.0090 | < 0.0010 | 0.0012 | < 0.0000050 | < 0.0000050 | 0.13 | 0.21 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0051 | < 0.050 | 0.064 | 0.40 | 0.76 | 16.9 | 17.9 |
| | 16-Jun-16 | 0.0082 | 0.0059 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.19 | 0.0013 | 0.0012 | < 0.0050 | 0.0050 | 0.098 | 0.087 | 0.66 | 0.70 | 17.0 | 17.3 |
| | 21-Jun-16 | 0.017 | 0.0077 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.18 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0059 | 0.15 | 0.10 | 0.66 | 0.73 | 16.9 | 18.3 |
| | 28-Jun-16 | 0.0055 | 0.0057 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.15 | 0.20 | 0.0013 | 0.0013 | < 0.0050 | 0.0057 | 0.10 | 0.091 | 0.76 | 0.75 | 17.8 | 21.1 |
| | 5-Jul-16 | 0.0076 | 0.0067 | 0.0011 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.24 | 0.0017 | 0.0019 | < 0.0050 | 0.0061 | 0.10 | 0.11 | 0.83 | 0.99 | 18.5 | 21.6 |
| | 12-Jul-16 | 0.0030 | 0.0058 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.13 | 0.21 | 0.0013 | 0.0014 | < 0.0050 | 0.0083 | 0.071 | 0.090 | 0.75 | 0.88 | 18.7 | 21.8 |
| | 2-Aug-16 | 0.0031 | 0.0034 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.090 | 0.25 | 0.0016 | 0.0025 | < 0.0050 | 0.015 | 0.15 | 0.073 | 0.87 | 1.15 | 19.8 | 26.2 |
| | 7-Sep-16 | 0.0031 | 0.0066 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.21 | 0.0019 | 0.0035 | < 0.0050 | 0.0090 | 0.092 | 0.10 | 0.92 | 0.99 | 24.0 | 27.4 |
| | 11-Oct-16 | 0.0058 | 0.0036 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.16 | 0.0018 | 0.0019 | < 0.0050 | < 0.0050 | 0.14 | 0.13 | 0.94 | 0.98 | 26.6 | 27.3 |
| | 1-Nov-16 | 0.0029 | 0.0052 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.18 | 0.21 | 0.0023 | 0.0022 | < 0.0050 | 0.0055 | 0.080 | 0.092 | 0.97 | 1.07 | 26.8 | 26.7 |
| | 6-Dec-16 | 0.0038 | 0.0032 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.21 | 0.21 | 0.0029 | 0.0031 | 0.0051 | 0.0069 | 0.11 | 0.097 | 0.92 | 0.96 | 25.5 | 25.7 |

**Table B.8: Selected Water Quality Data for the RG_USGOLD Water Quality Monitoring Station in Koocanusa Reservoir Upstream of the Elk River, 2014 to 2016**

| Date | | Temperature (Field) | | Dissolved Oxygen | | Dissolved Oxygen | | pH (Field) | | Conductivity | | Specific Conductivity (25 °C) | | Total Hardness ($CaCO_3$) | | Total Suspended Solids | | Turbidity (Lab) | | Secchi Depth | Chlorophyll-a | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Surface | Average of Middle and Bottom |
| | | °C | | mg/L | | % | | pH units | | µS/cm | | µS/cm | | mg/L | | mg/L | | NTU | | m | µg/L | |
| 2014 | 5-Nov-14 | - | - | - | - | - | - | 8.31 | 8.31 | 254 | 267 | - | - | 132 | 139 | 1.7 | 2.95 | 0.91 | 1.37 | - | - | - |
| 2015 | 7-Apr-15 | - | - | 11.6 | 11.7 | 98.8 | 96.1 | 8.27 | 8.25 | 297 | 299 | 294 | 296 | 137 | 140 | 2.9 | 4.3 | 7.51 | 7.88 | - | - | - |
| | 14-Apr-15 | - | - | 9.85 | 10.4 | 82.5 | 86.2 | 8.18 | 8.21 | 292 | 294 | 298 | 294 | 149 | 148 | 3.5 | 4.9 | 4.48 | 5.98 | - | - | - |
| | 21-Apr-15 | - | - | 9.30 | 9.08 | 85.0 | 82.6 | 8.01 | 7.89 | 301 | 286 | 309 | 299 | 158 | 150 | 2.5 | 3.1 | 3.87 | 5.77 | 1.50 | 1.44 | 0.52 |
| | 27-Apr-15 | - | - | 11.4 | 10.9 | 102 | 95.5 | 8.45 | 8.34 | 297 | 311 | 311 | 310 | 149 | 150 | 2.7 | 2.1 | 2.88 | 1.91 | 1.40 | 0.60 | 0.19 |
| | 5-May-15 | - | - | 10.1 | 10.3 | 95.0 | 92.8 | 8.37 | 8.24 | 283 | 303 | 275 | 300 | 134 | 146 | 3.2 | 2.2 | 4.56 | 3.94 | 1.20 | 1.15 | 0.32 |
| | 12-May-15 | - | - | 10.6 | 10.8 | 98.1 | 95.9 | 8.34 | 8.29 | 248 | 271 | 258 | 280 | 128 | 140 | 2.5 | 2.6 | 2.59 | 2.17 | 1.60 | 0.37 | 0.28 |
| | 19-May-15 | - | - | 10.0 | 10.2 | 91.1 | 87.5 | 8.16 | 8.05 | 249 | 254 | 246 | 279 | 124 | 140 | 4.3 | 31.0 | 3.54 | 19.1 | 1.10 | 0.32 | 0.10 |
| | 26-May-15 | - | - | 9.57 | 9.87 | 91.3 | 89.3 | 8.19 | 8.17 | 193 | 216 | 200 | 245 | 100 | 124 | 11.1 | 11.3 | 16.6 | 13.7 | 0.70 | 0.33 | 0.25 |
| | 2-Jun-15 | - | - | 8.51 | 9.79 | 86.2 | 91.6 | 8.33 | 8.26 | - | - | 221 | 192 | - | - | - | - | - | - | 1.30 | - | - |
| | 9-Jun-15 | - | - | 233 | 194 | 101 | 88.5 | 8.51 | 8.27 | 244 | 202 | 233 | 194 | 117 | 102 | 2.4 | 26.8 | 1.39 | 20.0 | 2.60 | 0.62 | 0.18 |
| | 16-Jun-15 | - | - | 11.8 | 11.0 | 110 | 113 | 8.15 | 8.29 | 196 | 193 | 200 | 202 | 107 | 107 | 1.3 | 10.2 | 4.08 | 6.87 | 1.70 | 1.12 | 0.16 |
| | 23-Jun-15 | - | - | - | - | - | - | - | - | 229 | 241 | - | - | 118 | 124 | 1.1 | 5.7 | 1.46 | 6.67 | - | 2.19 | 0.82 |
| | 30-Jun-15 | - | - | 9.72 | 9.84 | 107 | 95.6 | 8.43 | 8.04 | 220 | 230 | 213 | 226 | 110 | 115 | 1.4 | 2.1 | 1.14 | 2.94 | 4.70 | 1.63 | 0.61 |
| | 7-Jul-15 | - | - | - | - | - | - | - | - | 230 | 237 | - | - | 122 | 124 | < 1 | 4.3 | 0.70 | 2.49 | - | 0.66 | 0.42 |
| | 15-Jul-15 | - | - | 7.72 | 7.87 | 88.6 | 79.5 | 8.62 | 8.09 | 244 | 227 | 226 | 247 | 130 | 121 | 2 | 1.9 | 2.28 | 1.11 | 3.60 | 0.43 | 0.95 |
| | 4-Aug-15 | - | 16.8 | - | 7.99 | - | - | - | 8.43 | 239 | 254 | - | 266 | 126 | 131 | 3.1 | 5.9 | 0.93 | 2.47 | - | 1.67 | 0.67 |
| | 8-Sep-15 | 17.5 | 15.2 | 8.34 | 8.59 | - | 85.9 | 8.53 | 8.43 | 251 | 274 | 252 | 271 | 128 | 139 | 1.8 | 3.0 | 0.75 | 1.44 | 3.70 | 1.54 | 1.96 |
| | 6-Oct-15 | 15.1 | 15.0 | 10.2 | 9.24 | 101 | 87.7 | 8.53 | 8.42 | 266 | 266 | 258 | 276 | 131 | 131 | 1.4 | 2.9 | 0.75 | 0.70 | 4.00 | 1.58 | 1.56 |
| | 3-Nov-15 | - | - | 9.63 | 9.27 | 89.5 | 86.1 | 8.45 | 8.44 | 262 | 279 | 265 | 264 | 140 | 147 | 2 | 2.9 | 1.01 | 1.68 | 3.30 | 1.68 | 1.32 |
| | 1-Dec-15 | - | - | 9.62 | 9.57 | 78.1 | 74.6 | 8.47 | 8.40 | 268 | 278 | 271 | 283 | 139 | 146 | < 1 | < 1 | 0.92 | 1.39 | 4.00 | 1.29 | 1.47 |
| 2016 | 5-Apr-16 | 9.50 | 8.70 | 9.49 | 9.71 | 83.3 | 83.9 | 8.31 | 8.31 | 368 | 370 | 352 | 359 | 183 | 183 | 10.6 | 10.3 | 10.1 | 10.6 | 1.50 | 2.30 | 1.58 |
| | 12-Apr-16 | 9.20 | 8.30 | 9.94 | 9.76 | 86.0 | 83.3 | 8.09 | 8.07 | 275 | 287 | 278 | 292 | 156 | 164 | 27 | 28.4 | 30.1 | 28.5 | 0.30 | 1.07 | 0.85 |
| | 19-Apr-16 | 10.5 | 9.30 | 10.2 | 10.1 | 91.6 | 88.1 | 8.28 | 8.20 | 285 | 289 | 279 | 282 | 144 | 147 | 7.1 | 15.0 | 9.30 | 15.2 | 0.85 | 2.22 | 0.41 |
| | 26-Apr-16 | 9.40 | 8.15 | 11.2 | 11.3 | 98.2 | 95.9 | 8.02 | 8.07 | 226 | 216 | 219 | 211 | 119 | 117 | 31.4 | 52.8 | 33.6 | 51.0 | 0.60 | 1.70 | 0.69 |
| | 3-May-16 | 10.8 | 9.10 | 10.1 | 10.5 | 92.0 | 90.9 | 8.12 | 8.12 | 233 | 249 | 232 | 252 | 124 | 134 | 7.7 | 11.5 | 7.49 | 10.8 | 1.10 | 0.80 | 0.23 |
| | 10-May-16 | 10.0 | 10.2 | 10.8 | 11.0 | 96.0 | 98.7 | 8.13 | 7.99 | 195 | 200 | 197 | 204 | 107 | 113 | 21.2 | 26.3 | 25.0 | 24.9 | 0.40 | 0.42 | 0.51 |
| | 17-May-16 | 11.0 | 10.0 | 10.7 | 11.1 | 97.0 | 98.7 | 8.15 | 8.02 | 206 | 226 | 207 | 228 | 109 | 124 | 6.1 | 9.2 | 7.28 | 7.80 | 0.90 | 1.07 | 0.19 |
| | 24-May-16 | 11.8 | 10.0 | 9.93 | 10.7 | 91.2 | 95.0 | 8.23 | 8.21 | 218 | 202 | 216 | 201 | 112 | 103 | 5 | 13.2 | 3.58 | 9.79 | 1.40 | 1.31 | 0.50 |
| | 31-May-16 | 13.2 | 11.4 | 10.0 | 10.2 | 95.1 | 95.2 | 8.31 | 8.25 | 218 | 210 | 218 | 209 | 113 | 109 | 1.5 | 11.0 | 1.39 | 7.88 | 4.10 | 1.02 | 0.37 |
| | 7-Jun-16 | 15.0 | 13.4 | 9.82 | 10.2 | 97.7 | 97.9 | 8.15 | 8.18 | 202 | 210 | 189 | 211 | 111 | 116 | 2.5 | 6.8 | 2.26 | 4.54 | 1.10 | 1.45 | 0.35 |
| | 16-Jun-16 | 15.9 | 14.1 | 9.32 | 9.42 | 94.5 | 93.5 | 8.39 | 8.30 | 208 | 204 | 211 | 211 | 114 | 111 | 3.3 | 7.4 | 2.71 | 7.07 | 2.20 | 4.33 | 2.60 |
| | 21-Jun-16 | 15.6 | 13.4 | 9.72 | 9.76 | 99.7 | 94.0 | 8.41 | 8.23 | 210 | 222 | 210 | 219 | 108 | 112 | 3.8 | 9.0 | 1.37 | 5.35 | 3.10 | 4.10 | 2.25 |
| | 28-Jun-16 | 16.4 | 14.3 | 10.2 | 10.2 | 102 | 101 | 8.51 | 8.25 | 210 | 235 | 216 | 234 | 113 | 122 | 2.7 | 4.3 | 1.71 | 5.12 | 3.60 | 3.92 | 2.11 |
| | 5-Jul-16 | 19.0 | 16.0 | 8.91 | 9.20 | 96.4 | 93.8 | 8.56 | 8.33 | 213 | 220 | 218 | 222 | 114 | 117 | 2.2 | 3.5 | 1.65 | 2.95 | 3.10 | 3.15 | 1.63 |
| | 12-Jul-16 | 18.7 | 14.2 | 9.22 | 9.50 | 98.6 | 96.4 | 8.55 | 8.17 | 218 | 231 | 220 | 240 | 116 | 125 | 2.3 | 2.0 | 0.88 | 1.62 | 3.90 | 2.35 | 0.92 |
| | 2-Aug-16 | 21.7 | 15.2 | 8.67 | 8.48 | 98.8 | 95.4 | 8.60 | 8.11 | 219 | 248 | 222 | 255 | 117 | 131 | 2.2 | < 1 | 1.82 | 1.55 | 2.30 | 2.21 | 0.81 |
| | 7-Sep-16 | 18.6 | 17.9 | 8.75 | 8.55 | 93.4 | 90.2 | 8.50 | 8.43 | 243 | 263 | 247 | 261 | 119 | 128 | < 1 | 1.4 | 0.74 | 1.22 | 3.90 | 1.86 | 1.24 |
| | 11-Oct-16 | 14.4 | 13.5 | 8.59 | 8.51 | 87.1 | 83.9 | 8.41 | 8.33 | 251 | 251 | 258 | 275 | 128 | 129 | 1.3 | 1.2 | 0.67 | 0.66 | 5.10 | 1.37 | 1.31 |
| | 1-Nov-16 | 12.0 | 11.1 | 8.85 | 9.03 | 81.8 | 82.5 | 8.31 | 8.23 | 232 | 238 | 258 | 259 | 129 | 130 | 1.4 | 1.5 | 0.91 | 0.98 | 4.30 | 1.32 | 1.26 |
| | 6-Dec-16 | 6.10 | 5.55 | 10.2 | 10.1 | 82.3 | 80.9 | 8.11 | 8.03 | 257 | 260 | 256 | 258 | 128 | 133 | 1.3 | 1.1 | 1.08 | 0.89 | 4.00 | 1.98 | 1.45 |

## Table B.8: Selected Water Quality Data for the RG_USGOLD Water Quality Monitoring Station in Koocanusa Reservoir Upstream of the Elk River, 2014 to 2016

| | Date | Total Phosphorus | | Ortho-phosphate | | Dissolved Cadmium (Cd) | | Nitrate-Nitrogen ($NO_3$) | | Nitrite-Nitrogen ($NO_2$) | | Ammonia-Nitrogen ($NH_3$) | | Total Kjeldahl Nitrogen | | Total Selenium (Se) | | Sulphate ($SO_4$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom |
| | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | |
| 2014 | 5-Nov-14 | 0.0026 | 0.0039 | < 0.0010 | - | < 0.000010 | - | 0.16 | 0.21 | 0.0027 | 0.0025 | < 0.0050 | 0.0062 | < 0.050 | 0.051 | 1.16 | 1.39 | 23.8 | 27.0 |
| 2015 | 7-Apr-15 | 0.0066 | 0.0072 | < 0.0010 | < 0.0010 | < 0.000008 | < 0.0000050 | 0.32 | 0.33 | 0.0012 | 0.0011 | < 0.0050 | 0.0094 | 0.11 | 0.15 | 1.32 | 1.48 | 29.5 | 29.8 |
| | 14-Apr-15 | 0.0080 | 0.0078 | < 0.0010 | < 0.0010 | 0.0000072 | 0.0000055 | 0.41 | 0.41 | 0.0012 | 0.0015 | < 0.0050 | 0.0073 | 0.13 | 0.097 | 1.64 | 1.86 | 29.7 | 30.5 |
| | 21-Apr-15 | 0.0058 | 0.0064 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000065 | 0.42 | 0.39 | 0.0016 | 0.0014 | < 0.0050 | 0.010 | 0.12 | 0.13 | 2.07 | 1.78 | 34.8 | 30.4 |
| | 27-Apr-15 | 0.0058 | 0.0054 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000055 | 0.28 | 0.46 | 0.0012 | 0.0013 | < 0.0050 | 0.0065 | 0.092 | 0.078 | 1.47 | 2.32 | 35.6 | 35.3 |
| | 5-May-15 | 0.0059 | 0.0049 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000080 | 0.22 | 0.44 | 0.0011 | 0.0013 | < 0.0050 | 0.0080 | 0.13 | 0.18 | 0.89 | 2.26 | 29.0 | 32.1 |
| | 12-May-15 | 0.0057 | 0.0065 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.28 | 0.37 | 0.0011 | 0.0012 | < 0.0050 | 0.0083 | 0.13 | 0.16 | 0.98 | 1.61 | 26.3 | 28.3 |
| | 19-May-15 | 0.0063 | 0.0075 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000060 | 0.35 | 0.35 | 0.0012 | 0.0021 | < 0.0050 | 0.013 | 0.14 | 0.13 | 1.29 | 1.62 | 23.3 | 27.5 |
| | 26-May-15 | 0.011 | 0.010 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.37 | < 0.0010 | 0.0015 | 0.0060 | 0.010 | 0.11 | 0.12 | 0.31 | 1.35 | 15.2 | 21.8 |
| | 2-Jun-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9-Jun-15 | 0.0037 | 0.017 | < 0.0010 | 0.0016 | < 0.0000050 | < 0.0000050 | 0.21 | 0.23 | 0.0022 | < 0.0010 | < 0.0050 | < 0.0050 | 0.12 | 0.11 | 0.93 | 0.70 | 19.9 | 14.9 |
| | 16-Jun-15 | 0.0052 | 0.010 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.22 | 0.27 | 0.0015 | 0.0016 | < 0.0050 | 0.0061 | 0.096 | 0.14 | 0.78 | 0.82 | 17.4 | 16.7 |
| | 23-Jun-15 | 0.0035 | 0.0077 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.20 | 0.34 | 0.0016 | 0.0024 | < 0.0050 | 0.0059 | 0.11 | 0.092 | 0.97 | 1.36 | 17.4 | 19.8 |
| | 30-Jun-15 | 0.0035 | 0.0045 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.21 | 0.0013 | 0.0014 | < 0.0050 | < 0.0050 | 0.10 | 0.088 | 0.84 | 0.67 | 17.5 | 20.1 |
| | 7-Jul-15 | 0.0031 | 0.0046 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.29 | 0.0018 | 0.0026 | < 0.0050 | 0.0069 | 0.11 | 0.097 | 0.96 | 1.05 | 19.5 | 20.9 |
| | 15-Jul-15 | 0.0042 | 0.0024 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.25 | 0.26 | 0.0019 | 0.0016 | 0.0098 | < 0.0050 | 0.053 | 0.058 | 0.98 | 1.06 | 26.2 | 20.1 |
| | 4-Aug-15 | 0.0035 | 0.0051 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.18 | 0.30 | 0.0028 | 0.0024 | 0.014 | 0.0082 | 0.35 | 0.23 | 0.89 | 1.27 | 23.3 | 25.8 |
| | 8-Sep-15 | 0.036 | 0.0046 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.22 | 0.0029 | 0.0039 | 0.0089 | 0.010 | 0.12 | 0.12 | 1.17 | 1.22 | 25.3 | 29.3 |
| | 6-Oct-15 | 0.0022 | < 0.0020 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.16 | 0.0025 | 0.0019 | 0.0053 | 0.0099 | 0.097 | 0.11 | 1.15 | 1.18 | 26.3 | 26.5 |
| | 3-Nov-15 | < 0.0020 | < 0.0020 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.21 | 0.0025 | 0.0020 | < 0.0050 | 0.0074 | 0.11 | 0.15 | 1.12 | 1.16 | 27.7 | 31.4 |
| | 1-Dec-15 | 0.0029 | 0.0045 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000065 | 0.22 | 0.26 | 0.0030 | 0.0025 | < 0.0050 | 0.0054 | 0.094 | 0.11 | 1.34 | 1.40 | 28.9 | 32.0 |
| 2016 | 5-Apr-16 | 0.013 | 0.012 | < 0.0010 | < 0.0010 | < 0.0000050 | 0.0000055 | 0.38 | 0.38 | 0.0020 | 0.0020 | 0.0085 | 0.0080 | 0.13 | 0.12 | 1.62 | 1.67 | 42.3 | 42.5 |
| | 12-Apr-16 | 0.027 | 0.021 | 0.0021 | 0.0029 | < 0.0000050 | 0.0000055 | 0.36 | 0.44 | 0.0013 | 0.0019 | 0.013 | 0.016 | 0.21 | 0.22 | 1.26 | 1.70 | 28.5 | 31.5 |
| | 19-Apr-16 | 0.011 | 0.013 | < 0.0010 | 0.0012 | < 0.0000050 | < 0.0000050 | 0.37 | 0.44 | 0.0017 | 0.0011 | < 0.0050 | 0.0064 | 0.11 | 0.14 | 1.41 | 1.67 | 28.7 | 29.2 |
| | 26-Apr-16 | 0.025 | 0.029 | < 0.0010 | 0.0026 | < 0.0000050 | < 0.0000050 | 0.32 | 0.34 | < 0.0010 | < 0.0010 | 0.012 | 0.0072 | 0.16 | 0.15 | 0.77 | 0.80 | 17.8 | 16.2 |
| | 3-May-16 | 0.0062 | 0.0091 | 0.0011 | 0.0022 | < 0.0000050 | < 0.0000050 | 0.26 | 0.42 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0060 | 0.080 | 0.074 | 0.58 | 1.29 | 20.3 | 23.0 |
| | 10-May-16 | 0.022 | 0.022 | 0.0016 | 0.0013 | < 0.0000050 | 0.0000070 | 0.26 | 0.28 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.079 | 0.083 | 0.59 | 0.75 | 15.2 | 15.9 |
| | 17-May-16 | 0.012 | 0.0095 | 0.0014 | 0.0011 | < 0.0000050 | 0.0000055 | 0.28 | 0.34 | < 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.080 | 0.063 | 0.76 | 1.11 | 16.7 | 21.4 |
| | 24-May-16 | 0.0050 | 0.0094 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.24 | 0.23 | 0.0010 | < 0.0010 | < 0.0050 | < 0.0050 | 0.075 | 0.071 | 0.77 | 0.66 | 19.6 | 17.8 |
| | 31-May-16 | 0.0083 | 0.0097 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.23 | 0.23 | 0.0014 | < 0.0010 | 0.0060 | < 0.0050 | 0.078 | 0.083 | 0.75 | 0.78 | 18.7 | 17.9 |
| | 7-Jun-16 | 0.0090 | 0.0066 | 0.0012 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.15 | 0.24 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0058 | 0.067 | 0.10 | 0.46 | 0.86 | 17.9 | 18.7 |
| | 16-Jun-16 | 0.0033 | 0.0065 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.19 | 0.0014 | 0.0011 | < 0.0050 | 0.0052 | 0.14 | 0.11 | 0.76 | 0.66 | 17.2 | 17.2 |
| | 21-Jun-16 | 0.0043 | 0.0068 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.22 | < 0.0010 | < 0.0010 | 0.0052 | 0.0067 | 0.12 | 0.10 | 0.69 | 0.88 | 17.0 | 19.0 |
| | 28-Jun-16 | 0.0079 | 0.0057 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.24 | 0.0015 | 0.0015 | < 0.0050 | 0.0057 | 0.093 | 0.11 | 0.81 | 0.94 | 18.1 | 21.7 |
| | 5-Jul-16 | 0.0071 | 0.0049 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.15 | 0.18 | 0.0014 | 0.0014 | < 0.0050 | 0.0053 | 0.19 | 0.10 | 0.79 | 0.70 | 18.4 | 20.0 |
| | 12-Jul-16 | 0.0039 | 0.0023 | < 0.0010 | 0.0010 | < 0.0000050 | < 0.0000050 | 0.13 | 0.24 | 0.0013 | 0.0029 | < 0.0050 | 0.0088 | 0.076 | < 0.050 | 0.77 | 0.85 | 18.5 | 21.7 |
| | 2-Aug-16 | 0.0028 | 0.0025 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.088 | 0.30 | 0.0016 | 0.0016 | < 0.0050 | 0.0092 | 0.098 | 0.067 | 0.86 | 1.28 | 19.5 | 25.0 |
| | 7-Sep-16 | 0.0060 | 0.0050 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.14 | 0.18 | 0.0013 | 0.0021 | < 0.0050 | 0.0079 | 0.11 | 0.099 | 0.95 | 0.95 | 24.0 | 28.1 |
| | 11-Oct-16 | 0.0029 | 0.0026 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.16 | 0.16 | 0.0019 | 0.0018 | < 0.0050 | < 0.0050 | 0.12 | 0.12 | 1.02 | 1.01 | 26.2 | 26.9 |
| | 1-Nov-16 | < 0.0020 | 0.0025 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.19 | 0.18 | 0.0027 | 0.0027 | < 0.0050 | < 0.0050 | 0.10 | 0.090 | 0.93 | 0.95 | 26.7 | 26.8 |
| | 6-Dec-16 | 0.0028 | 0.0025 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.0000050 | 0.20 | 0.21 | 0.0032 | 0.0028 | < 0.0050 | 0.0062 | 0.11 | 0.11 | 0.92 | 0.96 | 25.2 | 25.7 |

## Table B.9: Selected Water Quality Data for the RG_BORDER Water Quality Monitoring Station in Koocanusa Reservoir, 2014 to 2016

| Date | | Temperature (Field) | | Dissolved Oxygen | | Dissolved Oxygen | | pH (Field) | | Conductivity | | Specific Conductivity (25 °C) | | Total Hardness ($CaCO_3$) | | Total Suspended Solids | | Turbidity (Lab) | | Secchi Depth | Chlorophyll-a | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Surface | Average of Middle and Bottom |
| | | °C | | mg/L | | % | | pH units | | μS/cm | | μS/cm | | mg/L | | mg/L | | NTU | | m | μg/L | |
| 2014 | 16-Apr-14 | - | - | - | - | - | - | - | - | 321 | 331 | - | - | 170 | 181 | - | - | 5.08 | 9.41 | - | - | - |
| | 30-Apr-14 | - | - | - | - | - | - | - | - | 307 | 347 | - | - | 171 | 173 | - | - | 11.3 | 20.7 | - | - | - |
| | 7-May-14 | - | - | - | - | - | - | - | - | 295 | 284 | - | - | 159 | 152 | - | - | 59.9 | 69.2 | - | - | - |
| | 14-May-14 | - | - | - | - | - | - | - | - | 262 | 271 | - | - | 133 | 136 | - | - | 22.1 | 30.3 | - | - | - |
| | 21-May-14 | - | - | - | - | - | - | - | - | 258 | 216 | - | - | 137 | 114 | - | - | 22.3 | 116 | - | - | - |
| | 28-May-14 | - | - | - | - | - | - | - | - | 248 | 197 | - | - | 135 | 110 | - | - | 12.1 | 131 | - | - | - |
| | 4-Jun-14 | - | - | - | - | - | - | - | - | 234 | 222 | - | - | 127 | 120 | - | - | 10.6 | 41.1 | - | - | - |
| | 11-Jun-14 | - | - | - | - | - | - | - | - | 239 | 208 | - | - | 126 | 111 | - | - | 4.50 | 26.0 | - | - | - |
| | 18-Jun-14 | - | - | - | - | - | - | - | - | 219 | 209 | - | - | 117 | 113 | - | - | 5.38 | 11.7 | - | - | - |
| | 25-Jun-14 | - | - | - | - | - | - | - | - | 218 | 201 | - | - | 117 | 108 | - | - | 2.46 | 18.4 | - | - | - |
| | 2-Jul-14 | - | - | - | - | - | - | - | - | 216 | 203 | - | - | 113 | 106 | - | - | 3.02 | 12.7 | - | - | - |
| | 6-Aug-14 | - | - | - | - | - | - | - | - | 222 | 226 | - | - | 118 | 119 | - | - | 0.65 | 1.13 | - | - | - |
| | 3-Sep-14 | - | - | - | - | - | - | - | - | 227 | 231 | - | - | 121 | 123 | - | - | 1.22 | 0.93 | - | - | - |
| | 8-Oct-14 | - | - | - | - | - | - | - | - | 238 | 262 | - | - | 126 | 138 | - | - | 1.17 | 2.06 | - | - | - |
| | 5-Nov-14 | - | - | - | - | - | - | - | - | 250 | 255 | - | - | 133 | 135 | 1.9 | 2.5 | 1.07 | 1.13 | - | - | - |
| 2015 | 7-Apr-15 | - | - | 11.6 | 11.9 | 100 | 93.3 | 8.28 | 8.28 | 279 | 255 | 292 | 294 | 140 | 138 | 2.1 | 2.8 | 4.64 | 3.98 | - | - | - |
| | 14-Apr-15 | - | - | 9.61 | 10.6 | 78.5 | 86.7 | 6.72 | 7.89 | 290 | 288 | 307 | 293 | 149 | 148 | 2.6 | 3.0 | 2.04 | 3.19 | - | - | - |
| | 21-Apr-15 | - | - | 9.83 | 10.2 | 10.1 | 6.25 | 7.95 | 7.83 | 289 | 281 | 307 | 294 | 153 | 147 | 1.6 | 3.4 | 3.23 | 5.50 | 1.90 | 0.91 | 0.98 |
| | 27-Apr-15 | - | - | 10.9 | 11.2 | 100 | 94.4 | 8.44 | 8.28 | 308 | 297 | 312 | 295 | 149 | 143 | 2.1 | 4.0 | 2.04 | 3.43 | 3.70 | 0.78 | 0.35 |
| | 5-May-15 | - | - | 10.6 | 10.8 | 97.9 | 92.8 | 8.28 | 8.03 | 288 | 288 | 289 | 299 | 139 | 147 | 1.9 | 2.6 | 3.41 | 3.85 | 1.70 | 0.64 | 0.55 |
| | 12-May-15 | - | - | 10.7 | 11.3 | 98.2 | 95.6 | 8.27 | 8.19 | 252 | 282 | 260 | 289 | 130 | 145 | 3.1 | 2.6 | 2.80 | 1.79 | 2.00 | 0.54 | 0.42 |
| | 19-May-15 | - | - | 10.4 | 10.7 | 94.4 | 90.4 | 8.03 | 8.02 | 259 | 284 | 257 | 282 | 126 | 142 | 3 | 2.4 | 2.07 | 2.24 | 2.40 | 0.13 | 0.15 |
| | 26-May-15 | - | - | 9.39 | 10.0 | 91.5 | 89.8 | 7.60 | 8.15 | 224 | 260 | 236 | 261 | 118 | 134 | 4 | 4.2 | 5.60 | 5.90 | 1.80 | 0.35 | 0.24 |
| | 2-Jun-15 | - | - | 9.00 | 8.84 | 91.3 | 80.0 | 8.30 | 7.90 | - | - | 237 | 243 | - | - | - | - | - | - | 2.00 | - | - |
| | 9-Jun-15 | - | - | 232 | 226 | 86.4 | 83.7 | 8.46 | 7.87 | 239 | 237 | 232 | 226 | 118 | 119 | 2.1 | 17.4 | 1.55 | 12.0 | 2.30 | 0.74 | 0.13 |
| | 16-Jun-15 | - | - | 9.18 | 11.0 | 79.2 | 109 | 7.80 | 8.25 | 204 | 226 | 282 | 214 | 109 | 121 | 2.5 | 8.6 | 1.60 | 5.85 | 2.10 | 0.99 | 0.17 |
| | 23-Jun-15 | - | - | - | - | - | - | - | - | 230 | 255 | - | - | 117 | 132 | 1 | 5.3 | 1.63 | 7.54 | - | 1.86 | 0.98 |
| | 30-Jun-15 | - | - | 8.88 | 9.40 | 101 | 85.5 | 8.37 | 7.63 | 226 | 265 | 217 | 255 | 114 | 133 | 1.2 | 3.5 | 1.22 | 4.30 | 3.60 | 1.50 | 0.87 |
| | 7-Jul-15 | - | - | - | - | - | - | - | - | 223 | 240 | - | - | 117 | 126 | 1.5 | 2.8 | 0.86 | 3.16 | - | 0.71 | 0.35 |
| | 15-Jul-15 | - | - | 8.48 | 8.54 | 96.4 | 80.2 | 8.44 | 7.74 | 225 | 242 | 226 | 247 | 118 | 130 | 1.9 | 2.9 | 0.70 | 1.92 | 3.60 | 1.03 | 0.19 |
| | 4-Aug-15 | - | - | - | - | - | - | - | - | 235 | 243 | - | - | 127 | 130 | 2.3 | 2.4 | 0.76 | 2.00 | - | 1.43 | 0.68 |
| | 8-Sep-15 | 17.6 | 14.9 | 8.30 | 6.41 | - | - | 8.51 | 8.17 | 248 | 252 | 249 | 252 | 126 | 129 | 1.8 | 2.4 | 0.94 | 1.48 | 3.70 | 1.80 | 0.94 |
| | 6-Oct-15 | 15.2 | 13.1 | 8.85 | 7.35 | 88.4 | 70.7 | 8.36 | 8.15 | 259 | 270 | 257 | 266 | 134 | 139 | 1.1 | 1.8 | 0.81 | 1.11 | 3.90 | 1.55 | 1.03 |
| | 3-Nov-15 | - | - | 9.43 | 9.40 | 88.7 | 86.7 | 8.41 | 8.40 | 267 | 273 | 264 | 272 | 138 | 144 | 1.3 | 3.0 | 1.04 | 1.93 | 3.00 | 1.87 | 1.49 |
| | 1-Dec-15 | - | - | 9.45 | 9.73 | 78.7 | 79.3 | 8.15 | 8.19 | 266 | 276 | 271 | 278 | 138 | 142 | < 1 | 1.3 | 0.85 | 0.83 | 4.00 | 0.90 | 1.18 |
| 2016 | 5-Apr-16 | 6.90 | 6.65 | 10.7 | 10.0 | 88.1 | 81.8 | 8.23 | 8.09 | 328 | 355 | 318 | 344 | 167 | 181 | 2.2 | 4.7 | 2.23 | 4.74 | 2.20 | 2.63 | 1.85 |
| | 12-Apr-16 | 10.0 | 6.50 | 10.1 | 10.2 | 88.1 | 84.3 | 7.96 | 7.99 | 295 | 328 | 301 | 338 | 166 | 183 | 9.8 | 3.4 | 11.6 | 3.43 | 0.50 | 1.22 | 0.94 |
| | 19-Apr-16 | 9.20 | 7.75 | 9.93 | 9.42 | 87.0 | 80.9 | 8.03 | 7.53 | 272 | 303 | 262 | 297 | 136 | 153 | 6.3 | 12.6 | 8.85 | 15.3 | 1.25 | 1.74 | 0.59 |
| | 26-Apr-16 | 10.8 | 8.95 | 10.3 | 11.2 | 94.3 | 97.6 | 7.99 | 7.54 | 247 | 215 | 239 | 207 | 128 | 113 | 10 | 40.4 | 13.4 | 44.8 | 1.00 | 2.57 | 0.93 |
| | 3-May-16 | 9.90 | 8.25 | 10.3 | 10.3 | 90.6 | 87.6 | 8.13 | 7.51 | 226 | 257 | 223 | 259 | 119 | 135 | 3.7 | 16.6 | 6.09 | 16.8 | 1.90 | 2.37 | 0.42 |
| | 10-May-16 | 11.3 | 9.75 | 10.9 | 10.5 | 99.4 | 92.7 | 8.12 | 7.82 | 200 | 245 | 205 | 244 | 112 | 136 | 12.9 | 13.2 | 15.4 | 14.3 | 0.60 | 0.50 | 0.44 |
| | 17-May-16 | 12.1 | 9.45 | 9.34 | 10.3 | 86.8 | 91.2 | 8.07 | 6.99 | 211 | 218 | 213 | 224 | 115 | 118 | 6 | 15.1 | 5.92 | 15.1 | 1.30 | 2.46 | 0.26 |
| | 24-May-16 | 12.2 | 11.3 | 9.35 | 10.5 | 90.2 | 96.3 | 7.86 | 8.21 | 219 | 207 | 220 | 208 | 113 | 106 | 5.7 | 16.0 | 5.04 | 13.5 | 1.30 | 2.12 | 0.79 |
| | 31-May-16 | 13.4 | 11.3 | 9.84 | 9.86 | 95.6 | 94.1 | 8.09 | 8.14 | 219 | 214 | 218 | 212 | 114 | 110 | < 1 | 8.9 | 1.34 | 6.91 | 3.90 | 1.04 | 0.64 |
| | 7-Jun-16 | 14.1 | 14.0 | 10.1 | 10.0 | 97.8 | 98.1 | 8.12 | 8.13 | 210 | 231 | 178 | 178 | 113 | 123 | 3.6 | 11.4 | 1.10 | 8.72 | 0.80 | 3.84 | 0.52 |
| | 16-Jun-16 | 15.6 | 13.6 | 9.37 | 9.37 | 94.3 | 90.6 | 8.16 | 8.15 | 213 | 200 | 215 | 202 | 119 | 112 | 2.6 | 6.8 | 2.13 | 7.12 | 2.80 | 4.52 | 2.13 |
| | 21-Jun-16 | 15.5 | 11.3 | 9.71 | 9.42 | 97.5 | 93.1 | 8.22 | 7.99 | 215 | 245 | 215 | 241 | 110 | 123 | 2.9 | 4.3 | 1.73 | 4.07 | 3.30 | 3.85 | 1.74 |
| | 28-Jun-16 | 16.3 | 12.0 | 9.63 | 10.3 | 100 | 101 | 8.14 | 8.05 | 203 | 237 | 216 | 244 | 114 | 123 | 2.1 | 3.4 | 1.84 | 3.61 | 3.25 | 3.46 | 1.45 |
| | 5-Jul-16 | 17.4 | 14.2 | 9.17 | 9.06 | 95.6 | 88.3 | 8.51 | 7.75 | 213 | 224 | 216 | 230 | 114 | 118 | 2.6 | 2.3 | 2.07 | 2.68 | 2.80 | 2.78 | 1.57 |
| | 12-Jul-16 | 18.1 | 12.5 | 9.22 | 9.37 | 97.7 | 96.6 | 7.93 | 7.99 | 215 | 245 | 218 | 245 | 118 | 131 | 1.9 | 2.2 | 1.09 | 2.55 | 3.35 | 1.58 | 0.44 |
| | 2-Aug-16 | 21.5 | 12.7 | 8.52 | 8.57 | 98.1 | 97.6 | 8.04 | 7.84 | 219 | 249 | 222 | 252 | 111 | 128 | 1.7 | 2.2 | 2.50 | 3.13 | 2.60 | 1.74 | 0.57 |
| | 7-Sep-16 | 18.4 | 17.5 | 8.57 | 8.31 | 91.5 | 86.8 | 8.40 | 8.29 | 238 | 254 | 243 | 274 | 118 | 124 | < 1 | 1.9 | 0.85 | 1.28 | 3.50 | 1.94 | 0.64 |
| | 11-Oct-16 | 14.5 | 12.9 | 8.46 | 8.71 | 86.1 | 89.5 | 7.88 | 8.02 | 249 | 255 | 255 | 261 | 123 | 127 | 1.5 | 2.2 | 0.71 | 1.19 | 3.20 | 1.18 | 0.87 |
| | 1-Nov-16 | 12.2 | 11.7 | 8.71 | 8.73 | 81.5 | 81.8 | 8.08 | 7.32 | 231 | 234 | 259 | 259 | 128 | 122 | 1 | 1.7 | 0.94 | 1.32 | 4.10 | 1.27 | 1.32 |
| | 6-Dec-16 | 7.80 | 6.45 | 10.4 | 10.4 | 86.3 | 84.7 | 7.98 | 6.85 | 255 | 260 | 254 | 258 | 130 | 133 | 1.4 | 1.6 | 1.10 | 1.58 | 4.00 | 0.18 | 1.35 |

## Table B.9: Selected Water Quality Data for the RG_BORDER Water Quality Monitoring Station in Koocanusa Reservoir, 2014 to 2016

| Date | | Total Phosphorus | | Ortho-phosphate | | Dissolved Cadmium (Cd) | | Nitrate-Nitrogen ($NO_3$) | | Nitrite-Nitrogen ($NO_2$) | | Ammonia-Nitrogen ($NH_3$) | | Total Kjeldahl Nitrogen | | Total Selenium (Se) | | Sulphate ($SO_4$) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom | Surface | Average of Middle and Bottom |
| | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | | mg/L | |
| 2014 | 16-Apr-14 | 0.016 | 0.014 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.31 | 0.34 | - | - | - | - | - | - | 1.37 | 1.52 | 35.5 | 39.0 |
| | 30-Apr-14 | 0.015 | 0.024 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.41 | 0.44 | - | - | - | - | - | - | 1.37 | 2.08 | 37.1 | 37.4 |
| | 7-May-14 | 0.051 | 0.054 | 0.0022 | 0.0027 | 0.000014 | < 0.000010 | 0.44 | 0.42 | - | - | - | - | - | - | 1.87 | 1.77 | 30.7 | 28.8 |
| | 14-May-14 | 0.018 | 0.024 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.37 | 0.42 | - | - | - | - | - | - | 1.39 | 1.65 | 25.2 | 27.6 |
| | 21-May-14 | 0.029 | 0.081 | 0.0014 | 0.0032 | < 0.000010 | < 0.000010 | 0.34 | 0.36 | - | - | - | - | - | - | 1.38 | 1.02 | 24.0 | 16.3 |
| | 28-May-14 | 0.017 | 0.078 | < 0.0010 | 0.0021 | < 0.000010 | < 0.000010 | 0.30 | 0.32 | - | - | - | - | - | - | 1.34 | 0.93 | 22.8 | 13.2 |
| | 4-Jun-14 | 0.013 | 0.027 | < 0.0010 | 0.0020 | 0.000012 | < 0.000010 | 0.28 | 0.38 | - | - | - | - | - | - | 1.13 | 1.33 | 20.0 | 17.0 |
| | 11-Jun-14 | 0.013 | 0.023 | < 0.0010 | 0.0013 | < 0.000010 | < 0.000010 | 0.25 | 0.28 | - | - | - | - | - | - | 1.17 | 0.93 | 19.9 | 15.2 |
| | 18-Jun-14 | 0.0099 | 0.016 | 0.0012 | < 0.0010 | < 0.000010 | < 0.000010 | 0.23 | 0.25 | - | - | - | - | - | - | 0.93 | 0.92 | 16.9 | 16.1 |
| | 25-Jun-14 | 0.012 | 0.017 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.20 | 0.22 | - | - | - | - | - | - | 0.94 | 0.71 | 16.8 | 15.3 |
| | 2-Jul-14 | 0.0078 | 0.011 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.18 | 0.20 | - | - | - | - | - | - | 0.87 | 0.76 | 16.6 | 15.4 |
| | 6-Aug-14 | 0.0031 | 0.0041 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.10 | 0.22 | - | - | - | - | - | - | 0.91 | 0.95 | 18.5 | 19.3 |
| | 3-Sep-14 | 0.0036 | 0.0033 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.093 | 0.24 | - | - | - | - | - | - | 1.00 | 1.07 | 18.8 | 19.0 |
| | 8-Oct-14 | 0.0025 | 0.0034 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.13 | 0.22 | - | - | - | - | - | - | 1.03 | 1.35 | 20.9 | 25.1 |
| | 5-Nov-14 | < 0.0020 | 0.0031 | < 0.0010 | < 0.0010 | < 0.000010 | < 0.000010 | 0.16 | 0.16 | 0.0028 | 0.0027 | < 0.0050 | 0.0051 | < 0.050 | 0.11 | 1.06 | 1.12 | 23.4 | 23.9 |
| 2015 | 7-Apr-15 | 0.0061 | 0.0054 | < 0.0010 | < 0.0010 | 0.0000065 | < 0.000050 | 0.34 | 0.30 | 0.0012 | < 0.0010 | 0.0054 | 0.0052 | 0.15 | 0.13 | 1.50 | 1.38 | 29.2 | 29.4 |
| | 14-Apr-15 | 0.0051 | 0.0059 | < 0.0010 | < 0.0010 | 0.0000057 | 0.0000058 | 0.30 | 0.32 | 0.0011 | 0.0013 | < 0.0050 | 0.0083 | 0.17 | 0.096 | 1.34 | 1.45 | 29.0 | 29.3 |
| | 21-Apr-15 | 0.0054 | 0.0072 | < 0.0010 | < 0.0010 | 0.0000066 | < 0.000050 | 0.35 | 0.30 | 0.0017 | 0.0012 | < 0.0050 | 0.0084 | 0.13 | 0.13 | 1.80 | 1.37 | 32.4 | 28.8 |
| | 27-Apr-15 | 0.0058 | 0.0068 | < 0.0010 | < 0.0010 | 0.0000054 | < 0.000050 | 0.35 | 0.33 | 0.0013 | 0.0013 | < 0.0050 | 0.0079 | 0.12 | 0.090 | 1.81 | 1.54 | 34.6 | 30.1 |
| | 5-May-15 | 0.0065 | 0.0051 | < 0.0010 | < 0.0010 | 0.0000052 | 0.000028 | 0.28 | 0.42 | 0.0013 | 0.0015 | < 0.0050 | 0.0099 | 0.20 | 0.15 | 1.36 | 2.08 | 31.2 | 32.2 |
| | 12-May-15 | 0.0059 | 0.0051 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.000050 | 0.33 | 0.32 | < 0.0010 | 0.0014 | < 0.0050 | 0.013 | 0.36 | 0.15 | 1.23 | 1.57 | 26.4 | 29.2 |
| | 19-May-15 | 0.0047 | 0.0047 | < 0.0010 | < 0.0010 | 0.0000057 | 0.000029 | 0.36 | 0.31 | 0.0013 | 0.0017 | 0.0051 | 0.014 | 0.12 | 0.14 | 1.40 | 1.47 | 24.6 | 28.1 |
| | 26-May-15 | 0.0057 | 0.0063 | < 0.0010 | < 0.0010 | < 0.0000050 | < 0.000050 | 0.30 | 0.38 | 0.0014 | 0.0018 | < 0.0050 | 0.011 | 0.096 | 0.10 | 1.00 | 1.49 | 19.8 | 24.3 |
| | 2-Jun-15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9-Jun-15 | 0.0046 | 0.016 | < 0.0010 | 0.0012 | < 0.000050 | 0.000028 | 0.21 | 0.30 | 0.0021 | 0.0030 | < 0.0050 | 0.0074 | 0.11 | 0.10 | 0.96 | 0.94 | 19.8 | 19.3 |
| | 16-Jun-15 | 0.0042 | 0.0092 | < 0.0010 | < 0.0010 | < 0.000050 | 0.000029 | 0.21 | 0.28 | 0.0018 | 0.0030 | < 0.0050 | 0.0070 | 0.13 | 0.091 | 0.90 | 0.95 | 18.0 | 21.8 |
| | 23-Jun-15 | 0.0030 | 0.0046 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.20 | 0.28 | 0.0016 | < 0.0010 | < 0.0050 | 0.0052 | 0.097 | 0.10 | 0.94 | 1.07 | 17.6 | 22.4 |
| | 30-Jun-15 | 0.0027 | 0.0046 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.17 | 0.30 | 0.0019 | 0.0013 | < 0.0050 | 0.0054 | 0.12 | 0.099 | 0.93 | 1.15 | 17.8 | 24.4 |
| | 7-Jul-15 | 0.0032 | 0.0058 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.16 | 0.29 | 0.0016 | 0.0017 | 0.0057 | 0.0056 | 0.13 | 0.12 | 0.86 | 1.04 | 17.2 | 20.1 |
| | 15-Jul-15 | 0.0027 | < 0.0020 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.16 | 0.28 | 0.0022 | 0.0020 | < 0.0050 | 0.0080 | 0.071 | 0.17 | 0.90 | 0.94 | 19.7 | 23.2 |
| | 4-Aug-15 | 0.0068 | 0.0046 | < 0.0010 | < 0.0010 | 0.0000079 | 0.0000080 | 0.20 | 0.35 | 0.0027 | 0.0024 | 0.0094 | 0.015 | 0.22 | 0.17 | 1.01 | 1.09 | 23.1 | 21.6 |
| | 8-Sep-15 | 0.0027 | 0.0041 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.15 | 0.26 | 0.0023 | 0.0026 | < 0.0050 | 0.0068 | 0.088 | 0.11 | 1.07 | 1.16 | 24.3 | 23.8 |
| | 6-Oct-15 | 0.0024 | 0.0036 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.16 | 0.26 | 0.0024 | 0.0026 | 0.0053 | 0.0065 | 0.13 | 0.093 | 1.17 | 1.24 | 25.9 | 26.6 |
| | 3-Nov-15 | < 0.0020 | 0.0032 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.19 | 0.19 | 0.0027 | 0.0024 | < 0.0050 | 0.0066 | 0.11 | 0.13 | 1.06 | 1.06 | 27.4 | 29.8 |
| | 1-Dec-15 | 0.0033 | 0.0080 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.22 | 0.23 | 0.0033 | 0.0027 | < 0.0050 | 0.0064 | 0.097 | 0.15 | 1.22 | 1.27 | 28.6 | 30.0 |
| 2016 | 5-Apr-16 | 0.012 | 0.010 | < 0.0010 | < 0.0010 | < 0.000050 | 0.000029 | 0.28 | 0.33 | 0.0014 | 0.0017 | < 0.0050 | 0.0084 | 0.10 | 0.14 | 1.36 | 1.43 | 34.5 | 38.9 |
| | 12-Apr-16 | 0.014 | 0.0053 | < 0.0010 | < 0.0010 | 0.0000069 | 0.000029 | 0.39 | 0.32 | 0.0016 | 0.0020 | < 0.0050 | 0.012 | 0.19 | 0.15 | 1.58 | 1.45 | 33.2 | 37.6 |
| | 19-Apr-16 | 0.010 | 0.014 | < 0.0010 | 0.0012 | < 0.000050 | 0.000028 | 0.30 | 0.33 | 0.0012 | 0.0018 | < 0.0050 | 0.017 | 0.14 | 0.15 | 1.01 | 1.24 | 25.4 | 30.4 |
| | 26-Apr-16 | 0.013 | 0.026 | < 0.0010 | 0.0015 | < 0.000050 | < 0.000050 | 0.31 | 0.31 | 0.0015 | 0.0011 | < 0.0050 | 0.011 | 0.14 | 0.16 | 0.92 | 0.71 | 21.9 | 16.1 |
| | 3-May-16 | 0.0069 | 0.013 | 0.0011 | 0.0019 | < 0.000050 | < 0.000050 | 0.28 | 0.34 | < 0.0010 | 0.0018 | < 0.0050 | 0.012 | 0.095 | 0.090 | 0.73 | 1.00 | 18.0 | 23.4 |
| | 10-May-16 | 0.020 | 0.015 | < 0.0010 | 0.0011 | < 0.000050 | < 0.000050 | 0.27 | 0.34 | < 0.0010 | 0.0017 | < 0.0050 | 0.011 | 0.072 | 0.073 | 0.67 | 1.12 | 16.1 | 22.9 |
| | 17-May-16 | 0.0059 | 0.013 | < 0.0010 | 0.0013 | < 0.000050 | < 0.000050 | 0.27 | 0.33 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0056 | 0.077 | 0.065 | 0.82 | 1.03 | 17.4 | 19.2 |
| | 24-May-16 | 0.0037 | 0.0076 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.25 | 0.24 | 0.0011 | < 0.0010 | < 0.0050 | < 0.0050 | 0.072 | 0.070 | 0.81 | 0.67 | 19.5 | 18.7 |
| | 31-May-16 | 0.014 | 0.0085 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.23 | 0.24 | 0.0011 | < 0.0010 | < 0.0050 | < 0.0050 | 0.085 | 0.083 | 0.73 | 0.77 | 18.8 | 17.8 |
| | 7-Jun-16 | 0.0047 | 0.0087 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.21 | 0.26 | 0.0010 | 0.0034 | 0.0053 | 0.0079 | 0.099 | 0.12 | 0.79 | 0.85 | 18.4 | 21.5 |
| | 16-Jun-16 | 0.0070 | 0.010 | < 0.0010 | < 0.0010 | < 0.000050 | 0.000028 | 0.17 | 0.20 | 0.0015 | 0.0013 | 0.0052 | 0.0058 | 0.22 | 0.096 | 0.78 | 0.73 | 17.7 | 16.7 |
| | 21-Jun-16 | 0.0056 | 0.0070 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.17 | 0.26 | < 0.0010 | < 0.0010 | < 0.0050 | 0.0062 | 0.11 | 0.087 | 0.78 | 0.91 | 17.6 | 22.0 |
| | 28-Jun-16 | 0.0081 | 0.0048 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.17 | 0.24 | 0.0014 | 0.0015 | < 0.0050 | < 0.0050 | 0.090 | 0.076 | 0.71 | 0.84 | 18.2 | 21.7 |
| | 5-Jul-16 | 0.0047 | 0.0055 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.15 | 0.20 | 0.0012 | 0.0013 | < 0.0050 | 0.0063 | 0.098 | 0.089 | 0.77 | 0.75 | 18.1 | 20.6 |
| | 12-Jul-16 | 0.0031 | 0.0061 | < 0.0010 | 0.0011 | < 0.000050 | < 0.000050 | 0.14 | 0.28 | 0.0013 | 0.0016 | < 0.0050 | 0.011 | 0.052 | 0.084 | 0.76 | 0.94 | 18.1 | 23.6 |
| | 2-Aug-16 | < 0.0020 | 0.0035 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.10 | 0.22 | 0.0015 | 0.0018 | < 0.0050 | 0.0081 | 0.095 | 0.055 | 0.84 | 0.76 | 18.7 | 23.8 |
| | 7-Sep-16 | 0.0030 | 0.0065 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.14 | 0.28 | 0.0018 | 0.0040 | < 0.0050 | 0.0062 | 0.13 | 0.071 | 0.87 | 0.87 | 23.0 | 25.5 |
| | 11-Oct-16 | 0.0025 | 0.0036 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.16 | 0.24 | 0.0022 | 0.0015 | < 0.0050 | < 0.0050 | 0.11 | 0.066 | 0.99 | 1.00 | 25.8 | 26.4 |
| | 1-Nov-16 | 0.0031 | 0.0033 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.19 | 0.19 | 0.0028 | 0.0031 | < 0.0050 | < 0.0050 | 0.090 | 0.090 | 0.93 | 0.90 | 26.7 | 26.8 |
| | 6-Dec-16 | 0.0022 | 0.0027 | < 0.0010 | < 0.0010 | < 0.000050 | < 0.000050 | 0.19 | 0.20 | 0.0037 | 0.0034 | < 0.0050 | 0.0070 | 0.092 | 0.084 | 1.00 | 0.97 | 24.8 | 25.2 |

## Table B.10: Selected Water Quality Data for the Elk River (RG_ELKMOUTH) Water Quality Monitoring Station, 2014 to 2016

| Date | | Temperature (Field) | Dissolved Oxygen | pH (Field) | Conductivity (Field) | Specific Conductivity (25 °C) | Total Hardness ($CaCO_3$) | Turbidity (Lab) | Total Phosphorus | Ortho-phosphate | Dissolved Cadmium (Cd) | Nitrate-Nitrogen ($NO_3$) | Total Selenium (Se) | Sulphate ($SO_4$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | °C | mg/L | - | µS/cm | µS/cm | mg/L | NTU | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| 2014 | 7-Jan-14 | - | - | - | - | - | 255 | 1.8 | 0.0051 | 0.0019 | < 0.01 | 1.7 | 7.6 | 59 |
| | 4-Feb-14 | - | - | - | - | - | 266 | 1.3 | 0.0022 | 0.0038 | < 0.01 | 1.7 | 8.0 | 66 |
| | 4-Mar-14 | - | - | - | - | - | 225 | 1.7 | 0.0053 | < 0.001 | < 0.01 | 1.6 | 7.4 | 62 |
| | 1-Apr-14 | - | - | - | - | - | 227 | 7.8 | 0.018 | 0.0022 | < 0.01 | 1.4 | 6.2 | 50 |
| | 15-Apr-14 | - | - | - | - | - | 201 | 7.7 | 0.022 | < 0.001 | 0.027 | 1.3 | 5.8 | 44 |
| | 22-Apr-14 | - | - | - | - | - | 200 | 10 | 0.030 | 0.0019 | < 0.01 | 1.2 | 5.6 | 43 |
| | 29-Apr-14 | - | - | - | - | - | 198 | 6.8 | 0.054 | 0.0015 | 0.011 | 1.3 | 6.6 | 48 |
| | 13-May-14 | - | - | - | - | - | 181 | 7.8 | 0.016 | 0.0011 | 0.012 | 1.1 | 5.5 | 38 |
| | 20-May-14 | - | - | - | - | - | 146 | 112 | 0.26 | 0.0046 | 0.017 | 0.78 | 3.6 | 24 |
| | 27-May-14 | - | - | - | - | - | 133 | 229 | 0.12 | 0.0069 | < 0.01 | 0.75 | 3.2 | 19 |
| | 3-Jun-14 | - | - | - | - | - | 131 | 108 | 0.20 | 0.0060 | 0.012 | 0.83 | 3.5 | 20 |
| | 10-Jun-14 | - | - | - | - | - | 135 | 60 | 0.17 | 0.0050 | 0.010 | 0.77 | 3.2 | 20 |
| | 17-Jun-14 | - | - | - | - | - | 139 | 28 | 0.073 | 0.0032 | < 0.01 | 0.76 | 3.4 | 22 |
| | 24-Jun-14 | - | - | - | - | - | 142 | 46 | 0.11 | 0.0046 | 0.011 | 0.71 | 3.3 | 21 |
| | 1-Jul-14 | - | - | - | - | - | 148 | 16 | 0.041 | 0.0031 | 0.014 | 0.76 | 3.4 | 23 |
| | 5-Aug-14 | - | - | - | - | - | 197 | 1.1 | 0.0036 | < 0.001 | < 0.01 | 1.0 | 5.2 | 40 |
| | 2-Sep-14 | - | - | - | - | - | 216 | 1.8 | 0.0033 | < 0.001 | < 0.01 | 1.3 | 6.5 | 49 |
| | 7-Oct-14 | 10 | 8.9 | 8.4 | 275 | 383 | 220 | 0.93 | < 0.002 | < 0.001 | < 0.01 | 1.4 | 6.8 | 54 |
| | 4-Nov-14 | 6.0 | 11 | 8.4 | 238 | 373 | 212 | 1.3 | 0.0025 | < 0.001 | < 0.01 | 1.3 | 6.4 | 50 |
| | 2-Dec-14 | -0.1 | 13 | 8.0 | 157 | 302 | 197 | 3.8 | 0.010 | 0.0046 | 0.011 | 0.86 | 4.0 | 37 |
| **n** | | **3.0** | **3.0** | **3.0** | **3.0** | **3.0** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** |
| **minimum** | | **-0.1** | **8.9** | **8.0** | **157** | **302** | **137** | **0.93** | **0.0020** | **0.001** | **0.010** | **0.76** | **3.3** | **21** |
| **median** | | **6.0** | **11** | **8.4** | **238** | **373** | **209** | **1.8** | **0.0052** | **0.0018** | **0.010** | **1.3** | **6.2** | **48** |
| **maximum** | | **10** | **13** | **8.4** | **275** | **383** | **266** | **116** | **0.14** | **0.0047** | **0.015** | **1.7** | **8.0** | **66** |
| **mean** | | **5.4** | **11** | **8.3** | **223** | **353** | **203** | **18** | **0.031** | **0.0024** | **0.011** | **1.2** | **5.7** | **45** |
| **standard deviation** | | **5.2** | **2.3** | **0.25** | **60** | **44** | **40** | **35** | **0.050** | **0.0016** | **0.0017** | **0.37** | **1.7** | **15** |
| 2015 | 6-Jan-15 | 0 | 15 | 8.2 | 200 | 382 | 209 | 2.7 | 0.0057 | 0.0015 | < 0.01 | 1.1 | 5.7 | 48 |
| | 3-Feb-15 | 1.1 | 13 | 8.2 | 205 | 378 | 213 | 0.89 | 0.0065 | < 0.001 | < 0.01 | 1.1 | 6.0 | 50 |
| | 3-Mar-15 | 0 | 14 | 8.3 | 209 | 401 | 204 | 0.81 | 0.0034 | < 0.001 | < 0.01 | 0.92 | 5.3 | 46 |
| | 17-Mar-15 | - | 13 | 8.3 | - | 273 | 140 | 28 | 0.039 | 0.0041 | 0.012 | 0.56 | 2.9 | 24 |
| | 24-Mar-15 | - | 13 | 8.4 | - | 325 | 169 | 7.9 | 0.020 | 0.0019 | 0.011 | 0.83 | 4.1 | 33 |
| | 1-Apr-15 | - | 13 | 8.3 | - | 312 | 171 | 11 | 0.026 | 0.0023 | 0.011 | 0.86 | 4.3 | 33 |
| | 7-Apr-15 | - | 13 | 8.6 | 208 | 347 | 184 | 3.5 | 0.0029 | < 0.001 | 0.0097 | 1.1 | 5.6 | 41 |
| | 14-Apr-15 | - | 12 | 8.7 | - | 364 | 193 | 2.0 | 0.0041 | < 0.001 | 0.012 | 1.0 | 5.8 | 44 |
| | 21-Apr-15 | - | 11 | 8.6 | 224 | 324 | 176 | 3.0 | 0.0066 | < 0.001 | 0.013 | 0.99 | 5.5 | 39 |
| | 27-Apr-15 | - | 12 | 8.5 | 224 | 332 | 166 | 1.8 | 0.0065 | < 0.001 | 0.011 | 1.0 | 5.8 | 40 |
| | 5-May-15 | - | 11 | 8.5 | 280 | 192 | 148 | 7.7 | 0.012 | < 0.001 | 0.012 | 0.79 | 4.4 | 30 |
| | 12-May-15 | - | 12 | 8.5 | 305 | 201 | 161 | 2.5 | 0.0092 | < 0.001 | 0.010 | 0.98 | 5.0 | 34 |
| | 19-May-15 | - | 11 | 8.6 | 270 | 189 | 152 | 3.9 | 0.0098 | < 0.001 | 0.010 | 0.84 | 4.3 | 29 |
| | 26-May-15 | - | 11 | 8.3 | 244 | 170 | 142 | 40 | 0.085 | < 0.001 | 0.0081 | 0.79 | 3.4 | 24 |
| | 2-Jun-15 | - | 11 | 8.4 | 165 | 235 | 139 | 47 | 0.084 | 0.0017 | 0.011 | 0.71 | 2.9 | 22 |
| | 9-Jun-15 | - | 10 | 8.4 | 182 | 239 | 149 | 12 | 0.056 | 0.0028 | 0.0094 | 0.78 | 3.1 | 24 |
| | 16-Jun-15 | - | 11 | 8.5 | 223 | 298 | 174 | 2.4 | 0.015 | 0.0018 | 0.0099 | 1.1 | 4.1 | 34 |
| | 23-Jun-15 | - | 10 | 8.5 | 245 | 316 | 189 | 5.1 | 0.035 | < 0.001 | 0.0068 | 1.1 | 5.3 | 37 |
| | 30-Jun-15 | - | 9.9 | 8.5 | 256 | 319 | 184 | 1.6 | 0.0066 | < 0.001 | 0.013 | 1.1 | 6.2 | 39 |
| | 7-Jul-15 | - | - | - | - | - | 196 | 1.2 | 0.0046 | < 0.001 | 0.0092 | 1.2 | 5.5 | 41 |
| | 15-Jul-15 | - | 11 | 8.6 | 277 | 342 | 209 | 2.3 | 0.0069 | < 0.001 | 0.0071 | 1.2 | 6.1 | 45 |
| | 21-Jul-15 | - | 10 | 8.5 | - | 375 | 215 | 0.81 | 0.0039 | < 0.001 | 0.0064 | 1.3 | 6.3 | 47 |
| | 28-Jul-15 | - | 10 | 8.6 | 274 | 348 | 202 | 1.2 | 0.0029 | 0.0011 | 0.0067 | 1.4 | 6.4 | 51 |
| | 4-Aug-15 | - | 9.5 | 8.6 | 308 | 361 | 209 | 0.59 | 0.0022 | < 0.001 | 0.0077 | 1.4 | 6.7 | 53 |
| | 8-Sep-15 | - | 11 | 8.5 | 271 | 383 | 230 | 0.42 | < 0.002 | < 0.001 | 0.0081 | 1.6 | 7.3 | 59 |
| | 6-Oct-15 | - | 11 | 8.6 | 273 | 394 | 224 | 0.42 | < 0.002 | 0.0014 | 0.0079 | 1.7 | 7.6 | 63 |
| | 3-Nov-15 | - | 12 | 8.5 | 229 | 366 | 224 | 2.5 | 0.0043 | < 0.001 | 0.010 | 1.4 | 5.7 | 55 |
| | 1-Dec-15 | - | 14 | 8.5 | 218 | 418 | 244 | 0.98 | 0.0047 | < 0.001 | 0.0074 | 1.4 | 6.2 | 61 |
| **n** | | **3.0** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** |
| **minimum** | | **0** | **9.5** | **8.2** | **200** | **188** | **151** | **0.42** | **0.0020** | **0.0010** | **0.0074** | **0.77** | **4.1** | **29** |
| **median** | | **0** | **12** | **8.5** | **224** | **364** | **209** | **1.9** | **0.0052** | **0.0010** | **0.010** | **1.2** | **5.9** | **49** |
| **maximum** | | **1.1** | **15** | **8.6** | **308** | **418** | **244** | **14** | **0.039** | **0.0023** | **0.011** | **1.7** | **7.6** | **63** |
| **mean** | | **0.37** | **12** | **8.5** | **241** | **348** | **202** | **4.4** | **0.011** | **0.0013** | **0.0092** | **1.2** | **5.8** | **47** |
| **standard deviation** | | **0.64** | **1.6** | **0.14** | **36** | **61** | **29** | **5.3** | **0.012** | **0.00041** | **0.0014** | **0.30** | **1.1** | **12** |
| 2016 | 7-Jan-16 | - | 16 | 8.4 | - | 434 | 236 | 1.1 | 0.0039 | 0.0010 | 0.0073 | 1.5 | 6.8 | 63 |
| | 2-Feb-16 | - | 11 | 8.5 | - | 418 | 231 | 1.4 | 0.0068 | 0.0010 | 0.012 | 1.3 | 5.5 | 56 |
| | 3-Mar-16 | 4.1 | 11 | 8.4 | - | 404 | 221 | 2.5 | 0.0081 | 0.0010 | 0.0093 | 1.2 | 5.2 | 52 |
| | 15-Mar-16 | 3.6 | 12 | 8.4 | - | 374 | 206 | 3.4 | 0.0085 | 0.0011 | 0.0084 | 0.94 | 4.3 | 43 |
| | 22-Mar-16 | 5.0 | 11 | 8.5 | - | 390 | 220 | 2.5 | 0.0061 | 0.0017 | 0.011 | 1.1 | 5.1 | 48 |
| | 29-Mar-16 | 5.0 | 13 | 8.5 | - | 391 | 216 | 2.3 | 0.0077 | 0.0010 | 0.0084 | 1.1 | 5.2 | 50 |
| | 5-Apr-16 | 4.9 | 12 | 8.4 | - | 268 | 161 | 22 | 0.062 | 0.0015 | 0.0098 | 0.85 | 3.5 | 35 |
| | 12-Apr-16 | 6.2 | 12 | 8.3 | - | 251 | 159 | 20 | 0.038 | 0.0045 | 0.014 | 0.93 | 3.8 | 32 |
| | 19-Apr-16 | 6.8 | 12 | 8.4 | - | 253 | 156 | 13 | 0.025 | 0.0021 | 0.013 | 0.88 | 3.7 | 32 |
| | 26-Apr-16 | 6.7 | 12 | 8.3 | - | 229 | 145 | 31 | 0.067 | 0.0050 | 0.015 | 0.73 | 3.3 | 26 |
| | 3-May-16 | 8.2 | 11 | 8.4 | - | 247 | 155 | 8.7 | 0.017 | 0.0029 | 0.012 | 0.86 | 3.7 | 30 |
| | 10-May-16 | 6.3 | 11 | 7.8 | - | 227 | 146 | 21 | 0.040 | 0.0038 | 0.012 | 0.71 | 2.7 | 25 |
| | 17-May-16 | 9.0 | 10 | 8.4 | - | 260 | 164 | 2.2 | 0.014 | 0.0013 | 0.0095 | 0.92 | 4.2 | 33 |
| | 24-May-16 | 7.6 | 12 | 8.4 | - | 225 | 136 | 7.7 | 0.020 | 0.0017 | 0.0094 | 0.65 | 2.8 | 25 |
| | 31-May-16 | 9.0 | 12 | 8.4 | - | 239 | 150 | 3.1 | 0.010 | 0.0010 | 0.010 | 0.68 | 3.1 | 27 |
| | 7-Jun-16 | 12 | 11 | 8.4 | - | 216 | 141 | 7.2 | 0.018 | 0.0015 | 0.011 | 0.62 | 2.7 | 24 |
| | 14-Jun-16 | 9.9 | 11 | 8.5 | - | 136 | 167 | 2.1 | 0.0069 | 0.0016 | 0.0080 | 0.84 | 3.6 | 33 |
| | 21-Jun-16 | 11 | 10 | 8.5 | - | 278 | 174 | 1.7 | 0.0073 | 0.0010 | 0.0082 | 0.91 | 4.2 | 36 |
| | 28-Jun-16 | 14 | 10 | 8.5 | - | 281 | 177 | 1.0 | 0.0048 | 0.0010 | < 0.005 | 0.92 | 4.1 | 37 |
| | 5-Jul-16 | 12 | 11 | 8.6 | - | 291 | 181 | 1.2 | 0.0061 | 0.0010 | 0.0087 | 0.99 | 4.0 | 39 |
| | 12-Jul-16 | 14 | 11 | 8.5 | - | 302 | 192 | 1.0 | 0.0044 | 0.0010 | 0.0077 | 1.1 | 4.3 | 42 |
| | 26-Jul-16 | 15 | 10 | 8.5 | - | 367 | 187 | 3.5 | 0.0097 | 0.0010 | 0.0073 | 1.4 | 5.7 | 48 |
| | 26-Jul-16 | 15 | 10 | 8.4 | - | 364 | 191 | 1.6 | 0.0039 | 0.0010 | 0.0060 | 1.2 | 5.2 | 46 |
| | 2-Aug-16 | 15 | 10 | 8.6 | - | 323 | 211 | 1.2 | 0.0043 | 0.0010 | 0.0079 | 1.2 | 5.6 | 48 |
| | 6-Sep-16 | 12 | 11 | 8.5 | - | 348 | 220 | 0.38 | 0.0030 | 0.0010 | < 0.005 | 1.5 | 6.2 | 58 |
| | 11-Oct-16 | 5.0 | 12 | 6.2 | - | 264 | 166 | 4.0 | 0.0072 | 0.0010 | 0.0092 | 0.92 | 4.1 | 41 |
| | 1-Nov-16 | 6.0 | 12 | 8.1 | 291 | - | 145 | 7.0 | 0.010 | 0.0014 | 0.0085 | 0.60 | 2.7 | 27 |
| | 6-Dec-16 | 0.10 | 14 | 8.3 | - | 342 | 200 | 0.69 | 0.014 | 0.0010 | 0.0071 | 1.0 | 4.7 | 45 |
| **n** | | **10** | **12** | **12** | **1.0** | **11** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** |
| **minimum** | | **0.10** | **10** | **6.2** | **291** | **228** | **145** | **0.38** | **0.0030** | **0.0010** | **0.0050** | **0.60** | **2.7** | **27** |
| **median** | | **7.1** | **11** | **8.4** | **291** | **331** | **194** | **2.2** | **0.0074** | **0.0010** | **0.0083** | **1.1** | **4.8** | **45** |
| **maximum** | | **15** | **16** | **8.6** | **291** | **434** | **236** | **21** | **0.048** | **0.0033** | **0.013** | **1.5** | **6.8** | **63** |
| **mean** | | **8.2** | **12** | **8.2** | **291** | **324** | **190** | **4.4** | **0.012** | **0.0014** | **0.0087** | **1.1** | **4.7** | **44** |
| **standard deviation** | | **4.7** | **1.6** | **0.64** | **0** | **72** | **33** | **5.9** | **0.012** | **0.00069** | **0.0021** | **0.29** | **1.2** | **12** |

Note: Annual summary statistics based on monthly means.

## Table B.11: Selected Water Quality Data for the Kootenay River (RG_WARDB) Water Quality Monitoring Station, 2014 to 2016

| Date | | Temperature (Field) | Dissolved Oxygen | | pH (Field) | Conductivity (Field) | Specific Conductivity (25 °C) | Total Hardness ($CaCO_3$) | Turbidity (Lab) | Total Phosphorus | Ortho-phosphate | Dissolved Cadmium (Cd) | Nitrate-Nitrogen ($NO_3$) | Total Selenium (Se) | Sulphate ($SO_4$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | °C | mg/L | % | - | µS/cm | µS/cm | mg/L | NTU | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| 2014 | 7-Jan-14 | - | - | - | - | - | - | 182 | 2.3 | 0.010 | 0.0028 | < 0.000010 | 0.14 | 0.13 | 44 |
| | 4-Feb-14 | - | - | - | - | - | - | 191 | 3.1 | 0.015 | 0.0039 | < 0.000010 | 0.13 | 0.14 | 49 |
| | 4-Mar-14 | - | - | - | - | - | - | 174 | 2.2 | 0.018 | 0.0039 | < 0.000010 | 0.15 | 0.11 | 53 |
| | 1-Apr-14 | - | - | - | - | - | - | 181 | 7.4 | 0.026 | 0.0044 | 0.000013 | 0.11 | 0.12 | 54 |
| | 15-Apr-14 | - | - | - | - | - | - | 143 | 4.0 | 0.018 | 0.0019 | < 0.000010 | 0.085 | < 0.10 | 45 |
| | 22-Apr-14 | - | - | - | - | - | - | 154 | 4.2 | 0.019 | 0.0013 | < 0.000010 | 0.066 | < 0.10 | 44 |
| | 29-Apr-14 | - | - | - | - | - | - | 142 | 6.2 | 0.018 | 0.0021 | 0.000011 | 0.069 | < 0.10 | 42 |
| | 6-May-14 | - | - | - | - | - | - | 105 | 25 | 0.039 | 0.0016 | 0.000036 | 0.21 | < 0.10 | 24 |
| | 13-May-14 | - | - | - | - | - | - | 123 | 17 | 0.017 | < 0.0010 | < 0.000010 | 0.15 | < 0.10 | 29 |
| | 20-May-14 | - | - | - | - | - | - | 95 | 178 | 0.25 | 0.0022 | < 0.000010 | 0.21 | 0.13 | 15 |
| | 27-May-14 | - | - | - | - | - | - | 90 | 200 | 0.022 | 0.0012 | < 0.000010 | 0.16 | 0.11 | 12 |
| | 3-Jun-14 | - | - | - | - | - | - | 91 | 101 | 0.076 | < 0.0010 | < 0.000010 | 0.14 | 0.11 | 14 |
| | 10-Jun-14 | - | - | - | - | - | - | 91 | 59 | 0.076 | < 0.0010 | < 0.000010 | 0.11 | < 0.10 | 14 |
| | 17-Jun-14 | - | - | - | - | - | - | 91 | 91 | 0.060 | < 0.0010 | < 0.000010 | 0.092 | < 0.10 | 15 |
| | 24-Jun-14 | - | - | - | - | - | - | 91 | 103 | 0.062 | < 0.0010 | < 0.000010 | 0.077 | < 0.10 | 14 |
| | 1-Jul-14 | - | - | - | - | - | - | 95 | 53 | 0.044 | 0.0013 | < 0.000010 | 0.069 | < 0.10 | 16 |
| | 5-Aug-14 | - | - | - | - | - | - | 129 | 12 | 0.013 | < 0.0010 | < 0.000010 | 0.060 | < 0.10 | 25 |
| | 2-Sep-14 | - | - | - | - | - | - | 139 | 8.3 | 0.010 | < 0.0010 | < 0.000010 | 0.056 | 0.11 | 31 |
| | 7-Oct-14 | 10 | 9.5 | 85 | 8.5 | 212 | 293 | 151 | 1.4 | 0.0044 | < 0.0010 | < 0.000010 | 0.038 | < 0.10 | 37 |
| | 4-Nov-14 | 6.4 | 9.9 | 80 | 8.3 | 171 | 265 | 133 | 2.1 | 0.0068 | < 0.0010 | < 0.000010 | 0.091 | < 0.10 | 33 |
| | 2-Dec-14 | -0.10 | 14 | 94 | 7.8 | 147 | 282 | 142 | 3.6 | 0.0084 | 0.0028 | < 0.000010 | 0.14 | < 0.10 | 33 |
| **n** | | **3.0** | **3.0** | **3.0** | **3.0** | **3.0** | **3.0** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** |
| **minimum** | | **-0.10** | **9.5** | **80** | **7.8** | **147** | **265** | **91** | **1.4** | **0.0044** | **0.0010** | **0.000010** | **0.038** | **0.10** | **14** |
| **median** | | **6.4** | **10** | **85** | **8.3** | **171** | **282** | **141** | **4.5** | **0.014** | **0.0014** | **0.000010** | **0.097** | **0.10** | **33** |
| **maximum** | | **10** | **14** | **94** | **8.5** | **212** | **293** | **191** | **105** | **0.081** | **0.0039** | **0.000017** | **0.18** | **0.14** | **53** |
| **mean** | | **5.6** | **11** | **86** | **8.2** | **177** | **280** | **140** | **24** | **0.025** | **0.0020** | **0.000011** | **0.10** | **0.11** | **34** |
| **standard deviation** | | **5.3** | **2.3** | **7.0** | **0.35** | **33** | **14** | **33** | **37** | **0.026** | **0.0011** | **0.0000019** | **0.044** | **0.013** | **13** |
| 2015 | 6-Jan-15 | 0.10 | 14 | 93 | 7.9 | 180 | 343 | 159 | 4.8 | 0.025 | 0.0094 | < 0.000010 | 0.16 | 0.12 | 46 |
| | 3-Feb-15 | 1.2 | 13 | 90 | 8.0 | 180 | 331 | 150 | 2.4 | 0.016 | 0.0037 | < 0.000010 | 0.14 | 0.12 | 45 |
| | 3-Mar-15 | 1.2 | 13 | 90 | 8.2 | 183 | 337 | 154 | 3.1 | 0.014 | 0.0042 | < 0.000010 | 0.10 | < 0.10 | 43 |
| | 7-Apr-15 | - | - | - | - | - | - | 137 | 4.4 | 0.010 | 0.0030 | 0.0000073 | 0.12 | 0.10 | 35 |
| | 7-Apr-15 | - | 12 | 95 | 8.4 | 177 | 278 | - | - | - | - | - | - | - | - |
| | 14-Apr-15 | - | 12 | 97 | 8.5 | - | 302 | 142 | 4.1 | 0.012 | 0.0029 | 0.0000061 | 0.095 | 0.081 | 39 |
| | 21-Apr-15 | - | 10 | 96 | 8.6 | 292 | 282 | 144 | 4.1 | 0.010 | < 0.0010 | 0.0000064 | 0.075 | 0.12 | 37 |
| | 27-Apr-15 | - | 11 | 99 | 8.4 | 177 | 250 | 120 | 3.9 | 0.011 | < 0.0010 | < 0.0000050 | 0.13 | 0.11 | 31 |
| | 5-May-15 | - | 11 | 97 | 8.4 | 237 | 173 | 108 | 8.5 | 0.012 | < 0.0010 | < 0.0000050 | 0.14 | 0.096 | 27 |
| | 12-May-15 | - | 10 | 95 | 8.3 | 203 | 148 | 99 | 13 | 0.017 | 0.0010 | < 0.0000050 | 0.14 | 0.061 | 21 |
| | 19-May-15 | - | 10 | 95 | 8.3 | 180 | 131 | 92 | 25 | 0.020 | < 0.0010 | < 0.0000050 | 0.15 | 0.093 | 18 |
| | 26-May-15 | - | 10 | 91 | 8.3 | 159 | 114 | 83 | 92 | 0.059 | < 0.0010 | < 0.0000050 | 0.14 | 0.075 | 13 |
| | 2-Jun-15 | - | - | - | - | - | - | 81 | 101 | 0.077 | 0.0011 | < 0.0000050 | 0.11 | 0.097 | 13 |
| | 2-Jun-15 | - | 10 | 91 | 8.3 | 98 | 136 | - | - | - | - | - | - | - | - |
| | 9-Jun-15 | - | 9.7 | 92 | 8.3 | 111 | 144 | 79 | 62 | 0.034 | 0.0014 | < 0.0000050 | 0.087 | 0.10 | 14 |
| | 16-Jun-15 | - | 9.9 | 93 | 8.2 | 145 | 192 | 103 | 5.1 | 0.015 | < 0.0010 | 0.0000050 | 0.094 | 0.087 | 21 |
| | 23-Jun-15 | - | 9.5 | 93 | 8.2 | 148 | 187 | 108 | 15 | 0.020 | 0.0010 | < 0.0000050 | 0.084 | 0.075 | 23 |
| | 30-Jun-15 | - | 8.9 | 92 | 8.2 | 155 | 184 | 96 | 22 | 0.029 | < 0.0010 | < 0.0000050 | 0.073 | 0.085 | 22 |
| | 7-Jul-15 | - | - | - | - | - | - | 118 | 6.9 | 0.011 | < 0.0010 | < 0.0000050 | 0.078 | 0.089 | 26 |
| | 15-Jul-15 | - | 9.7 | 100 | 8.3 | 176 | 209 | 122 | 17 | 0.026 | < 0.0010 | < 0.0000050 | 0.082 | 0.076 | 24 |
| | 28-Jul-15 | - | 9.7 | 96 | 8.5 | 196 | 241 | - | - | - | - | - | - | - | - |
| | 4-Aug-15 | - | 9.2 | 99 | 8.6 | 220 | 252 | 136 | 2.8 | 0.0057 | < 0.0010 | < 0.0000050 | 0.029 | 0.10 | 30 |
| | 8-Sep-15 | - | 11 | 96 | 8.5 | 183 | 252 | 142 | 2.4 | 0.0078 | < 0.0010 | 0.0000069 | 0.059 | 0.091 | 32 |
| | 6-Oct-15 | - | 11 | 101 | 8.6 | 210 | 290 | 153 | 2.2 | 0.0061 | 0.0015 | < 0.0000050 | 0.063 | 0.10 | 39 |
| | 3-Nov-15 | - | 12 | 95 | 8.6 | 181 | 285 | 158 | 2.1 | 0.0086 | 0.0016 | 0.0000060 | 0.099 | 0.11 | 39 |
| | 1-Dec-15 | - | 13 | 88 | 8.3 | 183 | 349 | 178 | 2.2 | 0.017 | 0.0020 | 0.0000080 | 0.16 | 0.14 | 48 |
| **n** | | **3.0** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** |
| **minimum** | | **0.10** | **9.2** | **88** | **7.9** | **131** | **142** | **93** | **2.1** | **0.0057** | **0.0010** | **0.0000050** | **0.029** | **0.081** | **19** |
| **median** | | **1.2** | **11** | **95** | **8.4** | **183** | **282** | **146** | **2.9** | **0.015** | **0.0016** | **0.0000061** | **0.10** | **0.10** | **37** |
| **maximum** | | **1.2** | **14** | **101** | **8.6** | **220** | **349** | **178** | **41** | **0.035** | **0.0094** | **0.000010** | **0.16** | **0.14** | **48** |
| **mean** | | **0.83** | **11** | **94** | **8.3** | **187** | **271** | **140** | **9.4** | **0.016** | **0.0025** | **0.0000068** | **0.10** | **0.10** | **35** |
| **standard deviation** | | **0.64** | **1.5** | **3.8** | **0.23** | **23** | **67** | **26** | **14** | **0.0092** | **0.0024** | **0.0000021** | **0.041** | **0.017** | **10** |
| 2016 | 7-Jan-16 | - | - | - | - | - | - | 182 | 1.2 | 0.012 | 0.0046 | < 0.0000050 | 0.16 | 0.16 | 50 |
| | 7-Jan-16 | - | 15 | 106 | 7.9 | - | 369 | - | - | - | - | - | - | - | - |
| | 2-Feb-16 | - | 12 | 85 | 8.4 | - | 344 | 167 | 2.2 | 0.017 | 0.0071 | 0.0000064 | 0.15 | 0.11 | 46 |
| | 3-Mar-16 | 4.7 | 12 | 90 | 8.3 | - | 350 | 173 | 4.2 | 0.022 | 0.0056 | < 0.0000050 | 0.11 | 0.13 | 48 |
| | 15-Mar-16 | 5.1 | 11 | 84 | 8.3 | - | 340 | 171 | 4.7 | 0.018 | 0.0049 | 0.0000066 | 0.11 | 0.11 | 44 |
| | 22-Mar-16 | - | - | - | - | - | - | 171 | 4.2 | 0.017 | 0.0044 | < 0.0000050 | 0.091 | 0.12 | 46 |
| | 22-Mar-16 | 6.4 | 10 | 85 | 8.6 | - | 350 | 172 | 3.6 | 0.018 | 0.0032 | 0.0000077 | 0.090 | 0.13 | 46 |
| | 29-Mar-16 | 6.3 | 12 | 99 | 8.4 | - | 339 | 164 | 2.7 | 0.018 | 0.0038 | < 0.0000050 | 0.091 | 0.10 | 45 |
| | 5-Apr-16 | 7.6 | 11 | 93 | 8.4 | - | 243 | 136 | 11 | 0.018 | 0.0022 | < 0.0000050 | 0.11 | 0.11 | 39 |
| | 12-Apr-16 | 8.6 | 10 | 90 | 8.2 | - | 196 | 114 | 14 | 0.020 | 0.0016 | < 0.0000050 | 0.17 | 0.088 | 26 |
| | 19-Apr-16 | 11 | 11 | 99 | 8.4 | - | 205 | 119 | 11 | 0.012 | < 0.0010 | < 0.0000050 | 0.13 | 0.080 | 28 |
| | 26-Apr-16 | 8.2 | 11 | 90 | 8.2 | - | 165 | 102 | 68 | 0.034 | < 0.0010 | < 0.0000050 | 0.21 | 0.092 | 16 |
| | 3-May-16 | 10 | 10 | 93 | 8.2 | - | 190 | 114 | 14 | 0.011 | 0.0014 | < 0.0000050 | 0.17 | 0.093 | 22 |
| | 10-May-16 | 8.2 | 9.9 | 84 | 7.5 | - | 148 | 88 | 0.80 | 0.048 | < 0.0010 | < 0.0000050 | 0.14 | 0.071 | 14 |
| | 17-May-16 | 11 | 9.3 | 85 | 8.2 | - | 181 | 100 | 4.5 | 0.011 | < 0.0010 | < 0.0000050 | 0.13 | 0.076 | 22 |
| | 24-May-16 | 8.4 | 11 | 92 | 8.2 | - | 152 | 84 | 16 | 0.011 | < 0.0010 | < 0.0000050 | 0.11 | 0.064 | 17 |
| | 31-May-16 | 11 | 11 | 97 | 8.1 | - | 174 | 99 | 11 | 0.012 | < 0.0010 | < 0.0000050 | 0.095 | 0.10 | 19 |
| | 7-Jun-16 | 13 | 9.7 | 93 | 8.2 | - | 141 | 81 | 46 | 0.033 | < 0.0010 | < 0.0000050 | 0.076 | 0.061 | 13 |
| | 14-Jun-16 | 10 | 9.9 | 89 | 8.0 | - | 146 | 97 | 19 | 0.019 | 0.0014 | < 0.0000050 | 0.085 | 0.082 | 19 |
| | 21-Jun-16 | 12 | 9.8 | 91 | 8.3 | - | 192 | 111 | 5.6 | 0.0095 | < 0.0010 | < 0.0000050 | 0.084 | 0.094 | 21 |
| | 28-Jun-16 | 14 | 9.9 | 97 | 8.3 | - | 175 | 98 | 6.8 | 0.0090 | < 0.0010 | < 0.0000050 | 0.068 | 0.070 | 19 |
| | 5-Jul-16 | 14 | 9.8 | 94 | 8.4 | - | 173 | 96 | 6.4 | 0.012 | < 0.0010 | < 0.0000050 | 0.068 | 0.11 | 20 |
| | 12-Jul-16 | 16 | 9.6 | 97 | 8.4 | - | 198 | 114 | 2.1 | 0.0068 | 0.0014 | < 0.0000050 | 0.058 | 0.085 | 23 |
| | 19-Jul-16 | - | - | - | - | - | - | 111 | 14 | 0.012 | 0.0010 | < 0.0000050 | 0.068 | 0.070 | 24 |
| | 26-Jul-16 | 14 | 10 | 100 | 8.1 | - | 231 | 122 | 6.5 | 0.0091 | < 0.0010 | < 0.0000050 | 0.063 | 0.092 | 26 |
| | 26-Jul-16 | 17 | 8.5 | 86 | 8.2 | - | 244 | - | - | - | - | - | - | - | - |
| | 2-Aug-16 | 17 | 8.8 | 91 | 8.4 | - | 212 | 112 | 37 | 0.023 | < 0.0010 | < 0.0000050 | 0.071 | 0.11 | 26 |
| | 6-Sep-16 | 13 | 9.9 | 95 | 8.5 | - | 233 | 145 | 2.5 | 0.0070 | < 0.0010 | < 0.0000050 | 0.052 | 0.092 | 34 |
| | 11-Oct-16 | 7.6 | 11 | 93 | 6.3 | - | 164 | 94 | 7.0 | 0.0093 | < 0.0010 | < 0.0000050 | 0.099 | 0.094 | 29 |
| | 1-Nov-16 | 6.5 | 11 | 90 | 8.2 | 238 | - | 107 | 2.5 | 0.0079 | < 0.0010 | < 0.0000050 | 0.11 | 0.066 | 25 |
| | 6-Dec-16 | 0.90 | 13 | 90 | - | - | - | 140 | 1.2 | 0.021 | 0.0013 | < 0.0000050 | 0.12 | 0.13 | 34 |
| **n** | | **10** | **12** | **12** | **11** | **1.0** | **10** | **12** | **12** | **12** | **12** | **12** | **12** | **12** | **12** |
| **minimum** | | **0.90** | **8.8** | **85** | **6.3** | **238** | **163** | **94** | **1.2** | **0.0070** | **0.0010** | **0.0000050** | **0.052** | **0.066** | **18** |
| **median** | | **9.3** | **11** | **92** | **8.3** | **238** | **212** | **115** | **5.5** | **0.017** | **0.0011** | **0.0000050** | **0.10** | **0.093** | **28** |
| **maximum** | | **17** | **15** | **106** | **8.5** | **238** | **369** | **182** | **37** | **0.023** | **0.0071** | **0.0000064** | **0.16** | **0.16** | **50** |
| **mean** | | **9.7** | **11** | **92** | **8.1** | **238** | **241** | **128** | **10** | **0.015** | **0.0022** | **0.0000052** | **0.11** | **0.10** | **31** |
| **standard deviation** | | **4.9** | **1.8** | **5.0** | **0.62** | **-** | **80** | **31** | **12** | **0.0056** | **0.0020** | **0.00000045** | **0.036** | **0.027** | **11** |

Note: Annual summary statistics based on monthly means.

## **Table B.12:** Average Flow of the Elk River (Fernie) and the Kootenay River (Fort Steele), 2014 to 2016

| Year | Elk River (Station No. 08NK002) | Kootenay River (Station No. 08NG065) |
|---|---|---|
| | $m^3/s$ | $m^3/s$ |
| 2014 | 55 | 188 |
| 2015 | 41 | 144 |
| 2016 | 42 | 170 |

# APPENDIX C

# SEDIMENT QUALITY DATA

**Table C.1:** **Sediment, Benthic, and Plankton Sampling Locations in Koocanusa Reservoir, August 2014**

| Station | | UTM (NAD 83, Zone 11U) | | Station Depth | Average Ponar Fullness | Sample Texture | Macrophytes in Sample | Algae in Sample | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | % Fullness | | | | |
| Upstream of Elk River | T2-2 | 629650 | 5450400 | 30.1 | 25% | 100% sand and finer | sparse organic matter | No | mostly clay, hard packed on bottom |
| | T2-3 | 629417 | 5450394 | 19.2 | 33% | 100% sand and finer | minimal organic matter | No | hard packed clay with minimal material on top |
| | T2-4 | 629235 | 5450445 | 19.5 | 33% | 100% sand and finer | minimal organic matter | No | - |
| | T2-5 | 629059 | 5450389 | 20.0 | 75% | 100% sand and finer, more organics than T2-2-4 | some dead organic matter | No | - |
| | T2-6 | 628883 | 5450370 | 18.3 | 100% | 100% sand and finer | dead organic matter common | No | - |
| Downstream of Elk River | T4-2 | 630076 | 5441806 | 27.8 | 100% | 100% sand and finer | No | No | - |
| | T4-3 | 629798 | 5441984 | 27.4 | 100% | 100% sand and finer | No | No | - |
| | T4-4 | 629703 | 5441675 | 26.4 | 100% | 100% sand and finer | No | No | - |
| | T4-5 | 629487 | 5441751 | 25.8 | 100% | 100% sand and finer | No | No | - |
| | T4-6 | 629403 | 5441477 | 30.5 | 100% | 100% sand and finer | No | No | - |

**Table C.2:** **Sediment Sampling Locations in Koocanusa Reservoir, August 2015**

| Station | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Average Ponar Fullness (%) | Sample Texture | Macrophytes in Sample | Algae in Sample |
|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | |
| Upstream of Elk River | TN-1 | 627377 | 5453471 | 13.5 | 75% | 90% sand and finer, 10% organics | No | No |
| | TN-2 | 627270 | 5453644 | 12.4 | 75% | 90% sand and finer, 10% organics | No | No |
| | TN-3 | 627341 | 5453711 | 13.2 | 100% | 90% sand and finer, 10% organics | No | No |
| | TN-4 | 627329 | 5453862 | 12.9 | 75% | 90% sand and finer, 10% organics | No | No |
| | TN-5 | 627211 | 5453978 | 13.4 | 100% | 90% sand and finer, 10% organics | No | No |
| Downstream of Elk River | T4-2 | 630082 | 5441810 | 24.2 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-3 | 629825 | 5442010 | 22.8 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-4 | 629715 | 5441648 | 22.7 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-5 | 629500 | 5441738 | 22.2 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-6 | 629511 | 5441551 | 23.2 | 100% | 90% sand and finer, 10% organics | No | No |

**Table C.3:** **Benthic Sampling Locations in Koocanusa Reservoir, August 2016**

| Station | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Average Ponar Fullness (%) | Sample Texture | Macrophytes in Sample | Algae in Sample |
|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | |
| Upstream of Elk River | TN-1 | 627369 | 5453492 | 15 | 50% | 100% sand and finer, minimal organics | No | Sparse |
| | TN-2 | 627256 | 5453672 | 14 | 75% - 100% | 100% sand and finer, minimal organics | No | Sparse |
| | TN-3 | 627367 | 5453710 | 15 | 75% - 100% | 100% sand and finer, 10% organics | No | Sparse |
| | TN-4 | 627333 | 5453882 | 15 | 75% - 100% | 100% sand and finer, minimal organics | No | Sparse |
| | TN-5 | 627200 | 5454005 | 15 | 75% - 100% | 100% sand and finer, minimal organics | No | Sparse |
| Downstream of Elk River | T4-2 | 630115 | 5441812 | 24 | 100% | 100% sand and finer | No | No |
| | T4-3 | 629831 | 5442006 | 25 | 100% | 100% sand and finer | No | No |
| | T4-4 | 629695 | 5441699 | 25 | 100% | 100% sand and finer | No | No |
| | T4-5 | 629494 | 5441783 | 24 | 100% | 100% sand and finer, minimal organics | No | Sparse |
| | T4-6 | 629430 | 5441547 | 25 | 100% | 100% sand and finer | No | No |

## Table C.4: Sediment Quality in Koocanusa Reservoir, August 2014

| Analytes | Units | BC Sediment Quality Guidelines [a] | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| **Non-metals** | | | | | | | | | | | | |
| Moisture | % | - | 34.2 | 40.0 | 36.2 | 36.2 | 43.2 | 38.4 | 40.1 | 44.1 | 43.3 | 43.8 |
| pH (1:2 soil:water) | pH | - | 8.04 | 8.13 | 8.08 | 8.02 | 7.89 | 8.17 | 8.08 | 8.04 | 8.03 | 8.06 |
| **Particle size** | | | | | | | | | | | | |
| % Gravel | % | - | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| % Sand | % | - | 14.2 | 4.9 | 9.6 | 15.9 | 4.0 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| % Silt | % | - | 67.5 | 69.1 | 72.3 | 72.2 | 81.3 | 70.0 | 68.3 | 72.7 | 77.4 | 75.9 |
| % Clay | % | - | 18.1 | 26.0 | 18.0 | 11.9 | 14.6 | 30.0 | 31.7 | 27.3 | 22.6 | 24.1 |
| **Carbon** | | | | | | | | | | | | |
| TOC | % | - | 0.97 | 0.87 | 1.74 | 1.69 | 1.47 | 1.26 | 1.45 | 1.51 | 1.22 | 1.22 |
| **Metals (< 1mm fraction)** | | | | | | | | | | | | |
| Aluminum (Al) | mg/kg dw | - | 11,800 | 13,600 | 11,900 | 10,500 | 12,100 | 13,600 | 13,000 | 12,600 | 12,600 | 12,600 |
| Antimony (Sb) | mg/kg dw | - | 0.34 | 0.32 | 0.31 | 0.31 | 0.30 | 0.44 | 0.46 | 0.44 | 0.39 | 0.36 |
| Arsenic (As) | mg/kg dw | 5.9/17 [b] | 5.50 | 6.02 | 5.27 | 5.64 | 5.76 | 6.08 | 6.07 | 5.94 | 5.79 | 5.61 |
| Barium (Ba) | mg/kg dw | - | 91.9 | 99.8 | 80.7 | 70.5 | 81.2 | 155 | 152 | 156 | 140 | 121 |
| Beryllium (Be) | mg/kg dw | - | 0.40 | 0.49 | 0.39 | 0.37 | 0.43 | 0.60 | 0.57 | 0.63 | 0.55 | 0.53 |
| Bismuth (Bi) | mg/kg dw | - | <0.20 | 0.23 | 0.22 | 0.23 | 0.23 | 0.21 | 0.21 | 0.21 | 0.22 | 0.21 |
| Cadmium (Cd) | mg/kg dw | 0.6/3.5 [b] | 0.259 | 0.240 | 0.178 | 0.209 | 0.193 | 0.576 | 0.567 | 0.624 | 0.502 | 0.392 |
| Calcium (Ca) | mg/kg dw | - | 117,000 | 110,000 | 113,000 | 99,900 | 106,000 | 100,000 | 98,500 | 102,000 | 104,000 | 110,000 |
| Chromium (Cr) | mg/kg dw | 37.3/90 [b] | 17.2 | 18.7 | 17.0 | 15.5 | 17.7 | 20.1 | 19.5 | 19.3 | 18.6 | 18.7 |
| Cobalt (Co) | mg/kg dw | - | 8.14 | 9.02 | 8.24 | 8.27 | 8.90 | 8.20 | 8.15 | 7.89 | 8.09 | 8.33 |
| Copper (Cu) | mg/kg dw | 35.7/197 [b] | 13.3 | 15.5 | 14.6 | 15.9 | 16.2 | 15.1 | 15.3 | 15.1 | 15.4 | 15.2 |
| Iron (Fe) | mg/kg dw | 21,200/43,766 [c] | 20,200 | 21,600 | 20,500 | 19,900 | 21,600 | 20,400 | 20,200 | 19,600 | 20,100 | 20,700 |
| Lead (Pb) | mg/kg dw | 35/91 [b] | 14.4 | 14.8 | 15.0 | 17.2 | 16.9 | 14.7 | 13.5 | 13.0 | 14.1 | 14.1 |
| Lithium (Li) | mg/kg dw | - | 21.9 | 25.3 | 23.7 | 21.9 | 25.4 | 23.6 | 23.8 | 22.9 | 23.3 | 24.0 |
| Magnesium (Mg) | mg/kg dw | - | 21,500 | 21,200 | 22,000 | 21,100 | 21,700 | 19,100 | 18,800 | 19,400 | 20,400 | 20,700 |
| Manganese (Mn) | mg/kg dw | 460/1,100 [c] | 435 | 471 | 417 | 391 | 429 | 552 | 536 | 529 | 502 | 488 |
| Mercury (Hg) | mg/kg dw | 0.170/0.486 [b] | 0.0224 | 0.0239 | 0.0205 | 0.0217 | 0.0232 | 0.0334 | 0.0328 | 0.0333 | 0.0315 | 0.0270 |
| Molybdenum (Mo) | mg/kg dw | - | 0.69 | 0.75 | 0.61 | 0.57 | 0.66 | 1.03 | 1.06 | 1.08 | 0.93 | 0.87 |
| Nickel (Ni) | mg/kg dw | 16/75 [c] | 19.2 | 21.4 | 19.5 | 18.5 | 20.3 | 22.2 | 21.8 | 21.6 | 21.6 | 21.1 |
| Phosphorus (P) | mg/kg dw | - | 461 | 513 | 493 | 509 | 495 | 615 | 630 | 671 | 681 | 535 |
| Potassium (K) | mg/kg dw | - | 1,350 | 1,600 | 1,160 | 780 | 1,080 | 2,220 | 2,080 | 2,070 | 1,780 | 1,540 |
| Selenium (Se) | mg/kg dw | 2 | 0.26 | 0.23 | 0.20 | 0.23 | 0.23 | 0.59 | 0.58 | 0.56 | 0.51 | 0.40 |
| Silver (Ag) | mg/kg dw | 0.5 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.12 | 0.11 | 0.12 | 0.11 | <0.10 |
| Sodium (Na) | mg/kg dw | - | 120 | 250 | 130 | 110 | 140 | 190 | 130 | 130 | 130 | 130 |
| Strontium (Sr) | mg/kg dw | - | 246 | 231 | 239 | 210 | 230 | 183 | 181 | 184 | 199 | 219 |
| Thallium (Tl) | mg/kg dw | - | 0.129 | 0.141 | 0.106 | 0.092 | 0.117 | 0.203 | 0.210 | 0.210 | 0.179 | 0.157 |
| Tin (Sn) | mg/kg dw | - | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.2 | <2.0 | <2.0 | <2.0 | <2.0 |
| Titanium (Ti) | mg/kg dw | - | 134 | 173 | 137 | 115 | 147 | 97.0 | 98.2 | 105 | 98.2 | 95.5 |
| Uranium (U) | mg/kg dw | - | 0.802 | 0.836 | 0.832 | 1.00 | 0.981 | 0.926 | 0.935 | 0.958 | 0.959 | 0.887 |
| Vanadium (V) | mg/kg dw | - | 16.9 | 16.6 | 14.4 | 12.8 | 14.7 | 24.5 | 24.1 | 24.4 | 21.6 | 19.0 |
| Zinc (Zn) | mg/kg dw | 123/315 [b] | 70.9 | 70.4 | 67.8 | 69.9 | 72.7 | 80.9 | 81.3 | 80.3 | 78.6 | 74.5 |

Note: Shaded values were above the lower guidelines (ISQG [b] or LEL[c]). No values exceeded the upper (PEL[b] or SEL[c]) guidelines.

[a] Working sediment quality guidelines (BC MOE 2015).

[b] Interim Sediment Quality Guideline (ISQG; or Threshold Effect Level [LEL])/ Probable Effect Level (PEL)

[c] Lowest Effect Level (LEL)/ Severe Effect Level (SEL).

[d] Gravel = >2.0mm; Sand = 0.063-2.0 mm; Silt = 0.004-0.063 mm; Clay = <0.004mm

[e] TOC = Total Organic Carbon

**Table C.5: Sediment Quality in Koocanusa Reservoir, August 2015**

| Analytes | Units | BC Sediment Quality Guidelines [a] | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| **Non-metals** | | | | | | | | | | | | |
| Moisture | % | - | 45.7 | 47.4 | 40.2 | 42.6 | 36.6 | 44.0 | 44.6 | 44.4 | 42.7 | 43.2 |
| pH (1:2 soil:water) | pH | - | 8.03 | 8.09 | 8.12 | 8.14 | 8.12 | 8.07 | 8.10 | 8.13 | 8.16 | 8.07 |
| **Particle size[d]** | | | | | | | | | | | | |
| % Gravel | % | - | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| % Sand | % | - | 1.7 | 1.5 | 1.9 | 12.1 | 28.4 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| % Silt | % | - | 78.2 | 74.9 | 79.0 | 66.6 | 59.6 | 63.4 | 64.8 | 71.8 | 74.3 | 73.4 |
| % Clay | % | - | 20.2 | 23.6 | 19.2 | 21.3 | 12.0 | 36.5 | 35.2 | 28.1 | 25.7 | 26.6 |
| **Carbon** | | | | | | | | | | | | |
| TOC[e] | % | - | 1.23 | 1.01 | 1.28 | 1.04 | 1.33 | 1.43 | 1.57 | 1.64 | 1.70 | 1.52 |
| **Metals (< 1mm fraction)** | | | | | | | | | | | | |
| Aluminum (Al) | mg/kg dw | - | 13,400 | 12,100 | 12,100 | 12,100 | 10,600 | 13,400 | 13,200 | 13,000 | 13,300 | 12,950 |
| Antimony (Sb) | mg/kg dw | - | 0.35 | 0.32 | 0.31 | 0.33 | 0.32 | 0.53 | 0.52 | 0.47 | 0.51 | 0.45 |
| Arsenic (As) | mg/kg dw | 5.9/17 [b] | 7.06 | 6.03 | 6.59 | 6.77 | 5.88 | 7.46 | 7.39 | 7.12 | 7.36 | 6.94 |
| Barium (Ba) | mg/kg dw | - | 88.9 | 84.6 | 81.0 | 82.5 | 66.1 | 175 | 178 | 166 | 163 | 144 |
| Beryllium (Be) | mg/kg dw | - | 0.46 | 0.43 | 0.41 | 0.42 | 0.37 | 0.63 | 0.66 | 0.58 | 0.60 | 0.54 |
| Bismuth (Bi) | mg/kg dw | - | 0.21 | <0.20 | <0.20 | <0.20 | <0.20 | 0.21 | <0.20 | <0.20 | 0.21 | 0.21 |
| Boron (B) | mg/kg dw | - | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 6.8 | 7.1 | 6.2 | 5.8 | 5.2 |
| Cadmium (Cd) | mg/kg dw | 0.6/3.5 [b] | 0.212 | 0.176 | 0.187 | 0.197 | 0.156 | 0.625 | 0.642 | 0.584 | 0.567 | 0.471 |
| Calcium (Ca) | mg/kg dw | - | 117,000 | 118,000 | 110,000 | 113,000 | 102,000 | 103,000 | 101,000 | 106,000 | 112,000 | 115,000 |
| Chromium (Cr) | mg/kg dw | 37.3/90 [b] | 20.1 | 18.3 | 18.8 | 17.9 | 16.0 | 21.2 | 21.3 | 20.8 | 21.4 | 20.9 |
| Cobalt (Co) | mg/kg dw | - | 10.2 | 9.11 | 9.27 | 9.25 | 8.27 | 9.34 | 8.85 | 9.11 | 9.64 | 9.47 |
| Copper (Cu) | mg/kg dw | 35.7/197 [b] | 17.4 | 14.7 | 15.7 | 15.1 | 13.2 | 17.4 | 17.1 | 17.4 | 18.2 | 17.6 |
| Iron (Fe) | mg/kg dw | 21,200/43,766 [c] | 24,400 | 22,300 | 22,800 | 22,700 | 20,800 | 22,800 | 22,300 | 22,500 | 23,700 | 23,550 |
| Lead (Pb) | mg/kg dw | 35/91 [b] | 15.9 | 14.5 | 14.9 | 15.6 | 14.4 | 13.8 | 13.3 | 14.0 | 14.6 | 14.2 |
| Lithium (Li) | mg/kg dw | - | 27.1 | 25.6 | 25.4 | 24.9 | 23.1 | 25.1 | 24.3 | 23.9 | 25.2 | 25.1 |
| Magnesium (Mg) | mg/kg dw | - | 25,500 | 23,100 | 23,900 | 24,300 | 22,800 | 20,500 | 20,100 | 22,700 | 23,600 | 23,300 |
| Manganese (Mn) | mg/kg dw | 460/1,100 [c] | 500 | 485 | 458 | 485 | 392 | 646 | 624 | 592 | 602 | 562 |
| Mercury (Hg) | mg/kg dw | 0.170/0.486 [b] | 0.0376 | 0.0249 | 0.0237 | 0.0305 | 0.0186 | 0.0487 | 0.0524 | 0.0425 | 0.0446 | 0.03985 |
| Molybdenum (Mo) | mg/kg dw | - | 0.66 | 0.65 | 0.61 | 0.66 | 0.54 | 1.15 | 1.10 | 0.97 | 1.04 | 0.94 |
| Nickel (Ni) | mg/kg dw | 16/75 [c] | 23.4 | 20.9 | 21.7 | 21.0 | 19.4 | 25.3 | 24.2 | 24.3 | 25.4 | 24.3 |
| Phosphorus (P) | mg/kg dw | - | 615 | 566 | 576 | 587 | 570 | 747 | 790 | 817 | 810 | 763 |
| Potassium (K) | mg/kg dw | - | 1,260 | 1,160 | 1,080 | 1,090 | 870 | 2,160 | 2,250 | 2,010 | 1,880 | 1,660 |
| Selenium (Se) | mg/kg dw | 2 | 0.26 | 0.22 | <0.20 | 0.21 | <0.20 | 0.69 | 0.73 | 0.70 | 0.64 | 0.54 |
| Silver (Ag) | mg/kg dw | 0.5 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.12 | 0.12 | 0.12 | 0.12 | 0.10 |
| Sodium (Na) | mg/kg dw | - | 116 | 108 | 103 | 110 | 96 | 125 | 127 | 122 | 123 | 117 |
| Strontium (Sr) | mg/kg dw | - | 260 | 262 | 238 | 247 | 218 | 188 | 184 | 203 | 218 | 232 |
| Thallium (Tl) | mg/kg dw | - | 0.102 | 0.087 | 0.092 | 0.089 | 0.077 | 0.190 | 0.187 | 0.169 | 0.170 | 0.148 |
| Tin (Sn) | mg/kg dw | - | <2.0 | 2.1 | <2.0 | 3.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Titanium (Ti) | mg/kg dw | - | 149 | 116 | 128 | 122 | 127 | 82.2 | 79.8 | 91.5 | 94.6 | 98.5 |
| Uranium (U) | mg/kg dw | - | 0.737 | 0.645 | 0.673 | 0.623 | 0.576 | 0.814 | 0.814 | 0.809 | 0.854 | 0.802 |
| Vanadium (V) | mg/kg dw | - | 16.8 | 14.8 | 15.1 | 15.1 | 13.5 | 26.2 | 26.6 | 25.1 | 24.5 | 21.8 |
| Zinc (Zn) | mg/kg dw | 123/315 [b] | 77.7 | 66.9 | 70.8 | 69.5 | 65.6 | 86.3 | 84.7 | 83.2 | 85.4 | 80.0 |
| Zirconium (Zr) | mg/kg dw | - | 1.7 | 1.3 | 1.3 | 1.3 | 1.4 | 1.1 | 1.0 | 1.1 | 1.2 | 1.3 |
| **Polycyclic Aromatic Hydrocarbons** | | | | | | | | | | | | |
| Acenaphthene | mg/kg dw | 0.00671/0.0889 [b] | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | 0.0054 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Acenaphthylene | mg/kg dw | 0.00587/0.128 [b] | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Anthracene | mg/kg dw | 0.0469/0.245 [b] | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | 0.0044 | 0.0040 | <0.0040 | <0.0040 |
| Benz(a)anthracene | mg/kg dw | 0.0317/0.385 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.015 | 0.017 | 0.016 | <0.010 | 0.011 |
| Benzo(a)pyrene | mg/kg dw | 0.0319/0.782 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.012 | 0.011 | <0.010 | <0.010 |
| Benzo(b&j)fluoranthene | mg/kg dw | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.027 | 0.031 | 0.025 | 0.014 | 0.017 |
| Benzo(b+j+k)fluoranthene | mg/kg dw | - | <0.015 | <0.015 | <0.015 | <0.015 | <0.015 | 0.027 | 0.031 | 0.025 | <0.015 | 0.017 |
| Benzo(g,h,i)perylene | mg/kg dw | 0.17/3.2 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.011 | 0.014 | <0.010 | <0.010 | <0.010 |
| Benzo(k)fluoranthene | mg/kg dw | 0.24/13.4 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Chrysene | mg/kg dw | 0.0571/0.862 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.027 | 0.034 | 0.026 | 0.011 | 0.018 |
| Dibenz(a,h)anthracene | mg/kg dw | 0.00622/0.135 [b] | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | 0.01 | <0.0050 | <0.0050 | <0.0050 |
| Fluoranthene | mg/kg dw | 0.111/2.355 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.021 | 0.024 | 0.021 | 0.013 | 0.014 |
| Fluorene | mg/kg dw | 0.021/0.144 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Indeno(1,2,3-c,d)pyrene | mg/kg dw | 0.2/3.2 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 2-Methylnaphthalene | mg/kg dw | 0.0202/0.201 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.081 | 0.072 | 0.059 | 0.025 | 0.045 |
| Naphthalene | mg/kg dw | 0.0346/0.391 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.033 | 0.030 | 0.029 | 0.013 | 0.022 |
| Phenanthrene | mg/kg dw | 0.0419/0.515 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.078 | 0.076 | 0.060 | 0.026 | 0.045 |
| Pyrene | mg/kg dw | 0.053/0.875 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.020 | 0.022 | 0.018 | 0.010 | 0.013 |

Note: Shaded values were above the lower guidelines (ISQG[b] or LEL[c]). No values exceeded the upper (PEL[b] or SEL[c]) guidelines.

[a] Working sediment quality guidelines (BC MOE 2015).

[b] Interim Sediment Quality Guideline (ISQG; or Threshold Effect Level [LEL])/ Probable Effect Level (PEL)

[c] Lowest Effect Level (LEL)/ Severe Effect Level (SEL).

[d] Gravel = >2.0 mm; Sand = 0.063-2.0 mm; Silt = 0.004-0.063 mm; Clay = <0.004 mm

[e] TOC = Total Organic Carbon

**Table C.6: Sediment quality in Koocanusa Reservoir, August 2016**

| Analytes | Units | BC Sediment Quality Guidelines [a] | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| **Non-metals** | | | | | | | | | | | | |
| Moisture | % | - | 33.9 | 35.6 | 39.2 | 38.2 | 37.5 | 42.5 | 45.9 | 42.5 | 41.9 | 44.8 |
| pH (1:2 soil:water) | pH | - | 8.28 | 8.25 | 8.09 | 8.03 | 8.02 | 8.18 | 8.01 | 7.99 | 8.17 | 8.11 |
| **Particle size[d]** | | | | | | | | | | | | |
| % Gravel | % | - | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| % Sand | % | - | 13.8 | 2.1 | 1.8 | 7.3 | 14.9 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| % Silt | % | - | 68.6 | 73.1 | 82.1 | 76.5 | 74.1 | 68.7 | 70.6 | 77.0 | 77.1 | 75.6 |
| % Clay | % | - | 17.5 | 24.8 | 16.1 | 16.2 | 10.9 | 31.3 | 29.4 | 22.9 | 22.9 | 24.3 |
| **Carbon** | | | | | | | | | | | | |
| TOC[e] | % | - | 1.19 | <0.96 | 1.4 | 1.2 | 1.23 | 1.11 | 1.21 | 1.2 | 1.2 | 1.3 |
| **Metals (< 1mm fraction)** | | | | | | | | | | | | |
| Aluminum (Al) | mg/kg dw | - | 11,200 | 12,300 | 11,200 | 10,900 | 10,800 | 12,700 | 12,600 | 11,600 | 11,900 | 12,500 |
| Antimony (Sb) | mg/kg dw | - | 0.25 | 0.27 | 0.27 | 0.25 | 0.26 | 0.42 | 0.41 | 0.38 | 0.39 | 0.37 |
| Arsenic (As) | mg/kg dw | 5.9/17 [b] | 5.14 | 5.64 | 5.64 | 5.52 | 5.28 | 6.71 | 6.68 | 5.86 | 6.03 | 6.27 |
| Barium (Ba) | mg/kg dw | - | 67.4 | 80.4 | 71.3 | 67.5 | 61.2 | 144 | 157 | 133 | 129 | 121 |
| Beryllium (Be) | mg/kg dw | - | 0.40 | 0.47 | 0.42 | 0.39 | 0.38 | 0.62 | 0.61 | 0.55 | 0.60 | 0.57 |
| Bismuth (Bi) | mg/kg dw | - | <0.20 | 0.20 | <0.20 | <0.20 | <0.20 | 0.21 | <0.20 | <0.20 | <0.20 | 0.21 |
| Boron (B) | mg/kg dw | - | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 6.1 | 6.1 | 5.7 | 5.1 | <5.0 |
| Cadmium (Cd) | mg/kg dw | 0.6/3.5 [b] | 0.179 | 0.190 | 0.189 | 0.187 | 0.184 | 0.604 | 0.611 | 0.528 | 0.515 | 0.481 |
| Calcium (Ca) | mg/kg dw | - | 102,000 | 102,000 | 105,000 | 99,900 | 102,000 | 91,600 | 94,000 | 95,200 | 99,700 | 100,000 |
| Chromium (Cr) | mg/kg dw | 37.3/90 [b] | 15.8 | 17.0 | 15.7 | 15.3 | 15.2 | 18.2 | 17.8 | 16.6 | 17.0 | 17.5 |
| Cobalt (Co) | mg/kg dw | - | 7.82 | 8.61 | 8.02 | 7.85 | 7.67 | 8.18 | 8.02 | 7.57 | 7.96 | 8.36 |
| Copper (Cu) | mg/kg dw | 35.7/197 [b] | 19.1 | 19.2 | 32.7 | 27.9 | 17.9 | 21.9 | 29.7 | 21.3 | 17.5 | 21.5 |
| Iron (Fe) | mg/kg dw | 21,200/43,766 [c] | 19,300 | 21,000 | 20,400 | 20,000 | 19,200 | 20,300 | 20,100 | 19,300 | 20,100 | 21,400 |
| Lead (Pb) | mg/kg dw | 35/91 [b] | 13.6 | 14.4 | 14.8 | 13.6 | 13.7 | 13.5 | 13.1 | 12.7 | 13.2 | 14.3 |
| Lithium (Li) | mg/kg dw | - | 24.9 | 26.8 | 24.9 | 24.1 | 23.9 | 24.7 | 23.5 | 22.7 | 24.9 | 26.0 |
| Magnesium (Mg) | mg/kg dw | - | 19,700 | 19,600 | 19,500 | 19,800 | 20,500 | 16,600 | 18,300 | 17,700 | 18,300 | 19,200 |
| Manganese (Mn) | mg/kg dw | 460/1,100 [c] | 383 | 425 | 410 | 398 | 378 | 572 | 612 | 502 | 518 | 518 |
| Mercury (Hg) | mg/kg dw | 0.170/0.486 [b] | 0.0172 | 0.0143 | 0.0167 | 0.0191 | 0.0163 | 0.0303 | 0.0339 | 0.0290 | 0.0284 | 0.0289 |
| Molybdenum (Mo) | mg/kg dw | - | 0.59 | 0.67 | 0.65 | 0.64 | 0.60 | 1.06 | 0.97 | 0.90 | 0.92 | 0.86 |
| Nickel (Ni) | mg/kg dw | 16/75 [c] | 18.5 | 20.6 | 19.8 | 18.9 | 18.7 | 22.7 | 21.9 | 20.5 | 21.3 | 21.5 |
| Phosphorus (P) | mg/kg dw | - | 465 | 474 | 491 | 527 | 506 | 739 | 708 | 676 | 606 | 621 |
| Potassium (K) | mg/kg dw | - | 850 | 1,050 | 790 | 740 | 740 | 1,760 | 1,680 | 1,370 | 1,380 | 1,330 |
| Selenium (Se) | mg/kg dw | 2 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | 0.67 | 0.78 | 0.66 | 0.67 | 0.64 |
| Silver (Ag) | mg/kg dw | 0.5 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.12 | 0.12 | 0.11 | 0.12 | 0.10 |
| Sodium (Na) | mg/kg dw | - | 109 | 102 | 91 | 84 | 83 | 106 | 121 | 126 | 111 | 107 |
| Strontium (Sr) | mg/kg dw | - | 221 | 230 | 242 | 228 | 226 | 179 | 179 | 193 | 211 | 215 |
| Thallium (Tl) | mg/kg dw | - | 0.087 | 0.099 | 0.084 | 0.076 | 0.077 | 0.181 | 0.162 | 0.149 | 0.145 | 0.137 |
| Tin (Sn) | mg/kg dw | - | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Titanium (Ti) | mg/kg dw | - | 93.8 | 91.9 | 81.1 | 77.8 | 91.9 | 57.0 | 55.2 | 60.1 | 63.6 | 70.8 |
| Uranium (U) | mg/kg dw | - | 0.701 | 0.724 | 0.722 | 0.644 | 0.633 | 0.856 | 0.799 | 0.783 | 0.825 | 0.789 |
| Vanadium (V) | mg/kg dw | - | 13.1 | 13.7 | 12.3 | 12.1 | 12.3 | 22.8 | 22.0 | 19.0 | 19.4 | 18.1 |
| Zinc (Zn) | mg/kg dw | 123/315 [b] | 65.4 | 65.7 | 67.8 | 66.5 | 64.7 | 82.2 | 83.1 | 74.9 | 76.0 | 78.1 |
| Zirconium (Zr) | mg/kg dw | - | 1.5 | 1.3 | 1.2 | 1.2 | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | 1.1 |
| **Polycyclic Aromatic Hydrocarbons** | | | | | | | | | | | | |
| Acenaphthene | mg/kg dw | 0.00671/0.0889 [b] | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Acenaphthylene | mg/kg dw | 0.00587/0.128 [b] | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Anthracene | mg/kg dw | 0.0469/0.245 [b] | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0040 |
| Benz(a)anthracene | mg/kg dw | 0.0317/0.385 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.011 | 0.014 | 0.012 | 0.010 | <0.010 |
| Benzo(a)pyrene | mg/kg dw | 0.0319/0.782 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.010 | <0.010 | <0.010 | <0.010 |
| Benzo(b&j)fluoranthene | mg/kg dw | - | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.018 | 0.023 | 0.019 | 0.016 | 0.013 |
| Benzo(b+j+k)fluoranthene | mg/kg dw | - | <0.015 | <0.015 | <0.015 | <0.015 | <0.015 | 0.018 | 0.023 | 0.019 | 0.016 | <0.015 |
| Benzo(g,h,i)perylene | mg/kg dw | 0.17/3.2 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Benzo(k)fluoranthene | mg/kg dw | 0.24/13.4 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Chrysene | mg/kg dw | 0.0571/0.862 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.027 | 0.032 | 0.025 | 0.018 | 0.018 |
| Dibenz(a,h)anthracene | mg/kg dw | 0.00622/0.135 [b] | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Fluoranthene | mg/kg dw | 0.111/2.355 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.016 | 0.021 | 0.017 | 0.014 | 0.011 |
| Fluorene | mg/kg dw | 0.021/0.144 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Indeno(1,2,3-c,d)pyrene | mg/kg dw | 0.2/3.2 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| 2-Methylnaphthalene | mg/kg dw | 0.0202/0.201 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.065 | 0.080 | 0.054 | 0.029 | 0.032 |
| Naphthalene | mg/kg dw | 0.0346/0.391 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.023 | 0.029 | 0.021 | 0.013 | 0.012 |
| Phenanthrene | mg/kg dw | 0.0419/0.515 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.055 | 0.070 | 0.046 | 0.028 | 0.030 |
| Pyrene | mg/kg dw | 0.053/0.875 [b] | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.015 | 0.019 | 0.014 | 0.012 | <0.010 |

Note: Shaded values were above the lower guidelines (ISQG[b] or LEL[c]). No values exceeded the upper (PEL[b] or SEL[c]) guidelines.

[a] Working sediment quality guidelines (BC MOE 2015).

[b] Interim Sediment Quality Guideline (ISQG; or Threshold Effect Level [LEL])/ Probable Effect Level (PEL)

[c] Lowest Effect Level (LEL)/ Severe Effect Level (SEL).

[d] Gravel = >2.0 mm; Sand = 0.063-2.0 mm; Silt = 0.004-0.063 mm; Clay = <0.004 mm

[e] TOC = Total Organic Carbon

## Table C.7: Statistical Summary of Spatial and Temporal Differences in Sediment Quality in Koocanusa Reservoir in the Area Downstream from the Elk River (T4) Compared to the Upstream Area (T2/TN) in 2014, 2015, and 2016

| Analytes | Units | Transformation | Measure of Central Tendency (Mean, Geometric Mean, or Median)$^{a,b}$ | | | | | | Model P-values | | | Downstream of Elk River (T4) vs Upstream of Elk River (T2/TN) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Contrasts | | | Magnitudes of Significant Differences | | |
| | | | 2014 | | 2015 | | 2016 | | Area x Year | Area | Year | Area × Year | | | % | | |
| | | | T4 | T2 | T4 | TN | T4 | TN | | | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| **Non-metals** | | | | | | | | | | | | | | | | | |
| Moisture | % | none | 42 | 38 | 44 | 43 | 44 | 37 | 0.119 | <0.001 | 0.030 | - | - | - | * (10) | | |
| pH (1:2 soil:water) | pH | none | 8.1 | 8.0 | 8.1 | 8.1 | 8.1 | 8.1 | 0.487 | 0.927 | 0.224 | - | - | - | - | | |
| **Particle size$^{c}$** | | | | | | | | | | | | | | | | | |
| % Gravel | % | rank | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.383 | 0.327 | 0.383 | - | - | - | - | | |
| % Sand | % | rank | 0.10 | 9.6 | 0.10 | 1.9 | 0.10 | 7.3 | 0.555 | <0.001 | 0.555 | - | - | - | * (-99) | | |
| % Silt | % | none | 73 | 72 | 70 | 72 | 74 | 75 | 0.876 | 0.641 | 0.324 | - | - | - | - | | |
| % Clay | % | none | 27 | 18 | 30 | 19 | 26 | 17 | 0.863 | <0.001 | 0.288 | - | - | - | * (55) | | |
| **Carbon** | | | | | | | | | | | | | | | | | |
| Total Organic Carbon | % | none | 1.3 | 1.3 | 1.6 | 1.2 | 1.2 | 1.2 | 0.056 | - | - | 0.901 | 0.005 | 0.951 | - | * (33) | - |
| **Metals (< 1mm fraction)** | | | | | | | | | | | | | | | | | |
| Aluminum (Al) | mg/kg dw | none | 12,880 | 11,980 | 13,170 | 12,060 | 12,260 | 11,280 | 0.946 | <0.001 | 0.034 | - | - | - | * (8.5) | | |
| Antimony (Sb) | mg/kg dw | none | 0.42 | 0.32 | 0.50 | 0.33 | 0.39 | 0.26 | 0.022 | - | - | <0.001 | <0.001 | <0.001 | * (32) | * (52) | * (52) |
| Arsenic (As) | mg/kg dw | none | 5.9 | 5.6 | **7.3** | **6.5** | **6.3** | 5.4 | 0.089 | - | - | 0.209 | <0.001 | <0.001 | - | * (12) | * (16) |
| Barium (Ba) | mg/kg dw | none | 145 | 85 | 165 | 81 | 137 | 70 | 0.078 | - | - | <0.001 | <0.001 | <0.001 | * (71) | * (105) | * (97) |
| Beryllium (Be) | mg/kg dw | none | 0.58 | 0.42 | 0.60 | 0.42 | 0.59 | 0.41 | 0.775 | <0.001 | 0.720 | - | - | - | * (42) | | |
| Bismuth (Bi) | mg/kg dw | rank | 0.21 | 0.23 | 0.21 | 0.20 | 0.20 | 0.20 | 0.282 | 0.272 | <0.001 | - | - | - | - | | |
| Boron (B) | mg/kg dw | rank | - | - | 6.2 | 5.0 | 5.7 | 5.0 | 0.107 | <0.001 | 0.107 | - | - | - | NA | * (19) | |
| Cadmium (Cd) | mg/kg dw | none | 0.53 | 0.22 | 0.58 | 0.19 | 0.55 | 0.19 | 0.302 | <0.001 | 0.827 | - | - | - | * (182) | | |
| Calcium (Ca) | mg/kg dw | none | 102,900 | 109,180 | 107,400 | 112,000 | 96,100 | 102,180 | 0.923 | 0.006 | <0.001 | - | - | - | * (-5.2) | | |
| Chromium (Cr) | mg/kg dw | none | 19 | 17 | 21 | 18 | 17 | 16 | 0.291 | <0.001 | <0.001 | - | - | - | * (13) | | |
| Cobalt (Co) | mg/kg dw | none | 8.1 | 8.5 | 9.3 | 9.2 | 8.0 | 8.0 | 0.410 | 0.511 | <0.001 | - | - | - | - | | |
| Copper (Cu) | mg/kg dw | rank | 15 | 16 | 17 | 15 | 22 | 19 | 0.015 | - | - | 0.773 | 0.001 | 1.000 | - | * (15) | - |
| Iron (Fe) | mg/kg dw | none | 20,200 | 20,760 | **22,970** | **22,600** | 20,240 | 19,980 | 0.393 | 0.938 | <0.001 | - | - | - | - | | |
| Lead (Pb) | mg/kg dw | none | 14 | 16 | 14 | 15 | 13 | 14 | 0.266 | <0.001 | 0.010 | - | - | - | * (-7.9) | | |
| Lithium (Li) | mg/kg dw | none | 24 | 24 | 25 | 25 | 24 | 25 | 0.905 | 0.376 | 0.040 | - | - | - | - | | |
| Magnesium (Mg) | mg/kg dw | none | 19,680 | 21,500 | 22,040 | 23,920 | 18,020 | 19,820 | 0.995 | <0.001 | <0.001 | - | - | - | * (-8.4) | | |
| Manganese (Mn) | mg/kg dw | none | **521** | 429 | **605** | **464** | **544** | 399 | 0.177 | <0.001 | <0.001 | - | - | - | * (29) | | |
| Mercury (Hg) | mg/kg dw | none | 0.032 | 0.022 | 0.046 | 0.027 | 0.030 | 0.017 | 0.048 | - | - | 0.001 | <0.001 | <0.001 | * (41) | * (69) | * (80) |
| Molybdenum (Mo) | mg/kg dw | none | 0.99 | 0.66 | 1.0 | 0.62 | 0.94 | 0.63 | 0.255 | <0.001 | 0.315 | - | - | - | * (56) | | |
| Nickel (Ni) | mg/kg dw | none | **22** | **20** | **25** | **21** | **22** | **19** | 0.185 | <0.001 | <0.001 | - | - | - | * (13) | | |
| Phosphorus (P) | mg/kg dw | none | 626 | 494 | 785 | 583 | 670 | 493 | 0.138 | <0.001 | <0.001 | - | - | - | * (33) | | |
| Potassium (K) | mg/kg dw | none | 1,938 | 1,194 | 1,992 | 1,092 | 1,504 | 834 | 0.512 | <0.001 | <0.001 | - | - | - | * (74) | | |
| Selenium (Se) | mg/kg dw | log | 0.52 | 0.23 | 0.66 | 0.22 | 0.68 | 0.20 | <0.001 | - | - | <0.001 | <0.001 | <0.001 | * (128) | * (203) | * (241) |
| Silver (Ag) | mg/kg dw | rank | 0.11 | 0.10 | 0.12 | 0.10 | 0.12 | 0.10 | 0.868 | <0.001 | 0.868 | - | - | - | * (20) | | |
| Sodium (Na) | mg/kg dw | rank | 130 | 130 | 123 | 108 | 111 | 91 | 0.313 | <0.001 | <0.001 | - | - | - | * (15) | | |
| Strontium (Sr) | mg/kg dw | none | 193 | 231 | 205 | 245 | 195 | 229 | 0.913 | <0.001 | 0.143 | - | - | - | * (-16) | | |
| Thallium (Tl) | mg/kg dw | none | 0.19 | 0.12 | 0.17 | 0.089 | 0.15 | 0.085 | 0.670 | <0.001 | <0.001 | - | - | - | * (78) | | |
| Tin (Sn) | mg/kg dw | rank | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.082 | - | - | 0.285 | 0.039 | 1.00 | - | * (0) | - |
| Titanium (Ti) | mg/kg dw | none | 99 | 141 | 89 | 128 | 61 | 87 | 0.251 | <0.001 | <0.001 | - | - | - | * (-30) | | |
| Uranium (U) | mg/kg dw | none | 0.93 | 0.89 | 0.82 | 0.65 | 0.81 | 0.68 | 0.039 | - | - | 0.206 | <0.001 | <0.001 | - | * (26) | * (18) |
| Vanadium (V) | mg/kg dw | none | 23 | 15 | 25 | 15 | 20 | 13 | 0.288 | <0.001 | <0.001 | - | - | - | * (58) | | |
| Zinc (Zn) | mg/kg dw | none | 79 | 70 | 84 | 70 | 79 | 66 | 0.160 | <0.001 | 0.009 | - | - | - | * (17) | | |
| Zirconium (Zr) | mg/kg dw | none | - | - | 1.1 | 1.4 | 1.0 | 1.3 | 0.866 | <0.001 | 0.040 | - | - | - | NA | * (-19) | |
| **Polycyclic Aromatic Hydrocarbons** | | | | | | | | | | | | | | | | | |
| Acenaphthene | mg/kg dw | rank | - | - | 0.0050 | 0.0050 | 0.0050 | 0.0050 | 0.332 | 0.332 | 0.332 | - | - | - | NA | - | |
| Acenaphthylene | mg/kg dw | rank | - | - | 0.0050 | 0.0050 | 0.0050 | 0.0050 | 0.332 | 0.332 | 0.332 | - | - | - | NA | - | |
| Anthracene | mg/kg dw | rank | - | - | 0.0040 | 0.0040 | 0.0040 | 0.0040 | 0.332 | 0.332 | 0.332 | - | - | - | NA | - | |
| Benz(a)anthracene | mg/kg dw | none | - | - | 0.014 | 0.010 | 0.011 | 0.010 | 0.177 | 0.006 | 0.177 | - | - | - | NA | * (26) | |
| Benzo(a)pyrene | mg/kg dw | rank | - | - | 0.010 | 0.010 | 0.010 | 0.010 | 0.123 | 0.123 | 0.123 | - | - | - | NA | - | |
| Benzo(b&j)-fluoranthene | mg/kg dw | none | - | - | 0.023 | 0.010 | 0.018 | 0.010 | 0.181 | <0.001 | 0.181 | - | - | - | NA | * (103) | |
| Benzo(b+j+k)-fluoranthene | mg/kg dw | rank | - | - | 0.025 | 0.015 | 0.018 | 0.015 | 0.528 | <0.001 | 0.528 | - | - | - | NA | * (23) | |
| Benzo(g,h,i)-perylene | mg/kg dw | rank | - | - | 0.010 | 0.010 | 0.010 | 0.010 | 0.123 | 0.123 | 0.123 | - | - | - | NA | - | |
| Benzo(k)fluoranthene | mg/kg dw | rank | - | - | 0.010 | 0.010 | 0.010 | 0.010 | 0.332 | 0.332 | 0.332 | - | - | - | NA | - | |
| Chrysene | mg/kg dw | none | - | - | 0.023 | 0.010 | 0.024 | 0.010 | 0.870 | <0.001 | 0.870 | - | - | - | NA | * (136) | |
| Dibenz(a,h)-anthracene | mg/kg dw | rank | - | - | 0.0050 | 0.0050 | 0.0050 | 0.0050 | 0.332 | 0.332 | 0.332 | - | - | - | NA | - | |
| Fluoranthene | mg/kg dw | log | - | - | 0.018 | 0.010 | 0.015 | 0.010 | 0.349 | <0.001 | 0.349 | - | - | - | NA | * (67) | |
| Fluorene | mg/kg dw | rank | - | - | 0.010 | 0.010 | 0.010 | 0.010 | 0.332 | 0.332 | 0.332 | - | - | - | NA | - | |
| Indeno(1,2,3-c,d)-pyrene | mg/kg dw | rank | - | - | 0.010 | 0.010 | 0.010 | 0.010 | 0.332 | 0.332 | 0.332 | - | - | - | NA | - | |
| 2-Methylnaphthalene | mg/kg dw | rank | - | - | **0.059** | 0.010 | **0.054** | 0.010 | 0.770 | <0.001 | 0.770 | - | - | - | NA | * (465) | |
| Naphthalene | mg/kg dw | none | - | - | 0.025 | 0.010 | 0.020 | 0.010 | 0.244 | <0.001 | 0.244 | - | - | - | NA | * (125) | |
| Phenanthrene | mg/kg dw | rank | - | - | **0.060** | 0.010 | **0.046** | 0.010 | 0.487 | <0.001 | 0.487 | - | - | - | NA | * (405) | |
| Pyrene | mg/kg dw | rank | - | - | 0.018 | 0.010 | 0.014 | 0.010 | 0.616 | <0.001 | 0.616 | - | - | - | NA | * (45) | |

* indicates a significant difference between the two areas at an α of 0.1.

[a] The measure of central tendency reported is based on the applied data-transformation, as follows: mean for no transformation; geometric mean for $\log_{10}$-transformation; and, median for rank-transformation.

[b] The bolded values are above the BC Sediment Quality Guidelines lowest effect level.

▨ P-value < 0.1.

# APPENDIX D
# PLANKTON DATA

## Phytoplankton
## Zooplankton

## Reference List of Published Literature Values for Length-weight Regression Equations

Bottrell, H.H., A. Duncan, Z.M. Gliwicz, E. Grygierczyk, A. Herzig, A. Hillbricht-Ilkowska, H. Kurasawa, P. Larson, and T. Weglenska. 1976. A review of some problems in zooplankton production studies. Norwegian Journal of Zoology 24:419-456

Culver D.A., M.M. Boucherle, D.J. Bean, and J.W. Fletcher. 1985. Biomass of Freshwater Crustacean Zooplankton from Length–Weight Regressions. Can. J. Fish. Aquat. Sci. 42:1380-1390.

Downing, J.A., and F.A. Rigler. 1984. A manual on methods for the assessment of secondary productivity in fresh waters. 2nd edition. Blackwell Scientific Publications, Boston, Massachusetts. 495 p.

Dumont, H.J., I. Van de Velde, and S. Dumont. 1975. The dry weight estimate of biomass in a selection of Cladocera, Copepoda and Rotifera from the plankton, periphyton and benthos of continental waters. Oecologia, 19:75-97.

Lawrence, S.G., D.F. Malley, W.J. Findlay, M.A. MacIver, and I.L. Delbaere. 1987. Method for estimating dry weight of freshwater planktonic crustaceans from measures of length and shape. Can. J. Fish. Aquat. Sci. 44: (Suppl. 1): 264-274.

Malley, D.F., S.G. Lawrence, M.A. MacIver, and W.J. Findlay. 1989. Range of variation in estimates of dry weight for planktonic Crustacea and Rotifera from temperate North American lakes. Can. Tech. Rep. Fish. Aquat. Sci. 1666: iv + 49 p.

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Yan, N. D. 1986. Empirical prediction of crustacean zooplankton biomass in nutrient-poor Canadian Shield lakes. Can. J. Fish. Aquat. Sci. 43:788-796.

# Phytoplankton

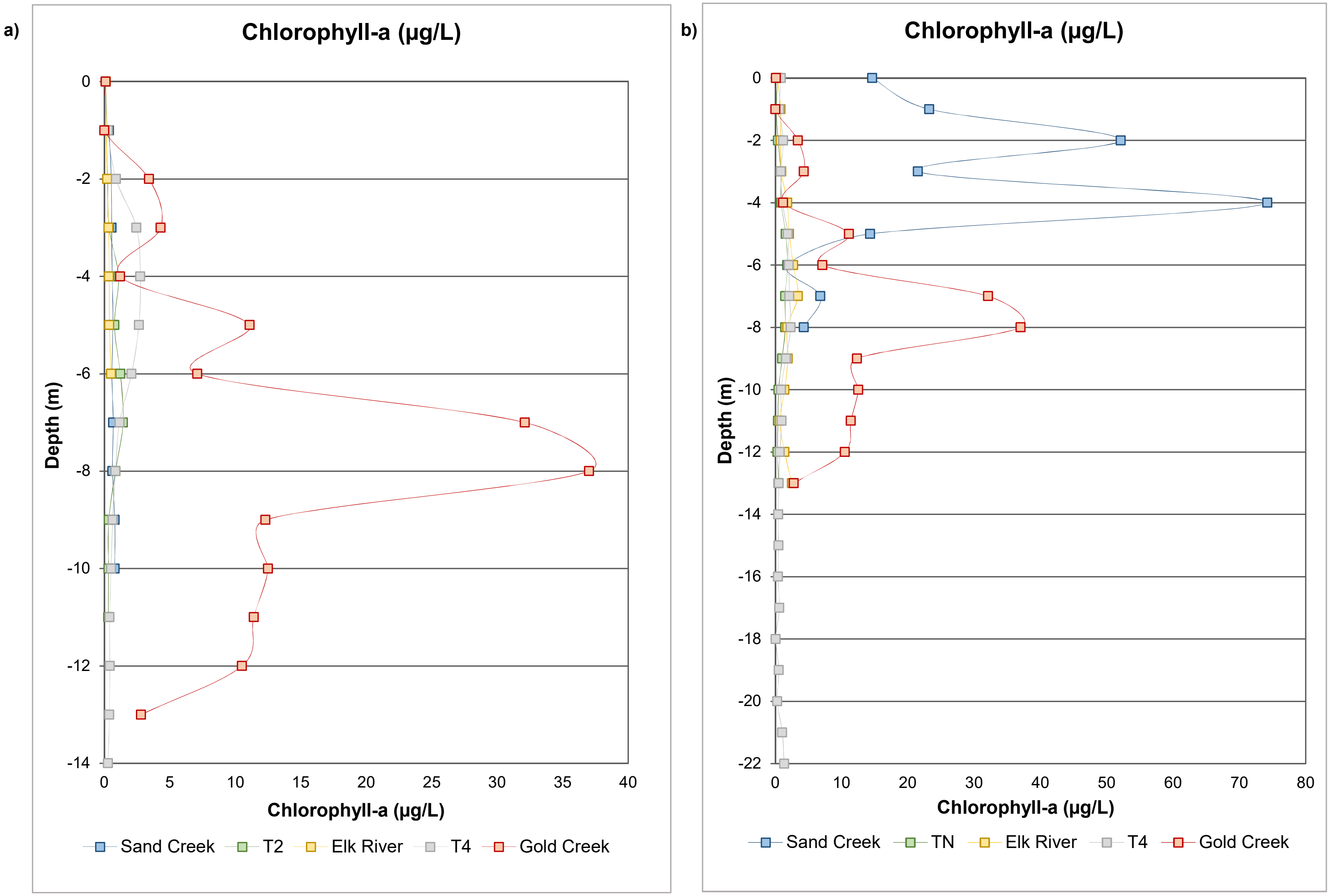

**Figure D.1:** **Chlorophyll-a Concentration (µg/L) from *In Situ* Water Quality Profiles in Koocanusa Reservoir in a) April and b) August 2015**

Notes: Sand Creek and T2/TN areas are located downstream of the Elk River confluence while Elk River, T4, and Gold Creek areas are located downstream.
The upstream location (T2) was relocated further upstream (TN) from the mouth of the Elk River after the April sampling in 2015.

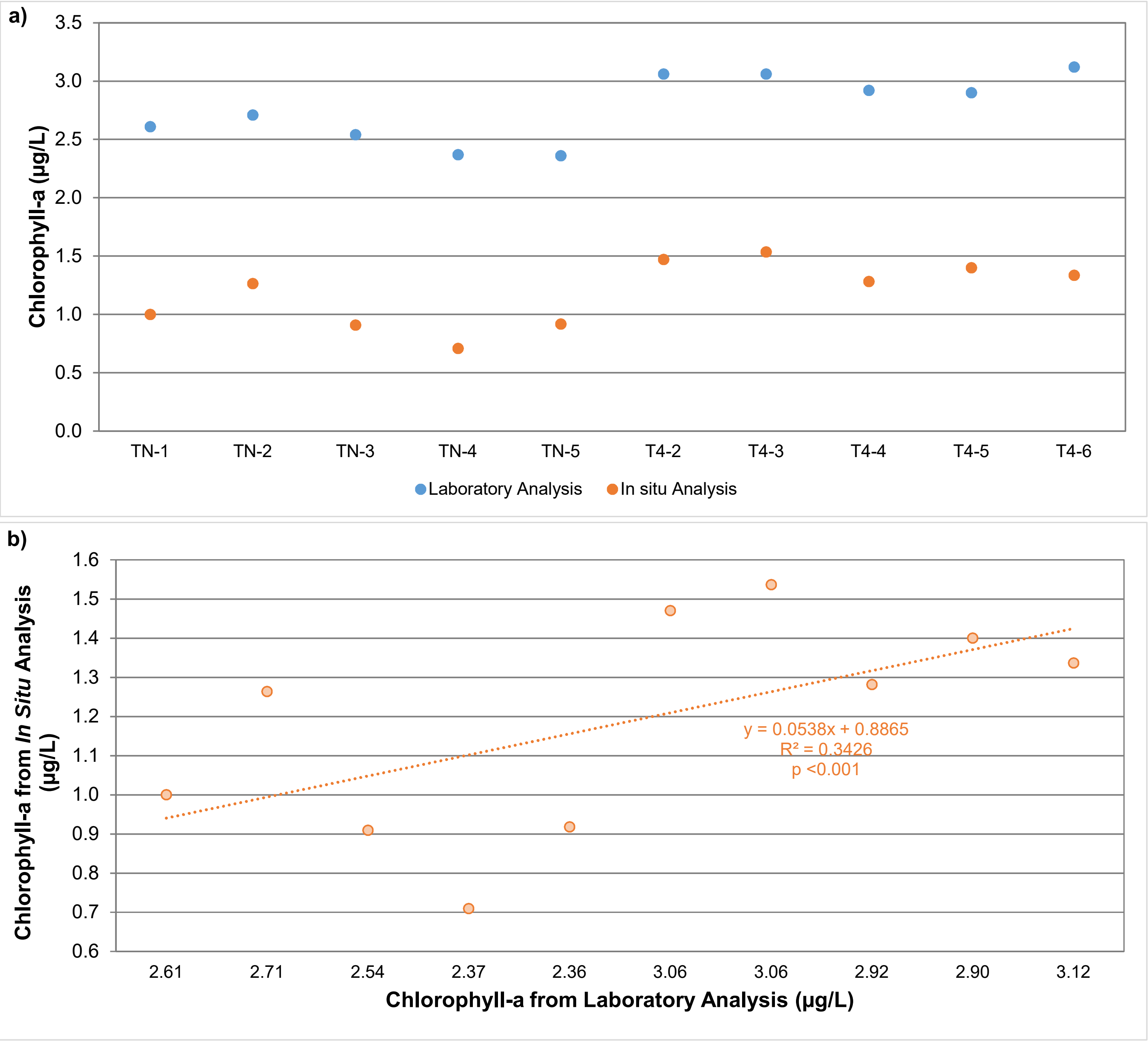

**Figure D.2:** a) Chlorophyll-a Concentrations in the Top 10 m of the Water Column Upstream (TN) and Downstream (T4) from the Elk River as Measured *In Situ* and in the Laboratory, August 2015
b) Regression Relationship Between the Chlorophyll-a Analyses

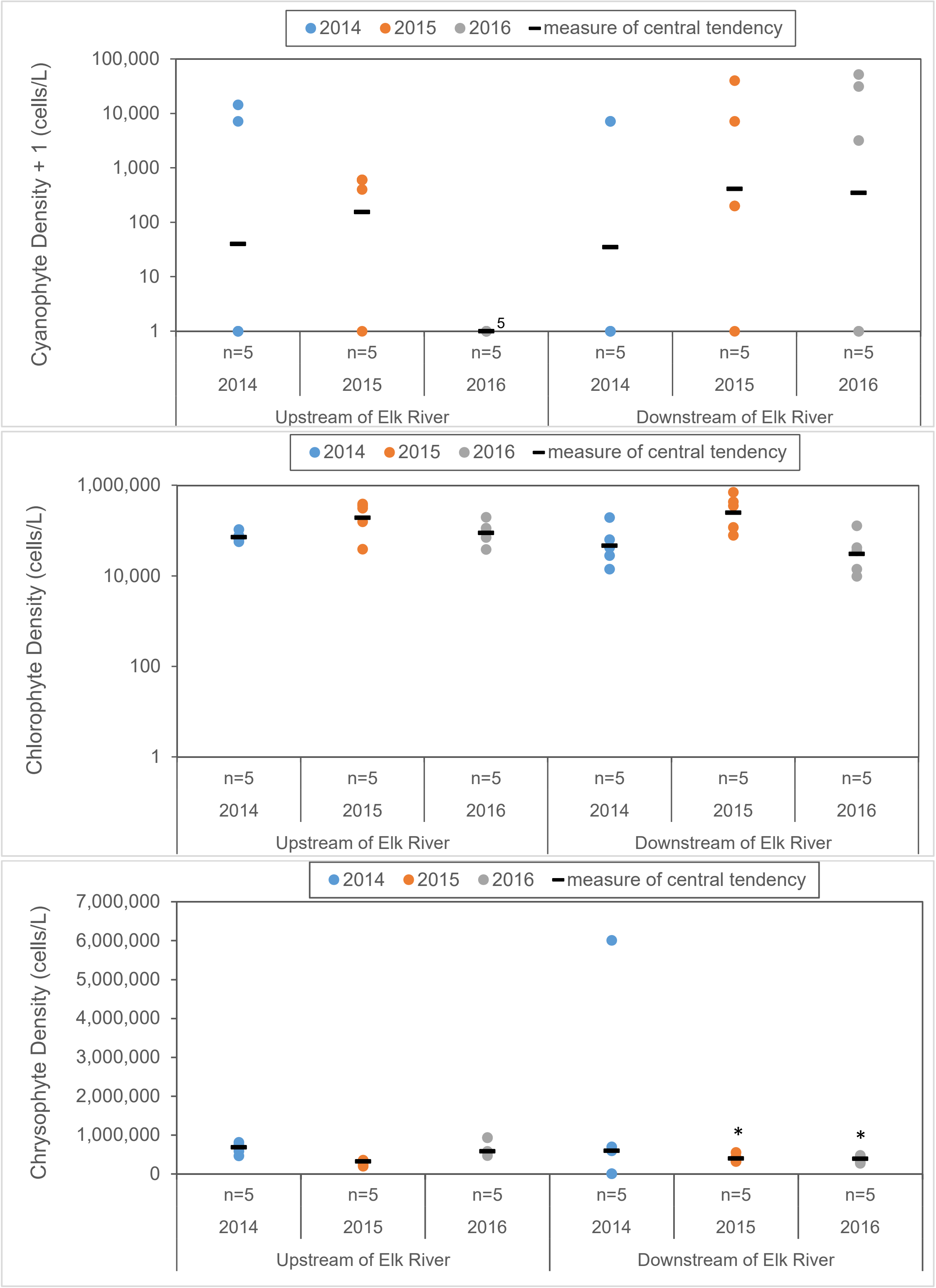

**Figure D.3:** **Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Density (cells/L) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

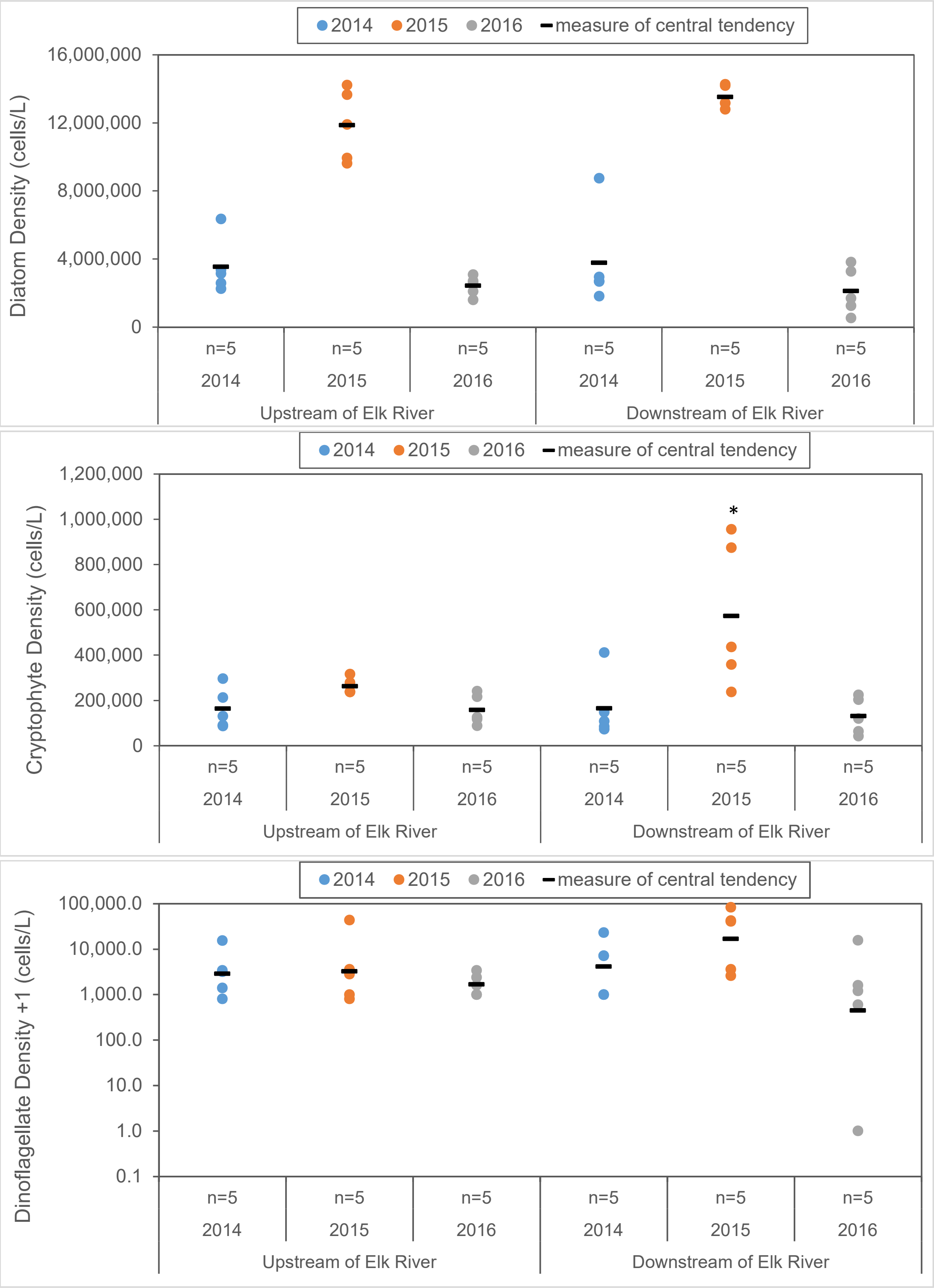

**Figure D.3:** **Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Density (cells/L) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

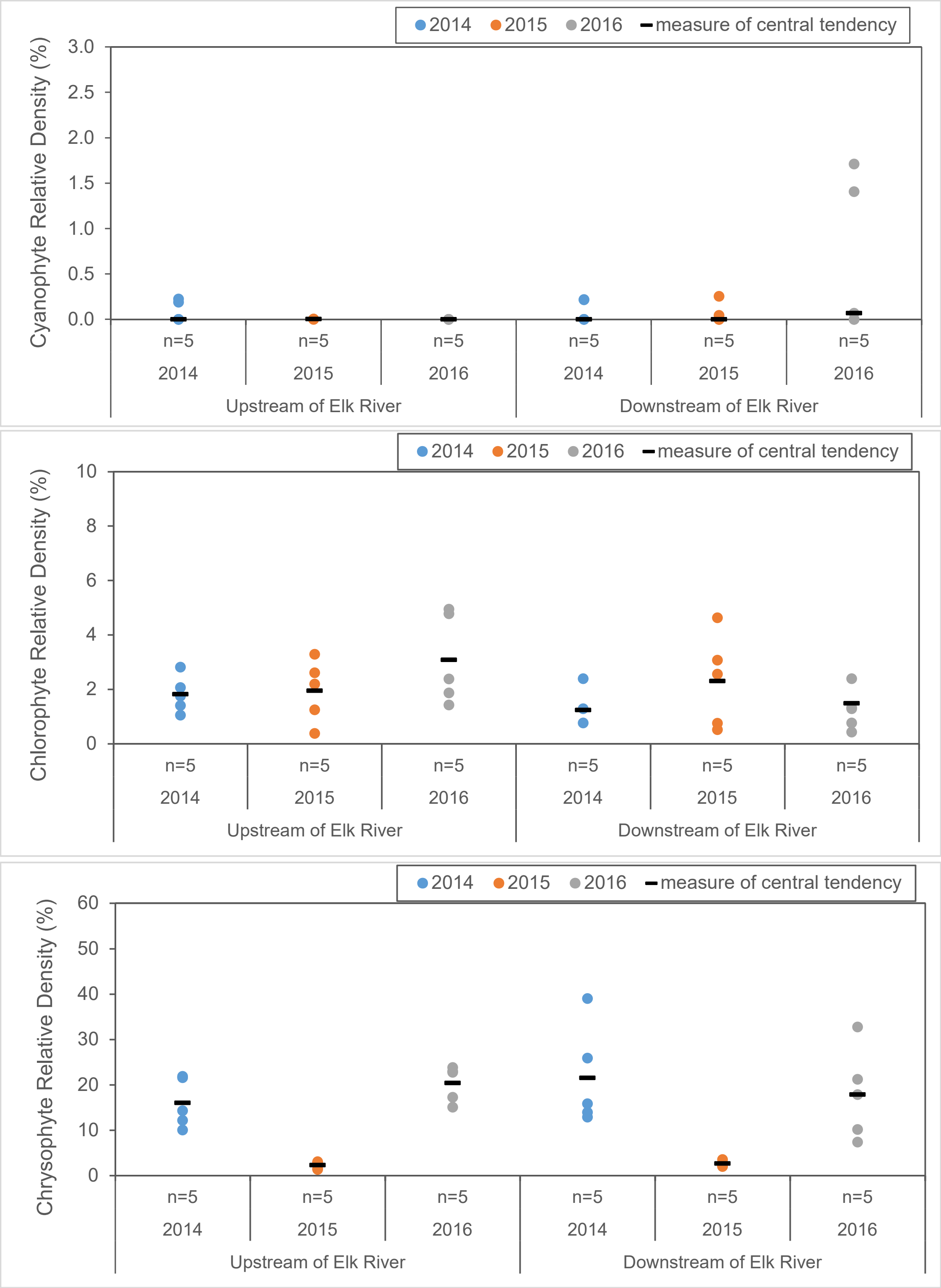

**Figure D.4:** **Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Relative Density (%) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

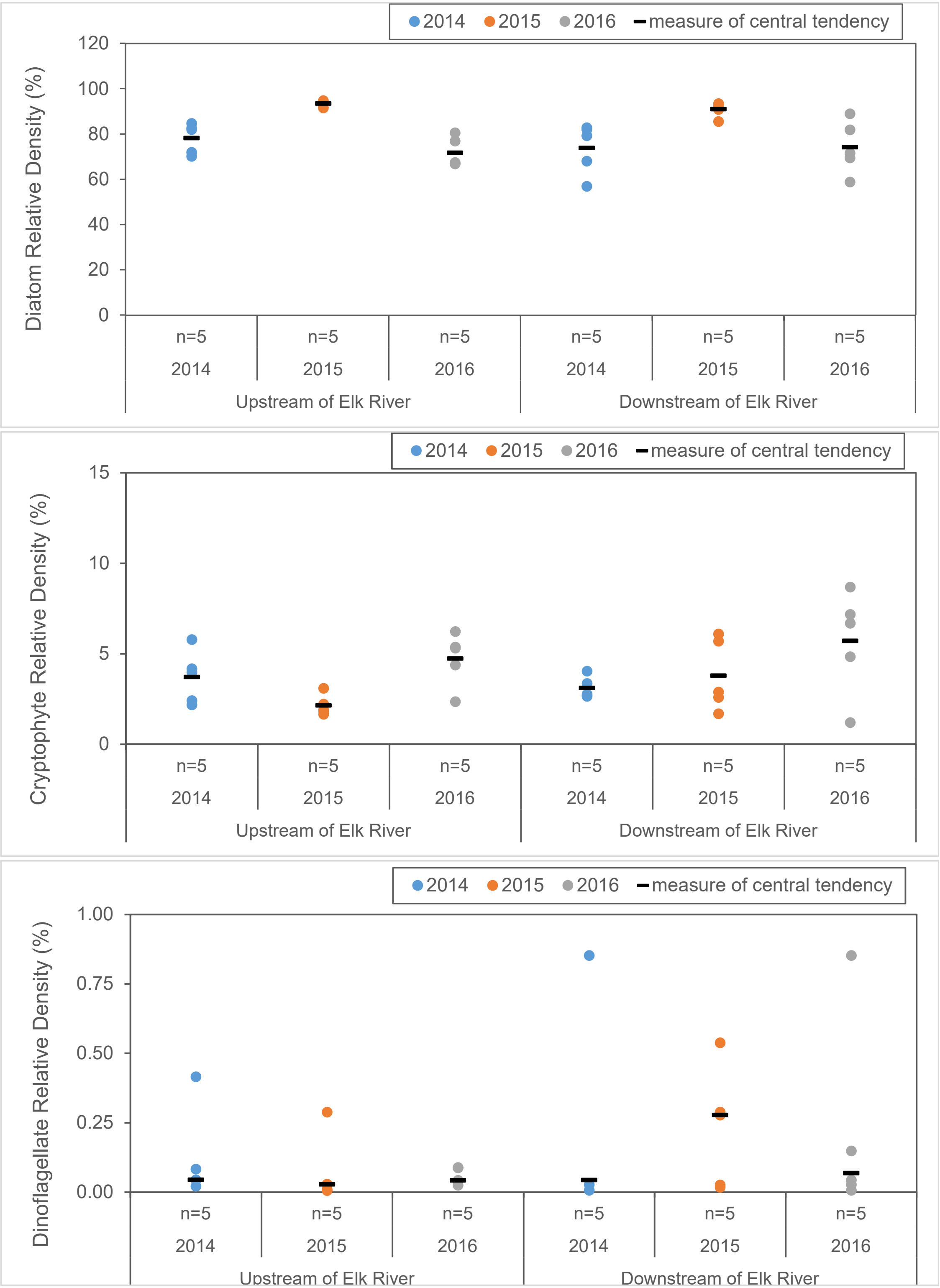

**Figure D.4: Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Relative Density (%) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

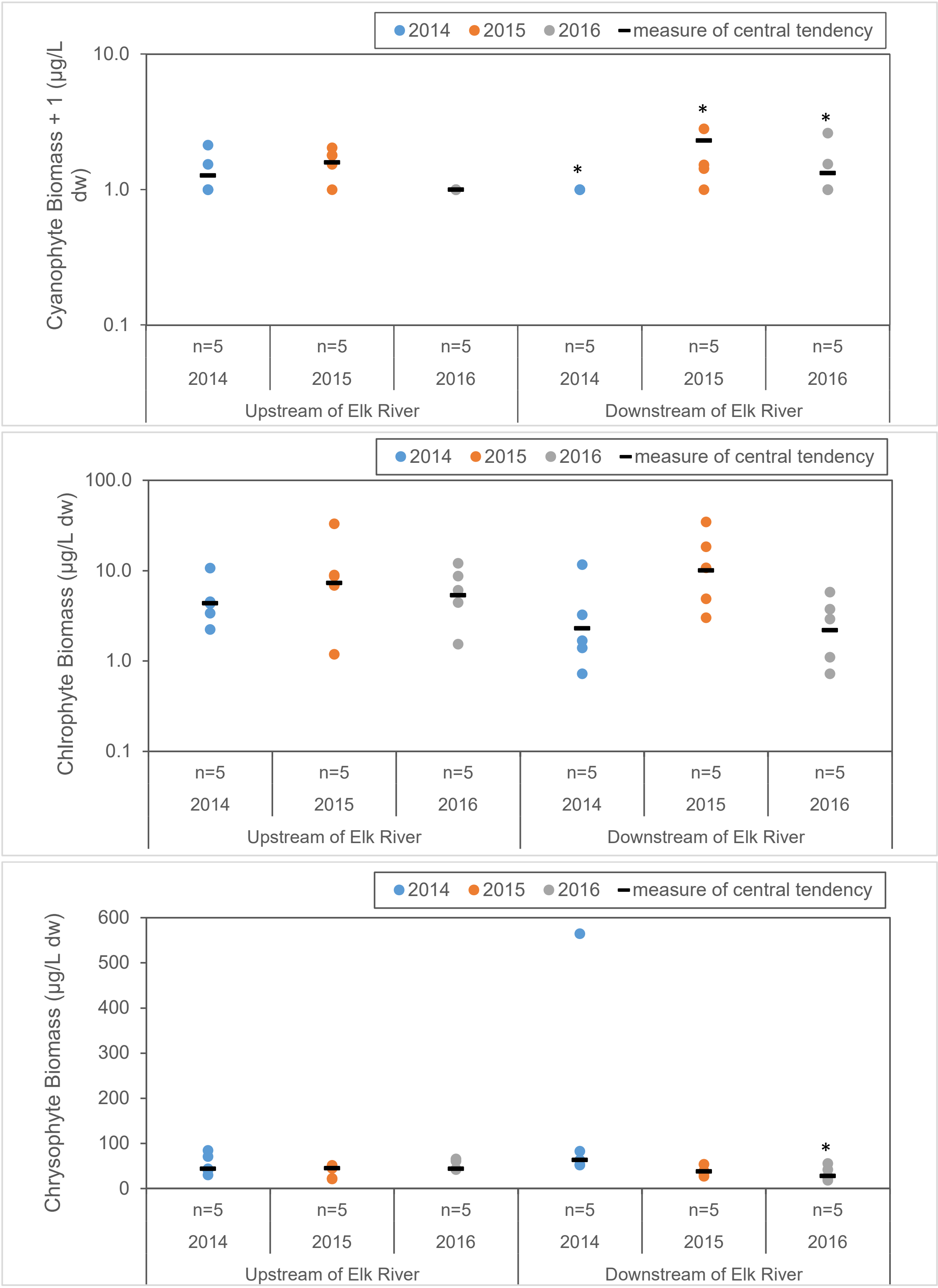

**Figure D.5: Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Biomass (µg/L) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

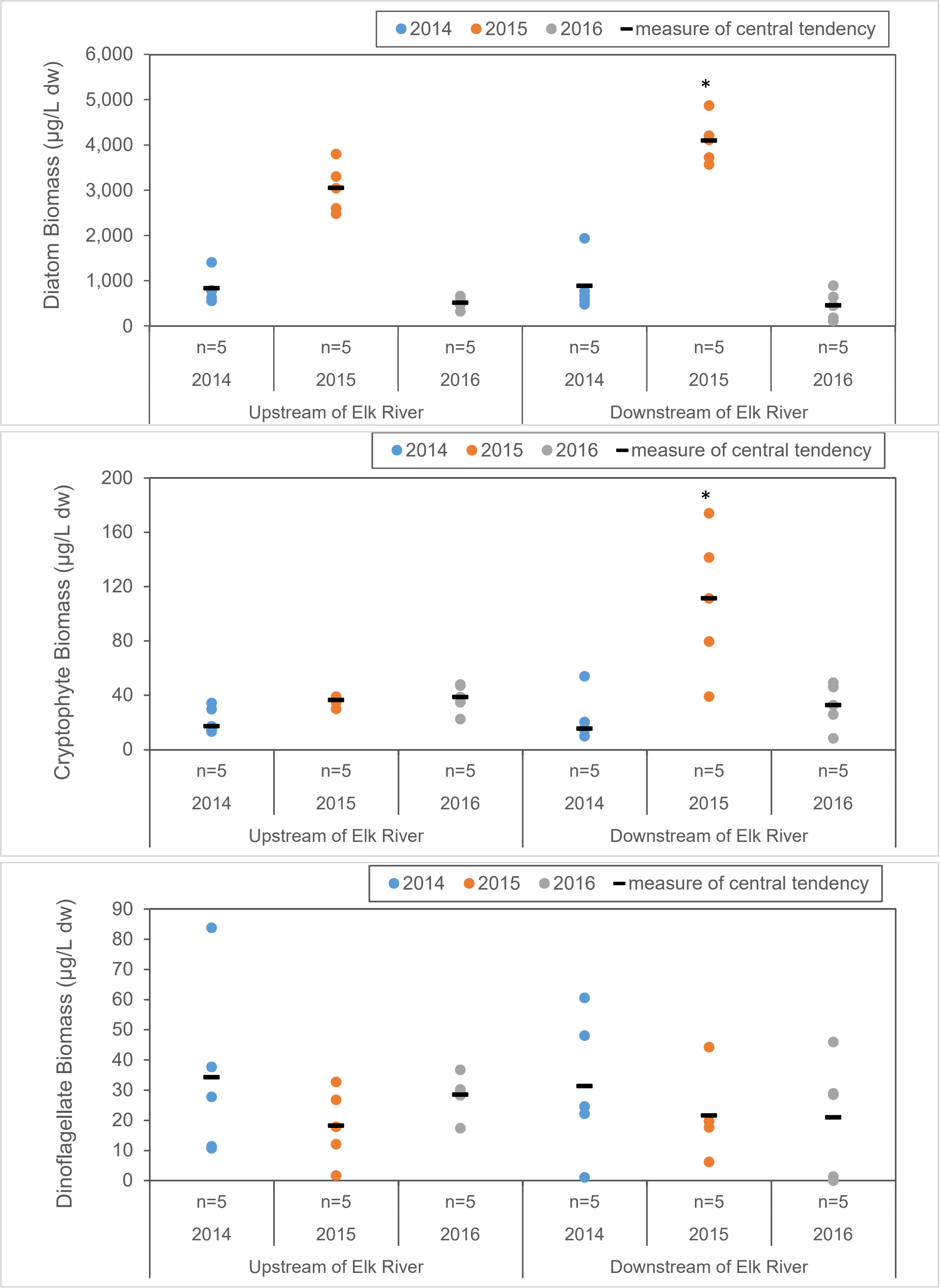

**Figure D.5:** **Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Biomass (µg/L) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

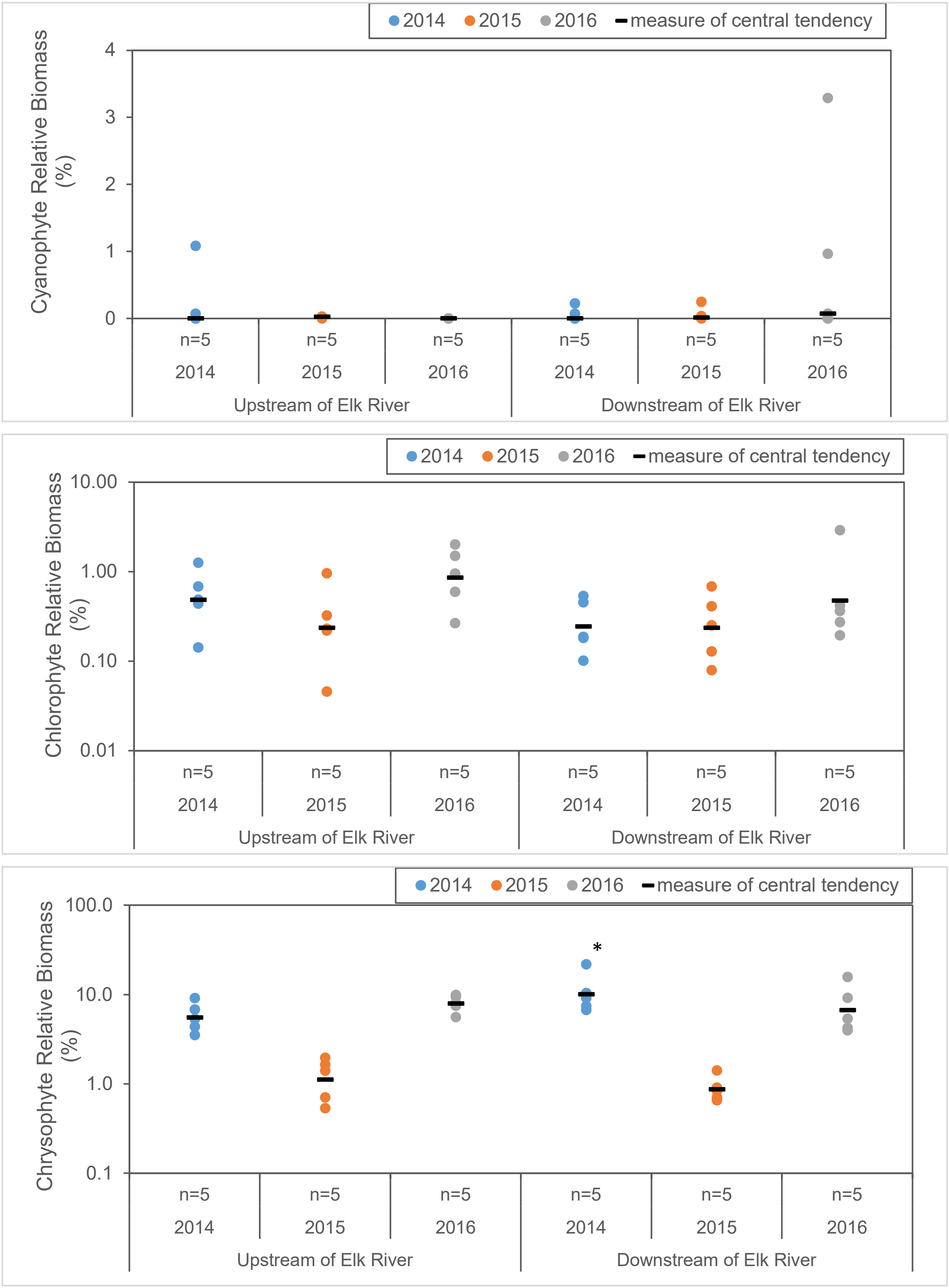

**Figure D.6:** **Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Relative Biomass (%) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

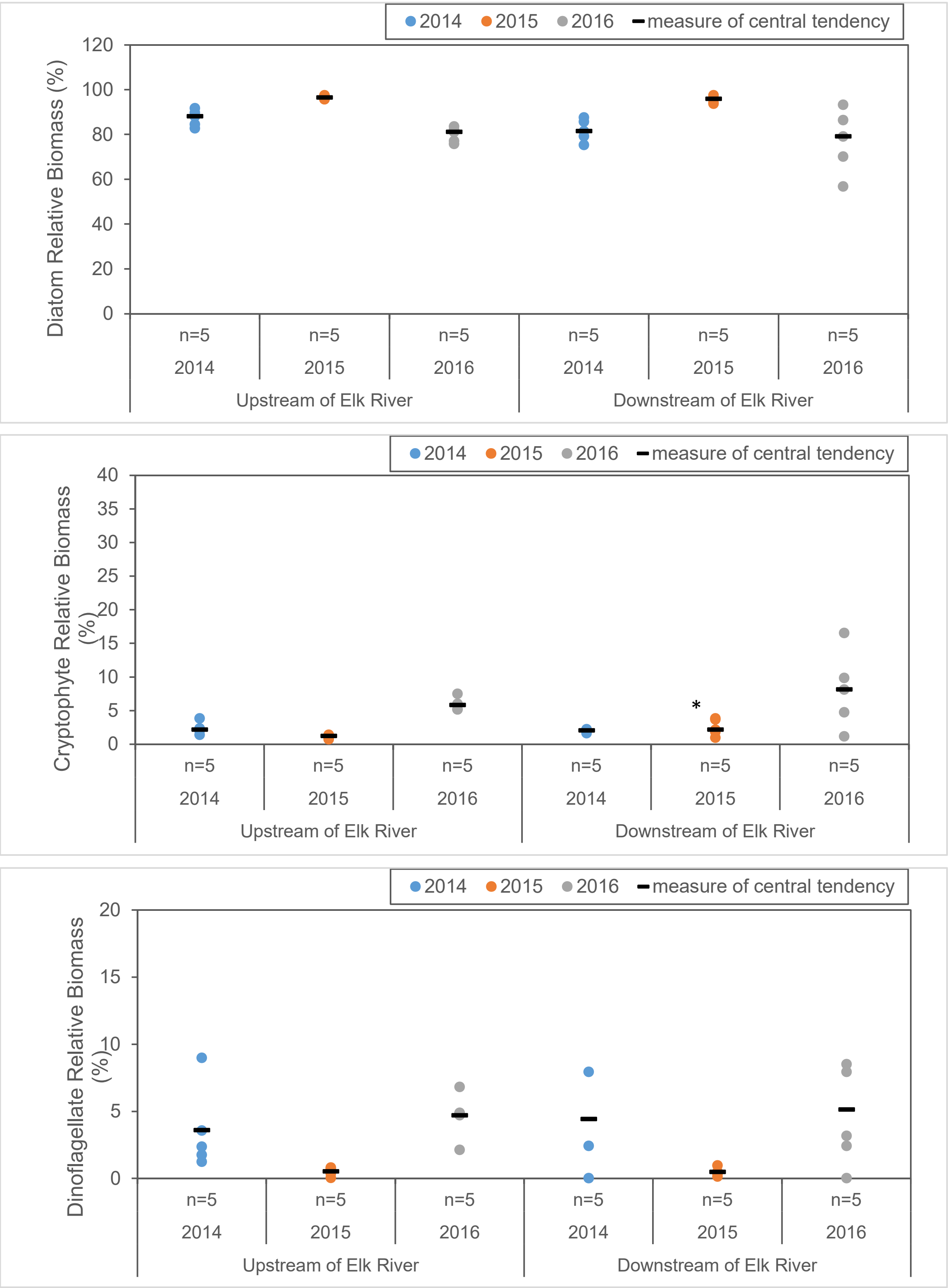

**Figure D.6:** **Cyanophyte, Chlorophyte, Chrysophyte, Diatom, Cryptophyte, and Dinoflagellate Relative Biomass (%) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

**Table D.1: Chlorophyll-a and Seston Biomass Concentrations in Water, August 2014 to 2016**

| Area | Sample ID | Chlorophyll-a (µg/L) | | | Seston Biomass (mg/L dw) | | |
|---|---|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Upstream of Elk River | TN-1 CHL/SES or T2-2 CHL/SES | 1.90 | 2.61 | 1.86 | 0.0212 | 0.0120 | 0.0247 |
| | TN-2 CHL/SES or T2-3 CHL/SES | 1.95 | 2.71 | 1.82 | 0.0472 | 0.0120 | 0.0261 |
| | TN-3 CHL/SES or T2-4 CHL/SES | 1.99 | 2.54 | 1.67 | 0.0374 | 0.0085 | 0.0254 |
| | TN-4 CHL/SES or T2-5 CHL/SES | 1.87 | 2.37 | 1.72 | 0.0310 | 0.0078 | 0.0289 |
| | TN-5 CHL/SES or T2-6 CHL/SES | 1.76 | 2.36 | 1.59 | 0.0339 | 0.0063 | 0.0183 |
| Downstream of Elk River | T4-2 CHL/SES | 2.36 | 3.06 | 2.40 | 0.0402 | 0.0014 | 0.0437 |
| | T4-3 CHL/SES | 2.34 | 3.06 | 2.40 | 0.0409 | 0.0028 | 0.0381 |
| | T4-4 CHL/SES | 2.03 | 2.92 | 2.50 | 0.0268 | 0.0035 | 0.0339 |
| | T4-5 CHL/SES | 2.31 | 2.90 | 2.41 | 0.0212 | 0.0014 | 0.0240 |
| | T4-6 CHL/SES | 2.10 | 3.12 | 2.12 | 0.0472 | 0.0021 | 0.0275 |

**Table D.2:** Koocanusa Reservoir Station Coordinates, Depth and Secchi Depth, August 2014

| Station Identifier | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Secchi Depth (m) |
|---|---|---|---|---|---|
| | | Easting | Northing | | |
| Upstream of Elk River | T2-2 | 629650 | 5450400 | 30.1 | 3.2 |
| | T2-3 | 629417 | 5450394 | 19.2 | 3.8 |
| | T2-4 | 629235 | 5450445 | 19.5 | 3.1 |
| | T2-5 | 629059 | 5450389 | 20.0 | 3.2 |
| | T2-6 | 628883 | 5450370 | 18.3 | 2.9 |
| Downstream of Elk River | T4-2 | 630076 | 5441806 | 27.8 | 3.4 |
| | T4-3 | 629798 | 5441984 | 27.4 | 3.0 |
| | T4-4 | 629703 | 5441675 | 26.4 | 2.7 |
| | T4-5 | 629487 | 5441751 | 25.8 | 3.3 |
| | T4-6 | 629403 | 5441477 | 30.5 | 3.2 |

**Table D.3:** **Koocanusa Reservoir Station Coordinates, Depth and Secchi Depth, August 2015**

| Station Identifier | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Secchi Depth (m) |
|---|---|---|---|---|---|
| | | Easting | Northing | | |
| Upstream of Elk River | TN-1 | 627377 | 5453471 | 13.5 | 2.2 |
| | TN-2 | 627270 | 5453644 | 12.4 | 2.2 |
| | TN-3 | 627341 | 5453711 | 13.2 | 2.1 |
| | TN-4 | 627329 | 5453862 | 12.9 | 2.2 |
| | TN-5 | 627211 | 5453978 | 13.4 | 2.3 |
| Downstream of Elk River | T4-2 | 630082 | 5441810 | 24.2 | 2.1 |
| | T4-3 | 629825 | 5442010 | 22.8 | 2.0 |
| | T4-4 | 629715 | 5441648 | 22.7 | 2.1 |
| | T4-5 | 629500 | 5441738 | 22.2 | 2.2 |
| | T4-6 | 629511 | 5441551 | 23.2 | 2.3 |

**Table D.4:** **Koocanusa Reservoir Station Coordinates, Depth and Secchi Depth, August 2016**

| Station Identifier | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Secchi Depth (m) |
|---|---|---|---|---|---|
| | | Easting | Northing | | |
| Upstream of Elk River | TN-1 | 627369 | 5453492 | 15 | 4.9 |
| | TN-2 | 627256 | 5453672 | 14 | 5.3 |
| | TN-3 | 627367 | 5453710 | 15 | 5.0 |
| | TN-4 | 627333 | 5453882 | 15 | 4.9 |
| | TN-5 | 627200 | 5454005 | 15 | 4.9 |
| Downstream of Elk River | T4-2 | 630115 | 5441812 | 24 | 4.4 |
| | T4-3 | 629831 | 5442006 | 25 | 4.3 |
| | T4-4 | 629695 | 5441699 | 25 | 4.2 |
| | T4-5 | 629494 | 5441783 | 24 | 4.8 |
| | T4-6 | 629430 | 5441547 | 25 | 4.2 |

## Table D.5: Density (no. of cells/L) of Phytoplankton Species, August 2014

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyano-phyte | *Aphanothece* sp. | 7,184 | - | - | - | 14,368 | - | 7,184 | 7,184 | - | - |
| Chlorophyte | *Botryococcus braunii* | 600 | - | 200 | - | - | - | - | - | - | - |
| | *Chlamydomonas* spp. | 64,656 | 21,552 | 64,656 | 7,184 | 14,368 | 39,683 | 14,368 | 14,368 | 28,736 | 64,656 |
| | *Coelastrum cambricum* | - | 200 | - | - | - | - | - | - | - | - |
| | *Oocystis lacustris* | - | 35,920 | - | 100,576 | 64,656 | 158,732 | - | 28,736 | - | - |
| | *Paulschulzia pseudovolvox* | 200 | - | - | - | - | - | - | - | - | - |
| Chrysophyte | *Bitrichia chodatii* | 7,184 | - | 7,184 | - | - | - | 21,552 | - | 14,368 | - |
| | *Chrysochromulina laurentiana* | - | - | - | - | 7,184 | 39,683 | - | 7,184 | - | - |
| | *Chrysochromulina parva* | 251,440 | 294,544 | 323,280 | 222,704 | 165,232 | 3,690,519 | 158,048 | 93,392 | 186,784 | 380,752 |
| | *Chrysococcus* sp. | 57,472 | 122,128 | 186,784 | 57,472 | 150,864 | 595,245 | 43,104 | 71,840 | 79,024 | 50,288 |
| | *Chrysolkos skuja* | - | - | - | - | - | - | 7,184 | - | - | - |
| | *Chrysostephanospaera globulifera* | - | - | 14,368 | - | - | 39,683 | 7,184 | - | - | 7,184 |
| | *Large chrysophyceae* | 7,184 | - | 7,184 | 7,184 | 14,368 | - | 7,184 | 14,368 | 28,736 | 14,368 |
| | *Small chrysophyceae* | 237,072 | 100,576 | 107,760 | 57,472 | 122,128 | 396,830 | 50,288 | 79,024 | 50,288 | 100,576 |
| | *Dinobryon mucronutom* | - | - | - | - | - | - | 21,552 | - | - | - |
| | *Dinobryon sertularia* | - | 28,936 | 400 | - | 15,168 | 1,000 | 7,184 | 7,584 | 7,184 | - |
| | *Dinobryon sociale* | 57,872 | 7,784 | 93,392 | 14,568 | 194,168 | 804,660 | 101,376 | 108,960 | 182,400 | 44,304 |
| | *Kephyrion* sp. | 28,736 | 21,552 | 57,472 | 14,368 | 50,288 | 198,415 | 14,368 | - | 43,104 | 100,576 |
| | *Mallomonas crassisquama* | 400 | - | 200 | 200 | - | 5,000 | - | 800 | 200 | 1,200 |
| | *Mallomonas duerrschmidtiae* | - | - | - | - | - | - | 200 | - | - | - |
| | *Salpingoeca frequentissima* | 35,920 | 14,368 | 14,368 | 93,392 | 7,184 | 79,366 | 21,552 | 7,184 | - | - |
| | *Stichogloea* spp. | - | - | - | - | 28,736 | 158,732 | - | 28,736 | - | - |
| Diatom | *Asterionella formosa* | - | - | - | - | - | - | - | 200 | - | - |
| | *Cyclotella bodanica* | 6,800 | 8,400 | 5,400 | 8,000 | 10,400 | 16,000 | 5,200 | 5,200 | 11,600 | 10,000 |
| | *Cyclotella ocellata* | - | - | 7,184 | - | 14,368 | - | - | 7,184 | - | - |
| | *Cyclotella pseudostelligera* | 2,219,856 | 3,268,720 | 2,521,584 | 3,046,016 | 6,286,000 | 8,611,211 | 2,672,448 | 2,593,424 | 2,859,232 | 1,781,632 |
| | *Cyclotella stelligera* | 30,400 | 36,000 | 45,600 | 44,200 | 39,600 | 61,000 | 3,000 | 48,800 | 56,200 | 24,800 |
| | *Fragilaria construens* | 6,200 | 4,600 | 3,000 | 5,400 | 200 | 24,000 | 16,200 | 26,600 | 12,600 | 5,200 |
| | *Gyrosigma* sp. | - | - | - | - | - | - | - | - | 200 | - |
| | *Rhizosolenia eriense* | - | 43,104 | 7,184 | 43,104 | - | 39,683 | - | - | 7,184 | 7,184 |
| | *Synedra ulna* | 9,600 | 7,000 | 5,400 | 7,400 | 8,400 | 3,000 | 5,200 | 5,800 | 9,400 | 5,800 |
| | *Tabellaria fenestrata* | - | - | 400 | - | - | - | - | 800 | - | 400 |
| Cryptophyte | *Cryptomonas erosa* | 2,600 | 3,200 | 5,600 | 5,600 | 3,200 | 17,000 | 2,400 | 6,600 | 6,200 | 2,200 |
| | *Cryptomonas pusilla* | - | 7,184 | - | 7,184 | - | - | - | - | - | - |
| | *Cryptomonas reflexa* | - | - | - | 200 | 400 | - | - | 400 | - | - |
| | *Cryptomonas rostratiformis* | - | - | 200 | - | - | - | 400 | - | 400 | 400 |
| | *Katablepharis ovalis* | 43,104 | 28,736 | - | 14,368 | 35,920 | 198,415 | 14,368 | 21,552 | 57,472 | 21,552 |
| | *Rhodomonas minuta* | 86,208 | 50,288 | 208,336 | 64,656 | 258,624 | 198,415 | 93,392 | 57,472 | 86,208 | 50,288 |
| Dino-flagellate | *Ceratium hirundenella* | 200 | 1,600 | 400 | 200 | 400 | - | 1,200 | 600 | 400 | 800 |
| | *Gymnodinium* sp. | - | 200 | 14,368 | - | 1,000 | - | - | - | 200 | 21,552 |
| | *Peridinium pusillum* | 1,200 | 1,600 | 400 | 600 | 1,800 | 1,000 | 200 | 4,200 | 400 | 600 |
| | *Peridinium wisconsiense* | - | - | 200 | - | - | - | - | - | - | - |
| **Total number of cells** | | **3,162,088** | **4,108,192** | **3,702,504** | **3,822,048** | **7,509,024** | **15,377,272** | **3,296,336** | **3,248,192** | **3,728,520** | **2,696,312** |
| **Total number of taxa** | | **23** | **23** | **28** | **23** | **26** | **23** | **26** | **27** | **24** | **23** |

## Table D.6: Density (no. of cells/L) of Phytoplankton Species, August 2015

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyanophyte | *Aphanocapsa delicatissima* | 600 | 600 | 600 | 400 | - | - | - | - | - | 600 |
| | *Aphanothece* sp. | - | - | - | - | - | - | - | 7,184 | - | - |
| | *Phormidium autumnale* | - | - | - | - | - | 200 | - | - | - | - |
| | *Pseudoanabaena* sp. | - | - | - | - | - | - | - | - | - | 39,683 |
| | *Woronichinia compacta* | - | - | - | - | - | - | 200 | - | - | - |
| Chlorophyte | *Ankyra judai* | 39,683 | - | - | - | - | - | - | - | - | - |
| | *Chlamydomonas* spp. | - | - | 39,683 | 79,366 | - | 39,683 | 79,366 | 39,683 | - | - |
| | *Collodictyon* sp. | - | - | 39,683 | - | - | 39,683 | - | - | - | - |
| | *Dictyosphaerium simplex* | - | - | - | - | - | - | - | - | 317,464 | - |
| | *Oocystis lacustris* | 119,049 | 357,147 | 317,464 | 238,098 | 39,683 | - | 277,781 | 674,611 | 119,049 | 119,049 |
| Chrysophyte | *Chrysococcus* sp. | 119,049 | 39,683 | - | - | 79,366 | 198,415 | 119,049 | 198,415 | 79,366 | 79,366 |
| | *Chrysostephanospaera globulifera* | - | 39,683 | 39,683 | - | - | - | - | - | - | 39,683 |
| | *Large chrysophyceae* | - | - | 39,683 | - | - | 39,683 | - | - | - | - |
| | *Small chrysophyceae* | - | 79,366 | 39,683 | - | - | - | 39,683 | 39,683 | - | - |
| | *Dinobryon sertularia* | - | - | - | - | 39,683 | - | 119,049 | 79,366 | - | - |
| | *Dinobryon sociale* | 39,683 | 79,366 | 79,366 | 79,366 | 158,732 | - | - | - | 79,366 | 79,366 |
| | *Kephyrion* sp. | 119,049 | - | - | 79,366 | 39,683 | 119,049 | 39,683 | 198,415 | 119,049 | 79,366 |
| | *Mallomonas crassisquama* | - | 200 | 600 | - | 200 | - | - | - | - | 200 |
| | *Mallomonas duerrschmidtiae* | - | - | - | - | - | 200 | - | - | - | - |
| | *Salpingoeca frequentissima* | 79,366 | 79,366 | 39,683 | 39,683 | - | 79,366 | 79,366 | 39,683 | 39,683 | 39,683 |
| Diatom | *Cyclotella bodanica* | - | - | - | 200 | - | - | - | - | - | - |
| | *Cyclotella michiganiana* | 277,781 | 277,781 | 79,366 | 238,098 | 357,147 | 555,562 | 674,611 | 1,111,124 | 39,683 | 238,098 |
| | *Cyclotella pseudostelligera* | 11,627,119 | 9,642,969 | 14,087,465 | 13,373,171 | 9,206,456 | 13,611,269 | 12,063,632 | 11,984,266 | 13,135,073 | 14,008,099 |
| | *Cyclotella stelligera* | 1,600 | 1,200 | 2,000 | 600 | 400 | 600 | 1,000 | 800 | 400 | 1,400 |
| | *Fragilaria crotonensis* | - | - | - | - | 1,600 | - | - | - | - | - |
| | *Rhizosolenia eriense* | - | - | 39,683 | 39,683 | 39,683 | - | 39,683 | 39,683 | - | - |
| | *Synedra acus* | 6,600 | 17,400 | 25,400 | 17,800 | 18,800 | 35,400 | 24,200 | 36,800 | 9,400 | 36,200 |
| | *Synedra ulna* | - | - | 400 | - | - | - | - | - | - | - |
| | *Tabellaria flocculsa* | - | - | - | - | - | 600 | - | - | - | - |
| Cryptophyte | *Cryptomonas erosa* | 1,600 | 1,800 | 2,800 | 800 | 200 | 1,400 | 3,000 | 2,800 | 800 | 4,200 |
| | *Cryptomonas pusilla* | - | - | - | - | - | 198,415 | 119,049 | 198,415 | - | - |
| | *Cryptomonas reflexa* | - | - | - | - | 400 | - | - | - | - | - |
| | *Cryptomonas rostratiformis* | - | 600 | 200 | - | - | - | 200 | 800 | 400 | 400 |
| | *Katablepharis ovalis* | - | 39,683 | 119,049 | 79,366 | 119,049 | - | 39,683 | 79,366 | - | 79,366 |
| | *Rhodomonas minuta* | 238,098 | 198,415 | 158,732 | 158,732 | 198,415 | 238,098 | 198,415 | 595,245 | 238,098 | 873,026 |
| Dinoflagellate | *Ceratium hirundenella* | - | - | - | 600 | 200 | - | - | - | - | - |
| | *Gymnodinium helveticum* | - | - | - | - | - | - | 200 | - | - | - |
| | *Gymnodinium* sp. | 1,000 | - | 40,083 | 200 | 600 | 39,883 | 1,200 | 80,966 | 40,483 | 400 |
| | *Peridinium pusillum* | 2,600 | 1,000 | 3,600 | - | 2,000 | 2,200 | 2,200 | 1,800 | 400 | 2,200 |
| **Total number of cells** | | **12,672,877** | **10,856,259** | **15,194,906** | **14,425,529** | **10,302,297** | **15,199,706** | **13,921,250** | **15,409,105** | **14,218,714** | **15,720,385** |
| **Total number of taxa** | | **15** | **17** | **22** | **17** | **19** | **18** | **21** | **20** | **15** | **19** |

## Table D.7: **Density (no. of cells/L) of Phytoplankton Species, August 2016**

| **Species** | | **Upstream of Elk River** | | | | | **Downstream of Elk River** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **TN-1** | **TN-2** | **TN-3** | **TN-4** | **TN-5** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Cyanophyte | *Chroococcus limneticus* | - | - | - | - | - | 28,736 | - | - | - | - |
| | *Planktolyngbya limnetica* | - | - | - | - | - | 23,200 | 31,200 | 3,200 | - | - |
| Chlorophyte | *Chlamydomonas* sp. | 57,472 | 7,184 | 71,840 | 14,368 | - | - | 14,368 | 7,184 | 14,368 | - |
| | *Pediastrum duplex* | - | 3,200 | - | - | - | - | - | - | - | 2,800 |
| | *Oocystis lacustris* | 14,368 | - | - | 43,104 | 14,368 | - | - | - | - | - |
| | *Paulschulzia pseudovolvox* | - | - | - | 200 | - | - | - | 200 | - | - |
| | *Scenedesmus denticulatus* | 28,736 | 14,368 | 50,288 | - | - | 14,368 | - | 14,368 | - | - |
| | *Kichnerella lunaris* | - | 14,368 | 71,840 | 14,368 | 64,656 | - | - | 107,760 | 28,736 | - |
| | *Spondylosium planum* | - | - | - | - | - | 14,368 | - | - | - | - |
| | *Botryococcus braunii* | - | - | - | - | - | 600 | - | 400 | - | - |
| | *Collodictyon* sp. | 7,184 | - | 7,184 | - | 7,184 | - | - | - | - | - |
| | *Bambusina brebissonii* | - | - | - | - | - | - | - | - | - | 7,184 |
| | *Ankistrodesmus spiralis* | 7,184 | - | - | - | 7,184 | 7,184 | - | - | - | - |
| Chrysophyte | *Small chrysophyceae* | 100,576 | 150,864 | 64,656 | 114,944 | 158,048 | 64,656 | 86,208 | 71,840 | 114,944 | 107,760 |
| | *Large chrysophyceae* | 28,736 | 21,552 | 7,184 | 43,104 | 43,104 | - | 35,920 | 7,184 | 43,104 | 14,368 |
| | *Chrysochromulina parva* | 158,048 | 64,656 | 646,560 | 265,808 | 423,856 | - | 14,368 | 28,736 | 21,552 | 43,104 |
| | *Chrysococcus* sp. | 122,128 | 129,312 | 86,208 | 64,656 | 222,704 | 100,576 | 129,312 | 158,048 | 215,520 | 93,392 |
| | *Chrysostephanospaera globulifera* | - | 14,368 | 7,184 | - | 14,368 | - | - | - | - | - |
| | *Kephyrion* sp. | 50,288 | 35,920 | 71,840 | 43,104 | 64,656 | 21,552 | 50,288 | 14,368 | - | 21,552 |
| | *Dinobryon mucronutom* | - | - | - | - | - | - | - | - | 7,184 | - |
| | *Dinobryon bavaricum* | 800 | 57,472 | 43,104 | 43,104 | 7,184 | 50,288 | 50,288 | 2,600 | 14,368 | 21,552 |
| | *Dinobryon sertularia* | - | - | - | - | - | - | - | 57,472 | - | - |
| | *Dinobryon sociale* | 71,840 | - | - | - | - | 35,920 | 21,552 | 86,208 | 7,184 | - |
| | *Chrysolkos skuja* | - | - | - | 7,184 | - | - | - | 7,184 | - | - |
| | *Bitrichia chodatii* | - | - | - | - | - | - | - | 35,920 | - | - |
| | *Bicoeca lacustris* | 21,552 | - | - | - | - | - | - | 7,184 | - | - |
| Diatom | *Cyclotella stelligera* | 3,400 | 1,600 | 2,600 | 4,200 | 1,800 | 1,600 | 1,200 | 1,200 | 3,000 | 2,400 |
| | *Cyclotella pseudostelligera* | 1,415,248 | 1,875,024 | 2,406,640 | 2,162,384 | 2,011,520 | 3,031,648 | 747,136 | 3,232,800 | 1,587,664 | 423,856 |
| | *Rhizosolenia eriense* | - | 14,368 | 21,552 | - | 14,368 | - | - | - | - | - |
| | *Tabellaria fenestrata* | 200 | - | - | - | - | 400 | 200 | - | 800 | 200 |
| | *Tabellaria flocculsa* | - | - | - | 200 | - | - | 200 | - | - | - |
| | *Fragilaria crotonensis* | 18,800 | 21,200 | 8,800 | 15,400 | 3,200 | 4,800 | 6,400 | 4,600 | 4,800 | 5,800 |
| | *Synedra acus* | 2,600 | 1,600 | 3,200 | 5,600 | 4,000 | 20,800 | 8,200 | 26,800 | 3,200 | 400 |
| | *Synedra ulna* | 1,800 | 400 | 600 | 2,400 | 600 | - | - | 800 | 1,000 | - |
| | *Cyclotella michiganiana* | 165,232 | 193,968 | 272,992 | 905,184 | 603,456 | 222,704 | 502,880 | 567,536 | 93,392 | 107,760 |
| | *Cyclotella bodanica* | 400 | 200 | - | - | - | - | - | - | 1,000 | 600 |
| Cryptophyte | *Rhodomonas minuta* | 93,392 | 93,392 | 107,760 | 57,472 | 143,680 | 43,104 | 93,392 | 201,152 | 165,232 | 50,288 |
| | *Cryptomonas erosa* | 5,400 | 12,200 | 16,200 | 18,600 | 13,600 | 1,200 | 6,800 | 10,000 | 11,200 | 15,200 |
| | *Cryptomonas rostratiformis* | - | - | 400 | - | - | - | - | 800 | 400 | 400 |
| | *Katablepharis ovalis* | 28,736 | 14,368 | 93,392 | 14,368 | 86,208 | - | 21,552 | 14,368 | 28,736 | - |
| Dinoflagellate | *Gymnodinium* sp. | 600 | 1,000 | 600 | 1,200 | 600 | - | - | 14,368 | 200 | 800 |
| | *Peridinium pusillum* | - | 1200 | 200 | 1800 | 600 | - | 600 | 800 | 600 | 200 |
| | *Ceratium hirundenella* | 400 | 200 | 200 | 400 | 400 | - | - | 400 | 800 | 200 |
| **Total number of cells** | | **2,405,120** | **2,743,984** | **4,063,024** | **3,843,152** | **3,911,344** | **3,687,704** | **1,822,064** | **4,685,480** | **2,368,984** | **919,816** |
| **Total number of taxa** | | **26** | **25** | **25** | **24** | **24** | **19** | **20** | **30** | **24** | **21** |

## Table D.8: Density (no. of cells/L) of Phytoplankton Species by Major Groups, August 2014

| Group | Upstream of the Elk River | | | | | Downstream of the Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyanophyte | 7,184 | 0 | 0 | 0 | 14,368 | 0 | 7,184 | 7,184 | 0 | 0 |
| Chlorophyte | 65,456 | 57,672 | 64,856 | 107,760 | 79,024 | 198,415 | 14,368 | 43,104 | 28,736 | 64,656 |
| Chrysophyte | 683,280 | 589,888 | 812,392 | 467,360 | 755,320 | 6,009,133 | 460,776 | 419,072 | 592,088 | 699,248 |
| Diatom | 2,272,856 | 3,367,824 | 2,595,752 | 3,154,120 | 6,358,968 | 8,754,894 | 2,702,048 | 2,688,008 | 2,956,416 | 1,835,016 |
| Cryptophyte | 131,912 | 89,408 | 214,136 | 92,008 | 298,144 | 413,830 | 110,560 | 86,024 | 150,280 | 74,440 |
| Dinoflagellates | 1,400 | 3,400 | 15,368 | 800 | 3,200 | 1,000 | 1,400 | 4,800 | 1,000 | 22,952 |
| **Total number of cells** | **3,162,088** | **4,108,192** | **3,702,504** | **3,822,048** | **7,509,024** | **15,377,272** | **3,296,336** | **3,248,192** | **3,728,520** | **2,696,312** |
| **Total number of groups** | **5** | **5** | **5** | **5** | **5** | **5** | **5** | **5** | **5** | **5** |

## Table D.9: Density (no. of cells/L) of Phytoplankton Species by Major Groups, August 2015

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyanophyte | 600 | 600 | 600 | 400 | 0 | 200 | 200 | 7,184 | 0 | 40,283 |
| Chlorophyte | 158,732 | 357,147 | 396,830 | 317,464 | 39,683 | 79,366 | 357,147 | 714,294 | 436,513 | 119,049 |
| Chrysophyte | 357,147 | 317,664 | 238,698 | 198,415 | 317,664 | 436,713 | 396,830 | 555,562 | 317,464 | 317,664 |
| Diatom | 11,913,100 | 9,939,350 | 14,234,314 | 13,669,552 | 9,624,086 | 14,203,431 | 12,803,126 | 13,172,673 | 13,184,556 | 14,283,797 |
| Cryptophyte | 239,698 | 240,498 | 280,781 | 238,898 | 318,064 | 437,913 | 360,347 | 876,626 | 239,298 | 956,992 |
| Dinoflagellate | 3,600 | 1,000 | 43,683 | 800 | 2,800 | 42,083 | 3,600 | 82,766 | 40,883 | 2,600 |
| **Total number of cells** | **12,672,877** | **10,856,259** | **15,194,906** | **14,425,529** | **10,302,297** | **15,199,706** | **13,921,250** | **15,409,105** | **14,218,714** | **15,720,385** |
| **Total number of groups** | **6** | **6** | **6** | **6** | **5** | **6** | **6** | **6** | **5** | **6** |

## **Table D.10:** Density (no. of cells/L) of Phytoplankton Species by Major Groups, August 2016

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyanophyte | 0 | 0 | 0 | 0 | 0 | 51,936 | 31,200 | 3,200 | 0 | 0 |
| Chlorophyte | 114,944 | 39,120 | 201,152 | 72,040 | 93,392 | 36,520 | 14,368 | 129,912 | 43,104 | 9,984 |
| Chrysophyte | 553,968 | 474,144 | 926,736 | 581,904 | 933,920 | 272,992 | 387,936 | 476,744 | 423,856 | 301,728 |
| Diatom | 1,607,680 | 2,108,360 | 2,716,384 | 3,095,368 | 2,638,944 | 3,281,952 | 1,266,216 | 3,833,736 | 1,694,856 | 541,016 |
| Cryptophyte | 127,528 | 119,960 | 217,752 | 90,440 | 243,488 | 44,304 | 121,744 | 226,320 | 205,568 | 65,888 |
| Dinoflagellate | 1,000 | 2,400 | 1,000 | 3,400 | 1,600 | 0 | 600 | 15,568 | 1,600 | 1,200 |
| **Total number of cells** | **2,405,120** | **2,743,984** | **4,063,024** | **3,843,152** | **3,911,344** | **3,687,704** | **1,822,064** | **4,685,480** | **2,368,984** | **919,816** |
| **Total number of groups** | **5** | **5** | **5** | **5** | **5** | **5** | **6** | **6** | **5** | **5** |

## Table D.11: Relative Densities (%) of Phytoplankton Species, August 2014

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | | Summary Statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Minimum | | Median | | Maximum | | Mean | | SD | |
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 |
| Cyano-phyte | *Aphanothece* sp. | 0.23 | 0 | 0 | 0 | 0.19 | 0 | 0.22 | 0.22 | 0 | 0 | 0 | 0 | 0 | 0 | 0.23 | 0.22 | 0.084 | 0.088 | 0.12 | 0.12 |
| Chlorophyte | *Botryococcus braunii* | 0.019 | 0 | 0.0054 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.019 | 0 | 0.0049 | 0 | 0.0082 | 0 |
| | *Chlamydomonas* spp. | 2.0 | 0.52 | 1.7 | 0.19 | 0.19 | 0.26 | 0.44 | 0.44 | 0.77 | 2.4 | 0.19 | 0.26 | 0.52 | 0.44 | 2.0 | 2.4 | 0.94 | 0.86 | 0.89 | 0.88 |
| | *Coelastrum cambricum* | 0 | 0.0049 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0049 | 0 | 0.0010 | 0 | 0.0022 | 0 |
| | *Oocystis lacustris* | 0 | 0.87 | 0 | 2.6 | 0.86 | 1.0 | 0 | 0.88 | 0 | 0 | 0 | 0 | 1 | 0 | 2.6 | 1.0 | 0.87 | 0.38 | 1.1 | 0.53 |
| | *Paulschulzia pseudovolvox* | 0.0063 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0063 | 0 | 0.0013 | 0 | 0.0028 | 0 |
| Chrysophyte | *Bitrichia chodatii* | 0.23 | 0 | 0.19 | 0 | 0 | 0 | 0.65 | 0 | 0.39 | 0 | 0 | 0 | 0 | 0 | 0.23 | 0.65 | 0.084 | 0.21 | 0.12 | 0.30 |
| | *Chrysochromulina laurentiana* | 0 | 0 | 0 | 0 | 0.096 | 0.26 | 0 | 0.22 | 0 | 0 | 0 | 0 | 0 | 0 | 0.10 | 0.26 | 0.019 | 0.096 | 0.043 | 0.13 |
| | ***Chrysochromulina parva*** | 8.0 | 7.2 | 8.7 | 5.8 | 2.2 | 24 | 4.8 | 2.9 | 5.0 | 14 | 2.2 | 2.9 | 7.2 | 5.0 | 8.7 | 24 | 6.4 | 10.2 | 2.6 | 8.9 |
| | ***Chrysococcus* sp.** | 1.8 | 3.0 | 5.0 | 1.5 | 2.0 | 3.9 | 1.3 | 2.2 | 2.1 | 1.9 | 1.5 | 1.3 | 2.0 | 2.1 | 5.0 | 3.9 | 2.7 | 2.3 | 1.4 | 0.96 |
| | *Chrysolkos skuja* | 0 | 0 | 0 | 0 | 0 | 0 | 0.22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.22 | 0 | 0.044 | 0 | 0.097 |
| | *Chrysostephanospaera globulifera* | 0 | 0 | 0.39 | 0 | 0 | 0.26 | 0.22 | 0 | 0 | 0.27 | 0 | 0 | 0 | 0.22 | 0.39 | 0.27 | 0.078 | 0.15 | 0.17 | 0.14 |
| | *Large chrysophyceae* | 0.23 | 0 | 0.19 | 0.19 | 0.19 | 0 | 0.22 | 0.44 | 0.77 | 0.53 | 0 | 0 | 0.19 | 0.44 | 0.23 | 0.77 | 0.16 | 0.39 | 0.091 | 0.30 |
| | ***Small chrysophyceae*** | 7.5 | 2.4 | 2.9 | 1.5 | 1.6 | 2.6 | 1.5 | 2.4 | 1.3 | 3.7 | 1.5 | 1.3 | 2.45 | 2.43 | 7.5 | 3.7 | 3.20 | 2.32 | 2.47 | 0.95 |
| | *Dinobryon mucronutom* | 0 | 0 | 0 | 0 | 0 | 0 | 0.65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.65 | 0 | 0.13 | 0 | 0.29 |
| | *Dinobryon sertularia* | 0 | 0.70 | 0.011 | 0 | 0.20 | 0.0065 | 0.22 | 0.23 | 0.19 | 0 | 0 | 0 | 0.01 | 0.19 | 0.70 | 0.23 | 0.18 | 0.13 | 0.30 | 0.12 |
| | ***Dinobryon sociale*** | 1.8 | 0.19 | 2.5 | 0.38 | 2.6 | 5.2 | 3.1 | 3.4 | 4.9 | 1.6 | 0.19 | 1.6 | 1.8 | 3.4 | 2.6 | 5.2 | 1.5 | 3.6 | 1.2 | 1.5 |
| | *Kephyrion* sp. | 0.91 | 0.52 | 1.6 | 0.38 | 0.67 | 1.3 | 0.44 | 0 | 1.2 | 3.7 | 0.38 | 0 | 0.67 | 1.2 | 1.6 | 3.7 | 0.81 | 1.3 | 0.46 | 1.4 |
| | *Mallomonas crassisquama* | 0.013 | 0 | 0.0054 | 0.0052 | 0 | 0.033 | 0 | 0.025 | 0.0054 | 0.045 | 0 | 0 | 0.0052 | 0.025 | 0.013 | 0.045 | 0.0047 | 0.021 | 0.0052 | 0.019 |
| | *Mallomonas duerrschmidtiae* | 0 | 0 | 0 | 0 | 0 | 0 | 0.0061 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0061 | 0 | 0.0012 | 0 | 0.0027 |
| | *Salpingoeca frequentissima* | 1.1 | 0.35 | 0.39 | 2.4 | 0.096 | 0.52 | 0.65 | 0.22 | 0 | 0 | 0.096 | 0 | 0.39 | 0.22 | 2.4 | 0.65 | 0.88 | 0.28 | 0.96 | 0.30 |
| | *Stichogloea* spp. | 0 | 0 | 0 | 0 | 0.38 | 1.0 | 0 | 0.88 | 0 | 0 | 0 | 0 | 0 | 0 | 0.38 | 1.0 | 0.077 | 0.38 | 0.17 | 0.53 |
| Diatom | *Asterionella formosa* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0062 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0062 | 0 | 0.0012 | 0 | 0.0028 |
| | *Cyclotella bodanica* | 0.22 | 0.20 | 0.15 | 0.21 | 0.14 | 0.10 | 0.16 | 0.16 | 0.31 | 0.37 | 0.14 | 0.10 | 0.20 | 0.16 | 0.22 | 0.37 | 0.18 | 0.22 | 0.037 | 0.11 |
| | *Cyclotella ocellata* | 0 | 0 | 0.19 | 0 | 0.19 | 0 | 0 | 0.22 | 0 | 0 | 0 | 0 | 0 | 0 | 0.19 | 0.22 | 0.077 | 0.044 | 0.11 | 0.099 |
| | ***Cyclotella pseudostelligera*** | 70 | 80 | 68 | 80 | 84 | 56 | 81 | 80 | 77 | 66 | 68 | 56 | 80 | 77 | 84 | 81 | 76 | 72 | 6.7 | 11 |
| | *Cyclotella stelligera* | 0.96 | 0.88 | 1.2 | 1.2 | 0.53 | 0.40 | 0.091 | 1.5 | 1.5 | 0.92 | 0.53 | 0.091 | 0.96 | 0.92 | 1.2 | 1.5 | 0.95 | 0.88 | 0.28 | 0.64 |
| | *Fragilaria construens* | 0.20 | 0.11 | 0.081 | 0.14 | 0.0027 | 0.16 | 0.49 | 0.82 | 0.34 | 0.19 | 0.0027 | 0.16 | 0.11 | 0.34 | 0.20 | 0.82 | 0.11 | 0.40 | 0.072 | 0.27 |
| | *Gyrosigma* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0054 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0054 | 0 | 0.0011 | 0 | 0.0024 |
| | *Rhizosolenia eriense* | 0 | 1.0 | 0.19 | 1.1 | 0 | 0.26 | 0 | 0 | 0.19 | 0.27 | 0 | 0 | 0.19 | 0.19 | 1.1 | 0.27 | 0.47 | 0.14 | 0.57 | 0.13 |
| | *Synedra ulna* | 0.30 | 0.17 | 0.15 | 0.19 | 0.11 | 0.020 | 0.16 | 0.18 | 0.25 | 0.22 | 0.11 | 0.020 | 0.17 | 0.18 | 0.30 | 0.25 | 0.19 | 0.16 | 0.073 | 0.09 |
| | *Tabellaria fenestrata* | 0 | 0 | 0.011 | 0 | 0 | 0 | 0 | 0.025 | 0 | 0.015 | 0 | 0 | 0 | 0 | 0.011 | 0.025 | 0.0022 | 0.0079 | 0.0048 | 0.011 |
| Cryptophyte | *Cryptomonas erosa* | 0.082 | 0.078 | 0.15 | 0.15 | 0.043 | 0.11 | 0.073 | 0.20 | 0.17 | 0.082 | 0.043 | 0.073 | 0.082 | 0.11 | 0.15 | 0.20 | 0.10 | 0.13 | 0.047 | 0.056 |
| | *Cryptomonas pusilla* | 0 | 0.17 | 0 | 0.19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.19 | 0 | 0.073 | 0 | 0.099 | 0 |
| | *Cryptomonas reflexa* | 0 | 0 | 0 | 0.0052 | 0.0053 | 0 | 0 | 0.012 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0053 | 0.012 | 0.0021 | 0.0025 | 0.0029 | 0.0055 |
| | *Cryptomonas rostratiformis* | 0 | 0 | 0.0054 | 0 | 0 | 0 | 0.012 | 0 | 0.011 | 0.015 | 0 | 0 | 0 | 0.011 | 0.0054 | 0.015 | 0.0011 | 0.0075 | 0.0024 | 0.0070 |
| | *Katablepharis ovalis* | 1.4 | 0.70 | 0 | 0.38 | 0.48 | 1.3 | 0.44 | 0.66 | 1.5 | 0.80 | 0 | 0.44 | 0.48 | 0.80 | 1.4 | 1.5 | 0.58 | 0.95 | 0.50 | 0.46 |
| | ***Rhodomonas minuta*** | 2.7 | 1.2 | 5.6 | 1.7 | 3.4 | 1.3 | 2.8 | 1.8 | 2.3 | 1.9 | 1.2 | 1.3 | 2.7 | 1.9 | 5.6 | 2.8 | 2.9 | 2.0 | 1.7 | 0.58 |
| Dino-flagellate | *Ceratium hirundenella* | 0.0063 | 0.039 | 0.011 | 0.0052 | 0.0053 | 0 | 0.036 | 0.018 | 0.011 | 0.030 | 0.0052 | 0 | 0.0063 | 0.018 | 0.039 | 0.036 | 0.013 | 0.019 | 0.015 | 0.015 |
| | *Gymnodinium* sp. | 0 | 0.0049 | 0.39 | 0 | 0.013 | 0 | 0 | 0 | 0.0054 | 0.80 | 0 | 0 | 0 | 0 | 0.39 | 0.80 | 0.081 | 0.16 | 0.17 | 0.36 |
| | *Peridinium pusillum* | 0.038 | 0.039 | 0.011 | 0.016 | 0.024 | 0.0065 | 0.0061 | 0.13 | 0.011 | 0.022 | 0.011 | 0.0061 | 0.024 | 0.011 | 0.039 | 0.13 | 0.025 | 0.035 | 0.013 | 0.053 |
| | *Peridinium wisconsiense* | 0 | 0 | 0.0054 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0054 | 0 | 0.0011 | 0 | 0.0024 | 0 |

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of cells at one or more stations within an area (as shown in Figure 5.4).

## Table D.12: Relative Densities (%) of Phytoplankton Species, August 2015

| | Species | Upstream of Elk River | | | | | Downstream of Elk River | | | | | Summary Statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Minimum | | Median | | Maximum | | Mean | | SD | |
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | TN | T4 | TN | T4 | TN | T4 | TN | T4 | TN | T4 |
| Cyanophyte | *Aphanocapsa delicatissima* | 0.0047 | 0.0055 | 0.0039 | 0.0028 | 0 | 0 | 0 | 0 | 0 | 0.0038 | 0 | 0 | 0.0039 | 0 | 0.0055 | 0.0038 | 0.0034 | 0.00076 | 0.0022 | 0.0017 |
| | *Aphanothece* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.047 | 0 | 0.0093 | 0 | 0.0208 |
| | *Phormidium autumnale* | 0 | 0 | 0 | 0 | 0 | 0.0013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0013 | 0 | 0.00026 | 0 | 0.0006 |
| | *Pseudoanabaena* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0.050 | 0 | 0.1129 |
| | *Woronichinia compacta* | 0 | 0 | 0 | 0 | 0 | 0 | 0.0014 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0014 | 0 | 0.00029 | 0 | 0.0006 |
| Chlorophyte | *Ankyra judai* | 0.31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.31 | 0 | 0.063 | 0 | 0.1400 | 0 |
| | *Chlamydomonas* spp. | 0 | 0 | 0.26 | 0.55 | 0 | 0.26 | 0.57 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0.26 | 0.55 | 0.57 | 0.1623 | 0.2177 | 0.2446 | 0.2358 |
| | *Collodictyon* sp. | 0 | 0 | 0.26 | 0 | 0 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.26 | 0.26 | 0.052 | 0.052 | 0.1168 | 0.1168 |
| | *Dictyosphaerium simplex* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 | 0 | 0.4465 | 0 | 0.9985 |
| | *Oocystis lacustris* | 0.94 | 3.3 | 2.1 | 1.7 | 0.39 | 0 | 2.0 | 4.4 | 0.84 | 0.76 | 0.39 | 0 | 1.7 | 0.84 | 3.3 | 4.4 | 1.7 | 1.6 | 1.1163 | 1.7121 |
| Chrysophyte | *Chrysococcus* sp. | 0.94 | 0.37 | 0 | 0 | 0.77 | 1.3 | 0.86 | 1.3 | 0.56 | 0.50 | 0 | 0.50 | 0.37 | 0.86 | 0.94 | 1.3 | 0.4151 | 0.9022 | 0.4325 | 0.3839 |
| | *Chrysostephanospaera globulifera* | 0 | 0.37 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0 | 0 | 0.37 | 0.25 | 0.1253 | 0.050 | 0.1755 | 0.1129 |
| | *Large chrysophyceae* | 0 | 0 | 0.26 | 0 | 0 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.26 | 0.26 | 0.052 | 0.052 | 0.12 | 0.12 |
| | *Small chrysophyceae* | 0 | 0.73 | 0.26 | 0 | 0 | 0 | 0.29 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0 | 0.73 | 0.29 | 0.20 | 0.11 | 0.32 | 0.15 |
| | *Dinobryon sertularia* | 0 | 0 | 0 | 0 | 0.39 | 0 | 0.86 | 0.52 | 0 | 0 | 0 | 0 | 0 | 0 | 0.39 | 0.86 | 0.077 | 0.27 | 0.17 | 0.39 |
| | *Dinobryon sociale* | 0.31 | 0.73 | 0.52 | 0.55 | 1.5 | 0 | 0 | 0 | 0.56 | 0.50 | 0.31 | 0 | 0.55 | 0 | 1.5 | 0.56 | 0.73 | 0.21 | 0.48 | 0.29 |
| | *Kephyrion* sp. | 0.94 | 0 | 0 | 0.55 | 0.39 | 0.78 | 0.29 | 1.3 | 0.84 | 0.50 | 0 | 0.29 | 0.39 | 0.78 | 0.94 | 1.3 | 0.37 | 0.74 | 0.40 | 0.38 |
| | *Mallomonas crassisquama* | 0 | 0.0018 | 0.0039 | 0 | 0.0019 | 0 | 0 | 0 | 0 | 0.0013 | 0 | 0 | 0.0018 | 0 | 0.0039 | 0.0013 | 0.0015 | 0.00025 | 0.0016 | 0.00057 |
| | *Mallomonas duerrschmidtiae* | 0 | 0 | 0 | 0 | 0 | 0.0013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0013 | 0 | 0.00026 | 0 | 0.00059 |
| | *Salpingoeca frequentissima* | 0.63 | 0.73 | 0.26 | 0.28 | 0 | 0.52 | 0.57 | 0.26 | 0.28 | 0.25 | 0 | 0.25 | 0.28 | 0.28 | 0.73 | 0.57 | 0.38 | 0.38 | 0.30 | 0.16 |
| Diatom | *Cyclotella bodanica* | 0 | 0 | 0 | 0.0014 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0014 | 0 | 0.00028 | 0 | 0.00062 | 0 |
| | ***Cyclotella michiganiana*** | 2.2 | 2.6 | 0.52 | 1.7 | 3.5 | 3.7 | 4.8 | 7.2 | 0.28 | 1.5 | 0.52 | 0.28 | 2.2 | 3.7 | 3.5 | 7.2 | 2.1 | 3.5 | 1.1 | 2.7 |
| | ***Cyclotella pseudostelligera*** | 92 | 89 | 93 | 93 | 89 | 90 | 87 | 78 | 92 | 89 | 89 | 78 | 92 | 89 | 93 | 92 | 91 | 87 | 1.9 | 5.6 |
| | *Cyclotella stelligera* | 0.013 | 0.011 | 0.013 | 0.0042 | 0.0039 | 0.0039 | 0.0072 | 0.0052 | 0.0028 | 0.0089 | 0.0039 | 0.0028 | 0.011 | 0.0052 | 0.013 | 0.0089 | 0.0090 | 0.0056 | 0.0046 | 0.0025 |
| | *Fragilaria crotonensis* | 0 | 0 | 0 | 0 | 0.016 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.016 | 0 | 0.0031 | 0 | 0.0069 | 0 |
| | *Rhizosolenia eriense* | 0 | 0 | 0.26 | 0.28 | 0.39 | 0 | 0.29 | 0.26 | 0 | 0 | 0 | 0 | 0.26 | 0 | 0.39 | 0.29 | 0.18 | 0.11 | 0.17 | 0.15 |
| | *Synedra acus* | 0.052 | 0.16 | 0.17 | 0.12 | 0.18 | 0.23 | 0.17 | 0.24 | 0.066 | 0.23 | 0.052 | 0.066 | 0.16 | 0.23 | 0.18 | 0.24 | 0.14 | 0.19 | 0.052 | 0.073 |
| | *Synedra ulna* | 0 | 0 | 0.0026 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0026 | 0 | 0.0005 | 0 | 0.0012 | 0 |
| | *Tabellaria flocculsa* | 0 | 0 | 0 | 0 | 0 | 0.0039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0039 | 0 | 0.00079 | 0 | 0.0018 |
| Cryptophyte | *Cryptomonas erosa* | 0.013 | 0.017 | 0.018 | 0.0055 | 0.0019 | 0.0092 | 0.022 | 0.018 | 0.0056 | 0.027 | 0.0019 | 0.0056 | 0.013 | 0.018 | 0.018 | 0.0267 | 0.011 | 0.016 | 0.0071 | 0.0087 |
| | *Cryptomonas pusilla* | 0 | 0 | 0 | 0 | 0 | 1.3 | 0.86 | 1.3 | 0 | 0 | 0 | 0 | 0 | 0.86 | 0 | 1.3 | 0 | 0.69 | 0 | 0.65 |
| | *Cryptomonas reflexa* | 0 | 0 | 0 | 0 | 0.0039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0039 | 0 | 0.00078 | 0 | 0.0017 | 0 |
| | *Cryptomonas rostratiformis* | 0 | 0.0055 | 0.0013 | 0 | 0 | 0 | 0.0014 | 0.0052 | 0.0028 | 0.0025 | 0 | 0 | 0 | 0.0025 | 0.0055 | 0.0052 | 0.0014 | 0.0024 | 0.0024 | 0.0019 |
| | *Katablepharis ovalis* | 0 | 0.37 | 0.78 | 0.55 | 1.2 | 0 | 0.29 | 0.52 | 0 | 0.50 | 0 | 0 | 0.55 | 0.29 | 1.2 | 0.52 | 0.57 | 0.26 | 0.43 | 0.26 |
| | ***Rhodomonas minuta*** | 1.9 | 1.8 | 1.0 | 1.1 | 1.9 | 1.6 | 1.4 | 3.9 | 1.7 | 5.6 | 1.0 | 1.4 | 1.8 | 1.7 | 1.9 | 5.6 | 1.6 | 2.8 | 0.44 | 1.8 |
| Dino-flagellate | *Ceratium hirundenella* | 0 | 0 | 0 | 0.0042 | 0.0019 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0042 | 0 | 0.0012 | 0 | 0.0018 | 0 |
| | *Gymnodinium helveticum* | 0 | 0 | 0 | 0 | 0 | 0 | 0.0014 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0014 | 0 | 0.0003 | 0 | 0.00064 |
| | *Gymnodinium* sp. | 0.0079 | 0 | 0.26 | 0.0014 | 0.0058 | 0.26 | 0.0086 | 0.53 | 0.28 | 0.0025 | 0 | 0.0025 | 0.0058 | 0.26 | 0.26 | 0.53 | 0.056 | 0.22 | 0.12 | 0.22 |
| | *Peridinium pusillum* | 0.021 | 0.0092 | 0.024 | 0 | 0.019 | 0.014 | 0.016 | 0.012 | 0.0028 | 0.014 | 0 | 0.0028 | 0.019 | 0.014 | 0.024 | 0.016 | 0.015 | 0.012 | 0.0098 | 0.0052 |

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of cells at one or more stations within an area (as shown in Figure 5.4).

**Table D.13:** **Relative Densities (%) of Phytoplankton Species, August 2016**

|  | Species | Upstream of Elk River |  |  |  |  | Downstream of Elk River |  |  |  |  | Summary Statistics |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |  |  |  | Minimum |  | Median |  | Maximum |  | Mean |  | SD |  |
|  |  | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | TN | T4 | TN | T4 | TN | T4 | TN | T4 | TN | T4 |
| Cyano-phyte | *Chroococcus limneticus* | 0 | 0 | 0 | 0 | 0 | 0.78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.78 | 0 | 0.16 | 0 | 0.35 |
|  | *Planktolyngbya limnetica* | 0 | 0 | 0 | 0 | 0 | 0.63 | 1.7 | 0.068 | 0 | 0 | 0 | 0 | 0 | 0.068 | 0 | 1.7 | 0 | 0.48 | 0 | 0.74 |
| Chlorophyte | *Chlamydomonas* sp. | 2.4 | 0.26 | 1.8 | 0.37 | 0 | 0 | 0.79 | 0.15 | 0.61 | 0 | 0 | 0 | 0.37 | 0.15 | 2.4 | 0.79 | 0.96 | 0.31 | 1.1 | 0.37 |
|  | *Pediastrum duplex* | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.30 | 0 | 0 | 0 | 0 | 0.12 | 0.30 | 0.023 | 0.061 | 0.052 | 0.14 |
|  | *Oocystis lacustris* | 0.60 | 0 | 0 | 1.1 | 0.37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.37 | 0 | 1.1 | 0 | 0.42 | 0 | 0.47 | 0 |
|  | *Paulschulzia pseudovolvox* | 0 | 0 | 0 | 0.0052 | 0 | 0 | 0 | 0.0043 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0052 | 0.0043 | 0.0010 | 0.00085 | 0.0023 | 0.0019 |
|  | *Scenedesmus denticulatus* | 1.2 | 0.52 | 1.2 | 0 | 0 | 0.39 | 0 | 0.31 | 0 | 0 | 0 | 0 | 0.52 | 0 | 1.2 | 0.39 | 0.59 | 0.14 | 0.61 | 0.19 |
|  | *Kichnerella lunaris* | 0 | 0.52 | 1.8 | 0.37 | 1.7 | 0 | 0 | 2.3 | 1.2 | 0 | 0 | 0 | 0.52 | 0 | 1.8 | 2.3 | 0.86 | 0.70 | 0.80 | 1.0 |
|  | *Spondylosium planum* | 0 | 0 | 0 | 0 | 0 | 0.39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.39 | 0 | 0.078 | 0 | 0.17 |
|  | *Botryococcus braunii* | 0 | 0 | 0 | 0 | 0 | 0.016 | 0 | 0.0085 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.016 | 0 | 0.0050 | 0 | 0.0073 |
|  | *Collodictyon* sp. | 0.30 | 0 | 0.18 | 0 | 0.18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.18 | 0 | 0.30 | 0 | 0.13 | 0 | 0.13 | 0 |
|  | *Bambusina brebissonii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.78 | 0 | 0 | 0 | 0 | 0 | 0.78 | 0 | 0.16 | 0 | 0.35 |
|  | *Ankistrodesmus spiralis* | 0.30 | 0 | 0 | 0 | 0.18 | 0.19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.30 | 0.19 | 0.096 | 0.039 | 0.14 | 0.087 |
| Chrysophyte | ***Small chrysophyceae*** | 4.2 | 5.5 | 1.6 | 3.0 | 4.0 | 1.8 | 4.7 | 1.5 | 4.9 | 12 | 1.6 | 1.5 | 4.0 | 4.7 | 5.5 | 12 | 3.7 | 4.9 | 1.5 | 4.1 |
|  | *Large chrysophyceae* | 1.2 | 0.79 | 0.18 | 1.1 | 1.1 | 0 | 2.0 | 0.15 | 1.8 | 1.6 | 0.18 | 0 | 1.1 | 1.6 | 1.2 | 2.0 | 0.88 | 1.1 | 0.42 | 0.95 |
|  | *Chrysochromulina parva* | 6.6 | 2.4 | 16 | 6.9 | 11 | 0 | 0.79 | 0.61 | 0.91 | 4.7 | 2.4 | 0 | 6.9 | 0.79 | 16 | 4.7 | 8.5 | 1.4 | 5.1 | 1.9 |
|  | ***Chrysococcus* sp.** | 5.1 | 4.7 | 2.1 | 1.7 | 5.7 | 2.7 | 7.1 | 3.4 | 9.1 | 10 | 1.7 | 2.7 | 4.7 | 7.1 | 5.7 | 10 | 3.9 | 6.5 | 1.8 | 3.3 |
|  | *Chrysostephanospaera globulifera* | 0 | 0.52 | 0.18 | 0 | 0.37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.177 | 0 | 0.52 | 0 | 0.21 | 0 | 0.23 | 0 |
|  | *Kephyrion* sp. | 2.1 | 1.3 | 1.8 | 1.1 | 1.7 | 0.58 | 2.8 | 0.31 | 0 | 2.3 | 1.1 | 0 | 1.7 | 0.58 | 2.1 | 2.8 | 1.6 | 1.2 | 0.38 | 1.3 |
|  | *Dinobryon mucronutom* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0.30 | 0 | 0.061 | 0 | 0.14 |
|  | *Dinobryon bavaricum* | 0.033 | 2.1 | 1.1 | 1.1 | 0.18 | spe | 2.8 | 0.055 | 0.61 | 2.3 | 0.033 | 0.055 | 1.1 | 1.5 | 2.1 | 2.8 | 0.90 | 1.4 | 0.83 | 1.3 |
|  | *Dinobryon sertularia* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | 0 | 0.25 | 0 | 0.55 |
|  | *Dinobryon sociale* | 3.0 | 0 | 0 | 0 | 0 | 0.97 | 1.2 | 1.8 | 0.30 | 0 | 0 | 0 | 0 | 0.97 | 3.0 | 1.8 | 0.60 | 0.86 | 1.3 | 0.73 |
|  | *Chrysolkos skuja* | 0 | 0 | 0 | 0.19 | 0 | 0 | 0 | 0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0.19 | 0.15 | 0.037 | 0.031 | 0.084 | 0.069 |
|  | *Bitrichia chodatii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.77 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.77 | 0 | 0.15 | 0 | 0.34 |
|  | *Bicoeca lacustris* | 0.90 | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0.90 | 0.15 | 0.18 | 0.031 | 0.40 | 0.069 |
| Diatom | *Cyclotella stelligera* | 0.14 | 0.058 | 0.064 | 0.11 | 0.046 | 0.043 | 0.066 | 0.026 | 0.13 | 0.26 | 0.046 | 0.026 | 0.064 | 0.066 | 0.14 | 0.26 | 0.084 | 0.10 | 0.040 | 0.095 |
|  | ***Cyclotella pseudostelligera*** | 59 | 68 | 59 | 56 | 51 | 82 | 41 | 69 | 67 | 46 | 51 | 41 | 59 | 67 | 68 | 82 | 59 | 61 | 6.2 | 17 |
|  | *Rhizosolenia eriense* | 0 | 0.52 | 0.53 | 0 | 0.37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.37 | 0 | 0.53 | 0 | 0.28 | 0 | 0.27 | 0 |
|  | *Tabellaria fenestrata* | 0.0083 | 0 | 0 | 0 | 0 | 0.011 | 0.011 | 0 | 0.034 | 0.022 | 0 | 0 | 0 | 0.011 | 0.0083 | 0.034 | 0.0017 | 0.015 | 0.0037 | 0.013 |
|  | *Tabellaria flocculsa* | 0 | 0 | 0 | 0.0052 | 0 | 0 | 0.011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0052 | 0.011 | 0.0010 | 0.0022 | 0.0023 | 0.0049 |
|  | *Fragilaria crotonensis* | 0.78 | 0.77 | 0.22 | 0.40 | 0.082 | 0.13 | 0.35 | 0.10 | 0.20 | 0.63 | 0.082 | 0.098 | 0.40 | 0.20 | 0.78 | 0.63 | 0.45 | 0.28 | 0.32 | 0.22 |
|  | *Synedra acus* | 0.11 | 0.058 | 0.079 | 0.15 | 0.10 | 0.56 | 0.45 | 0.57 | 0.14 | 0.043 | 0.058 | 0.043 | 0.10 | 0.45 | 0.15 | 0.57 | 0.099 | 0.35 | 0.033 | 0.25 |
|  | *Synedra ulna* | 0.075 | 0.015 | 0.015 | 0.062 | 0.015 | 0 | 0 | 0.017 | 0.042 | 0 | 0.015 | 0 | 0.015 | 0 | 0.075 | 0.042 | 0.036 | 0.012 | 0.030 | 0.019 |
|  | ***Cyclotella michiganiana*** | 6.9 | 7.1 | 6.7 | 24 | 15 | 6.0 | 28 | 12 | 3.9 | 12 | 6.7 | 3.9 | 7.1 | 12 | 24 | 28 | 12 | 12 | 7.5 | 9.3 |
|  | *Cyclotella bodanica* | 0.017 | 0.0073 | 0 | 0 | 0 | 0 | 0 | 0 | 0.042 | 0.065 | 0 | 0 | 0 | 0 | 0.017 | 0.065 | 0.0048 | 0.0215 | 0.0073 | 0.031 |
| Crypto-phyte | ***Rhodomonas minuta*** | 3.9 | 3.4 | 2.7 | 1.5 | 3.7 | 1.2 | 5.1 | 4.3 | 7.0 | 5.5 | 1.5 | 1.2 | 3.4 | 5.1 | 3.9 | 7.0 | 3.0 | 4.6 | 0.97 | 2.2 |
|  | *Cryptomonas erosa* | 0.22 | 0.44 | 0.40 | 0.48 | 0.35 | 0.033 | 0.37 | 0.21 | 0.47 | 1.7 | 0.22 | 0.033 | 0.40 | 0.37 | 0.48 | 1.7 | 0.38 | 0.55 | 0.10 | 0.64 |
|  | *Cryptomonas rostratiformis* | 0 | 0 | 0.010 | 0 | 0 | 0 | 0 | 0.017 | 0.017 | 0.043 | 0 | 0 | 0 | 0.017 | 0.0098 | 0.043 | 0.0020 | 0.015 | 0.0044 | 0.018 |
|  | *Katablepharis ovalis* | 1.2 | 0.52 | 2.3 | 0.37 | 2.2 | 0 | 1.2 | 0.31 | 1.2 | 0 | 0.37 | 0 | 1.2 | 0.31 | 2.3 | 1.2 | 1.3 | 0.54 | 0.91 | 0.61 |
| Dino-flagellate | *Gymnodinium* sp. | 0.025 | 0.036 | 0.015 | 0.031 | 0.015 | 0 | 0 | 0.31 | 0.0084 | 0.087 | 0.015 | 0 | 0.025 | 0.0084 | 0.036 | 0.31 | 0.025 | 0.080 | 0.0096 | 0.13 |
|  | *Peridinium pusillum* | 0 | 0.044 | 0.0049 | 0.047 | 0.015 | 0 | 0.033 | 0.017 | 0.025 | 0.022 | 0 | 0 | 0.015 | 0.022 | 0.047 | 0.033 | 0.022 | 0.019 | 0.022 | 0.012 |
|  | *Ceratium hirundenella* | 0.017 | 0.0073 | 0.0049 | 0.010 | 0.010 | 0 | 0 | 0.0085 | 0.034 | 0.022 | 0.0049 | 0 | 0.010 | 0.0085 | 0.017 | 0.034 | 0.0099 | 0.013 | 0.0044 | 0.015 |

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of cells at one or more stations within an area (as shown in Figure 5.4).

## Table D.14: Biomass (µg/L dw) of Phytoplankton Species, August 2014

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyanophyte | *Aphanothece* sp. | 0.54 | - | - | - | 1.1 | - | 1.6 | 0.55 | - | - |
| Chlorophyte | *Botryococcus braunii* | 0.54 | - | 0.14 | - | - | - | - | - | - | - |
| | *Chlamydomonas* spp. | 3.3 | 1.1 | 3.3 | 0.20 | 0.72 | 1.1 | 0.72 | 0.72 | 1.7 | 3.3 |
| | *Coelastrum cambricum* | - | 1.1 | - | - | - | - | - | - | - | - |
| | *Oocystis lacustris* | - | 2.4 | - | 11 | 1.5 | 11 | - | 0.68 | - | - |
| | *Paulschulzia pseudovolvox* | 0.54 | - | - | - | - | - | - | - | - | - |
| Chrysophyte | *Bitrichia chodatii* | 0.36 | - | 0.36 | - | - | - | 1.1 | - | 0.72 | - |
| | *Chrysochromulina laurentiana* | - | - | - | - | 2.9 | 16 | - | 2.8 | - | - |
| | *Chrysochromulina parva* | 16 | 19 | 21 | 15 | 11 | 241 | 10 | 6.1 | 12 | 25 |
| | *Chrysococcus* sp. | 3.8 | 8.0 | 12 | 3.8 | 9.9 | 39 | 2.8 | 4.7 | 5.2 | 3.3 |
| | *Chrysolkos skuja* | - | - | - | - | - | - | 0.25 | - | - | - |
| | *Chrysostephanospaera globulifera* | - | - | 7.5 | - | - | 21 | 3.8 | - | - | 3.8 |
| | *Large chrysophyceae* | 2.7 | - | 2.7 | 2.7 | 5.5 | - | 2.7 | 2.9 | 11 | 5.5 |
| | *Small chrysophyceae* | 3.3 | 1.4 | 1.5 | 0.81 | 1.7 | 5.6 | 0.71 | 1.1 | 0.71 | 1.4 |
| | *Dinobryon mucronutom* | - | - | - | - | - | - | 2.7 | - | - | - |
| | *Dinobryon sertularia* | - | 7.5 | 2.0 | - | 6.2 | 5.1 | 1.6 | 3.1 | 1.6 | - |
| | *Dinobryon sociale* | 14 | 3.7 | 21 | 3.9 | 45 | 217 | 25 | 28 | 50 | 14 |
| | *Kephyrion* sp. | 0.70 | 0.53 | 1.4 | 0.35 | 1.2 | 3.4 | 0.73 | - | 1.1 | 9.3 |
| | *Mallomonas crassisquama* | 0.44 | - | 0.21 | 0.22 | - | 5.6 | - | 0.88 | 0.21 | 1.3 |
| | *Mallomonas duerrschmidtiae* | - | - | - | - | - | - | 0.17 | - | - | - |
| | *Salpingoeca frequentissima* | 1.2 | 0.49 | 0.49 | 3.6 | 0.25 | 2.7 | 0.74 | 0.25 | - | - |
| | *Stichogloea* spp. | - | - | - | - | 1.4 | 8.0 | - | 1.4 | - | - |
| Diatom | *Asterionella formosa* | - | - | - | - | - | - | - | 0.02 | - | - |
| | *Cyclotella bodanica* | 46 | 57 | 37 | 54 | 75 | 109 | 35 | 35 | 77 | 68 |
| | *Cyclotella ocellata* | - | - | 1.9 | - | 3.8 | - | - | 1.9 | - | - |
| | *Cyclotella pseudostelligera* | 436 | 642 | 495 | 598 | 1,234 | 1,690 | 525 | 509 | 561 | 350 |
| | *Cyclotella stelligera* | 64 | 75 | 95 | 92 | 83 | 128 | 6.3 | 102 | 117 | 52 |
| | *Fragilaria construens* | 2.6 | 1.9 | 1.2 | 2.3 | 0.083 | 10 | 6.8 | 11 | 5.3 | 2.2 |
| | *Gyrosigma* sp. | - | - | - | - | - | - | - | - | 0.45 | - |
| | *Rhizosolenia eriense* | - | 3.7 | 0.99 | 17 | - | 2.5 | - | - | 0.81 | 0.46 |
| | *Synedra ulna* | 10 | 7.6 | 5.9 | 14 | 16 | 3.3 | 5.7 | 11 | 10 | 6.3 |
| | *Tabellaria fenestrata* | - | - | 0.29 | - | - | - | - | 0.60 | - | 0.31 |
| Cryptophyte | *Cryptomonas erosa* | 3.1 | 3.9 | 6.8 | 6.8 | 3.9 | 21 | 2.9 | 8.0 | 7.5 | 2.7 |
| | *Cryptomonas pusilla* | - | 2.6 | - | 2.6 | - | - | - | - | - | - |
| | *Cryptomonas reflexa* | - | - | - | 0.14 | 0.28 | - | - | 0.27 | - | - |
| | *Cryptomonas rostratiformis* | - | - | 0.41 | - | - | - | 0.82 | - | 0.82 | 0.82 |
| | *Katablepharis ovalis* | 2.6 | 1.6 | - | 0.83 | 2.1 | 12 | 0.71 | 1.1 | 2.8 | 1.2 |
| | *Rhodomonas minuta* | 9.4 | 5.5 | 23 | 7.1 | 28 | 22 | 10 | 6.3 | 9.4 | 5.5 |
| Dinoflagellate | *Ceratium hirundenella* | 10 | 80 | 20 | 10 | 20 | - | 60 | 20 | 20 | 40 |
| | *Gymnodinium* sp. | - | 1.6 | 5.3 | - | 16 | - | - | - | 1.6 | 7.2 |
| | *Peridinium pusillum* | 1.3 | 1.7 | 0.42 | 0.63 | 2.0 | 1.1 | 0.21 | 4.4 | 0.41 | 0.63 |
| | *Peridinium wisconsiense* | - | - | 1.9 | - | - | - | - | - | - | - |
| **Total biomass of cells** | | **633** | **930** | **769** | **847** | **1,572** | **2,574** | **709** | **765** | **900** | **604** |
| **Total number of taxa** | | **23** | **23** | **28** | **23** | **26** | **23** | **26** | **27** | **24** | **23** |

## **Table D.15:** Biomass (µg/L dw) of Phytoplankton Species, August 2015

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **TN-1** | **TN-2** | **TN-3** | **TN-4** | **TN-5** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Cyanophyte | *Aphanocapsa delicatissima* | 0.80 | 0.80 | 1.0 | 0.54 | - | - | - | - | - | 0.87 |
| | *Aphanothece* sp. | - | - | - | - | - | - | - | 0.52 | - | - |
| | *Phormidium autumnale* | - | - | - | - | - | 1.8 | - | - | - | - |
| | *Pseudoanabaena* sp. | - | - | - | - | - | - | - | - | - | 8.7 |
| | *Woronichinia compacta* | - | - | - | - | - | - | 0.43 | - | - | - |
| Chlorophyte | *Ankyra judai* | 4.0 | - | - | - | - | - | - | - | - | - |
| | *Chlamydomonas* spp. | - | - | 2.0 | 1.9 | - | 2.3 | 4.0 | 2.0 | - | - |
| | *Collodictyon* sp. | - | - | 23 | - | - | 32 | - | - | - | - |
| | *Dictyosphaerium simplex* | - | - | - | - | - | - | - | - | 1.8 | - |
| | *Oocystis lacustris* | 2.9 | 8.8 | 7.8 | 7.1 | 1.2 | - | 6.8 | 17 | 3.1 | 3.0 |
| Chrysophyte | *Chrysococcus* sp. | 7.8 | 2.6 | - | - | 5.2 | 13 | 7.8 | 13 | 5.2 | 4.9 |
| | *Chrysostephanospaera globulifera* | - | 20 | 21 | - | - | - | - | - | - | 28 |
| | *Large chrysophyceae* | - | - | 7.1 | - | - | 15 | - | - | - | - |
| | *Small chrysophyceae* | - | 1.4 | 0.56 | - | - | - | 0.56 | 0.56 | - | - |
| | *Dinobryon sertularia* | - | - | - | - | 9.0 | - | 27 | 18 | - | - |
| | *Dinobryon sociale* | 9.0 | 18 | 18 | 18 | 36 | - | - | - | 18 | 18 |
| | *Kephyrion* sp. | 2.9 | - | - | 1.8 | 0.89 | 2.9 | 0.97 | 4.8 | 2.9 | 1.9 |
| | *Mallomonas crassisquama* | - | 0.21 | 0.65 | - | 0.21 | - | - | - | - | 0.22 |
| | *Mallomonas duerrschmidtiae* | - | - | - | - | - | 0.12 | - | - | - | - |
| | *Salpingoeca frequentissima* | 2.6 | 2.4 | 1.2 | 1.3 | - | 2.3 | 2.8 | 1.2 | 1.2 | 1.3 |
| Diatom | *Cyclotella bodanica* | - | - | - | 1.5 | - | - | - | - | - | - |
| | *Cyclotella michiganiana* | 6.8 | 6.8 | 2.0 | 5.8 | 8.3 | 14 | 17 | 29 | 0.97 | 4.5 |
| | *Cyclotella pseudostelligera* | 3,038 | 2,589 | 3,295 | 3,789 | 2,472 | 4,852 | 4,093 | 4,168 | 3,721 | 3,562 |
| | *Cyclotella stelligera* | 3.0 | 2.2 | 3.6 | 1.1 | 0.74 | 1.2 | 2.0 | 1.6 | 0.75 | 2.5 |
| | *Fragilaria crotonensis* | - | - | - | - | 0.62 | - | - | - | - | - |
| | *Rhizosolenia eriense* | - | - | 3.1 | 3.1 | 3.1 | - | 3.1 | 3.1 | - | - |
| | *Synedra acus* | 0.76 | 1.9 | 2.8 | 2.1 | 2.1 | 4.1 | 2.9 | 4.6 | 1.1 | 4.2 |
| | *Synedra ulna* | - | - | 1.7 | - | - | - | - | - | - | - |
| | *Tabellaria flocculsa* | - | - | - | - | - | 0.80 | - | - | - | - |
| Cryptophyte | *Cryptomonas erosa* | 1.9 | 2.1 | 3.4 | 0.97 | 0.24 | 1.7 | 3.5 | 3.3 | 0.95 | 4.9 |
| | *Cryptomonas pusilla* | - | - | - | - | - | 71 | 43 | 71 | - | - |
| | *Cryptomonas reflexa* | - | - | - | - | 0.27 | - | - | - | - | - |
| | *Cryptomonas rostratiformis* | - | 1.2 | 0.41 | - | - | - | 0.41 | 1.7 | 0.82 | 0.88 |
| | *Katablepharis ovalis* | - | 2.2 | 6.1 | 4.2 | 6.1 | - | 2.0 | 4.1 | - | 4.3 |
| | *Rhodomonas minuta* | 37 | 31 | 25 | 25 | 31 | 39 | 31 | 94 | 37 | 132 |
| Dinoflagellate | *Ceratium hirundenella* | - | - | - | 31 | 11 | - | - | - | - | - |
| | *Gymnodinium helveticum* | - | - | - | - | - | - | 5.0 | - | - | - |
| | *Gymnodinium* sp. | 7.8 | - | 21 | 2.1 | 3.6 | 16 | 9.0 | 41 | 19 | 2.6 |
| | *Peridinium pusillum* | 4.3 | 1.6 | 5.9 | - | 3.3 | 3.6 | 3.6 | 3.0 | 0.6 | 3.6 |
| **Total biomass of cells** | | **3,130** | **2,693** | **3,453** | **3,896** | **2,595** | **5,074** | **4,265** | **4,481** | **3,815** | **3,788** |
| **Total number of taxa** | | **15** | **17** | **22** | **17** | **19** | **18** | **21** | **20** | **15** | **19** |

## Table D.16: Biomass (µg/L dw) of Phytoplankton Species, August 2016

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyano-phyte | *Chroococcus limneticus* | - | - | - | - | - | 1.0 | - | - | - | - |
| | *Planktolyngbya limnetica* | - | - | - | - | - | 5.7 | 8.7 | 0.76 | - | - |
| Chlorophyte | *Chlamydomonas* sp. | 2.9 | 0.36 | 5.4 | 0.84 | - | - | 0.72 | 0.36 | 0.72 | - |
| | *Pediastrum duplex* | - | 0.38 | - | - | - | - | - | - | - | 0.33 |
| | *Oocystis lacustris* | 0.37 | - | - | 2.9 | 0.72 | - | - | - | - | - |
| | *Paulschulzia pseudovolvox* | - | - | - | 0.54 | - | - | - | 0.54 | - | - |
| | *Scenedesmus denticulatus* | 1.3 | 0.59 | 2.3 | - | - | 1.1 | - | 0.72 | - | - |
| | *Kichnerella lunaris* | - | 0.22 | 1.1 | 0.19 | 0.86 | - | - | 1.6 | 0.38 | - |
| | *Spondylosium planum* | - | - | - | - | - | 0.54 | - | - | - | - |
| | *Botryococcus braunii* | - | - | - | - | - | 0.86 | - | 0.57 | - | - |
| | *Collodictyon* sp. | 3.8 | - | 3.3 | - | 4.1 | - | - | - | - | - |
| | *Bambusina brebissonii* | - | - | - | - | - | - | - | - | - | 5.5 |
| | *Ankistrodesmus spiralis* | 0.42 | - | - | - | 0.42 | 0.39 | - | - | - | - |
| Chrysophyte | *Small chrysophyceae* | 0.93 | 2.1 | 0.59 | 1.6 | 2.2 | 1.3 | 1.3 | 1.0 | 1.8 | 1.5 |
| | *Large chrysophyceae* | 5.2 | 8.2 | 2.7 | 7.7 | 7.7 | - | 14 | 2.7 | 1.1 | 2.6 |
| | *Chrysochromulina parva* | 10 | 4.2 | 42 | 17 | 28 | - | 0.89 | 1.9 | 1.4 | 2.8 |
| | *Chrysococcus* sp. | 6.2 | 8.5 | 5.6 | 4.2 | 15 | 6.6 | 8.5 | 10 | 14 | 6.1 |
| | *Chrysostephanospaera globulifera* | - | 6.7 | 2.5 | - | 5.3 | - | - | - | - | - |
| | *Kephyrion* sp. | 1.2 | 0.88 | 2.2 | 1.1 | 1.6 | 0.37 | 1.0 | 0.35 | - | 0.53 |
| | *Dinobryon mucronutom* | - | - | - | - | - | - | - | - | 0.87 | - |
| | *Dinobryon bavaricum* | 1.6 | 13 | 9.8 | 9.8 | 1.6 | 11 | 11 | 5.2 | 3.3 | 4.9 |
| | *Dinobryon sertularia* | - | - | - | - | - | - | - | 13 | - | - |
| | *Dinobryon sociale* | 16 | - | - | - | - | 8.1 | 4.9 | 20 | 1.6 | - |
| | *Chrysolkos skuja* | - | - | - | 0.18 | - | - | - | 0.22 | - | - |
| | *Bitrichia chodatii* | - | - | - | - | - | - | - | 0.95 | - | - |
| | *Bicoeca lacustris* | 1.5 | - | - | - | - | - | - | 0.50 | - | - |
| Diatom | *Cyclotella stelligera* | 7.1 | 2.9 | 5.4 | 8.9 | 3.4 | 4.0 | 2.9 | 2.2 | 5.9 | 4.4 |
| | *Cyclotella pseudostelligera* | 304 | 451 | 646 | 581 | 470 | 632 | 165 | 868 | 426 | 99 |
| | *Rhizosolenia eriense* | - | 1.1 | 1.4 | - | 0.91 | - | - | - | - | - |
| | *Tabellaria fenestrata* | 0.35 | - | - | - | - | 0.34 | 0.15 | - | 0.69 | 0.15 |
| | *Tabellaria flocculsa* | - | - | - | 0.16 | - | - | 0.26 | - | - | - |
| | *Fragilaria crotonensis* | 7.2 | 7.8 | 3.0 | 5.5 | 1.2 | 2.1 | 2.7 | 1.8 | 1.8 | 2.3 |
| | *Synedra acus* | 0.31 | 0.17 | 0.34 | 0.65 | 0.43 | 2.4 | 1.0 | 3.1 | 0.37 | 0.05 |
| | *Synedra ulna* | 4.2 | 1.0 | 1.5 | 6.3 | 1.6 | - | - | 2.1 | 2.6 | - |
| | *Cyclotella michiganiana* | 4.3 | 5.4 | 6.7 | 22 | 15 | 5.8 | 13 | 15 | 2.4 | 2.3 |
| | *Cyclotella bodanica* | 3.3 | 1.2 | - | - | - | - | - | - | 8.9 | 4.6 |
| Crypto-phyte | *Rhodomonas minuta* | 12 | 14 | 17 | 8.7 | 22 | 6.5 | 14 | 30 | 25 | 7.6 |
| | *Cryptomonas erosa* | 9.2 | 20 | 26 | 30 | 22 | 1.9 | 11 | 17 | 19 | 25 |
| | *Cryptomonas rostratiformis* | - | - | 0.85 | - | - | - | - | 1.7 | 0.88 | 0.85 |
| | *Katablepharis ovalis* | 1.2 | 0.66 | 4.2 | 0.64 | 3.9 | - | 1.2 | 0.80 | 1.7 | - |
| Dino-flagellate | *Gymnodinium sp.* | 9.4 | 16 | 6.9 | 12 | 8.5 | - | - | 5.3 | 3.1 | 18 |
| | *Peridinium pusillum* | - | 2.0 | 0.43 | 3.4 | 1.3 | - | 1.4 | 1.8 | 1.9 | 0.31 |
| | *Ceratium hirundenella* | 20 | 11 | 10 | 21 | 20 | - | - | 22 | 41 | 10 |
| **Total biomass of cells** | | **435** | **579** | **807** | **746** | **638** | **692** | **264** | **1,031** | **566** | **199** |
| **Total number of taxa** | | **26** | **25** | **25** | **24** | **24** | **19** | **20** | **30** | **24** | **21** |

## Table D.17: Biomass (µg/L dw) of Phytoplankton Species by Group, August 2014

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **T2-2** | **T2-3** | **T2-4** | **T2-5** | **T2-6** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Cyanophyte | 0.54 | 0 | 0 | 0 | 1.14 | 0 | 1.62 | 0.55 | 0 | 0 |
| Chlorophyte | 4.33 | 4.54 | 3.39 | 10.7 | 2.25 | 11.8 | 0.72 | 1.40 | 1.68 | 3.25 |
| Chrysophyte | 43.4 | 40.9 | 70.8 | 30.0 | 84.4 | 564 | 53.1 | 51.8 | 82.8 | 63.2 |
| Diatom | 559 | 787 | 637 | 778 | 1,411 | 1,943 | 579 | 671 | 773 | 479 |
| Cryptophyte | 15.1 | 13.5 | 30.0 | 17.4 | 34.5 | 54.3 | 14.7 | 15.6 | 20.6 | 10.1 |
| Dinoflagellates | 11.3 | 83.8 | 27.7 | 10.7 | 37.7 | 1.06 | 60.5 | 24.5 | 22.2 | 48.1 |
| **Total biomass of cells** | **633** | **930** | **769** | **847** | **1,572** | **2,574** | **709** | **765** | **900** | **604** |
| **Total number of groups** | **6** | **5** | **5** | **5** | **6** | **6** | **6** | **6** | **5** | **5** |

## Table D.18: Biomass (µg/L dw) of Phytoplankton Species by Group, August 2015

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **TN-1** | **TN-2** | **TN-3** | **TN-4** | **TN-5** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Cyanophyte | 0.80 | 0.80 | 1.0 | 0.54 | 0 | 1.8 | 0.43 | 0.52 | 0 | 9.5 |
| Chlorophyte | 6.9 | 8.8 | 33 | 9.0 | 1.2 | 35 | 11 | 19 | 4.9 | 3.0 |
| Chrysophyte | 22 | 45 | 49 | 21 | 51 | 33 | 39 | 38 | 27 | 54 |
| Diatom | 3,049 | 2,600 | 3,308 | 3,802 | 2,487 | 4,873 | 4,118 | 4,206 | 3,724 | 3,574 |
| Cryptophyte | 39 | 37 | 35 | 30 | 38 | 111 | 80 | 174 | 39 | 142 |
| Dinoflagellate | 12 | 1.6 | 27 | 33 | 18 | 20 | 18 | 44 | 20 | 6.2 |
| **Total biomass of cells** | **3,130** | **2,693** | **3,453** | **3,896** | **2,595** | **5,074** | **4,265** | **4,481** | **3,815** | **3,788** |
| **Total number of groups** | **6** | **6** | **6** | **6** | **5** | **6** | **6** | **6** | **5** | **6** |

## Table D.19: Biomass (µg/L dw) of Phytoplankton Species by Group, August 2016

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **TN-1** | **TN-2** | **TN-3** | **TN-4** | **TN-5** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Cyanophyte | 0 | 0 | 0 | 0 | 0 | 6.7 | 8.68 | 0.76 | 0 | 0 |
| Chlorophyte | 8.8 | 1.5 | 12 | 4.5 | 6.1 | 2.9 | 0.7 | 3.8 | 1.1 | 5.8 |
| Chrysophyte | 43 | 44 | 66 | 42 | 61 | 28 | 42 | 56 | 24 | 18 |
| Diatom | 330 | 470 | 665 | 624 | 493 | 646 | 185 | 892 | 449 | 113 |
| Cryptophyte | 23 | 35 | 47 | 39 | 48 | 8.4 | 26 | 49 | 46 | 33 |
| Dinoflagellate | 30 | 28 | 17 | 37 | 30 | 0 | 1 | 29 | 46 | 28 |
| **Total biomass of cells** | **435** | **579** | **807** | **746** | **638** | **692** | **264** | **1,031** | **566** | **199** |
| **Total number of groups** | **5** | **5** | **5** | **5** | **5** | **5** | **6** | **6** | **5** | **5** |

## **Table D.20:** Relative Biomass (%) of Phytoplankton, August 2014

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyano-phyte | *Aphanothece* sp. | 0.085 | 0 | 0 | 0 | 0.072 | 0 | 0.23 | 0.071 | 0 | 0 |
| Chlorophyte | *Botryococcus braunii* | 0.086 | 0 | 0.018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Chlamydomonas* spp. | 0.51 | 0.12 | 0.42 | 0.024 | 0.046 | 0.044 | 0.10 | 0.094 | 0.19 | 0.54 |
| | *Coelastrum cambricum* | 0 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Oocystis lacustris* | 0 | 0.26 | 0 | 1.2 | 0.10 | 0.41 | 0 | 0.089 | 0 | 0 |
| | *Paulschulzia pseudovolvox* | 0.085 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chrysophyte | *Bitrichia chodatii* | 0.057 | 0 | 0.047 | 0 | 0 | 0 | 0.15 | 0 | 0.080 | 0 |
| | *Chrysochromulina laurentiana* | 0 | 0 | 0 | 0 | 0.19 | 0.63 | 0 | 0.37 | 0 | 0 |
| | *Chrysochromulina parva* | 2.6 | 2.1 | 2.7 | 1.7 | 0.69 | 9.4 | 1.5 | 0.80 | 1.4 | 4.1 |
| | *Chrysococcus* sp. | 0.59 | 0.86 | 1.6 | 0.44 | 0.63 | 1.5 | 0.40 | 0.61 | 0.57 | 0.54 |
| | *Chrysolkos skuja* | 0 | 0 | 0 | 0 | 0 | 0 | 0.035 | 0 | 0 | 0 |
| | *Chrysostephanospaera globulifera* | 0 | 0 | 1.0 | 0 | 0 | 0.81 | 0.53 | 0 | 0 | 0.62 |
| | *Large chrysophyceae* | 0.43 | 0 | 0.36 | 0.32 | 0.35 | 0 | 0.39 | 0.38 | 1.2 | 0.91 |
| | *Small chrysophyceae* | 0.53 | 0.15 | 0.20 | 0.10 | 0.11 | 0.22 | 0.10 | 0.15 | 0.079 | 0.23 |
| | *Dinobryon mucronutom* | 0 | 0 | 0 | 0 | 0 | 0 | 0.38 | 0 | 0 | 0 |
| | *Dinobryon sertularia* | 0 | 0.81 | 0.26 | 0 | 0.39 | 0.20 | 0.23 | 0.40 | 0.18 | 0 |
| | *Dinobryon sociale* | 2.3 | 0.39 | 2.7 | 0.46 | 2.8 | 8.4 | 3.6 | 3.7 | 5.6 | 2.3 |
| | *Kephyrion* sp. | 0.11 | 0.057 | 0.18 | 0.041 | 0.078 | 0.13 | 0.10 | 0 | 0.12 | 1.5 |
| | *Mallomonas crassisquama* | 0.069 | 0 | 0.028 | 0.026 | 0 | 0.22 | 0 | 0.11 | 0.023 | 0.22 |
| | *Mallomonas duerrschmidtiae* | 0 | 0 | 0 | 0 | 0 | 0 | 0.024 | 0 | 0 | 0 |
| | *Salpingoeca frequentissima* | 0.19 | 0.053 | 0.064 | 0.42 | 0.016 | 0.11 | 0.10 | 0.032 | 0 | 0 |
| | *Stichogloea* spp. | 0 | 0 | 0 | 0 | 0.092 | 0.31 | 0 | 0.19 | 0 | 0 |
| Diatom | *Asterionella formosa* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0025 | 0 | 0 |
| | *Cyclotella bodanica* | 7.3 | 6.1 | 4.8 | 6.4 | 4.8 | 4.2 | 5.0 | 4.6 | 8.6 | 11 |
| | *Cyclotella ocellata* | 0 | 0 | 0.24 | 0 | 0.24 | 0 | 0 | 0.25 | 0 | 0 |
| | *Cyclotella pseudostelligera* | 69 | 69 | 64 | 71 | 79 | 66 | 74 | 67 | 62 | 58 |
| | *Cyclotella stelligera* | 10 | 8.1 | 12 | 11 | 5.3 | 5.0 | 0.88 | 13 | 13 | 8.6 |
| | *Fragilaria construens* | 0.41 | 0.21 | 0.16 | 0.27 | 0.0053 | 0.39 | 1.0 | 1.5 | 0.59 | 0.36 |
| | *Gyrosigma* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.050 | 0 |
| | *Rhizosolenia eriense* | 0 | 0.39 | 0.13 | 2.0 | 0 | 0.10 | 0 | 0 | 0.090 | 0.076 |
| | *Synedra ulna* | 1.7 | 0.82 | 0.76 | 1.7 | 1.0 | 0.13 | 0.80 | 1.5 | 1.1 | 1.0 |
| | *Tabellaria fenestrata* | 0 | 0 | 0.037 | 0 | 0 | 0 | 0 | 0.079 | 0 | 0.051 |
| Cryptophyte | *Cryptomonas erosa* | 0.50 | 0.42 | 0.88 | 0.80 | 0.25 | 0.80 | 0.41 | 1.0 | 0.83 | 0.44 |
| | *Cryptomonas pusilla* | 0 | 0.28 | 0 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Cryptomonas reflexa* | 0 | 0 | 0 | 0.016 | 0.018 | 0 | 0 | 0.035 | 0 | 0 |
| | *Cryptomonas rostratiformis* | 0 | 0 | 0.053 | 0 | 0 | 0 | 0.12 | 0 | 0.091 | 0.14 |
| | *Katablepharis ovalis* | 0.40 | 0.17 | 0 | 0.10 | 0.13 | 0.47 | 0.10 | 0.14 | 0.31 | 0.19 |
| | *Rhodomonas minuta* | 1.5 | 0.59 | 3.0 | 0.84 | 1.8 | 0.84 | 1.4 | 0.82 | 1.0 | 0.91 |
| Dino-flagellate | *Ceratium hirundenella* | 1.6 | 8.6 | 2.6 | 1.2 | 1.3 | 0 | 8.5 | 2.6 | 2.2 | 6.7 |
| | *Gymnodinium* sp. | 0 | 0.18 | 0.69 | 0 | 1.0 | 0 | 0 | 0 | 0.18 | 1.2 |
| | *Peridinium pusillum* | 0.20 | 0.18 | 0.055 | 0.075 | 0.13 | 0.041 | 0.030 | 0.58 | 0.046 | 0.10 |
| | *Peridinium wisconsiense* | 0 | 0 | 0.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## **Table D.21:** Relative Biomass (%) of Phytoplankton, August 2015

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Cyanophyte | *Aphanocapsa delicatissima* | 0.025 | 0.030 | 0.030 | 0.014 | - | - | - | - | - | 0.023 |
| | *Aphanothece* sp. | - | - | - | - | - | - | - | 0.012 | - | - |
| | *Phormidium autumnale* | - | - | - | - | - | 0.036 | - | - | - | - |
| | *Pseudoanabaena* sp. | - | - | - | - | - | - | - | - | - | 0.23 |
| | *Woronichinia compacta* | - | - | - | - | - | - | 0.010 | - | - | - |
| Chlorophyte | *Ankyra judai* | 0.13 | - | - | - | - | - | - | - | - | - |
| | *Chlamydomonas* spp. | - | - | 0.058 | 0.048 | - | 0.046 | 0.094 | 0.045 | - | - |
| | *Collodictyon* sp. | - | - | 0.68 | - | - | 0.64 | - | - | - | - |
| | *Dictyosphaerium simplex* | - | - | - | - | - | - | - | - | 0.047 | - |
| | *Oocystis lacustris* | 0.093 | 0.32 | 0.23 | 0.18 | 0.046 | - | 0.16 | 0.37 | 0.082 | 0.080 |
| Chrysophyte | *Chrysococcus* sp. | 0.25 | 0.096 | - | - | 0.20 | 0.26 | 0.18 | 0.29 | 0.14 | 0.13 |
| | *Chrysostephanospaera globulifera* | - | 0.75 | 0.62 | - | - | - | - | - | - | 0.73 |
| | *Large chrysophyceae* | - | - | 0.21 | - | - | 0.30 | - | - | - | - |
| | *Small chrysophyceae* | - | 0.051 | 0.016 | - | - | - | 0.013 | 0.012 | - | - |
| | *Dinobryon sertularia* | - | - | - | - | 0.35 | - | 0.63 | 0.40 | - | - |
| | *Dinobryon sociale* | 0.29 | 0.67 | 0.52 | 0.46 | 1.4 | - | - | - | 0.47 | 0.47 |
| | *Kephyrion* sp. | 0.093 | - | - | 0.046 | 0.034 | 0.057 | 0.023 | 0.11 | 0.076 | 0.051 |
| | *Mallomonas crassisquama* | - | 0.0079 | 0.019 | - | 0.0082 | - | - | - | - | 0.0057 |
| | *Mallomonas duerrschmidtiae* | - | - | - | - | - | 0.0023 | - | - | - | - |
| | *Salpingoeca frequentissima* | 0.082 | 0.088 | 0.034 | 0.032 | - | 0.045 | 0.066 | 0.027 | 0.031 | 0.034 |
| Diatom | *Cyclotella bodanica* | - | - | - | 0.037 | - | - | - | - | - | - |
| | *Cyclotella michiganiana* | 0.22 | 0.25 | 0.058 | 0.15 | 0.32 | 0.28 | 0.39 | 0.64 | 0.025 | 0.12 |
| | *Cyclotella pseudostelligera* | 97 | 96 | 95 | 97 | 95 | 96 | 96 | 93 | 98 | 94 |
| | *Cyclotella stelligera* | 0.096 | 0.081 | 0.11 | 0.028 | 0.028 | 0.023 | 0.046 | 0.035 | 0.020 | 0.067 |
| | *Fragilaria crotonensis* | - | - | - | - | 0.024 | - | - | - | - | - |
| | *Rhizosolenia eriense* | - | - | 0.089 | 0.079 | 0.12 | - | 0.072 | 0.069 | - | - |
| | *Synedra acus* | 0.024 | 0.069 | 0.082 | 0.054 | 0.079 | 0.081 | 0.067 | 0.10 | 0.028 | 0.11 |
| | *Synedra ulna* | - | - | 0.049 | - | - | - | - | - | - | - |
| | *Tabellaria flocculsa* | - | - | - | - | - | 0.016 | - | - | - | - |
| Cryptophyte | *Cryptomonas erosa* | 0.061 | 0.079 | 0.098 | 0.025 | 0.0091 | 0.033 | 0.081 | 0.074 | 0.025 | 0.13 |
| | *Cryptomonas pusilla* | - | - | - | - | - | 1.4 | 1.0 | 1.6 | - | - |
| | *Cryptomonas reflexa* | - | - | - | - | 0.010 | - | - | - | - | - |
| | *Cryptomonas rostratiformis* | - | 0.046 | 0.012 | - | - | - | 0.0096 | 0.038 | 0.022 | 0.023 |
| | *Katablepharis ovalis* | - | 0.080 | 0.18 | 0.11 | 0.24 | - | 0.048 | 0.091 | - | 0.11 |
| | *Rhodomonas minuta* | 1.2 | 1.2 | 0.72 | 0.64 | 1.2 | 0.77 | 0.74 | 2.1 | 0.98 | 3.5 |
| Dinoflagellate | *Ceratium hirundenella* | - | - | - | 0.79 | 0.42 | - | - | - | - | - |
| | *Gymnodinium helveticum* | - | - | - | - | - | - | 0.12 | - | - | - |
| | *Gymnodinium* sp. | 0.25 | - | 0.60 | 0.053 | 0.14 | 0.32 | 0.21 | 0.92 | 0.50 | 0.069 |
| | *Peridinium pusillum* | 0.14 | 0.061 | 0.17 | - | 0.13 | 0.071 | 0.085 | 0.066 | 0.017 | 0.095 |

## **Table D.22:** Relative Biomass (%) of Phytoplankton, August 2016

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **TN-1** | **TN-2** | **TN-3** | **TN-4** | **TN-5** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Cyano-phyte | *Cyanophyte* | 0 | 0 | 0 | 0 | 0 | 0.15 | 0 | 0 | 0 | 0 |
| | *Planktolyngbya limnetica* | 0 | 0 | 0 | 0 | 0 | 0.82 | 3.3 | 0.074 | 0 | 0 |
| Chlorophyte | *Chlamydomonas* sp. | 0.66 | 0.062 | 0.67 | 0.11 | 0 | 0 | 0.27 | 0.035 | 0.13 | 0 |
| | *Pediastrum duplex* | 0 | 0.065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 |
| | *Oocystis lacustris* | 0.086 | 0 | 0 | 0.39 | 0.11 | 0 | 0 | 0 | 0 | 0 |
| | *Paulschulzia pseudovolvox* | 0 | 0 | 0 | 0.072 | 0 | 0 | 0 | 0.052 | 0 | 0 |
| | *Scenedesmus denticulatus* | 0.30 | 0.10 | 0.29 | 0 | 0 | 0.16 | 0 | 0.070 | 0 | 0 |
| | *Kichnerella lunaris* | 0 | 0.038 | 0.14 | 0.026 | 0.13 | 0 | 0 | 0.15 | 0.067 | 0 |
| | *Spondylosium planum* | 0 | 0 | 0 | 0 | 0 | 0.078 | 0 | 0 | 0 | 0 |
| | *Botryococcus braunii* | 0 | 0 | 0 | 0 | 0 | 0.12 | 0 | 0.056 | 0 | 0 |
| | *Collodictyon* sp. | 0.86 | 0 | 0.41 | 0 | 0.64 | 0 | 0 | 0 | 0 | 0 |
| | *Bambusina brebissonii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.75 |
| | *Ankistrodesmus spiralis* | 0.10 | 0 | 0 | 0 | 0.066 | 0.056 | 0 | 0 | 0 | 0 |
| Chrysophyte | *Small chrysophyceae* | 0.21 | 0.37 | 0.074 | 0.22 | 0.35 | 0.19 | 0.51 | 0.10 | 0.32 | 0.76 |
| | *Large chrysophyceae* | 1.2 | 1.4 | 0.34 | 1.0 | 1.2 | 0 | 5.2 | 0.27 | 0.19 | 1.3 |
| | *Chrysochromulina parva* | 2.4 | 0.73 | 5.2 | 2.3 | 4.3 | 0 | 0.34 | 0.18 | 0.25 | 1.4 |
| | *Chrysococcus* sp. | 1.4 | 1.5 | 0.70 | 0.57 | 2.3 | 1.0 | 3.2 | 1.0 | 2.5 | 3.1 |
| | *Chrysostephanospaera globulifera* | 0 | 1.1 | 0.31 | 0 | 0.83 | 0 | 0 | 0 | 0 | 0 |
| | *Kephyrion* sp. | 0.28 | 0.15 | 0.28 | 0.14 | 0.25 | 0.054 | 0.39 | 0.034 | 0 | 0.26 |
| | *Dinobryon mucronutom* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 0 |
| | *Dinobryon bavaricum* | 0.37 | 2.2 | 1.2 | 1.3 | 0.25 | 1.6 | 4.3 | 0.50 | 0.57 | 2.5 |
| | *Dinobryon sertularia* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 |
| | *Dinobryon sociale* | 3.7 | 0 | 0 | 0 | 0 | 1.2 | 1.8 | 1.9 | 0.29 | 0 |
| | *Chrysolkos skuja* | 0 | 0 | 0 | 0.024 | 0 | 0 | 0 | 0.021 | 0 | 0 |
| | *Bitrichia chodatii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.092 | 0 | 0 |
| | *Bicoeca lacustris* | 0.34 | 0 | 0 | 0 | 0 | 0 | 0 | 0.048 | 0 | 0 |
| Diatom | *Cyclotella stelligera* | 1.6 | 0.50 | 0.67 | 1.2 | 0.54 | 0.58 | 1.1 | 0.21 | 1.0 | 2.2 |
| | *Cyclotella pseudostelligera* | 70 | 78 | 80 | 78 | 74 | 91 | 63 | 84 | 75 | 50 |
| | *Rhizosolenia eriense* | 0 | 0.19 | 0.17 | 0 | 0.14 | 0 | 0 | 0 | 0 | 0 |
| | *Tabellaria fenestrata* | 0.079 | 0 | 0 | 0 | 0 | 0.050 | 0.059 | 0 | 0.12 | 0.077 |
| | *Tabellaria flocculsa* | 0 | 0 | 0 | 0.021 | 0 | 0 | 0.10 | 0 | 0 | 0 |
| | *Fragilaria crotonensis* | 1.6 | 1.3 | 0.37 | 0.74 | 0.18 | 0.31 | 1.0 | 0.18 | 0.32 | 1.2 |
| | *Synedra acus* | 0.072 | 0.029 | 0.042 | 0.086 | 0.068 | 0.35 | 0.38 | 0.30 | 0.065 | 0.023 |
| | *Synedra ulna* | 1.0 | 0.17 | 0.19 | 0.85 | 0.25 | 0 | 0 | 0.20 | 0.47 | 0 |
| | *Cyclotella michiganiana* | 1.0 | 0.92 | 0.83 | 3.0 | 2.3 | 0.84 | 5.0 | 1.4 | 0.43 | 1.2 |
| | *Cyclotella bodanica* | 0.75 | 0.21 | 0 | 0 | 0 | 0 | 0 | 0 | 1.6 | 2.3 |
| Crypto-phyte | *Rhodomonas minuta* | 2.8 | 2.5 | 2.1 | 1.2 | 3.4 | 0.94 | 5.3 | 2.9 | 4.4 | 3.8 |
| | *Cryptomonas erosa* | 2.1 | 3.5 | 3.2 | 4.0 | 3.5 | 0.28 | 4.1 | 1.6 | 3.3 | 12 |
| | *Cryptomonas rostratiformis* | 0 | 0 | 0.11 | 0 | 0 | 0 | 0 | 0.16 | 0.15 | 0.43 |
| | *Katablepharis ovalis* | 0.27 | 0.11 | 0.52 | 0.086 | 0.62 | 0 | 0.46 | 0.078 | 0.30 | 0 |
| Dino-flagellate | *Gymnodinium* sp. | 2.2 | 2.7 | 0.85 | 1.6 | 1.3 | 0 | 0 | 0.51 | 0.55 | 9.0 |
| | *Peridinium pusillum* | 0 | 0.34 | 0.053 | 0.45 | 0.21 | 0 | 0.52 | 0.18 | 0.34 | 0.15 |
| | *Ceratium hirundenella* | 4.7 | 1.9 | 1.2 | 2.8 | 3.2 | 0 | 0 | 2.1 | 7.2 | 5.1 |

**Table D.23:** **Descriptive Statistics for Phytoplankton in Koocanusa Reservoir Upstream (T2) and Downstream (T4) of the Elk River, August 2014**

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of cells/L) | | T2 | 5 | 3,162,088 | 3,822,048 | 7,509,024 | 4,460,771 | 1,738,223 |
| | | T4 | 5 | 2,696,312 | 3,296,336 | 15,377,272 | 5,669,326 | 5,439,272 |
| Richness (no. of taxa) | | T2 | 5 | 23 | 23 | 28 | 25 | 2.3 |
| | | T4 | 5 | 23 | 24 | 27 | 25 | 1.8 |
| Biomass (µg/L dw) | | T2 | 5 | 633 | 847 | 1,572 | 950 | 364 |
| | | T4 | 5 | 604 | 765 | 2,574 | 1,111 | 825 |
| Major Group Density (no. of cells/L) | Cyanophyte | T2 | 5 | 0 | 0 | 14,368 | 4,310 | 6,426 |
| | | T4 | 5 | 0 | 0 | 7,184 | 2,874 | 3,935 |
| | Chlorophyte | T2 | 5 | 57,672 | 65,456 | 107,760 | 74,954 | 19,898 |
| | | T4 | 5 | 14,368 | 43,104 | 198,415 | 69,856 | 74,229 |
| | Chrysophyte | T2 | 5 | 467,360 | 683,280 | 812,392 | 661,648 | 136,806 |
| | | T4 | 5 | 419,072 | 592,088 | 6,009,133 | 1,636,063 | 2,447,121 |
| | Diatom | T2 | 5 | 2,272,856 | 3,154,120 | 6,358,968 | 3,549,904 | 1,629,563 |
| | | T4 | 5 | 1,835,016 | 2,702,048 | 8,754,894 | 3,787,276 | 2,809,136 |
| | Cryptophyte | T2 | 5 | 89,408 | 131,912 | 298,144 | 165,122 | 89,831 |
| | | T4 | 5 | 74,440 | 110,560 | 413,830 | 167,027 | 140,992 |
| | Dinoflagellate | T2 | 5 | 800 | 3,200 | 15,368 | 4,834 | 5,995 |
| | | T4 | 5 | 1,000 | 1,400 | 22,952 | 6,230 | 9,483 |
| Major Groups Relative Density (%) | Cyanophyte | T2 | 5 | 0 | 0 | 0.23 | 0.084 | 0.12 |
| | | T4 | 5 | 0 | 0 | 0.22 | 0.088 | 0.12 |
| | Chlorophyte | T2 | 5 | 1.1 | 1.8 | 2.8 | 1.8 | 0.68 |
| | | T4 | 5 | 0.44 | 1.3 | 2.4 | 1.2 | 0.75 |
| | Chrysophyte | T2 | 5 | 10 | 14 | 22 | 16 | 5.5 |
| | | T4 | 5 | 13 | 16 | 39 | 22 | 11 |
| | Diatom | T2 | 5 | 70 | 82 | 85 | 78 | 6.7 |
| | | T4 | 5 | 57 | 79 | 83 | 74 | 11 |
| | Cryptophyte | T2 | 5 | 2.2 | 4.0 | 5.8 | 3.7 | 1.5 |
| | | T4 | 5 | 2.7 | 2.8 | 4.0 | 3.1 | 0.60 |
| | Dinoflagellate | T2 | 5 | 0.021 | 0.044 | 0.42 | 0.12 | 0.17 |
| | | T4 | 5 | 0.007 | 0.043 | 0.85 | 0.22 | 0.36 |
| Major Group Biomass (µg/L dw) | Cyanophyte | T2 | 5 | 0 | 0 | 1.1 | 0.34 | 0.51 |
| | | T4 | 5 | 0 | 0 | 1.6 | 0.43 | 0.70 |
| | Chlorophyte | T2 | 5 | 2.3 | 4.3 | 11 | 5.1 | 3.3 |
| | | T4 | 5 | 0.72 | 1.7 | 12 | 3.8 | 4.6 |
| | Chrysophyte | T2 | 5 | 30 | 43 | 84 | 54 | 23 |
| | | T4 | 5 | 52 | 63 | 564 | 163 | 225 |
| | Diatom | T2 | 5 | 559 | 778 | 1,411 | 835 | 337 |
| | | T4 | 5 | 479 | 671 | 1,943 | 889 | 599 |
| | Cryptophyte | T2 | 5 | 14 | 17 | 35 | 22 | 9.5 |
| | | T4 | 5 | 10 | 16 | 54 | 23 | 18 |
| | Dinoflagellate | T2 | 5 | 11 | 28 | 84 | 34 | 30 |
| | | T4 | 5 | 1.1 | 25 | 61 | 31 | 23 |
| Major Groups Relative Biomass (%) | Cyanophyte | T2 | 5 | 0 | 0 | 0.085 | 0.032 | 0.043 |
| | | T4 | 5 | 0 | 0 | 0.23 | 0.060 | 0.10 |
| | Chlorophyte | T2 | 5 | 0.14 | 0.49 | 1.3 | 0.61 | 0.42 |
| | | T4 | 5 | 0.10 | 0.19 | 0.54 | 0.29 | 0.19 |
| | Chrysophyte | T2 | 5 | 3.5 | 5.4 | 9.2 | 5.9 | 2.2 |
| | | T4 | 5 | 6.8 | 9.2 | 22 | 11 | 6.2 |
| | Diatom | T2 | 5 | 83 | 88 | 92 | 88 | 3.7 |
| | | T4 | 5 | 76 | 82 | 88 | 82 | 4.9 |
| | Cryptophyte | T2 | 5 | 1.5 | 2.2 | 3.9 | 2.4 | 0.91 |
| | | T4 | 5 | 1.7 | 2.1 | 2.3 | 2.0 | 0.22 |
| | Dinoflagellate | T2 | 5 | 1.3 | 2.4 | 9.0 | 3.6 | 3.1 |
| | | T4 | 5 | 0.041 | 3.2 | 8.5 | 4.4 | 3.7 |

**Table D.24: Descriptive Statistics for Phytoplankton in Koocanusa Reservoir Upstream (TN) and Downstream (T4) of the Elk River, August 2015**

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of cells/L) | | TN | 5 | 10,302,297 | 12,672,877 | 15,194,906 | 12,690,374 | 2,141,882 |
| | | T4 | 5 | 13,921,250 | 15,199,706 | 15,720,385 | 14,893,832 | 781,658 |
| Richness (no. of taxa) | | TN | 5 | 15 | 17 | 22 | 18 | 2.7 |
| | | T4 | 5 | 15 | 19 | 21 | 19 | 2.3 |
| Biomass (µg/L dw) | | TN | 5 | 2,595 | 3,130 | 3,896 | 3,153 | 540 |
| | | T4 | 5 | 3,788 | 4,265 | 5,074 | 4,285 | 531 |
| Major Group Density (no. of cells/L) | Cyanophyte | TN | 5 | 0 | 600 | 600 | 440 | 261 |
| | | T4 | 5 | 0 | 200 | 40,283 | 9,573 | 17,437 |
| | Chlorophyte | TN | 5 | 39,683 | 317,464 | 396,830 | 253,971 | 150,063 |
| | | T4 | 5 | 79,366 | 357,147 | 714,294 | 341,274 | 258,092 |
| | Chrysophyte | TN | 5 | 198,415 | 317,664 | 357,147 | 285,918 | 65,145 |
| | | T4 | 5 | 317,464 | 396,830 | 555,562 | 404,847 | 98,782 |
| | Diatom | TN | 5 | 9,624,086 | 11,913,100 | 14,234,314 | 11,876,080 | 2,097,712 |
| | | T4 | 5 | 12,803,126 | 13,184,556 | 14,283,797 | 13,529,517 | 670,276 |
| | Cryptophyte | TN | 5 | 238,898 | 240,498 | 318,064 | 263,588 | 35,273 |
| | | T4 | 5 | 239,298 | 437,913 | 956,992 | 574,235 | 321,892 |
| | Dinoflagellate | TN | 5 | 800 | 2,800 | 43,683 | 10,377 | 18,657 |
| | | T4 | 5 | 2,600 | 40,883 | 82,766 | 34,386 | 33,167 |
| Major Groups Relative Density (%) | Cyanophyte | TN | 5 | 0 | 0.0040 | 0.0055 | 0.0034 | 0.0022 |
| | | T4 | 5 | 0 | 0.0014 | 0.26 | 0.061 | 0.11 |
| | Chlorophyte | TN | 5 | 0.39 | 2.2 | 3.3 | 2.0 | 1.1 |
| | | T4 | 5 | 0.52 | 2.6 | 4.6 | 2.3 | 1.7 |
| | Chrysophyte | TN | 5 | 1.4 | 2.8 | 3.1 | 2.4 | 0.81 |
| | | T4 | 5 | 2.0 | 2.9 | 3.6 | 2.7 | 0.62 |
| | Diatom | TN | 5 | 92 | 94 | 95 | 94 | 1.2 |
| | | T4 | 5 | 86 | 92 | 93 | 91 | 3.2 |
| | Cryptophyte | TN | 5 | 1.7 | 1.9 | 3.1 | 2.1 | 0.57 |
| | | T4 | 5 | 1.7 | 2.9 | 6.1 | 3.8 | 2.0 |
| | Dinoflagellate | TN | 5 | 0.0056 | 0.027 | 0.29 | 0.072 | 0.12 |
| | | T4 | 5 | 0.017 | 0.28 | 0.54 | 0.23 | 0.22 |
| Major Group Biomass (µg/L dw) | Cyanophyte | TN | 5 | 0 | 0.80 | 1.0 | 0.63 | 0.40 |
| | | T4 | 5 | 0 | 0.52 | 9.5 | 2.5 | 4.0 |
| | Chlorophyte | TN | 5 | 1.2 | 8.8 | 33 | 12 | 12 |
| | | T4 | 5 | 3.0 | 11 | 35 | 14 | 13 |
| | Chrysophyte | TN | 5 | 21 | 45 | 51 | 38 | 15 |
| | | T4 | 5 | 27 | 38 | 54 | 38 | 9.9 |
| | Diatom | TN | 5 | 2,487 | 3,049 | 3,802 | 3,049 | 537 |
| | | T4 | 5 | 3,574 | 4,118 | 4,873 | 4,099 | 507 |
| | Cryptophyte | TN | 5 | 30 | 37 | 39 | 36 | 3.6 |
| | | T4 | 5 | 39 | 111 | 174 | 109 | 53 |
| | Dinoflagellate | TN | 5 | 1.6 | 18 | 33 | 18 | 12 |
| | | T4 | 5 | 6.2 | 20 | 44 | 22 | 14 |
| Major Groups Relative Biomass (%) | Cyanophyte | TN | 5 | 0 | 0.025 | 0.030 | 0.020 | 0.013 |
| | | T4 | 5 | 0 | 0.012 | 0.25 | 0.062 | 0.11 |
| | Chlorophyte | TN | 5 | 0.046 | 0.23 | 0.96 | 0.36 | 0.35 |
| | | T4 | 5 | 0.080 | 0.25 | 0.69 | 0.31 | 0.25 |
| | Chrysophyte | TN | 5 | 0.54 | 1.4 | 2.0 | 1.3 | 0.62 |
| | | T4 | 5 | 0.66 | 0.84 | 1.4 | 0.91 | 0.30 |
| | Diatom | TN | 5 | 96 | 97 | 98 | 97 | 0.84 |
| | | T4 | 5 | 94 | 96 | 98 | 96 | 1.6 |
| | Cryptophyte | TN | 5 | 0.77 | 1.3 | 1.5 | 1.2 | 0.28 |
| | | T4 | 5 | 1.0 | 2.2 | 3.9 | 2.6 | 1.2 |
| | Dinoflagellate | TN | 5 | 0.061 | 0.69 | 0.84 | 0.55 | 0.32 |
| | | T4 | 5 | 0.16 | 0.41 | 0.99 | 0.49 | 0.30 |

**Table D.25:** **Descriptive Statistics for Phytoplankton in Koocanusa Reservoir Upstream (TN) and Downstream (T4) of the Elk River, August 2016**

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of cells/L) | | TN | 5 | 2,405,120 | 3,843,152 | 4,063,024 | 3,393,325 | 761,147 |
| | | T4 | 5 | 919,816 | 2,368,984 | 4,685,480 | 2,696,810 | 1,497,251 |
| Richness (no. of taxa) | | TN | 5 | 24 | 25 | 26 | 25 | 0.84 |
| | | T4 | 5 | 19 | 21 | 30 | 23 | 4.4 |
| Biomass (µg/L dw) | | TN | 5 | 435 | 638 | 807 | 641 | 146 |
| | | T4 | 5 | 199 | 566 | 1,031 | 550 | 338 |
| Major Group Density (no. of cells/L) | Cyanophyte | TN | 5 | 0 | 0 | 0 | 0 | 0 |
| | | T4 | 5 | 0 | 3,200 | 51,936 | 17,267 | 23,400 |
| | Chlorophyte | TN | 5 | 39,120 | 93,392 | 201,152 | 104,130 | 61,036 |
| | | T4 | 5 | 9,984 | 36,520 | 129,912 | 46,778 | 48,565 |
| | Chrysophyte | TN | 5 | 474,144 | 581,904 | 933,920 | 694,134 | 219,225 |
| | | T4 | 5 | 272,992 | 387,936 | 476,744 | 372,651 | 84,636 |
| | Diatom | TN | 5 | 1,607,680 | 2,638,944 | 3,095,368 | 2,433,347 | 580,516 |
| | | T4 | 5 | 541,016 | 1,694,856 | 3,833,736 | 2,123,555 | 1,386,529 |
| | Cryptophyte | TN | 5 | 90,440 | 127,528 | 243,488 | 159,834 | 66,711 |
| | | T4 | 5 | 44,304 | 121,744 | 226,320 | 132,765 | 81,351 |
| | Dinoflagellate | TN | 5 | 1,000 | 1,600 | 3,400 | 1,880 | 1,026 |
| | | T4 | 5 | 0 | 1,200 | 15,568 | 3,794 | 6,610 |
| Major Groups Relative Density (%) | Cyanophyte | TN | 5 | 0 | 0 | 0 | 0 | 0 |
| | | T4 | 5 | 0 | 0.068 | 1.7 | 0.64 | 0.85 |
| | Chlorophyte | TN | 5 | 1.4 | 2.4 | 5.0 | 3.1 | 1.7 |
| | | T4 | 5 | 0.79 | 1.1 | 2.8 | 1.5 | 0.82 |
| | Chrysophyte | TN | 5 | 15 | 23 | 24 | 20 | 3.9 |
| | | T4 | 5 | 7.4 | 18 | 33 | 18 | 10 |
| | Diatom | TN | 5 | 67 | 68 | 81 | 72 | 6.5 |
| | | T4 | 5 | 59 | 72 | 89 | 74 | 12 |
| | Cryptophyte | TN | 5 | 2.4 | 5.3 | 6.2 | 4.7 | 1.5 |
| | | T4 | 5 | 1.2 | 6.7 | 8.7 | 5.7 | 2.9 |
| | Dinoflagellate | TN | 5 | 0.025 | 0.042 | 0.089 | 0.057 | 0.029 |
| | | T4 | 5 | 0 | 0.068 | 0.33 | 0.11 | 0.13 |
| Major Group Biomass (µg/L dw) | Cyanophyte | TN | 5 | 0 | 0 | 0 | 0 | 0 |
| | | T4 | 5 | 0 | 0.76 | 8.7 | 3.2 | 4.2 |
| | Chlorophyte | TN | 5 | 1.5 | 6.1 | 12 | 6.6 | 4.1 |
| | | T4 | 5 | 0.72 | 2.9 | 5.8 | 2.9 | 2.1 |
| | Chrysophyte | TN | 5 | 42 | 44 | 66 | 51 | 11 |
| | | T4 | 5 | 18 | 28 | 56 | 34 | 15 |
| | Diatom | TN | 5 | 330 | 493 | 665 | 517 | 133 |
| | | T4 | 5 | 113 | 449 | 892 | 457 | 323 |
| | Cryptophyte | TN | 5 | 23 | 39 | 48 | 38 | 10 |
| | | T4 | 5 | 8.4 | 33 | 50 | 33 | 17 |
| | Dinoflagellate | TN | 5 | 17 | 30 | 37 | 29 | 7.0 |
| | | T4 | 5 | 0 | 29 | 46 | 21 | 20 |
| Major Groups Relative Biomass (%) | Cyanophyte | TN | 5 | 0 | 0 | 0 | 0 | 0 |
| | | T4 | 5 | 0 | 0.074 | 3.3 | 0.87 | 1.4 |
| | Chlorophyte | TN | 5 | 0.27 | 0.96 | 2.0 | 1.1 | 0.70 |
| | | T4 | 5 | 0.20 | 0.37 | 2.9 | 0.84 | 1.2 |
| | Chrysophyte | TN | 5 | 5.6 | 8.1 | 9.9 | 8.2 | 1.7 |
| | | T4 | 5 | 4.0 | 5.4 | 16 | 7.8 | 5.0 |
| | Diatom | TN | 5 | 76 | 81 | 84 | 80 | 3.3 |
| | | T4 | 5 | 57 | 79 | 93 | 77 | 14 |
| | Cryptophyte | TN | 5 | 5.2 | 5.9 | 7.5 | 6.0 | 0.95 |
| | | T4 | 5 | 1.2 | 8.2 | 17 | 8.1 | 5.8 |
| | Dinoflagellate | TN | 5 | 2.2 | 4.9 | 6.9 | 4.7 | 1.7 |
| | | T4 | 5 | 0 | 2.8 | 14 | 5.2 | 6.1 |

## Table D.26: Mean Skewness and Kurtosis Values of Phytoplankton Lowest Practical Level Density Matrix by Transformation for the Area Upstream and Downstream of the Elk River Sampled in 2014, 2015, and 2016 (n= 30)

| Transformation | Endpoint | Skewness (mean) | Kurtosis (mean) |
|---|---|---|---|
| None | Area\Row | 6.218 | 39.562 |
| | Taxa\Col | 2.427 | 7.145 |
| $Log_{10}$ | Area\Row | 0.491 | -1.319 |
| | Taxa\Col | 0.665 | 1.402 |
| Square root | Area\Row | 4.857 | 27.055 |
| | Taxa\Col | 1.560 | 3.018 |
| Fourth root | Area\Row | 2.175 | 6.653 |
| | Taxa\Col | 0.974 | 1.585 |
| Power 2 | Area\Row | 6.488 | 42.278 |
| | Taxa\Col | 3.296 | 12.580 |
| Power 4 | Area\Row | 6.545 | 42.872 |
| | Taxa\Col | 3.940 | 17.119 |

▨ - mean skewness and kurtosis values closest to zero.

**Table D.27: Non-Metric Multidimensional Scaling (NMDS) Results for Phytoplankton Community Data (Lowest Practical Level) Displaying Percent Variance Explained by Each Axis, Monte Carlo Randomization p-values of Axis Significance, and Axis Scores for Areas Upstream and Downstream of the Elk River Sampled in 2014, 2015, and 2016**

| Year | Station Identifier | | $Log_{10}$ Transformation | | Non-transformed | |
|---|---|---|---|---|---|---|
| | | | NMDS-1 | NMDS-2 | NMDS-1 | NMDS-2[a] |
| 2014 | Upstream of Elk River | T2-2 | 0.99 | -0.27 | 0.62 | - |
| | | T2-3 | 0.56 | -0.34 | 0.29 | - |
| | | T2-4 | 0.96 | -0.18 | 0.50 | - |
| | | T2-5 | 0.65 | -0.45 | 0.31 | - |
| | | T2-6 | 0.90 | -0.59 | -0.49 | - |
| | Downstream of Elk River | T4-2 | 0.81 | -0.69 | -1.02 | - |
| | | T4-3 | 1.06 | -0.13 | 0.46 | - |
| | | T4-4 | 1.22 | -0.59 | 0.48 | - |
| | | T4-5 | 0.84 | -0.01 | 0.40 | - |
| | | T4-6 | 0.73 | 0.10 | 0.84 | - |
| 2015 | Upstream of Elk River | TN-1 | -1.07 | -0.39 | -1.12 | - |
| | | TN-2 | -0.94 | -0.87 | -0.97 | - |
| | | TN-3 | -0.53 | -0.98 | -1.33 | - |
| | | TN-4 | -0.55 | -0.78 | -1.25 | - |
| | | TN-5 | -0.44 | -0.30 | -0.90 | - |
| | Downstream of Elk River | T4-2 | -1.34 | -0.05 | -1.27 | - |
| | | T4-3 | -0.66 | -0.50 | -1.15 | - |
| | | T4-4 | -0.66 | -0.64 | -1.23 | - |
| | | T4-5 | -1.05 | -0.43 | -1.24 | - |
| | | T4-6 | -0.81 | -0.50 | -1.31 | - |
| 2016 | Upstream of Elk River | TN-1 | 0.10 | 0.57 | 1.02 | - |
| | | TN-2 | 0.19 | 0.75 | 0.80 | - |
| | | TN-3 | 0.17 | 0.87 | 0.56 | - |
| | | TN-4 | -0.02 | 0.77 | 0.67 | - |
| | | TN-5 | -0.14 | 0.71 | 0.71 | - |
| | Downstream of Elk River | T4-2 | -1.09 | 1.30 | 0.37 | - |
| | | T4-3 | -0.37 | 0.89 | 1.75 | - |
| | | T4-4 | 0.36 | 0.87 | 0.23 | - |
| | | T4-5 | 0.32 | 0.71 | 0.96 | - |
| | | T4-6 | -0.21 | 1.15 | 2.33 | - |
| **Final Stress** | | | **13.81** | | **7.31** | |
| **% Variance explained** | | | **53.8** | **32.1** | **92.5** | **-** |
| **Monte Carlo p-value** | | | **0.004** | **0.004** | **0.012** | **-** |

[a] A one dimensional (axis) solution was obtained because a two dimensional solution did not reduce stress by at least 5 units, which indicates that an additional axis does little to improve the monotonic relationship between the original dimensional space and the reduced dimensional space (McCune and Grace 2002).

## Table D.28: Pearson Correlations Non-Metric Multidimensional Scaling (NMDS) Axis Scores, using Three Years (2014, 2015, 2016) of Phytoplankton Community Data from the Upstream and Downstream Areas of the Elk River with Relative Benthic Invertebrate Taxon Density

| **Taxa** | **Log$_{10}$ Transformation** | | | | **Non-transformed** | | | |
|---|---|---|---|---|---|---|---|---|
| | **NMDS-1 (53.8%)** | | **NMDS-2 (32.1%)** | | **NMDS-1 (92.5%)** | | **NMDS-2 $^{a}$** | |
| | **Pearson r-value** | **Pearson p-value** | **Pearson r-value** | **Pearson p-value** | **Pearson r-value** | **Pearson p-value** | **Pearson r-value** | **Pearson p-value** |
| *Aphanocapsa delicatissima* | -0.466 | 0.009 | -0.476 | 0.008 | -0.527 | 0.003 | - | - |
| *Aphanothece* sp. | 0.420 | 0.021 | -0.303 | 0.104 | -0.045 | 0.815 | - | - |
| *Planktolyngbya limnetica* | -0.184 | 0.331 | 0.517 | 0.003 | 0.311 | 0.095 | - | - |
| *Chlamydomonas* spp. | 0.541 | 0.002 | -0.113 | 0.553 | -0.095 | 0.618 | - | - |
| *Oocystis lacustris* | -0.284 | 0.129 | -0.667 | 0.000 | -0.624 | 0.000 | - | - |
| *Paulschulzia pseudovolvox* | 0.198 | 0.295 | 0.230 | 0.221 | 0.168 | 0.375 | - | - |
| *Scenedesmus denticulatus* | -0.027 | 0.888 | 0.587 | 0.001 | 0.239 | 0.203 | - | - |
| *Kichnerella lunaris* | 0.100 | 0.599 | 0.589 | 0.001 | 0.209 | 0.267 | - | - |
| *Collodictyon* sp. | 0.020 | 0.915 | 0.361 | 0.050 | 0.254 | 0.176 | - | - |
| *Ankistrodesmus spiralis* | -0.167 | 0.378 | 0.433 | 0.017 | 0.232 | 0.216 | - | - |
| *Bitrichia chodatii* | 0.495 | 0.005 | 0.053 | 0.782 | 0.137 | 0.472 | - | - |
| *Chrysochromulina laurentiana* | 0.427 | 0.019 | -0.314 | 0.091 | -0.186 | 0.324 | - | - |
| *Chrysochromulina parva* | 0.860 | 0.000 | 0.365 | 0.048 | -0.084 | 0.659 | - | - |
| *Chrysococcus* sp. | 0.182 | 0.335 | 0.363 | 0.049 | -0.079 | 0.679 | - | - |
| *Chrysolkos skuja* | 0.208 | 0.270 | 0.254 | 0.176 | 0.151 | 0.427 | - | - |
| *Chrysostephanospaera globulifera* | 0.111 | 0.558 | -0.137 | 0.472 | -0.352 | 0.057 | - | - |
| *Kephyrion* sp. | -0.071 | 0.711 | 0.188 | 0.320 | -0.440 | 0.015 | - | - |
| *Dinobryon bavaricum* | -0.084 | 0.658 | 0.921 | 0.000 | 0.504 | 0.005 | - | - |
| *Dinobryon sertularia* | 0.358 | 0.052 | -0.306 | 0.101 | -0.304 | 0.103 | - | - |
| *Dinobryon sociale* | 0.287 | 0.124 | -0.395 | 0.031 | -0.262 | 0.162 | - | - |
| *Mallomonas crassisquama* | 0.362 | 0.050 | -0.495 | 0.005 | -0.170 | 0.369 | - | - |
| *Salpingoeca frequentissima* | -0.106 | 0.578 | -0.851 | 0.000 | -0.657 | 0.000 | - | - |
| *Stichogloea* spp. | 0.428 | 0.018 | -0.314 | 0.091 | -0.186 | 0.324 | - | - |
| *Cyclotella bodanica* | 0.835 | 0.000 | -0.157 | 0.408 | 0.082 | 0.666 | - | - |
| *Cyclotella michiganiana* | -0.815 | 0.000 | 0.340 | 0.066 | -0.182 | 0.336 | - | - |
| *Cyclotella ocellata* | 0.454 | 0.012 | -0.230 | 0.222 | 0.000 | 0.998 | - | - |
| *Cyclotella pseudostelligera* | -0.488 | 0.006 | -0.751 | 0.000 | -0.942 | 0.000 | - | - |
| *Cyclotella stelligera* | 0.831 | 0.000 | -0.168 | 0.376 | 0.104 | 0.584 | - | - |
| *Fragilaria construens* | 0.734 | 0.000 | 0.577 | 0.001 | 0.423 | 0.020 | - | - |
| *Rhizosolenia eriense* | 0.142 | 0.453 | -0.278 | 0.137 | -0.389 | 0.034 | - | - |
| *Synedra acus* | -0.869 | 0.000 | 0.205 | 0.276 | -0.629 | 0.000 | - | - |
| *Synedra ulna* | 0.900 | 0.000 | 0.031 | 0.870 | 0.256 | 0.172 | - | - |
| *Tabellaria fenestrata* | 0.193 | 0.307 | 0.423 | 0.020 | 0.427 | 0.019 | - | - |
| *Tabellaria flocculsa* | -0.276 | 0.139 | 0.250 | 0.182 | -0.079 | 0.678 | - | - |
| *Cryptomonas erosa* | 0.437 | 0.016 | 0.466 | 0.009 | 0.498 | 0.005 | - | - |
| *Cryptomonas pusilla* | -0.234 | 0.214 | -0.265 | 0.157 | -0.396 | 0.030 | - | - |
| *Cryptomonas reflexa* | 0.303 | 0.104 | -0.286 | 0.125 | -0.082 | 0.668 | - | - |
| *Cryptomonas rostratiformis* | -0.042 | 0.826 | -0.039 | 0.836 | -0.078 | 0.683 | - | - |
| *Katablepharis ovalis* | 0.371 | 0.043 | -0.233 | 0.216 | -0.398 | 0.029 | - | - |
| *Rhodomonas minuta* | -0.400 | 0.028 | -0.463 | 0.010 | -0.571 | 0.001 | - | - |
| *Ceratium hirundenella* | 0.728 | 0.000 | 0.263 | 0.160 | 0.348 | 0.060 | - | - |
| *Gymnodinium* sp. | -0.297 | 0.111 | -0.007 | 0.969 | -0.409 | 0.025 | - | - |
| *Peridinium pusillum* | 0.115 | 0.544 | -0.344 | 0.063 | -0.444 | 0.014 | - | - |

🟧- Pearson correlation coefficients greater than an absolute value of 0.5.

⬜- Pearson correlation with p-value less than 0.05.

[a] A one dimensional (axis) solution was obtained because a two dimensional solution did not reduce stress by at least 5 units, which indicates that an additional axis does little to improve the monotonic relationship between the original dimensional space and the reduced dimensional space (McCune and Grace 2002).

# Zooplankton

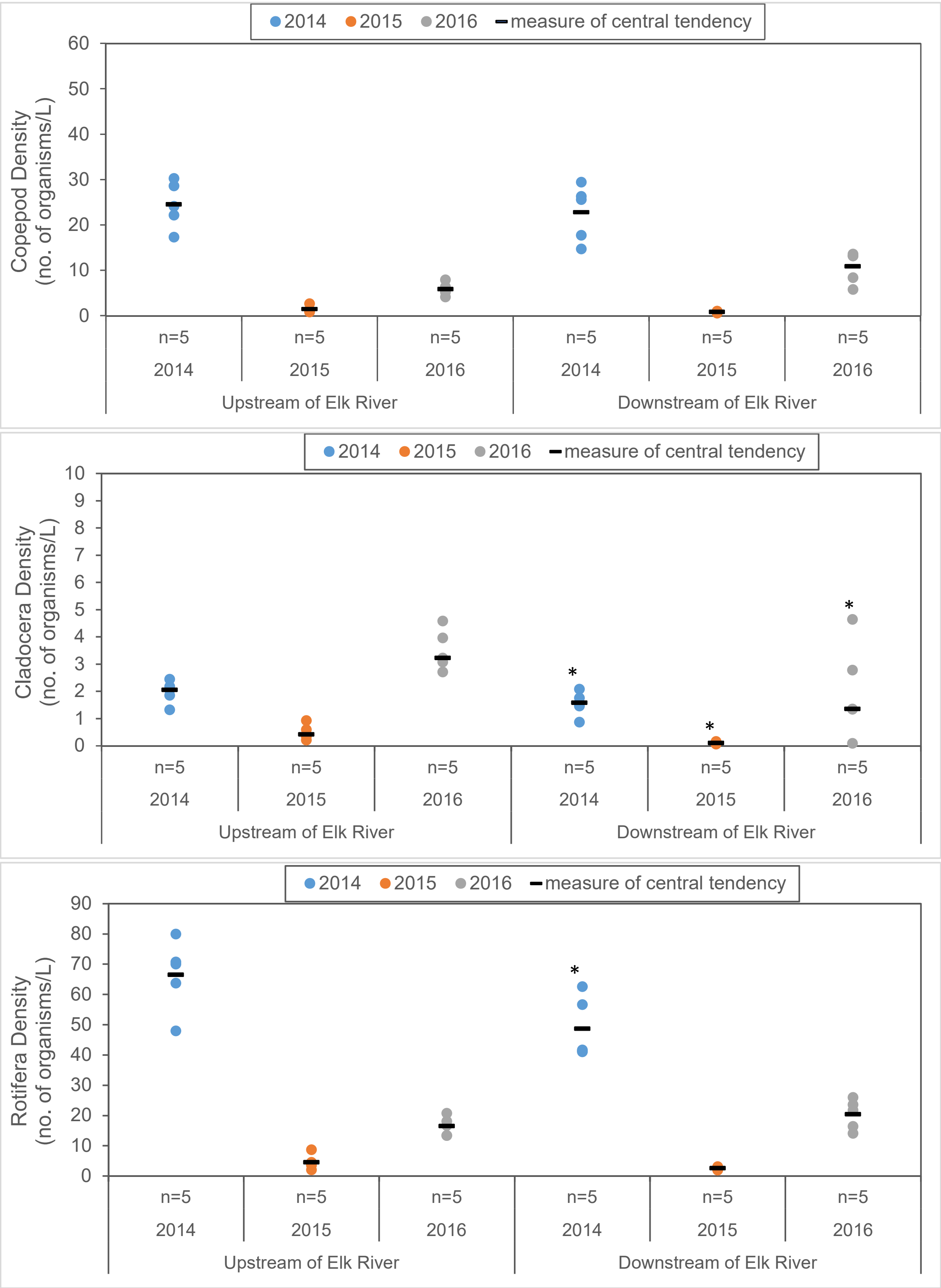

**Figure D.7: Copepod Density, Cladocera Density, and Rotifera Density in Koocanusa Reservoir, August 2014, 2015, and 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

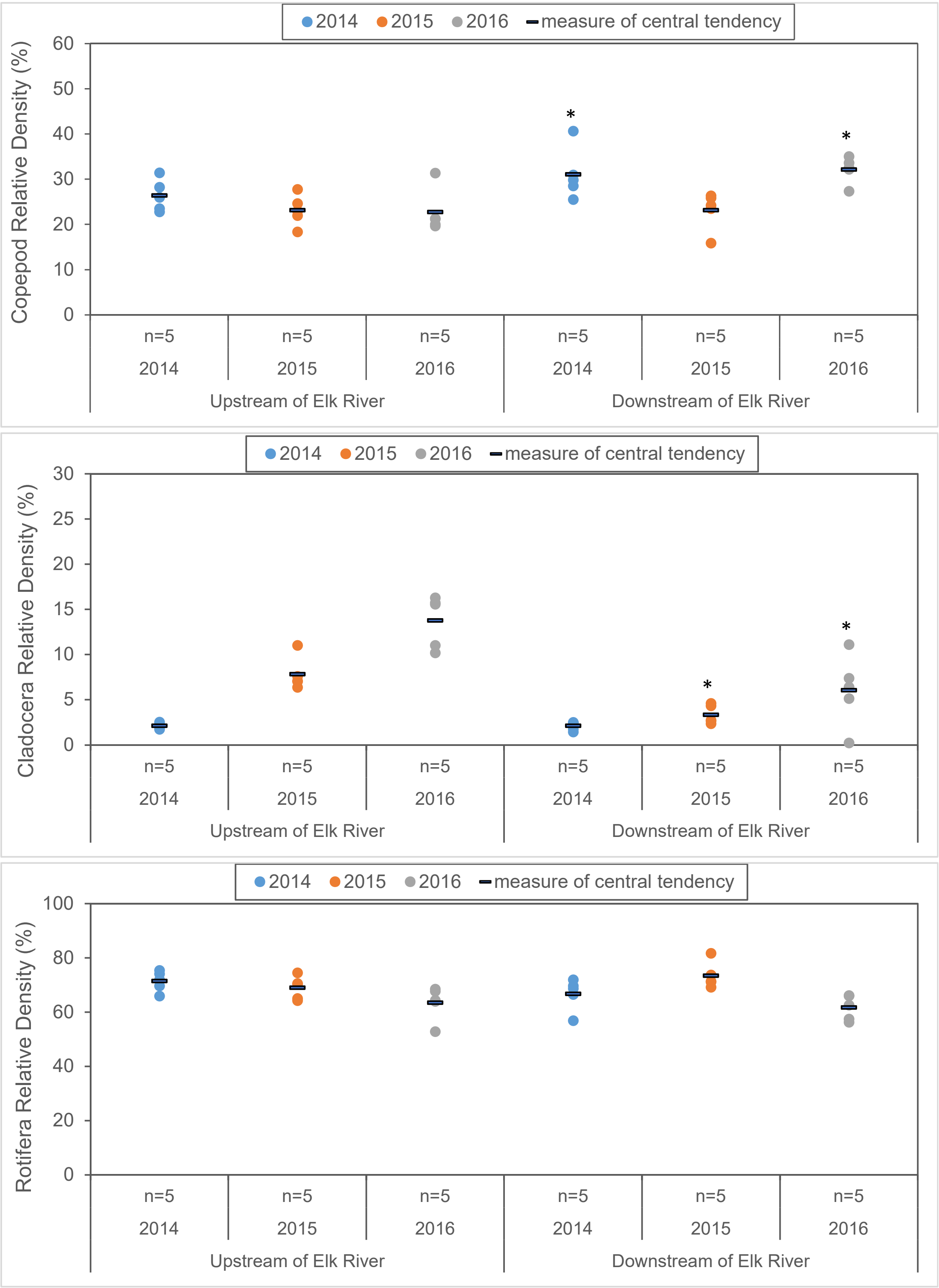

**Figure D.8:** **Copepod Relative Density, Cladocera Relative Density, and Rotifera Relative Density in Koocanusa Reservoir, August 2014, 2015, and 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

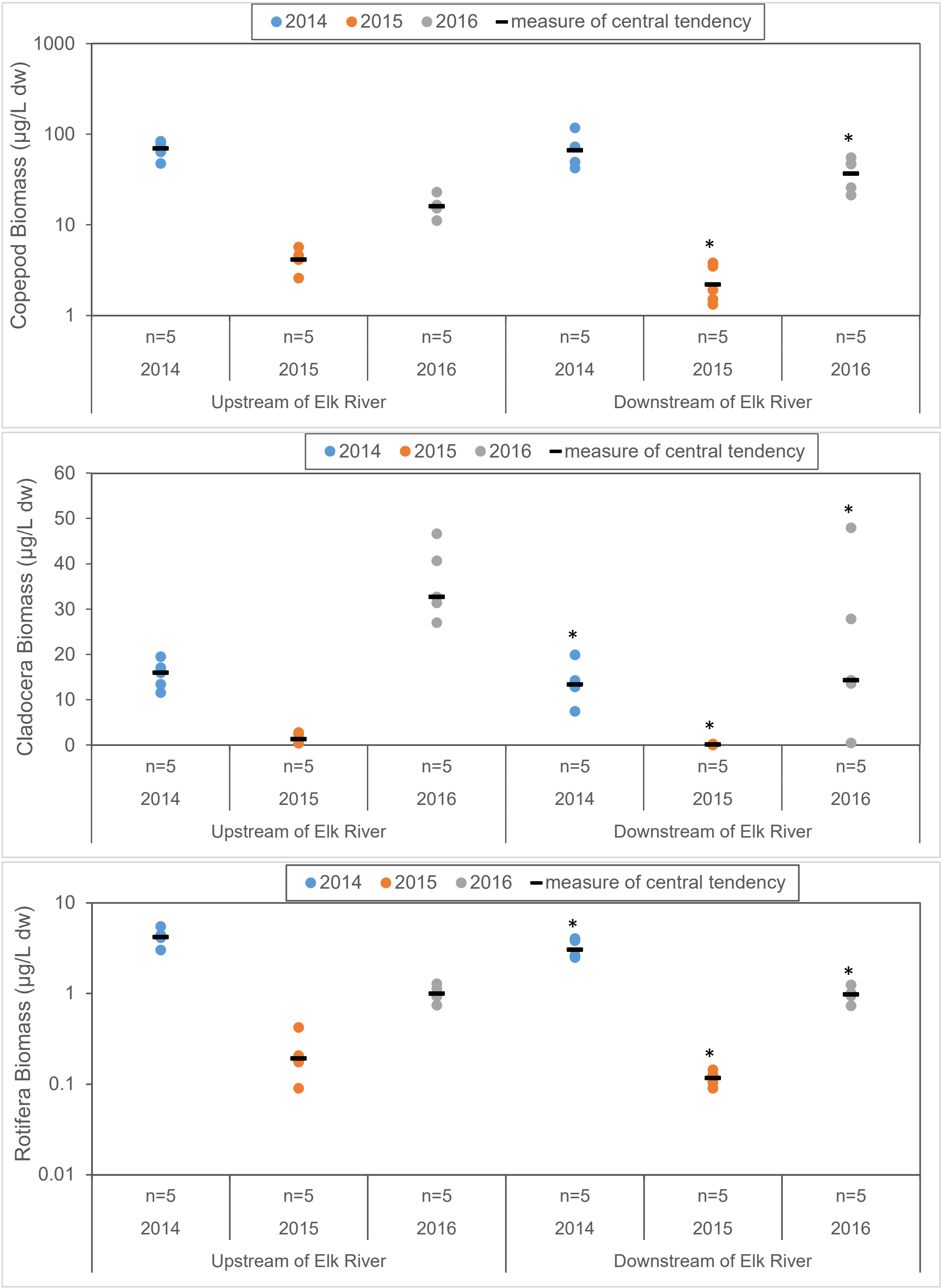

**Figure D.9: Copepod Biomass, Cladocera Biomass, and Rotifera Biomass in Koocanusa Reservoir, August 2014, 2015, and 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

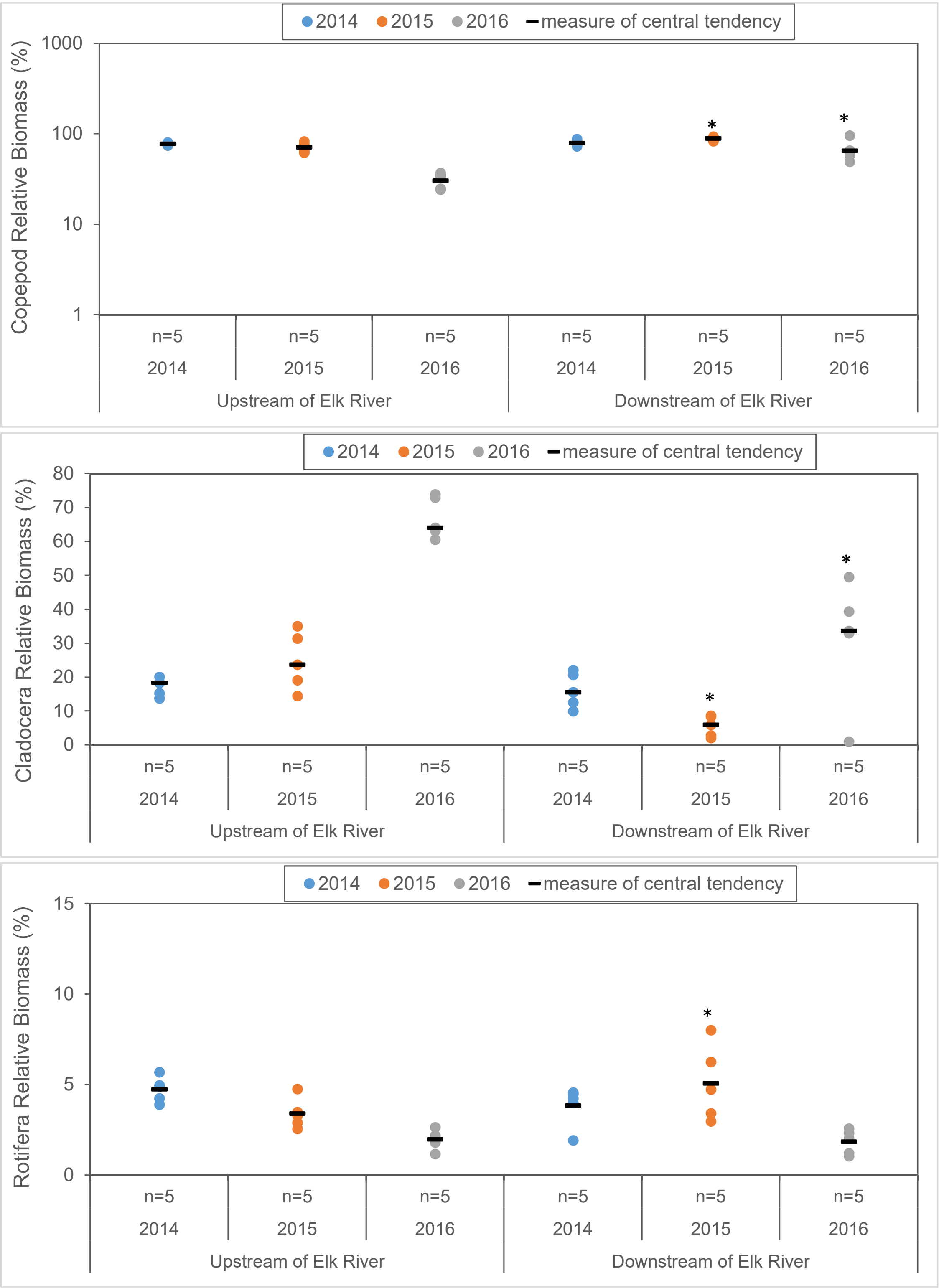

**Figure D.10:** **Copepod Relative Biomass, Cladocera Relative Biomass, and Rotifera Relative Biomass in Koocanusa Reservoir, August 2014, 2015, and 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016.
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

**Table D.29:** Zooplankton Community and Biomass Results as Provided by the Analytical Laboratory, August 2014

| Species | Sex | Upstream of Elk River | | | | | | | | | | Downstream of Elk River | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T2-2 | | T2-3 | | T2-4 | | T2-5 | | T2-6 | | T4-2 | | T4-3 | | T4-4 | | T4-5 | | T4-6 | |
| | | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass |
| | | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw |
| Calanoid nauplii | - | 1.1 | 0.083 | 5.6 | 0.41 | 4.8 | 0.35 | 3.9 | 0.28 | 2.8 | 0.21 | 1.8 | 0.13 | 1.2 | 0.086 | 1.3 | 0.093 | 1.8 | 0.13 | 4.6 | 0.33 |
| Calanoid nauplii | - | 0.52 | 0.37 | 1.7 | 1.2 | 2.1 | 1.5 | 0.87 | 0.62 | 0.73 | 0.52 | 0.56 | 0.40 | 0.40 | 0.28 | 0.35 | 0.25 | 0.59 | 0.42 | 2.1 | 1.5 |
| Calanoid copepodids | - | 0.61 | 2.9 | 2.6 | 12 | 2.7 | 13 | 2.0 | 9.4 | 2.3 | 11 | 0.68 | 3.3 | 0.26 | 1.2 | 0.56 | 2.7 | 0.61 | 2.9 | 1.7 | 8.4 |
| Calanoid copepodids | - | 0.99 | 7.9 | 2.8 | 23 | 2.1 | 17 | 1.9 | 15 | 2.4 | 19 | 0.80 | 6.4 | 0.66 | 5.3 | 0.73 | 5.9 | 0.87 | 7.0 | 3.1 | 25 |
| Cyclopoid nauplii | - | 3.3 | 0.19 | 4.2 | 0.25 | 4.5 | 0.27 | 3.5 | 0.20 | 3.9 | 0.23 | 3.2 | 0.19 | 3.9 | 0.23 | 2.4 | 0.14 | 2.7 | 0.16 | 2.5 | 0.15 |
| Cyclopoid nauplii | - | 3.5 | 0.55 | 4.5 | 0.70 | 3.7 | 0.58 | 3.5 | 0.55 | 4.1 | 0.64 | 3.6 | 0.56 | 4.4 | 0.69 | 1.6 | 0.25 | 2.1 | 0.33 | 1.5 | 0.23 |
| Cyclopoid copepodids | - | 3.6 | 7.3 | 4.7 | 9.7 | 4.0 | 8.1 | 3.2 | 6.6 | 3.9 | 7.9 | 7.6 | 16 | 8.3 | 17 | 4.6 | 9.3 | 5.6 | 11 | 4.9 | 9.9 |
| Cyclopoid copepodids | - | 1.7 | 7.1 | 1.5 | 6.1 | 1.4 | 5.6 | 1.1 | 4.6 | 0.99 | 4.1 | 5.0 | 21 | 4.6 | 19 | 1.7 | 7.1 | 1.8 | 7.4 | 4.5 | 19 |
| *Diaptomus sicilis* | M | 0 | 0 | 0 | 0 | 0.024 | 0.25 | 0.035 | 0.37 | 0.012 | 0.12 | 0 | 0 | 0.012 | 0.12 | 0 | 0 | 0.024 | 0.25 | 0.024 | 0.25 |
| *Diaptomus oregonensis* | M | 0.25 | 2.8 | 0.68 | 7.9 | 0.87 | 10 | 0.55 | 6.4 | 0.95 | 11 | 0.63 | 7.3 | 0.67 | 7.7 | 0.31 | 3.5 | 0.49 | 5.7 | 1.7 | 19 |
| *Diaptomus oregonensis* | F | 0.25 | 3.6 | 0.45 | 6.5 | 0.61 | 8.9 | 0.41 | 6.0 | 0.61 | 8.9 | 0.21 | 3.1 | 0.28 | 4.1 | 0.24 | 3.4 | 0.35 | 5.2 | 0.75 | 11 |
| *Diaptomus oregonensis* | eggs | 0.13 | 0 | 0.61 | 0 | 0.19 | 0 | 0 | 0 | 0 | 0 | 0.28 | 0 | 0.18 | 0 | 0 | 0 | 0.12 | 0 | 0.14 | 0 |
| Total Calanoid loose eggs | eggs | 0.094 | 0 | 0 | 0 | 2.1 | 0 | 2.1 | 0 | 1.9 | 0 | 0.75 | 0 | 0.38 | 0 | 0 | 0 | 0.16 | 0 | 1.3 | 0 |
| *Epischura lacustris* | M | 0 | 0 | 0 | 0 | 0 | 0 | 0.012 | 0.10 | 0.012 | 0.10 | 0 | 0 | 0.024 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Epischura lacustris* | F | 0 | 0 | 0.012 | 0.010 | 0 | 0 | 0.012 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Cyclops bicuspidatus thomasi* | M | 0.58 | 4.0 | 0.66 | 4.6 | 0.61 | 4.2 | 0.38 | 2.6 | 0.47 | 3.3 | 0.47 | 3.3 | 0.55 | 3.8 | 0.38 | 2.6 | 0.40 | 2.8 | 0.40 | 2.8 |
| *Cyclops bicuspidatus thomasi* | F | 0.90 | 11 | 0.82 | 9.7 | 1.2 | 14 | 0.93 | 11 | 0.95 | 11 | 1.0 | 12 | 1.1 | 13 | 0.61 | 7.2 | 0.47 | 5.5 | 1.7 | 20 |
| *Cyclops bicuspidatus thomasi* | eggs | 0.40 | 0 | 1.6 | 0 | 1.3 | 0 | 0.28 | 0 | 0.48 | 0 | 0.85 | 0 | 0.45 | 0 | 0.11 | 0 | 0.035 | 0 | 0.024 | 0 |
| *Orthocyclops modestus* | F | 0 | 0 | 0.024 | 0.28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Cyclopoid loose eggs | eggs | 1.4 | 0 | 3.1 | 0 | 1.7 | 0 | 0.61 | 0 | 1.1 | 0 | 0.28 | 0 | 0.000 | 0.000 | 0.071 | 0 | 0.16 | 0 | 0.31 | 0 |
| **Total Copepod Biomass** | - | - | **48** | - | **83** | - | **84** | - | **64** | - | **78** | - | **62** | - | **72** | - | **43** | - | **49** | - | **118** |
| *Daphnia galeata mendotae* | F | 1.1 | 11 | 1.8 | 19 | 1.5 | 16 | 1.6 | 17 | 1.2 | 13 | 1.3 | 14 | 1.9 | 20 | 1.2 | 13 | 0.69 | 7.4 | 1.2 | 13 |
| *Daphnia galeata mendotae* | eggs | 0.15 | 0 | 0.35 | 0 | 0.21 | 0 | 0.39 | 0 | 0.34 | 0 | 0.28 | 0 | 0.18 | 0 | 0.012 | 0 | 0.059 | 0 | 0.13 | 0 |
| *Bosmina longirostris* | F | 0 | 0 | 0.024 | 0.0086 | 0 | 0 | 0 | 0 | 0 | 0 | 0.047 | 0.017 | 0.024 | 0.0086 | 0.024 | 0.0086 | 0 | 0 | 0.047 | 0.017 |
| *Bosmina longirostris* | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.012 | 0 | 0.012 | 0 | 0.012 | 0 | 0 | 0 | 0.024 | 0 |
| *Diaphanosoma birgei* | F | 0.22 | 0.10 | 0.56 | 0.25 | 0.54 | 0.24 | 0.56 | 0.25 | 0.63 | 0.29 | 0.19 | 0.085 | 0.14 | 0.063 | 0.24 | 0.11 | 0.16 | 0.074 | 0.46 | 0.21 |
| *Diaphanosoma birgei* | eggs | 0.012 | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 | 0.035 | 0 | 0.024 | 0 | 0 | 0 | 0.024 | 0 | 0 | 0 | 0.024 | 0 |
| *Leptadora kindtii* | - | 0.012 | 0.014 | 0.071 | 0.082 | 0.024 | 0.027 | 0.024 | 0.027 | 0.035 | 0.041 | 0.047 | 0.055 | 0.024 | 0.027 | 0 | 0 | 0.024 | 0.027 | 0.059 | 0.069 |
| Total Cladocera loose eggs | eggs | 0.024 | 0 | 0.26 | 0 | 0.12 | 0 | 0.16 | 0 | 0.16 | 0 | 0.047 | 0 | 0.12 | 0 | 0.047 | 0 | 0.047 | 0 | 0.19 | 0 |
| **Total Cladocera Biomass** | - | - | **12** | - | **20** | - | **16** | - | **17** | - | **13** | - | **14** | - | **20** | - | **13** | - | **7.5** | - | **13** |
| Keratella cochlearis (large) | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.47 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Keratella cochlearis (large) | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Keratella cochlearis | - | 8.0 | 0.82 | 13 | 1.4 | 12 | 1.2 | 9.6 | 0.99 | 21 | 2.2 | 13 | 1.3 | 14 | 1.4 | 7.1 | 0.73 | 4.0 | 0.41 | 3.5 | 0.36 |
| Keratella cochlearis | eggs | 0.94 | 0 | 1.2 | 0 | 0.71 | 0 | 0.47 | 0 | 1.9 | 0 | 0.35 | 0 | 0.35 | 0 | 0.12 | 0 | 0 | 0 | 0.12 | 0 |
| Kellicottia longispina | - | 0.47 | 0.0071 | 1.4 | 0.021 | 0.94 | 0.014 | 2.8 | 0.042 | 2.8 | 0.042 | 2.7 | 0.041 | 2.0 | 0.030 | 1.6 | 0.025 | 0.94 | 0.014 | 0.47 | 0.0071 |
| Kellicottia longispina | eggs | 0 | 0 | 0.24 | 0 | 0 | 0 | 0.71 | 0 | 0.47 | 0 | 0.12 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Polyarthra remata | - | 0 | 0 | 0.94 | 0.040 | 0.71 | 0.030 | 0.71 | 0.030 | 0.71 | 0.030 | 0.24 | 0.010 | 0.47 | 0.020 | 0.35 | 0.015 | 0.59 | 0.025 | 0.12 | 0.0050 |
| Polyarthra vulgaris | - | 8.2 | 0.54 | 12 | 0.82 | 19 | 1.3 | 16 | 1.1 | 17 | 1.1 | 21 | 1.4 | 18 | 1.2 | 15 | 1.0 | 14 | 0.95 | 10 | 0.68 |
| Polyarthra vulgaris | eggs | 0 | 0 | 0 | 0 | 0.24 | 0 | 0.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Keratella taurocephala | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.019 | 0 | 0 |
| Trichocerca sp. (sp 1) | - | 0.24 | 0.039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.24 | 0.039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trichocerca (sp 2) | - | 0.24 | 0.039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gastropus stylifer | - | 3.3 | 0.14 | 4.0 | 0.18 | 4.5 | 0.20 | 6.1 | 0.27 | 2.6 | 0.11 | 1.6 | 0.072 | 2.1 | 0.093 | 1.5 | 0.067 | 2.7 | 0.12 | 2.9 | 0.13 |
| Keratella crassa | - | 1.9 | 0.18 | 3.1 | 0.29 | 0.94 | 0.088 | 3.3 | 0.31 | 4.5 | 0.42 | 0.35 | 0.033 | 2.1 | 0.20 | 0.82 | 0.077 | 1.4 | 0.13 | 4.5 | 0.42 |
| Keratella crassa | eggs | 0 | 0 | 0.71 | 0 | 0.24 | 0 | 0.24 | 0 | 1.2 | 0 | 0.12 | 0 | 0.12 | 0 | 0 | 0 | 0.12 | 0 | 0.35 | 0 |
| Ascomorpha ovalis | - | 2.1 | 0.096 | 5.6 | 0.26 | 4.5 | 0.20 | 5.4 | 0.24 | 7.3 | 0.33 | 4.3 | 0.20 | 3.8 | 0.17 | 5.1 | 0.23 | 3.2 | 0.14 | 1.5 | 0.069 |
| Collotheca | - | 20 | 1.1 | 16 | 0.83 | 19 | 0.99 | 16 | 0.86 | 16 | 0.86 | 18 | 0.93 | 12 | 0.64 | 8.1 | 0.42 | 11 | 0.56 | 11 | 0.57 |
| Collotheca sp.(eggs) | eggs | 8.2 | 0 | 6.8 | 0 | 6.6 | 0 | 6.6 | 0 | 8.2 | 0 | 0 | 0 | 4.9 | 0 | 2.5 | 0 | 2.4 | 0 | 3.2 | 0 |
| Synchaeta sp. | - | 0.24 | 0.011 | 2.8 | 0.13 | 4.9 | 0.22 | 3.5 | 0.16 | 4.0 | 0.18 | 0 | 0 | 0.24 | 0.011 | 0.24 | 0.011 | 0.12 | 0.0053 | 3.9 | 0.17 |
| Keratella sp. (Large) | - | 0 | 0 | 0.24 | 0.047 | 0.24 | 0.047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Rotifer Biomass** | - | - | **2.9** | - | **4.0** | - | **4.2** | - | **4.0** | - | **5.4** | - | **4.0** | - | **3.7** | - | **2.6** | - | **2.4** | - | **2.4** |
| **Total Biomass (µg/L)** | | | **62** | **-** | **106** | **-** | **104** | **-** | **85** | **-** | **97** | **-** | **81** | **-** | **96** | **-** | **58** | **-** | **59** | **-** | **133** |

**Table D.30:** **Zooplankton Community and Biomass Results as Provided by the Analytical Laboratory, August 2015**

| Species | Sex | Upstream of Elk River | | | | | | | | | | Downstream of Elk River | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | | TN-2 | | TN-3 | | TN-4 | | TN-5 | | T4-2 | | T4-3 | | T4-4 | | T4-5 | | T4-6 | |
| | | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass |
| | | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw |
| Calanoid nauplii | - | 0.73 | 0.053 | 0.24 | 0.02 | 0.19 | 0.014 | 0.24 | 0.017 | 0.16 | 0.012 | 0.082 | 0.006 | 0.041 | 0.0030 | 0.029 | 0.0021 | 0.053 | 0.0039 | 0.035 | 0.0026 |
| Calanoid nauplii | - | 0.33 | 0.23 | 0.14 | 0.10 | 0.12 | 0.088 | 0.094 | 0.067 | 0.11 | 0.079 | 0.088 | 0.063 | 0.012 | 0.0083 | 0.065 | 0.046 | 0.076 | 0.054 | 0.11 | 0.079 |
| Calanoid copepodids | - | 0.26 | 1.2 | 0.12 | 0.59 | 0.12 | 0.57 | 0.12 | 0.59 | 0.065 | 0.31 | 0.088 | 0.42 | 0.029 | 0.14 | 0.059 | 0.28 | 0.053 | 0.25 | 0.076 | 0.37 |
| Calanoid copepodids | - | 0.16 | 1.3 | 0.15 | 1.2 | 0.11 | 0.90 | 0.12 | 0.99 | 0.065 | 0.52 | 0.11 | 0.90 | 0.053 | 0.42 | 0 | 0 | 0.0059 | 0.047 | 0.035 | 0.28 |
| Cyclopoid nauplii | - | 0.25 | 0.015 | 0.16 | 0.0094 | 0.094 | 0.0056 | 0.11 | 0.0066 | 0.12 | 0.0069 | 0.13 | 0.0076 | 0.059 | 0.0035 | 0.047 | 0.0028 | 0.059 | 0.0035 | 0.053 | 0.0031 |
| Cyclopoid nauplii | - | 0.24 | 0.037 | 0.13 | 0.020 | 0.071 | 0.011 | 0.16 | 0.026 | 0.059 | 0.0091 | 0.15 | 0.023 | 0.15 | 0.024 | 0.15 | 0.023 | 0.088 | 0.014 | 0.18 | 0.028 |
| Cyclopoid copepodids | - | 0.51 | 1.0 | 0.15 | 0.31 | 0.11 | 0.22 | 0.15 | 0.31 | 0.10 | 0.20 | 0.14 | 0.29 | 0.35 | 0.71 | 0.15 | 0.30 | 0.11 | 0.23 | 0.16 | 0.32 |
| Cyclopoid copepodids | - | 0.15 | 0.63 | 0.10 | 0.41 | 0.047 | 0.19 | 0.035 | 0.15 | 0.076 | 0.32 | 0.065 | 0.27 | 0.22 | 0.90 | 0.071 | 0.29 | 0.10 | 0.41 | 0.11 | 0.44 |
| *Diaptomus sicilis* | M | 0 | 0 | 0.012 | 0.12 | 0.047 | 0.49 | 0.024 | 0.25 | 0.012 | 0.12 | 0.047 | 0.49 | 0.012 | 0.12 | 0.012 | 0.12 | 0.024 | 0.25 | 0.012 | 0.12 |
| *Diaptomus sicilis* | F | 0 | 0 | 0.012 | 0.12 | 0.035 | 0.37 | 0.047 | 0.49 | 0 | 0 | 0.012 | 0.12 | 0.012 | 0.12 | 0.012 | 0.12 | 0.024 | 0.25 | 0 | 0 |
| *Diaptomus sicilis* | eggs | 0 | 0 | 0.076 | 0 | 0.071 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.053 | 0 | 0.065 | 0 | 0 | 0 |
| *Diaptomus oregonensis* | M | 0.047 | 0.54 | 0 | 0 | 0.024 | 0.27 | 0.024 | 0.27 | 0.024 | 0.27 | 0.024 | 0.27 | 0.012 | 0.14 | 0.0059 | 0.068 | 0 | 0 | 0 | 0 |
| *Diaptomus oregonensis* | F | 0.024 | 0.34 | 0.035 | 0.52 | 0.059 | 0.86 | 0.029 | 0.43 | 0.029 | 0.43 | 0.012 | 0.17 | 0.024 | 0.34 | 0 | 0 | 0 | 0 | 0.0059 | 0.086 |
| *Diaptomus oregonensis* | eggs | 0 | 0 | 0.047 | 0 | 0.11 | 0 | 0.17 | 0 | 0.15 | 0 | 0.071 | 0 | 0.065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Epischura lacustris* | M | 0.012 | 0.10 | 0.024 | 0.20 | 0.012 | 0.10 | 0.012 | 0.10 | 0 | 0 | 0.0059 | 0.051 | 0.0059 | 0.051 | 0 | 0 | 0 | 0 | 0.0059 | 0.051 |
| *Epischura lacustris* | F | 0 | 0 | 0.029 | 0.25 | 0.012 | 0.10 | 0.012 | 0.10 | 0.0059 | 0.051 | 0.035 | 0.31 | 0.0059 | 0.051 | 0 | 0 | 0 | 0 | 0.0059 | 0.051 |
| Total Calanoid loose eggs | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Cyclops bicuspidatus thomasi* | M | 0 | 0 | 0.024 | 0.17 | 0.018 | 0.13 | 0.018 | 0.13 | 0.0059 | 0.042 | 0.012 | 0.084 | 0.0059 | 0.042 | 0 | 0 | 0 | 0 | 0.012 | 0.084 |
| *Cyclops bicuspidatus thomasi* | F | 0.012 | 0.14 | 0.018 | 0.21 | 0.024 | 0.28 | 0.018 | 0.21 | 0.018 | 0.21 | 0.029 | 0.35 | 0.035 | 0.42 | 0.0059 | 0.069 | 0 | 0 | 0 | 0 |
| *Cyclops bicuspidatus thomasi* | eggs | 0 | 0 | 0.11 | 0 | 0.047 | 0 | 0.088 | 0 | 0 | 0 | 0.11 | 0 | 0.14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Tropocyclops sp.* | F | 0 | 0 | 0 | 0 | 0.0059 | 0.029 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Cyclopoid loose eggs | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Copepod Biomass** | - | - | **5.7** | - | **4.3** | - | **4.6** | - | **4.1** | - | **2.6** | - | **3.8** | - | **3.5** | - | **1.3** | - | **1.5** | - | **1.9** |
| *Daphnia galeata mendotae* | F | 0.24 | 2.5 | 0.21 | 2.2 | 0.094 | 1.0 | 0.12 | 1.2 | 0.035 | 0.37 | 0.018 | 0.19 | 0.0059 | 0.062 | 0 | 0 | 0.012 | 0.12 | 0.012 | 0.12 |
| *Daphnia galeata mendotae* | eggs | 0.15 | 0 | 0.094 | 0 | 0.065 | 0 | 0.076 | 0 | 0.018 | 0 | 0.012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.018 | 0 |
| *Bosmina longirostris* | F | 0.082 | 0.030 | 0.071 | 0.026 | 0.029 | 0.011 | 0.0059 | 0.0022 | 0.024 | 0.0086 | 0.035 | 0.013 | 0.018 | 0.0065 | 0.012 | 0.0043 | 0.018 | 0.0065 | 0.0059 | 0.0022 |
| *Bosmina longirostris* | eggs | 0.047 | 0 | 0.0059 | 0 | 0 | 0 | 0 | 0 | 0.018 | 0 | 0 | 0 | 0 | 0 | 0.0059 | 0 | 0 | 0 | 0 | 0 |
| *Diaphanosoma birgei* | F | 0.62 | 0.28 | 0.32 | 0.15 | 0.30 | 0.13 | 0.22 | 0.098 | 0.16 | 0.071 | 0.12 | 0.053 | 0.082 | 0.037 | 0.059 | 0.026 | 0.059 | 0.026 | 0.14 | 0.061 |
| *Diaphanosoma birgei* | eggs | 0.082 | 0 | 0.0059 | 0 | 0.029 | 0 | 0.0059 | 0 | 0.012 | 0 | 0.076 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.018 | 0 |
| Total Cladocera loose eggs | eggs | 0.12 | 0 | 0.13 | 0 | 0.14 | 0 | 0.059 | 0 | 0.13 | 0 | 0.082 | 0 | 0.059 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Cladocera Biomass** | - | - | **2.8** | - | **2.4** | - | **1.1** | - | **1.3** | - | **0.45** | - | **0.25** | - | **0.11** | - | **0.031** | - | **0.16** | - | **0.19** |
| *Keratella cochlearis* | - | 0.12 | 0.012 | 0.12 | 0.012 | 0 | 0 | 0.12 | 0.012 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.012 | 0 | 0 | 0 | 0 |
| *Keratella cochlearis* | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Kellicottia longispina* | - | 0.59 | 0.0088 | 0.12 | 0.0018 | 0.24 | 0.0035 | 0 | 0 | 0.12 | 0.0018 | 0.12 | 0.0018 | 0.35 | 0.0053 | 0.12 | 0.0018 | 0 | 0 | 0.24 | 0.0035 |
| *Kellicottia longispina* | eggs | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Polyarthra remata* | - | 2 | 0.08 | 0.4 | 0.02 | 0.94 | 0.040 | 0.71 | 0.030 | 0.71 | 0.030 | 1.2 | 0.050 | 0.59 | 0.025 | 0.94 | 0.040 | 1.4 | 0.060 | 0.59 | 0.025 |
| *Polyarthra remata* | eggs | 0.12 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Polyarthra vulgaris* | - | 0 | 0 | 0.118 | 0.0050 | 0 | 0 | 0.12 | 0.0050 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.0050 |
| *Gastropus stylifer* | - | 0.24 | 0.010 | 0 | 0 | 0.35 | 0.016 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.0052 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Ascomorpha ovalis* | - | 1.3 | 0.058 | 0.35 | 0.016 | 0.35 | 0.016 | 0.94 | 0.043 | 0.24 | 0.011 | 0.12 | 0.0053 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Collotheca* | - | 4.2 | 0.22 | 2.1 | 0.11 | 2.4 | 0.12 | 1.8 | 0.092 | 0.82 | 0.043 | 1.3 | 0.067 | 1.8 | 0.092 | 0.71 | 0.037 | 1.5 | 0.079 | 1.1 | 0.055 |
| *Collotheca* sp. | eggs | 1.8 | 0 | 0.35 | 0 | 0.82 | 0 | 0.71 | 0 | 0.12 | 0 | 0.24 | 0 | 0.59 | 0 | 0.47 | 0 | 0.82 | 0 | 0.59 | 0 |
| *Synchaeta* sp. | - | 0.24 | 0.011 | 0.35 | 0.016 | 0.24 | 0.011 | 0.12 | 0.0053 | 0.12 | 0.0053 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.0053 | 0.35 | 0.016 |
| *Keratella* sp. | - | 0.12 | 0.024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Rotifer Biomass** | - | - | **0.42** | - | **0.18** | - | **0.21** | - | **0.19** | - | **0.091** | - | **0.12** | - | **0.13** | - | **0.091** | - | **0.14** | - | **0.10** |
| **Total Biomass (µg/L)** | | | **8.9** | **-** | **6.9** | **-** | **6.0** | **-** | **5.7** | **-** | **3.1** | **-** | **4.2** | **-** | **3.7** | **-** | **1.5** | **-** | **1.8** | **-** | **2.2** |

## Table D.31: Zooplankton Community and Biomass Results as Provided by the Analytical Laboratory, August 2016

| Species | Sex | Upstream of Elk River | | | | | | | | | | Downstream of Elk River | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | | TN-2 | | TN-3 | | TN-4 | | TN-5 | | T4-2 | | T4-3 | | T4-4 | | T4-5 | | T4-6 | |
| | | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass | density | Biomass |
| | | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw | #/L | µg/L dw |
| Calanoid nauplii | - | 0.76 | 0.056 | 1.6 | 0.12 | 0.71 | 0.052 | 0.93 | 0.068 | 0.90 | 0.066 | 1.1 | 0.083 | 2.0 | 0.15 | 1.8 | 0.13 | 1.2 | 0.086 | 1.1 | 0.077 |
| Calanoid nauplii | - | 0.58 | 0.41 | 0.82 | 0.58 | 0.38 | 0.27 | 0.65 | 0.46 | 0.53 | 0.38 | 0.71 | 0.50 | 0.89 | 0.63 | 1.3 | 0.93 | 0.94 | 0.67 | 0.40 | 0.28 |
| Calanoid copepodids | - | 0.36 | 1.8 | 0.78 | 3.7 | 0.31 | 1.5 | 0.35 | 1.7 | 0.36 | 1.8 | 1.2 | 5.8 | 0.82 | 4.0 | 1.2 | 5.5 | 0.56 | 2.7 | 0.45 | 2.1 |
| Calanoid copepodids | - | 0.13 | 1.0 | 0.26 | 2.1 | 0.024 | 0.19 | 0.20 | 1.6 | 0.16 | 1.3 | 1.4 | 11 | 0.71 | 5.7 | 0.89 | 7.2 | 0.38 | 3.0 | 0.33 | 2.6 |
| Cyclopoid nauplii | - | 0.72 | 0.042 | 1.1 | 0.064 | 0.73 | 0.043 | 1.4 | 0.083 | 1.1 | 0.065 | 0.66 | 0.039 | 0.73 | 0.043 | 0.38 | 0.022 | 0.42 | 0.025 | 0.35 | 0.021 |
| Cyclopoid nauplii | - | 0.34 | 0.053 | 0.59 | 0.091 | 0.31 | 0.048 | 0.78 | 0.12 | 0.43 | 0.068 | 0.38 | 0.058 | 0.28 | 0.044 | 0.31 | 0.048 | 0.40 | 0.062 | 0.14 | 0.022 |
| Cyclopoid copepodids | - | 0.86 | 1.7 | 0.94 | 1.9 | 0.72 | 1.5 | 0.83 | 1.7 | 0.85 | 1.7 | 3.2 | 6.5 | 3.7 | 7.5 | 3.7 | 7.6 | 2.4 | 4.9 | 1.5 | 3.0 |
| Cyclopoid copepodids | - | 0.58 | 2.4 | 0.78 | 3.2 | 0.40 | 1.7 | 0.47 | 1.9 | 0.40 | 1.7 | 2.6 | 11 | 2.6 | 11 | 2.0 | 8.5 | 1.3 | 5.5 | 0.68 | 2.8 |
| *Diaptomus sicilis* | M | 0.047 | 0.49 | 0.071 | 0.74 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 1.2 | 0.21 | 2.2 | 0.12 | 1.2 | 0.071 | 0.74 | 0.047 | 0.49 |
| *Diaptomus sicilis* | F | 0.071 | 0.74 | 0.16 | 1.7 | 0 | 0 | 0.024 | 0.25 | 0.035 | 0.37 | 0.15 | 1.6 | 0.094 | 0.98 | 0.19 | 2.0 | 0.024 | 0.25 | 0.071 | 0.74 |
| *Diaptomus sicilis* | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Diaptomus oregonensis* | M | 0.035 | 0.41 | 0.094 | 1.1 | 0.024 | 0.27 | 0.035 | 0.41 | 0.071 | 0.81 | 0.22 | 2.6 | 0.16 | 1.9 | 0.31 | 3.5 | 0.21 | 2.4 | 0.21 | 2.4 |
| *Diaptomus oregonensis* | F | 0.059 | 0.86 | 0.071 | 1.0 | 0.024 | 0.34 | 0.035 | 0.52 | 0.094 | 1.4 | 0.26 | 3.8 | 0.14 | 2.1 | 0.19 | 2.7 | 0.082 | 1.2 | 0.18 | 2.6 |
| *Diaptomus oregonensis* | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Epischura lacustris* | M | 0.035 | 0.31 | 0.047 | 0.41 | 0.012 | 0.10 | 0.024 | 0.20 | 0.012 | 0.10 | 0.13 | 1.1 | 0.12 | 1.0 | 0.071 | 0.61 | 0 | 0 | 0.035 | 0.31 |
| *Epischura lacustris* | F | 0 | 0 | 0 | 0 | 0.012 | 0.10 | 0.035 | 0.31 | 0 | 0 | 0.059 | 0.51 | 0 | 0 | 0.024 | 0.20 | 0.012 | 0.10 | 0.035 | 0.31 |
| Total Calanoid loose eggs | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Cyclops bicuspidatus thomasi* | M | 0.28 | 2.0 | 0.16 | 1.2 | 0.20 | 1.4 | 0.14 | 1.0 | 0.31 | 2.2 | 0.53 | 3.8 | 0.61 | 4.4 | 0.16 | 1.2 | 0.13 | 0.92 | 0.13 | 0.92 |
| *Cyclops bicuspidatus thomasi* | F | 0.36 | 4.3 | 0.42 | 5.0 | 0.32 | 3.7 | 0.51 | 6.0 | 0.29 | 3.5 | 0.53 | 6.2 | 0.54 | 6.4 | 0.47 | 5.5 | 0.27 | 3.2 | 0.21 | 2.5 |
| *Cyclops bicuspidatus thomasi* | eggs | 0 | 0 | 0 | 0 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0 | 0 | 0 |
| *Tropocyclops sp.* | F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Cyclopoid loose eggs | eggs | 0 | 0 | 0 | 0 | 1.1 | 0 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0.35 | 0 | 0.47 | 0 | 0.24 | 0 | 0.47 | 0 |
| **Total Copepod Biomass** | - | - | **17** | - | **23** | - | **11** | - | **16** | - | **15** | - | **55** | - | **48** | - | **47** | - | **26** | - | **21** |
| *Daphnia galeata mendotae* | F | 2.5 | 27 | 3.8 | 41 | 3.1 | 33 | 2.9 | 31 | 4.4 | 47 | 2.6 | 28 | 4.5 | 48 | 0.047 | 0.50 | 1.3 | 14 | 1.4 | 14 |
| *Daphnia galeata mendotae* | eggs | 0.024 | 0 | 0.024 | 0 | 0.24 | 0 | 0.012 | 0 | 0.012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Bosmina longirostris* | F | 0.11 | 0.039 | 0.024 | 0.0086 | 0.094 | 0.034 | 0.071 | 0.026 | 0.047 | 0.017 | 0.11 | 0.039 | 0.12 | 0.043 | 0.047 | 0.017 | 0.035 | 0.013 | 0.012 | 0.0043 |
| *Bosmina longirostris* | eggs | 0.012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Diaphanosoma birgei* | F | 0.059 | 0.026 | 0.12 | 0.053 | 0.059 | 0.026 | 0.047 | 0.021 | 0.13 | 0.058 | 0.047 | 0.021 | 0.024 | 0.011 | 0 | 0 | 0.035 | 0.016 | 0 | 0 |
| *Diaphanosoma birgei* | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Cladocera loose eggs | eggs | 0.35 | 0 | 2.5 | 0 | 0.66 | 0 | 1.6 | 0 | 1.6 | 0 | 0.80 | 0 | 1.9 | 0 | 1.3 | 0 | 0.24 | 0 | 0.94 | 0 |
| *Ceriodaphnia sp.* | - | 0.012 | 0.034 | 0 | 0 | 0 | 0 | 0.012 | 0.034 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Leptadora kindtii* | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.035 | 0.041 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Scapholeberis sp.* | F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.012 | 0.0050 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Cladocera Biomass** | - | - | **27** | - | **41** | - | **33** | - | **31** | - | **47** | - | **28** | - | **48** | - | **0.52** | - | **14** | - | **14** |
| Keratella cochlearis (large) | - | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Keratella cochlearis* | - | 5.5 | 0.57 | 3.9 | 0.40 | 6.2 | 0.64 | 7.1 | 0.73 | 7.1 | 0.73 | 3.3 | 0.34 | 2.6 | 0.27 | 6.3 | 0.65 | 5.4 | 0.56 | 3.1 | 0.31 |
| *Keratella cochlearis* | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Kellicottia longispina* | - | 4.7 | 0.071 | 3.8 | 0.056 | 2.0 | 0.030 | 4.0 | 0.060 | 4.2 | 0.063 | 7.5 | 0.11 | 9.0 | 0.14 | 11 | 0.17 | 4.8 | 0.072 | 4.0 | 0.060 |
| *Kellicottia longispina* | eggs | 0.12 | 0 | 0.35 | 0 | 0.24 | 0 | 0.47 | 0 | 0.12 | 0 | 0.35 | 0 | 0.35 | 0 | 1.1 | 0 | 0.12 | 0 | 0.12 | 0 |
| *Polyarthra remata* | - | 0 | 0 | 0 | 0 | 0 | 0 | 1.0 | 0.043 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Polyarthra remata* | eggs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Polyarthra vulgaris* | - | 0.066 | 0 | 0.066 | 0.0028 | 0.066 | 0.0028 | 0.066 | 0.0028 | 0.066 | 0.0028 | 0.066 | 0.0028 | 0.066 | 0.0028 | 0.066 | 0.0028 | 0.066 | 0.0028 | 0.066 | 0.0028 |
| *Gastropus stylifer* | - | 0 | 0 | 0 | 0 | 0.12 | 0.0052 | 0.35 | 0.016 | 0.24 | 0.010 | 0 | 0 | 0.47 | 0.021 | 0.12 | 0.0052 | 0.35 | 0.016 | 0.24 | 0.010 |
| *Ascomorpha ovalis* | - | 0.24 | 0.011 | 0.59 | 0.027 | 0.82 | 0.037 | 0.47 | 0.021 | 0.71 | 0.032 | 0.94 | 0.043 | 0.71 | 0.032 | 0.35 | 0.016 | 0.35 | 0.016 | 0.24 | 0.011 |
| *Collotheca* | - | 6.1 | 0.32 | 5.1 | 0.26 | 4.1 | 0.21 | 7.5 | 0.39 | 5.8 | 0.30 | 9.9 | 0.51 | 11 | 0.56 | 7.8 | 0.40 | 5.4 | 0.28 | 6.5 | 0.34 |
| *Collotheca* sp. | eggs | 3.2 | 0 | 2.9 | 0 | 2.4 | 0 | 3.3 | 0 | 3.1 | 0 | 3.9 | 0 | 5.8 | 0 | 5.8 | 0 | 3.2 | 0 | 3.5 | 0 |
| *Synchaeta* sp. | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Keratella* sp. | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Monostyla sp.* | - | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0.0061 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Rotifer Biomass** | - | - | **0.97** | - | **0.75** | - | **0.93** | - | **1.3** | - | **1.1** | - | **0.67** | - | **1.0** | - | **1.2** | - | **0.94** | - | **0.73** |
| **Total Biomass (µg/L)** | **-** | **-** | **45** | **-** | **64** | **-** | **45** | **-** | **49** | **-** | **63** | **-** | **84** | **-** | **97** | **-** | **49** | **-** | **40** | **-** | **36** |

## Table D.32: Zooplankton Community Density Data (no. of organisms/L), August 2014

| Species | | Upstream of the Elk River | | | | | Downstream of the Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | *Calanoid copepodids* | 1.6 | 5.4 | 4.8 | 3.8 | 4.7 | 1.5 | 0.92 | 1.3 | 1.5 | 4.8 |
| | *Calanoid nauplii* | 1.7 | 7.3 | 6.9 | 4.7 | 3.6 | 2.4 | 1.6 | 1.6 | 2.4 | 6.7 |
| | *Cyclopoid copepodids* | 5.3 | 6.2 | 5.4 | 4.3 | 4.9 | 13 | 13 | 6.3 | 7.4 | 9.4 |
| | *Cyclopoid nauplii* | 6.8 | 8.7 | 8.2 | 7.0 | 8.0 | 6.8 | 8.3 | 4.0 | 4.8 | 4.0 |
| | *Cyclops bicuspidatus thomasi* | 1.5 | 1.5 | 1.8 | 1.3 | 1.4 | 1.5 | 1.7 | 0.99 | 0.87 | 2.1 |
| | *Diaptomus oregonensis* | 0.50 | 1.1 | 1.5 | 0.96 | 1.6 | 0.84 | 0.95 | 0.55 | 0.84 | 2.5 |
| | *Diaptomus sicilis* | 0 | 0 | 0.024 | 0.035 | 0.012 | 0 | 0.012 | 0 | 0.024 | 0.024 |
| | *Epischura lacustris* | 0 | 0.012 | 0 | 0.024 | 0.012 | 0 | 0.024 | 0 | 0 | 0 |
| | *Orthocyclops modestus* | 0 | 0.024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cladocera | *Bosmina longirostris* | 0 | 0.024 | 0 | 0 | 0 | 0.047 | 0.024 | 0.024 | 0 | 0.047 |
| | *Daphnia galeata mendotae* | 1.1 | 1.8 | 1.5 | 1.6 | 1.2 | 1.3 | 1.9 | 1.2 | 0.69 | 1.2 |
| | *Diaphanosoma birgei* | 0.22 | 0.56 | 0.54 | 0.56 | 0.63 | 0.19 | 0.14 | 0.24 | 0.16 | 0.46 |
| | *Leptadora kindtii* | 0.012 | 0.071 | 0.024 | 0.024 | 0.035 | 0.047 | 0.024 | 0 | 0.024 | 0.059 |
| Rotifera | *Ascomorpha ovalis* | 2.1 | 5.6 | 4.5 | 5.4 | 7.3 | 4.3 | 3.8 | 5.1 | 3.2 | 1.5 |
| | *Collotheca* sp. | 20 | 16 | 19 | 16 | 16 | 18 | 12 | 8.1 | 11 | 11 |
| | *Gastropus stylifer* | 3.3 | 4.0 | 4.5 | 6.1 | 2.6 | 1.6 | 2.1 | 1.5 | 2.7 | 2.9 |
| | *Kellicottia longispina* | 0.47 | 1.4 | 0.94 | 2.8 | 2.8 | 2.7 | 2.0 | 1.6 | 0.94 | 0.47 |
| | *Keratella cochlearis* | 8.0 | 13 | 12 | 9.6 | 22 | 13 | 14 | 7.1 | 4.0 | 3.5 |
| | *Keratella crassa* | 1.9 | 3.1 | 0.94 | 3.3 | 4.5 | 0.35 | 2.1 | 0.82 | 1.4 | 4.5 |
| | *Keratella* sp. (Large) | 0 | 0.24 | 0.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Keratella taurocephala* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0 |
| | *Polyarthra remata* | 0 | 0.94 | 0.71 | 0.71 | 0.71 | 0.24 | 0.47 | 0.35 | 0.59 | 0.12 |
| | *Polyarthra vulgaris* | 8.2 | 12 | 19 | 16 | 17 | 21 | 18 | 15 | 14 | 10 |
| | *Synchaeta* sp. | 0.24 | 2.8 | 4.9 | 3.5 | 4.0 | 0 | 0.24 | 0.24 | 0.12 | 3.9 |
| | *Trichocerca* | 3.5 | 4.0 | 4.5 | 6.1 | 2.6 | 1.9 | 2.1 | 1.5 | 2.7 | 2.9 |
| **Total number of organisms/L** | | **67** | **96** | **101** | **94** | **106** | **90** | **85** | **58** | **60** | **72** |
| **Total number of taxa** | | **18** | **23** | **21** | **21** | **21** | **19** | **22** | **19** | **21** | **21** |

## **Table D.33:** Zooplankton Community Density Data (no. of organisms/L), August 2015

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **TN-1** | **TN-2** | **TN-3** | **TN-4** | **TN-5** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Copepoda | Calanoid copepodids | 0.42 | 0.28 | 0.23 | 0.25 | 0.13 | 0.20 | 0.082 | 0.059 | 0.059 | 0.11 |
| | Calanoid nauplii | 1.1 | 0.38 | 0.32 | 0.33 | 0.28 | 0.17 | 0.053 | 0.094 | 0.13 | 0.15 |
| | Cyclopoid copepodids | 0.66 | 0.25 | 0.15 | 0.19 | 0.18 | 0.21 | 0.56 | 0.22 | 0.21 | 0.26 |
| | Cyclopoid nauplii | 0.48 | 0.29 | 0.16 | 0.28 | 0.18 | 0.28 | 0.21 | 0.19 | 0.15 | 0.24 |
| | *Cyclops bicuspidatus thomasi* | 0.012 | 0.041 | 0.041 | 0.035 | 0.024 | 0.041 | 0.041 | 0.0059 | 0 | 0.012 |
| | *Diaptomus oregonensis* | 0.071 | 0.035 | 0.082 | 0.053 | 0.053 | 0.035 | 0.035 | 0.0059 | 0 | 0.0059 |
| | *Diaptomus sicilis* | 0 | 0.024 | 0.082 | 0.071 | 0.012 | 0.059 | 0.024 | 0.024 | 0.047 | 0.012 |
| | *Epischura lacustris* | 0.012 | 0.053 | 0.024 | 0.024 | 0.0059 | 0.041 | 0.012 | 0 | 0 | 0.012 |
| | *Tropocyclops* sp. | 0 | 0 | 0.0059 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cladocer | *Bosmina longirostris* | 0.082 | 0.071 | 0.029 | 0.0059 | 0.024 | 0.035 | 0.018 | 0.012 | 0.018 | 0.0059 |
| | *Daphnia galeata mendotae* | 0.24 | 0.21 | 0.094 | 0.12 | 0.035 | 0.018 | 0.0059 | 0 | 0.012 | 0.012 |
| | *Diaphanosoma birgei* | 0.62 | 0.32 | 0.30 | 0.22 | 0.16 | 0.12 | 0.082 | 0.059 | 0.059 | 0.14 |
| Rotifera | *Ascomorpha ovalis* | 1.3 | 0.35 | 0.35 | 0.94 | 0.24 | 0.12 | 0 | 0 | 0 | 0 |
| | *Collotheca* sp. | 4.2 | 2.1 | 2.4 | 1.8 | 0.82 | 1.3 | 1.8 | 0.71 | 1.5 | 1.1 |
| | *Gastropus stylifer* | 0.24 | 0 | 0.35 | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 |
| | *Kellicottia longispina* | 0.59 | 0.12 | 0.24 | 0 | 0.12 | 0.12 | 0.35 | 0.12 | 0 | 0.24 |
| | *Keratella cochlearis* | 0.12 | 0.12 | 0 | 0.12 | 0 | 0 | 0 | 0.12 | 0 | 0 |
| | *Keratella* sp. | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Polyarthra remata* | 1.9 | 0.35 | 0.94 | 0.71 | 0.71 | 1.2 | 0.59 | 0.94 | 1.4 | 0.59 |
| | *Polyarthra vulgaris* | 0 | 0.12 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0.12 |
| | *Synchaeta* sp. | 0.24 | 0.35 | 0.24 | 0.12 | 0.12 | 0 | 0 | 0 | 0.12 | 0.35 |
| **Total number of organisms/L** | | **12** | **5.5** | **6.0** | **5.3** | **3.1** | **3.9** | **3.9** | **2.5** | **3.7** | **3.3** |
| **Total number of taxa** | | **18** | **18** | **18** | **17** | **16** | **15** | **15** | **13** | **11** | **16** |

## Table D.34: Zooplankton Community Density Data (no. of organisms/L), August 2016

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | Calanoid nauplii | 1.3 | 2.5 | 1.1 | 1.6 | 1.4 | 1.8 | 2.9 | 3.1 | 2.1 | 1.5 |
| | Calanoid copepodids | 0.49 | 1.0 | 0.33 | 0.55 | 0.53 | 2.6 | 1.5 | 2.0 | 0.94 | 0.78 |
| | Cyclopoid nauplii | 1.1 | 1.7 | 1.0 | 2.2 | 1.5 | 1.0 | 1.0 | 0.68 | 0.82 | 0.49 |
| | Cyclopoid copepodids | 1.4 | 1.7 | 1.1 | 1.3 | 1.2 | 5.8 | 6.3 | 5.8 | 3.8 | 2.2 |
| | *Diaptomus sicilis* | 0.12 | 0.24 | 0 | 0.024 | 0.035 | 0.27 | 0.31 | 0.31 | 0.094 | 0.12 |
| | *Diaptomus oregonensis* | 0.094 | 0.16 | 0.047 | 0.071 | 0.16 | 0.48 | 0.31 | 0.49 | 0.29 | 0.39 |
| | *Epischura lacustris* | 0.035 | 0.047 | 0.024 | 0.059 | 0.012 | 0.19 | 0.12 | 0.094 | 0.012 | 0.071 |
| | *Cyclops bicuspidatus thomasi* | 0.65 | 0.59 | 0.52 | 0.65 | 0.60 | 1.1 | 1.2 | 0.63 | 0.40 | 0.34 |
| Caldocera | *Daphnia galeata mendotae* | 2.5 | 3.8 | 3.1 | 2.9 | 4.4 | 2.6 | 4.5 | 0.047 | 1.3 | 1.4 |
| | *Bosmina longirostris* | 0.11 | 0.024 | 0.094 | 0.071 | 0.047 | 0.11 | 0.12 | 0.047 | 0.035 | 0.012 |
| | *Diaphanosoma birgei* | 0.059 | 0.12 | 0.059 | 0.047 | 0.13 | 0.047 | 0.024 | 0 | 0.035 | 0 |
| | *Ceriodaphnia* sp. | 0.012 | 0 | 0 | 0.012 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Leptadora kindtii* | 0 | 0 | 0 | 0 | 0.035 | 0 | 0 | 0 | 0 | 0 |
| | *Scapholeberis* sp. | 0 | 0 | 0 | 0 | 0 | 0.012 | 0 | 0 | 0 | 0 |
| Rotifera | *Keratella cochlearis* | 5.5 | 3.9 | 6.2 | 7.2 | 7.1 | 3.3 | 2.6 | 6.3 | 5.4 | 3.1 |
| | *Kellicottia longispina* | 4.7 | 3.8 | 2.0 | 4.0 | 4.2 | 7.5 | 9.0 | 11 | 4.8 | 4.0 |
| | *Polyarthra remata* | 0.066 | 0 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Polyarthra vulgaris* | 0 | 0.066 | 0.066 | 0.066 | 0.066 | 0.066 | 0.066 | 0.066 | 0.066 | 0.066 |
| | *Gastropus stylifer* | 0 | 0 | 0.12 | 0.35 | 0.24 | 0 | 0.47 | 0.12 | 0.35 | 0.24 |
| | *Ascomorpha ovalis* | 0.24 | 0.59 | 0.82 | 0.47 | 0.71 | 0.94 | 0.71 | 0.35 | 0.35 | 0.24 |
| | *Collotheca* sp. | 6.1 | 5.1 | 4.1 | 7.5 | 5.8 | 9.9 | 11 | 7.8 | 5.4 | 6.5 |
| | *Monostyla* sp. | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total number of organisms/L** | | **25** | **25** | **21** | **30** | **28** | **38** | **42** | **39** | **26** | **21** |
| **Total number of taxa** | | **17** | **16** | **16** | **20** | **18** | **17** | **17** | **16** | **17** | **16** |

**Table D.35:** Zooplankton Density (no. of organisms/L) Organized by Major Groups, August 2014

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | 17 | 30 | 29 | 22 | 24 | 26 | 26 | 15 | 18 | 29 |
| Cladocera | 1.3 | 2.5 | 2.1 | 2.2 | 1.9 | 1.6 | 2.1 | 1.5 | 0.87 | 1.8 |
| Rotifera | 48 | 64 | 71 | 70 | 80 | 63 | 57 | 42 | 41 | 41 |
| **Total number of organisms/L** | **67** | **96** | **101** | **94** | **106** | **90** | **85** | **58** | **60** | **72** |
| **Total number of groups** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** |

**Table D.36:** Zooplankton Density (no. of organisms/L) Organized by Major Groups, August 2015

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-1 | T4-2 | T4-3 | T4-4 | T4-5 |
| Copepoda | 2.7 | 1.4 | 1.1 | 1.2 | 0.85 | 1.0 | 1.0 | 0.60 | 0.59 | 0.80 |
| Cladocera | 0.94 | 0.61 | 0.42 | 0.34 | 0.22 | 0.17 | 0.11 | 0.071 | 0.088 | 0.15 |
| Rotifera | 8.7 | 3.5 | 4.5 | 3.8 | 2.0 | 2.7 | 2.8 | 1.9 | 3.1 | 2.4 |
| **Total number of organisms/L** | **12** | **5.5** | **6.0** | **5.3** | **3.1** | **3.9** | **3.9** | **2.5** | **3.7** | **3.3** |
| **Total number of groups** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** |

## Table D.37: Zooplankton Density (no. of organisms/L) Organized by Major Groups, August 2016

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | 5.2 | 7.9 | 4.1 | 6.4 | 5.5 | 13 | 14 | 13 | 8.4 | 5.8 |
| Cladocera | 2.7 | 4.0 | 3.2 | 3.1 | 4.6 | 2.8 | 4.7 | 0.094 | 1.4 | 1.4 |
| Rotifera | 17 | 13 | 13 | 21 | 18 | 22 | 24 | 26 | 16 | 14 |
| **Total number of organisms/L** | **25** | **25** | **21** | **30** | **28** | **38** | **42** | **39** | **26** | **21** |
| **Total number of groups** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** |

**Table D.38:** **Relative Density (%) of Zooplankton Species, August 2014**

| | Species | Upstream of Elk River | | | | | Downstream of Elk River | | | | | Summary Statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Minimum | | Median | | Maximum | | Mean | | SD | |
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 |
| Copepoda | ***Calanoid copepodids*** | 2.4 | 5.6 | 4.8 | 4.1 | 4.4 | 1.7 | 1.1 | 2.2 | 2.5 | 6.7 | 2.4 | 1.1 | 4.4 | 2.2 | 5.6 | 6.7 | 4.3 | 2.8 | 1.2 | 2.2 |
| | ***Calanoid nauplii*** | 2.5 | 7.6 | 6.8 | 5.0 | 3.4 | 2.7 | 1.8 | 2.8 | 4.0 | 9.2 | 2.5 | 1.8 | 5.0 | 2.8 | 7.6 | 9.2 | 5.0 | 4.1 | 2.2 | 2.9 |
| | ***Cyclopoid copepodids*** | 8.0 | 6.4 | 5.3 | 4.6 | 4.6 | 14 | 15 | 11 | 12 | 13 | 4.6 | 11 | 5.3 | 13 | 8.0 | 15.2 | 5.8 | 13 | 1.4 | 1.6 |
| | ***Cyclopoid nauplii*** | 10 | 9.0 | 8.1 | 7.4 | 7.6 | 7.6 | 9.8 | 6.9 | 8.0 | 5.5 | 7.4 | 5.5 | 8.1 | 7.6 | 10 | 9.8 | 8.5 | 7.6 | 1.2 | 1.6 |
| | *Cyclops bicuspidatus thomasi* | 2.2 | 1.5 | 1.8 | 1.4 | 1.3 | 1.6 | 1.9 | 1.7 | 1.5 | 2.9 | 1.3 | 1.5 | 1.5 | 1.7 | 2.2 | 2.9 | 1.7 | 1.9 | 0.36 | 0.57 |
| | *Diaptomus oregonensis* | 0.75 | 1.2 | 1.5 | 1.0 | 1.5 | 0.94 | 1.1 | 0.95 | 1.4 | 3.4 | 0.75 | 0.94 | 1.2 | 1.1 | 1.5 | 3.4 | 1.2 | 1.6 | 0.31 | 1.0 |
| | *Diaptomus sicilis* | 0 | 0 | 0.024 | 0.037 | 0.011 | 0 | 0.014 | 0 | 0.040 | 0.033 | 0 | 0 | 0.011 | 0.014 | 0.037 | 0.0 | 0.014 | 0.017 | 0.016 | 0.019 |
| | *Epischura lacustris* | 0 | 0.012 | 0 | 0.025 | 0.011 | 0 | 0.028 | 0 | 0 | 0 | 0 | 0 | 0.011 | 0 | 0.025 | 0.0 | 0.0098 | 0.0056 | 0.011 | 0.013 |
| | *Orthocyclops modestus* | 0 | 0.025 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.025 | 0.0 | 0.0050 | 0 | 0.011 | 0 |
| Cladocera | *Bosmina longirostris* | 0 | 0.025 | 0 | 0 | 0 | 0.052 | 0.028 | 0.042 | 0 | 0.065 | 0 | 0 | 0 | 0.042 | 0.025 | 0.1 | 0.0050 | 0.037 | 0.011 | 0.025 |
| | *Daphnia galeata mendotae* | 1.7 | 1.9 | 1.5 | 1.7 | 1.1 | 1.4 | 2.2 | 2.1 | 1.2 | 1.7 | 1.1 | 1.2 | 1.7 | 1.7 | 1.9 | 2.2 | 1.6 | 1.7 | 0.28 | 0.44 |
| | *Diaphanosoma birgei* | 0.33 | 0.58 | 0.53 | 0.59 | 0.59 | 0.21 | 0.16 | 0.42 | 0.27 | 0.63 | 0.33 | 0.16 | 0.58 | 0.27 | 0.59 | 0.6 | 0.53 | 0.34 | 0.11 | 0.19 |
| | *Leptadora kindtii* | 0.018 | 0.074 | 0.024 | 0.025 | 0.033 | 0.052 | 0.028 | 0 | 0.040 | 0.081 | 0.018 | 0 | 0.025 | 0.040 | 0.074 | 0.1 | 0.035 | 0.040 | 0.022 | 0.03 |
| Rotifera | ***Ascomorpha ovalis*** | 3.2 | 5.8 | 4.4 | 5.7 | 6.9 | 4.8 | 4.4 | 8.7 | 5.3 | 2.1 | 3.2 | 2.1 | 5.7 | 4.8 | 6.9 | 8.7 | 5.2 | 5.1 | 1.4 | 2.4 |
| | ***Collotheca* sp.** | 30 | 17 | 19 | 17 | 16 | 20 | 15 | 14 | 18 | 15 | 16 | 14 | 17 | 15 | 30 | 19.9 | 20 | 16 | 6.1 | 2.5 |
| | ***Gastropus stylifer*** | 4.9 | 4.1 | 4.4 | 6.5 | 2.4 | 1.8 | 2.5 | 2.6 | 4.5 | 4.1 | 2.4 | 1.8 | 4.4 | 2.6 | 6.5 | 4.5 | 4.5 | 3.1 | 1.5 | 1.1 |
| | *Kellicottia longispina* | 0.71 | 1.5 | 0.93 | 3.0 | 2.7 | 3.0 | 2.3 | 2.8 | 1.6 | 0.65 | 0.71 | 0.65 | 1.5 | 2.3 | 3.0 | 3.0 | 1.7 | 2.1 | 1.0 | 0.98 |
| | ***Keratella cochlearis*** | 12 | 14 | 11 | 10 | 21 | 14 | 16 | 12 | 6.7 | 4.9 | 10 | 4.9 | 12 | 12 | 21 | 15.9 | 14 | 11 | 4.1 | 4.8 |
| | ***Keratella crassa*** | 2.8 | 3.2 | 0.93 | 3.5 | 4.2 | 0.39 | 2.5 | 1.4 | 2.4 | 6.2 | 0.93 | 0.39 | 3.2 | 2.4 | 4.2 | 6.2 | 2.9 | 2.6 | 1.2 | 2.2 |
| | *Keratella* sp. (Large) | 0 | 0.24 | 0.23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.24 | 0.0 | 0.095 | 0 | 0.13 | 0 |
| | *Keratella taurocephala* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 0 | 0.039 | 0 | 0.088 |
| | *Polyarthra remata* | 0 | 1.0 | 0.7 | 0.7 | 0.7 | 0.3 | 0.6 | 0.61 | 1.0 | 0.2 | 0 | 0.16 | 0.70 | 0.55 | 0.97 | 1.0 | 0.62 | 0.51 | 0.37 | 0.32 |
| | ***Polyarthra vulgaris*** | 12 | 13 | 19 | 17 | 16 | 23 | 21 | 26 | 24 | 14 | 12 | 14 | 16 | 23 | 19 | 26.4 | 15 | 22 | 2.7 | 4.6 |
| | **Synchaeta sp.** | 0.35 | 2.9 | 4.9 | 3.7 | 3.8 | 0 | 0.28 | 0.41 | 0.20 | 5.4 | 0.35 | 0 | 3.7 | 0.28 | 4.9 | 5.4 | 3.1 | 1.2 | 1.7 | 2.3 |
| | ***Trichocerca* sp.** | 5.29 | 4 | 4 | 6 | 2 | 2 | 2 | 3 | 5 | 4 | 2.4 | 2.1 | 4.4 | 2.6 | 6.5 | 4.5 | 4.6 | 3.2 | 1.5 | 1.1 |

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of organisms at one or more stations within an area (as shown in Figure 5.8).

**Table D.39:** **Relative Density (%) of Zooplankton Species, August 2015**

| | Species | Upstream of Elk River | | | | | Downstream of Elk River | | | | | Summary Statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Minimum | | Median | | Maximum | | Mean | | SD | |
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | TN | T4 | TN | T4 | TN | T4 | TN | T4 | TN | T4 |
| Copepoda | **Calanoid copepodids** | 3.4 | 5.0 | 3.8 | 4.6 | 4.2 | 5.1 | 2.08 | 2.30 | 1.57 | 3.4 | 3.4 | 1.6 | 4.2 | 2.3 | 5.0 | 5.1 | 4.2 | 2.9 | 0.64 | 1.4 |
| | **Calanoid nauplii** | 8.6 | 7.0 | 5.3 | 6.2 | 9.0 | 4.4 | 1.3 | 3.69 | 3.46 | 4.4 | 5.3 | 1.3 | 7.0 | 3.7 | 9.0 | 4.4 | 7.2 | 3.5 | 1.6 | 1.3 |
| | **Cyclopoid copepodids** | 5.3 | 4.6 | 2.6 | 3.5 | 5.7 | 5.3 | 14.3 | 8.5 | 5.7 | 8.0 | 2.6 | 5.3 | 4.6 | 8.0 | 5.7 | 14 | 4.4 | 8.3 | 1.3 | 3.6 |
| | **Cyclopoid nauplii** | 3.9 | 5.3 | 2.7 | 5.2 | 5.7 | 7.1 | 5.4 | 7.6 | 3.9 | 7.1 | 2.7 | 3.9 | 5.2 | 7.1 | 5.7 | 7.6 | 4.6 | 6.2 | 1.2 | 1.5 |
| | *Cyclops bicuspidatus thomasi* | 0.095 | 0.75 | 0.69 | 0.66 | 0.77 | 1.05 | 1.04 | 0.230 | 0 | 0.36 | 0.10 | 0 | 0.69 | 0.36 | 0.77 | 1.1 | 0.59 | 0.54 | 0.28 | 0.48 |
| | *Diaptomus oregonensis* | 0.57 | 0.64 | 1.37 | 0.99 | 1.72 | 0.90 | 0.89 | 0.230 | 0 | 0.178 | 0.57 | 0 | 1.0 | 0.23 | 1.7 | 0.90 | 1.1 | 0.44 | 0.49 | 0.43 |
| | *Diaptomus sicilis* | 0 | 0.43 | 1.37 | 1.32 | 0.38 | 1.51 | 0.60 | 0.92 | 1.26 | 0.36 | 0 | 0.36 | 0.43 | 0.92 | 1.4 | 1.5 | 0.70 | 0.93 | 0.61 | 0.47 |
| | *Epischura lacustris* | 0.095 | 0.96 | 0.39 | 0.44 | 0.192 | 1.05 | 0.30 | 0 | 0 | 0.36 | 0.095 | 0 | 0.39 | 0.30 | 1.0 | 1.1 | 0.42 | 0.34 | 0.34 | 0.43 |
| | *Tropocyclops* sp. | 0 | 0 | 0.098 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.10 | 0 | 0.020 | 0 | 0.044 | 0 |
| Cladocera | *Bosmina longirostris* | 0.67 | 1.29 | 0.49 | 0.110 | 0.77 | 0.90 | 0.45 | 0.46 | 0.47 | 0.178 | 0.11 | 0.18 | 0.67 | 0.46 | 1.3 | 0.90 | 0.66 | 0.49 | 0.43 | 0.26 |
| | *Daphnia galeata mendotae* | 1.90 | 3.9 | 1.57 | 2.2 | 1.15 | 0.45 | 0.149 | 0 | 0.314 | 0.36 | 1.1 | 0 | 1.9 | 0.31 | 3.9 | 0.45 | 2.1 | 0.25 | 1.0 | 0.18 |
| | ***Diaphanosoma birgei*** | 5.0 | 5.9 | 5.0 | 4.1 | 5.2 | 3.01 | 2.08 | 2.30 | 1.57 | 4.1 | 4.1 | 1.6 | 5.0 | 2.3 | 5.9 | 4.1 | 5.0 | 2.6 | 0.64 | 1.0 |
| Rotifera | ***Ascomorpha ovalis*** | 10.5 | 6.4 | 5.9 | 17.7 | 7.7 | 3.01 | 0 | 0 | 0 | 0 | 5.9 | 0 | 7.7 | 0 | 18 | 3.0 | 9.6 | 0.60 | 4.8 | 1.3 |
| | ***Collotheca* sp.** | 34 | 39 | 39 | 33 | 26.8 | 33 | 45 | 27.6 | 41 | 32 | 27 | 28 | 34 | 33 | 39 | 45 | 34 | 36 | 5.0 | 6.9 |
| | ***Gastropus stylifer*** | 1.90 | 0 | 5.9 | 0 | 0 | 0 | 3.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.9 | 3.0 | 1.6 | 0.60 | 2.6 | 1.3 |
| | ***Kellicottia longispina*** | 4.8 | 2.1 | 3.9 | 0 | 3.8 | 3.01 | 8.9 | 4.6 | 0 | 7.1 | 0 | 0 | 3.8 | 4.6 | 4.8 | 8.9 | 2.9 | 4.7 | 1.9 | 3.5 |
| | *Keratella cochlearis* | 0.95 | 2.1 | 0 | 2.2 | 0 | 0 | 0 | 4.6 | 0 | 0 | 0 | 0 | 1.0 | 0 | 2.2 | 4.6 | 1.1 | 0.92 | 1.1 | 2.1 |
| | *Keratella* sp. | 0.95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0 | 0.95 | 0 | 0.19 | 0 | 0.43 | 0 |
| | ***Polyarthra remata*** | 15 | 6.4 | 16 | 13 | 23 | 30 | 15 | 37 | 38 | 18 | 6.4 | 15 | 15 | 30 | 23 | 38 | 15 | 27 | 5.9 | 11 |
| | *Polyarthra vulgaris* | 0 | 2.14 | 0 | 2.21 | 0 | 0 | 0 | 0 | 0 | 3.56 | 0 | 0 | 0 | 0 | 2.2 | 3.6 | 0.87 | 0.71 | 1.2 | 1.6 |
| | ***Synchaeta* sp.** | 1.90 | 6.4 | 3.9 | 2.2 | 3.8 | 0 | 0 | 0 | 3.14 | 10.7 | 1.9 | 0 | 3.8 | 0 | 6.4 | 11 | 3.7 | 2.8 | 1.8 | 4.6 |

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of organisms at one or more stations within an area (as shown in Figure 5.8).

**Table D.40:** **Relative Density (%) of Zooplankton Species, August 2016**

|  | Species | Upstream of Elk River |  |  |  |  | Downstream of Elk River |  |  |  |  | Summary Statistics |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |  |  |  | Minimum |  | Median |  | Maximum |  | Mean |  | SD |  |
|  |  | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | TN | T4 | TN | T4 | TN | T4 | TN | T4 | TN | T4 |
| Copepoda | Calanoid nauplii | 5.5 | 9.8 | 5.2 | 5.2 | 5.1 | 4.9 | 6.9 | 8.0 | 8.1 | 6.9 | 5.1 | 4.9 | 5.2 | 6.9 | 9.8 | 8.1 | 6.2 | 7.0 | 2.0 | 1.3 |
|  | Calanoid copepodids | 2.0 | 4.1 | 1.6 | 1.8 | 1.9 | 6.8 | 3.7 | 5.2 | 3.6 | 3.7 | 1.6 | 3.6 | 1.9 | 3.7 | 4.1 | 6.8 | 2.3 | 4.6 | 1.0 | 1.4 |
|  | Cyclopoid nauplii | 4.3 | 6.6 | 5.0 | 7.2 | 5.4 | 2.7 | 2.4 | 1.7 | 3.1 | 2.3 | 4.3 | 1.7 | 5.4 | 2.4 | 7.2 | 3.1 | 5.7 | 2.5 | 1.2 | 0.52 |
|  | Cyclopoid copepodids | 5.8 | 6.8 | 5.4 | 4.3 | 4.4 | 15 | 15 | 15 | 14 | 10 | 4.3 | 10 | 5.4 | 15 | 6.8 | 15 | 5.4 | 14 | 1.0 | 2.1 |
|  | *Diaptomus sicilis* | 0.48 | 0.93 | 0 | 0.078 | 0.13 | 0.72 | 0.73 | 0.78 | 0.36 | 0.55 | 0 | 0.36 | 0.13 | 0.72 | 0.93 | 0.78 | 0.32 | 0.63 | 0.39 | 0.17 |
|  | *Diaptomus oregonensis* | 0.38 | 0.65 | 0.23 | 0.23 | 0.58 | 1.3 | 0.73 | 1.3 | 1.1 | 1.8 | 0.23 | 0.73 | 0.38 | 1.3 | 0.65 | 1.8 | 0.42 | 1.2 | 0.20 | 0.39 |
|  | *Epischura lacustris* | 0.14 | 0.19 | 0.113 | 0.195 | 0.042 | 0.50 | 0.28 | 0.24 | 0.045 | 0.33 | 0.042 | 0.045 | 0.14 | 0.28 | 0.19 | 0.50 | 0.14 | 0.28 | 0.06 | 0.16 |
|  | *Cyclops bicuspidatus thomasi* | 2.6 | 2.3 | 2.5 | 2.1 | 2.1 | 2.8 | 2.8 | 1.6 | 1.5 | 1.6 | 2.1 | 1.5 | 2.3 | 1.6 | 2.6 | 2.8 | 2.3 | 2.1 | 0.22 | 0.66 |
| Caldocera | *Daphnia galeata mendotae* | 10 | 15 | 15 | 10 | 16 | 7.0 | 11 | 0.12 | 4.9 | 6.4 | 9.8 | 0.12 | 15 | 6.4 | 16 | 11 | 13 | 5.8 | 2.8 | 3.9 |
|  | *Bosmina longirostris* | 0.43 | 0.093 | 0.45 | 0.23 | 0.17 | 0.28 | 0.28 | 0.12 | 0.13 | 0.055 | 0.093 | 0.055 | 0.23 | 0.13 | 0.45 | 0.28 | 0.28 | 0.17 | 0.16 | 0.10 |
|  | *Diaphanosoma birgei* | 0.24 | 0.47 | 0.28 | 0.16 | 0.46 | 0.12 | 0.056 | 0 | 0.13 | 0 | 0.16 | 0 | 0.28 | 0.056 | 0.47 | 0.13 | 0.32 | 0.063 | 0.14 | 0.065 |
|  | *Ceriodaphnia* sp. | 0.048 | 0 | 0 | 0.039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.048 | 0 | 0.017 | 0 | 0.024 | 0 |
|  | *Leptadora kindtii* | 0 | 0 | 0 | 0 | 0.13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.13 | 0 | 0.025 | 0 | 0.056 | 0 |
|  | *Scapholeberis* sp. | 0 | 0 | 0 | 0 | 0 | 0.031 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.031 | 0 | 0.0062 | 0 | 0.014 |
| Rotifera | *Keratella cochlearis* | 22 | 15 | 30 | 24 | 25 | 8.7 | 6.2 | 16 | 21 | 14 | 15 | 6.2 | 24 | 14 | 30 | 21 | 23 | 13 | 5.3 | 5.8 |
|  | *Kellicottia longispina* | 19 | 15 | 9.6 | 13 | 15 | 20 | 22 | 29 | 18 | 19 | 9.6 | 18 | 15 | 20 | 19 | 29 | 14 | 22 | 3.4 | 4.2 |
|  | *Polyarthra remata* | 0.27 | 0 | 0 | 3.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.3 | 0 | 0.7 | 0 | 1.5 | 0 |
|  | *Polyarthra vulgaris* | 0 | 0.26 | 0.32 | 0.22 | 0.23 | 0.18 | 0.16 | 0.17 | 0.25 | 0.31 | 0 | 0.16 | 0.23 | 0.18 | 0.32 | 0.31 | 0.21 | 0.21 | 0.12 | 0.066 |
|  | *Gastropus stylifer* | 0 | 0 | 0.57 | 1.2 | 0.83 | 0 | 1.1 | 0.30 | 1.3 | 1.1 | 0 | 0 | 0.57 | 1.1 | 1.2 | 1.3 | 0.51 | 0.78 | 0.52 | 0.59 |
|  | *Ascomorpha ovalis* | 0.96 | 2.3 | 4.0 | 1.6 | 2.5 | 2.5 | 1.7 | 0.90 | 1.3 | 1.1 | 1.0 | 0.90 | 2.3 | 1.3 | 4.0 | 2.5 | 2.3 | 1.5 | 1.1 | 0.62 |
|  | *Collotheca* sp. | 25 | 20 | 20 | 25 | 20 | 26 | 26 | 20 | 21 | 30 | 20 | 20 | 20 | 26 | 25 | 30 | 22 | 25 | 2.6 | 4.4 |
|  | *Monostyla* sp. | 0 | 0 | 0 | 0.39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.39 | 0 | 0.08 | 0 | 0.17 | 0 |

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of organisms at one or more stations within an area (as shown in Figure 5.8).

## Table D.41: Zooplankton Community Biomass Data (µg/L dw), August 2014

| **Species** | | **Upstream of Elk River** | | | | | **Downstream of Elk River** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **T2-2** | **T2-3** | **T2-4** | **T2-5** | **T2-6** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Copepoda | Calanoid copepodids | 11 | 35 | 30 | 24 | 30 | 9.7 | 6.5 | 8.6 | 9.9 | 33 |
| | Calanoid nauplii | 0.45 | 1.6 | 1.8 | 0.90 | 0.72 | 0.53 | 0.37 | 0.34 | 0.55 | 1.8 |
| | Cyclopoid copepodids | 14 | 16 | 14 | 11 | 12 | 36 | 36 | 16 | 19 | 29 |
| | Cyclopoid nauplii | 0.74 | 0.95 | 0.85 | 0.75 | 0.87 | 0.75 | 0.91 | 0.40 | 0.49 | 0.38 |
| | *Cyclops bicuspidatus thomasi* | 15 | 14 | 18 | 14 | 14 | 15 | 16 | 9.8 | 8.3 | 23 |
| | *Diaptomus oregonensis* | 6.5 | 14 | 19 | 12 | 20 | 10 | 12 | 7.0 | 11 | 30 |
| | *Diaptomus sicilis* | 0 | 0 | 0.25 | 0.37 | 0.12 | 0 | 0.12 | 0 | 0.25 | 0.25 |
| | *Epischura lacustris* | 0 | 0.010 | 0 | 0.20 | 0.10 | 0 | 0.20 | 0 | 0 | 0 |
| | *Orthocyclops modestus* | 0 | 0.28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cladocera | *Bosmina longirostris* | 0 | 0.0086 | 0 | 0 | 0 | 0.017 | 0.0086 | 0.0086 | 0 | 0.017 |
| | *Daphnia galeata mendotae* | 11 | 19 | 16 | 17 | 13 | 14 | 20 | 13 | 7.4 | 13 |
| | *Diaphanosoma birgei* | 0.10 | 0.25 | 0.24 | 0.25 | 0.29 | 0.085 | 0.063 | 0.11 | 0.074 | 0.21 |
| | *Leptadora kindtii* | 0.014 | 0.082 | 0.027 | 0.027 | 0.041 | 0.055 | 0.027 | 0 | 0.027 | 0.069 |
| Rotifer | *Ascomorpha ovalis* | 0.10 | 0.26 | 0.20 | 0.24 | 0.33 | 0.20 | 0.17 | 0.23 | 0.14 | 0.07 |
| | *Collotheca* sp. | 1.1 | 0.83 | 0.99 | 0.86 | 0.86 | 0.93 | 0.64 | 0.42 | 0.56 | 0.57 |
| | *Gastropus stylifer* | 0.14 | 0.18 | 0.20 | 0.27 | 0.11 | 0.07 | 0.09 | 0.07 | 0.12 | 0.13 |
| | *Kellicottia longispina* | 0.0071 | 0.021 | 0.014 | 0.042 | 0.042 | 0.041 | 0.030 | 0.025 | 0.014 | 0.0071 |
| | *Keratella cochlearis* | 0.82 | 1.4 | 1.2 | 0.99 | 2.3 | 1.3 | 1.4 | 0.73 | 0.41 | 0.36 |
| | *Keratella crassa* | 0.18 | 0.29 | 0.09 | 0.31 | 0.42 | 0.033 | 0.20 | 0.08 | 0.13 | 0.42 |
| | *Keratella* sp. (Large) | 0 | 0.047 | 0.047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Keratella taurocephala* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.019 | 0 |
| | *Polyarthra remata* | 0 | 0.040 | 0.030 | 0.030 | 0.030 | 0.010 | 0.020 | 0.015 | 0.025 | 0.0050 |
| | *Polyarthra vulgaris* | 0.54 | 0.82 | 1.3 | 1.1 | 1.1 | 1.4 | 1.2 | 1.0 | 0.95 | 0.68 |
| | *Synchaeta* sp. | 0.011 | 0.13 | 0.22 | 0.16 | 0.18 | 0 | 0.011 | 0.011 | 0.0053 | 0.17 |
| | *Trichocerca* | 0.18 | 0.18 | 0.20 | 0.27 | 0.11 | 0.11 | 0.09 | 0.07 | 0.12 | 0.13 |
| **Total biomass (µg/L dw)** | | **62** | **106** | **104** | **85** | **97** | **91** | **96** | **58** | **59** | **133** |
| **Total number of taxa** | | **18** | **23** | **21** | **21** | **21** | **19** | **22** | **19** | **21** | **21** |

## Table D.42: Zooplankton Community Biomass Data (µg/L dw), August 2015

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-1 | T4-2 | T4-3 | T4-4 | T4-5 |
| Copepoda | Calanoid copepodids | 2.6 | 1.8 | 1.5 | 1.6 | 0.83 | 1.3 | 0.57 | 0.28 | 0.30 | 0.65 |
| | Calanoid nauplii | 0.29 | 0.12 | 0.10 | 0.084 | 0.091 | 0.069 | 0.011 | 0.048 | 0.058 | 0.082 |
| | Cyclopoid copepodids | 1.7 | 0.72 | 0.41 | 0.46 | 0.52 | 0.55 | 1.6 | 0.59 | 0.64 | 0.76 |
| | Cyclopoid nauplii | 0.051 | 0.029 | 0.017 | 0.032 | 0.016 | 0.030 | 0.027 | 0.026 | 0.017 | 0.031 |
| | *Cyclops bicuspidatus thomasi* | 0.14 | 0.38 | 0.40 | 0.33 | 0.25 | 0.43 | 0.46 | 0.069 | 0 | 0.084 |
| | *Diaptomus oregonensis* | 0.89 | 0.52 | 1.1 | 0.70 | 0.70 | 0.44 | 0.48 | 0.068 | 0 | 0.086 |
| | *Diaptomus sicilis* | 0 | 0.25 | 0.86 | 0.74 | 0.12 | 0.61 | 0.25 | 0.25 | 0.49 | 0.12 |
| | *Epischura lacustris* | 0.10 | 0.46 | 0.20 | 0.20 | 0.051 | 0.36 | 0.10 | 0 | 0 | 0.10 |
| | *Tropocyclops* sp. | 0 | 0 | 0.029 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cladocera | *Bosmina longirostris* | 0.030 | 0.026 | 0.011 | 0.0022 | 0.0086 | 0.013 | 0.0065 | 0.0043 | 0.0065 | 0.0022 |
| | *Daphnia galeata mendotae* | 2.5 | 2.2 | 1.0 | 1.2 | 0.37 | 0.19 | 0.062 | 0 | 0.12 | 0.12 |
| | *Diaphanosoma birgei* | 0.28 | 0.15 | 0.13 | 0.098 | 0.071 | 0.053 | 0.037 | 0.026 | 0.026 | 0.061 |
| Rotifera | *Ascomorpha ovalis* | 0.058 | 0.016 | 0.016 | 0.043 | 0.011 | 0.0053 | 0 | 0 | 0 | 0 |
| | *Collotheca* sp. | 0.22 | 0.11 | 0.12 | 0.092 | 0.043 | 0.067 | 0.092 | 0.037 | 0.079 | 0.055 |
| | *Gastropus stylifer* | 0.010 | 0 | 0.016 | 0 | 0 | 0 | 0.0052 | 0 | 0 | 0 |
| | *Kellicottia longispina* | 0.0088 | 0.0018 | 0.0035 | 0 | 0.0018 | 0.0018 | 0.0053 | 0.0018 | 0 | 0.0035 |
| | *Keratella cochlearis* | 0.012 | 0.012 | 0 | 0.012 | 0 | 0 | 0 | 0.012 | 0 | 0 |
| | *Keratella* sp. | 0.024 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Polyarthra remata* | 0.080 | 0.015 | 0.040 | 0.030 | 0.030 | 0.050 | 0.025 | 0.040 | 0.060 | 0.025 |
| | *Polyarthra vulgaris* | 0 | 0.0050 | 0 | 0.0050 | 0 | 0 | 0 | 0 | 0 | 0.0050 |
| | *Synchaeta* sp. | 0.011 | 0.016 | 0.011 | 0.0053 | 0.0053 | 0 | 0 | 0 | 0.0053 | 0.016 |
| **Total biomass (µg/L dw)** | | **8.9** | **6.9** | **6.0** | **5.7** | **3.1** | **4.2** | **3.7** | **1.5** | **1.8** | **2.2** |
| **Total number of taxa** | | **18** | **18** | **18** | **17** | **16** | **15** | **15** | **13** | **11** | **16** |

## Table D.43: Zooplankton Community Biomass Data (µg/L dw), August 2016

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | Calanoid nauplii | 0.46 | 0.70 | 0.32 | 0.53 | 0.44 | 0.58 | 0.78 | 1.1 | 0.75 | 0.36 |
| | Calanoid copepodids | 2.8 | 5.8 | 1.7 | 3.3 | 3.1 | 17 | 9.6 | 13 | 5.7 | 4.8 |
| | Cyclopoid nauplii | 0.095 | 0.16 | 0.091 | 0.20 | 0.13 | 0.097 | 0.087 | 0.070 | 0.087 | 0.043 |
| | Cyclopoid copepodids | 4.1 | 5.1 | 3.1 | 3.6 | 3.4 | 17 | 18 | 16 | 10 | 5.8 |
| | *Diaptomus sicilis* | 1.2 | 2.5 | 0 | 0.25 | 0.37 | 2.8 | 3.2 | 3.2 | 0.98 | 1.2 |
| | *Diaptomus oregonensis* | 1.3 | 2.1 | 0.61 | 0.92 | 2.2 | 6.4 | 4.0 | 6.3 | 3.6 | 5.0 |
| | *Epischura lacustris* | 0.31 | 0.41 | 0.20 | 0.51 | 0.10 | 1.6 | 1.0 | 0.81 | 0.10 | 0.61 |
| | *Cyclops bicuspidatus thomasi* | 6.3 | 6.2 | 5.2 | 7.0 | 5.6 | 10 | 11 | 6.7 | 4.1 | 3.4 |
| Caldocera | *Daphnia galeata mendotae* | 27 | 41 | 33 | 31 | 47 | 28 | 48 | 0.50 | 14 | 14 |
| | *Bosmina longirostris* | 0.039 | 0.0086 | 0.034 | 0.026 | 0.017 | 0.039 | 0.043 | 0.017 | 0.013 | 0.0043 |
| | *Diaphanosoma birgei* | 0.026 | 0.053 | 0.026 | 0.021 | 0.058 | 0.021 | 0.011 | 0 | 0.016 | 0 |
| | *Ceriodaphnia* sp. | 0.034 | 0 | 0 | 0.034 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Leptadora kindtii* | 0 | 0 | 0 | 0 | 0.041 | 0 | 0 | 0 | 0 | 0 |
| | *Scapholeberis* sp. | 0 | 0 | 0 | 0 | 0 | 0.0050 | 0 | 0 | 0 | 0 |
| Rotifera | *Keratella cochlearis* | 0.57 | 0.40 | 0.64 | 0.75 | 0.73 | 0.34 | 0.27 | 0.65 | 0.56 | 0.31 |
| | *Kellicottia longispina* | 0.071 | 0.056 | 0.030 | 0.060 | 0.063 | 0.11 | 0.14 | 0.17 | 0.072 | 0.060 |
| | *Polyarthra remata* | 0.0028 | 0 | 0 | 0.043 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Polyarthra vulgaris* | 0 | 0.0028 | 0.0028 | 0.0028 | 0.0028 | 0.0028 | 0.0028 | 0.0028 | 0.0028 | 0.0028 |
| | *Gastropus stylifer* | 0 | 0 | 0.0052 | 0.016 | 0.010 | 0 | 0.021 | 0.0052 | 0.016 | 0.010 |
| | *Ascomorpha ovalis* | 0.011 | 0.027 | 0.037 | 0.021 | 0.032 | 0.043 | 0.032 | 0.016 | 0.016 | 0.011 |
| | *Collotheca* sp. | 0.32 | 0.26 | 0.21 | 0.39 | 0.30 | 0.51 | 0.56 | 0.40 | 0.28 | 0.34 |
| | *Monostyla* sp. | 0 | 0 | 0 | 0.0061 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total biomass (µg/L dw)** | | **45** | **64** | **45** | **49** | **63** | **84** | **97** | **49** | **40** | **36** |
| **Total number of taxa** | | **17** | **16** | **16** | **20** | **18** | **17** | **17** | **16** | **17** | **16** |

**Table D.44:** Biomass (µg/L dw) of Zooplankton by Group, August 2014

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | 48 | 83 | 84 | 64 | 78 | 73 | 72 | 43 | 49 | 118 |
| Cladocera | 12 | 20 | 16 | 17 | 13 | 14 | 20 | 13 | 7.5 | 13 |
| Rotifer | 3.0 | 4.1 | 4.4 | 4.2 | 5.5 | 4.1 | 3.8 | 2.6 | 2.5 | 2.6 |
| **Total biomass (µg/L dw)** | **62** | **106** | **104** | **85** | **97** | **91** | **96** | **58** | **59** | **133** |
| **Total number of groups** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** |

## Table D.45: Biomass (µg/L dw) of Zooplankton by Group, August 2015

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | 5.7 | 4.3 | 4.6 | 4.1 | 2.6 | 3.8 | 3.5 | 1.3 | 1.5 | 1.9 |
| Cladocera | 2.8 | 2.4 | 1.1 | 1.3 | 0.45 | 0.25 | 0.11 | 0.031 | 0.16 | 0.19 |
| Rotifer | 0.42 | 0.18 | 0.21 | 0.19 | 0.091 | 0.12 | 0.13 | 0.091 | 0.14 | 0.10 |
| **Total biomass (µg/L dw)** | **8.9** | **6.9** | **6.0** | **5.7** | **3.1** | **4.2** | **3.7** | **1.5** | **1.8** | **2.2** |
| **Total number of groups** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** |

## Table D.46: Biomass (µg/L dw) of Zooplankton by Group, August 2016

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | 17 | 23 | 11 | 16 | 15 | 55 | 48 | 47 | 26 | 21 |
| Cladocera | 27 | 41 | 33 | 31 | 47 | 28 | 48 | 0.52 | 14 | 14 |
| Rotifera | 0.97 | 0.75 | 0.93 | 1.3 | 1.1 | 1.0 | 1.0 | 1.2 | 0.94 | 0.73 |
| **Total biomass (µg/L dw)** | **45** | **64** | **45** | **49** | **63** | **84** | **97** | **49** | **40** | **36** |
| **Total number of groups** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** | **3** |

**Table D.47:** **Relative Biomass (%) of Zooplankton Species, August 2014**

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **T2-2** | **T2-3** | **T2-4** | **T2-5** | **T2-6** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Copopoda | Calanoid copepodids | 17 | 33 | 29 | 29 | 31 | 11 | 6.8 | 15 | 17 | 25 |
| | Calanoid nauplii | 0.72 | 1.5 | 1.7 | 1.1 | 0.74 | 0.59 | 0.38 | 0.59 | 0.93 | 1.4 |
| | Cyclopoid copepodids | 23 | 15 | 13 | 13 | 12 | 40 | 37 | 28 | 32 | 21 |
| | Cyclopoid nauplii | 1.19 | 0.89 | 0.81 | 0.88 | 0.89 | 0.82 | 0.95 | 0.68 | 0.83 | 0.28 |
| | *Cyclops bicuspidatus thomasi* | 24 | 13 | 18 | 16 | 15 | 17 | 17 | 17 | 14 | 17 |
| | *Diaptomus oregonensis* | 10 | 14 | 18 | 15 | 20 | 11 | 12 | 12 | 18 | 23 |
| | *Diaptomus sicilis* | 0 | 0 | 0.23 | 0.43 | 0.13 | 0 | 0.13 | 0 | 0.42 | 0.18 |
| | *Epischura lacustris* | 0 | 0.010 | 0 | 0.24 | 0.10 | 0 | 0.21 | 0 | 0 | 0 |
| | *Orthocyclops modestus* | 0 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cladocera | *Bosmina longirostris* | 0 | 0.0081 | 0 | 0 | 0 | 0.019 | 0.0089 | 0.015 | 0 | 0.013 |
| | *Daphnia galeata mendotae* | 18 | 18 | 15 | 20 | 13 | 15 | 21 | 22 | 12 | 9.8 |
| | *Diaphanosoma birgei* | 0.16 | 0.24 | 0.23 | 0.30 | 0.29 | 0.09 | 0.066 | 0.18 | 0.13 | 0.15 |
| | *Leptadora kindtii* | 0.022 | 0.078 | 0.026 | 0.032 | 0.042 | 0.060 | 0.029 | 0 | 0.047 | 0.052 |
| Rotifera | *Ascomorpha ovalis* | 0.15 | 0.24 | 0.19 | 0.29 | 0.34 | 0.22 | 0.18 | 0.39 | 0.24 | 0.052 |
| | *Collotheca* sp. | 1.7 | 0.78 | 0.95 | 1.0 | 0.88 | 1.0 | 0.67 | 0.73 | 0.95 | 0.43 |
| | *Gastropus stylifer* | 0.23 | 0.17 | 0.19 | 0.32 | 0.12 | 0.079 | 0.097 | 0.12 | 0.20 | 0.097 |
| | *Kellicottia longispina* | 0.011 | 0.020 | 0.013 | 0.050 | 0.043 | 0.045 | 0.031 | 0.043 | 0.024 | 0.0053 |
| | *Keratella cochlearis* | 1.3 | 1.3 | 1.1 | 1.2 | 2.4 | 1.4 | 1.4 | 1.3 | 0.70 | 0.27 |
| | *Keratella crassa* | 0.28 | 0.27 | 0.084 | 0.36 | 0.43 | 0.036 | 0.21 | 0.13 | 0.22 | 0.31 |
| | *Keratella* sp. (Large) | 0 | 0.044 | 0.045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Keratella taurocephala* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.03 | 0 |
| | *Polyarthra remata* | 0 | 0.04 | 0.03 | 0.04 | 0.03 | 0.011 | 0.02 | 0.026 | 0.04 | 0.004 |
| | *Polyarthra vulgaris* | 0.87 | 0.77 | 1.2 | 1.2 | 1.2 | 1.5 | 1.2 | 1.7 | 1.6 | 0.51 |
| | *Synchaeta* sp. | 0.017 | 0.12 | 0.21 | 0.19 | 0.18 | 0 | 0.011 | 0.018 | 0.0089 | 0.13 |
| | Trichocerca | 0.30 | 0 | 0 | 0 | 0 | 0.122 | 0 | 0 | 0 | 0 |

## Table D.48: Relative Biomass (%) of Zooplankton Species, August 2015

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-1 | T4-2 | T4-3 | T4-4 | T4-5 |
| Copepoda | Calanoid copepodids | 29 | 26 | 25 | 28 | 27 | 31 | 15 | 19 | 17 | 29 |
| | Calanoid nauplii | 3.2 | 1.7 | 1.7 | 1.5 | 2.9 | 1.6 | 0.30 | 3.3 | 3.2 | 3.7 |
| | Cyclopoid copepodids | 19 | 11 | 6.9 | 8.1 | 17 | 13 | 43 | 41 | 35 | 34 |
| | Cyclopoid nauplii | 0.57 | 0.43 | 0.28 | 0.57 | 0.51 | 0.73 | 0.73 | 1.8 | 0.95 | 1.4 |
| | *Cyclops bicuspidatus thomasi* | 1.6 | 5.5 | 6.7 | 5.9 | 8.0 | 10 | 12 | 4.8 | 0 | 3.8 |
| | *Diaptomus oregonensis* | 9.9 | 7.5 | 19 | 12 | 22 | 11 | 13 | 4.7 | 0 | 3.9 |
| | *Diaptomus sicilis* | 0 | 3.6 | 14 | 13 | 3.9 | 15 | 6.6 | 17 | 27 | 5.5 |
| | *Epischura lacustris* | 1.1 | 6.7 | 3.4 | 3.6 | 1.6 | 8.5 | 2.7 | 0 | 0 | 4.6 |
| | *Tropocyclops* sp. | 0 | 0 | 0.49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cladocera | *Bosmina longirostris* | 0.34 | 0.38 | 0.18 | 0.038 | 0.28 | 0.31 | 0.17 | 0.30 | 0.36 | 0.097 |
| | *Daphnia galeata mendotae* | 28 | 33 | 17 | 22 | 12 | 4.5 | 1.7 | 0 | 6.9 | 5.6 |
| | *Diaphanosoma birgei* | 3.1 | 2.1 | 2.3 | 1.7 | 2.3 | 1.3 | 0.99 | 1.8 | 1.5 | 2.8 |
| Rotifera | *Ascomorpha ovalis* | 0.66 | 0.23 | 0.26 | 0.75 | 0.34 | 0.13 | 0 | 0 | 0 | 0 |
| | *Collotheca* sp. | 2.5 | 1.6 | 2.0 | 1.6 | 1.4 | 1.6 | 2.5 | 2.5 | 4.4 | 2.5 |
| | *Gastropus stylifer* | 0.12 | 0 | 0.26 | 0 | 0 | 0 | 0.14 | 0 | 0 | 0 |
| | *Kellicottia longispina* | 0.099 | 0.026 | 0.059 | 0 | 0.056 | 0.042 | 0.14 | 0.12 | 0 | 0.16 |
| | *Keratella cochlearis* | 0.14 | 0.18 | 0 | 0.21 | 0 | 0 | 0 | 0.83 | 0 | 0 |
| | *Keratella* sp. | 0.26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Polyarthra remata* | 0.90 | 0.22 | 0.67 | 0.53 | 1.0 | 1.2 | 0.67 | 2.8 | 3.3 | 1.1 |
| | *Polyarthra vulgaris* | 0 | 0.073 | 0 | 0.088 | 0 | 0 | 0 | 0 | 0 | 0.23 |
| | *Synchaeta* sp. | 0.12 | 0.23 | 0.18 | 0.093 | 0.17 | 0 | 0 | 0 | 0.29 | 0.72 |

**Table D.49:** **Relative Biomass (%) of Zooplankton Species, August 2016**

| Species | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Copepoda | *Calanoid nauplii* | 1.0 | 1.1 | 0.71 | 1.1 | 0.70 | 0.69 | 0.81 | 2.2 | 1.9 | 1.0 |
| | *Calanoid copepodids* | 6.3 | 9.0 | 3.7 | 6.7 | 4.9 | 20 | 10 | 26 | 14 | 13 |
| | *Cyclopoid nauplii* | 0.21 | 0.24 | 0.20 | 0.42 | 0.21 | 0.12 | 0.090 | 0.14 | 0.22 | 0.12 |
| | *Cyclopoid copepodids* | 9.3 | 8.0 | 6.9 | 7.4 | 5.4 | 20 | 19 | 33 | 26 | 16 |
| | *Diaptomus sicilis* | 2.8 | 3.8 | 0 | 0.50 | 0.58 | 3.3 | 3.3 | 6.6 | 2.4 | 3.4 |
| | *Diaptomus oregonensis* | 2.8 | 3.3 | 1.4 | 1.9 | 3.5 | 7.5 | 4.1 | 13 | 9.0 | 14 |
| | *Epischura lacustris* | 0.68 | 0.63 | 0.45 | 1.0 | 0.16 | 1.9 | 1.1 | 1.7 | 0.25 | 1.7 |
| | *Cyclops bicuspidatus thomasi* | 14 | 9.6 | 12 | 14 | 8.9 | 12 | 11 | 14 | 10 | 9.4 |
| Caldocera | *Daphnia galeata mendotae* | 60 | 63 | 73 | 64 | 74 | 33 | 50 | 1.0 | 34 | 39 |
| | *Bosmina longirostris* | 0.087 | 0.013 | 0.077 | 0.053 | 0.027 | 0.046 | 0.044 | 0.035 | 0.032 | 0.012 |
| | *Diaphanosoma birgei* | 0.059 | 0.082 | 0.059 | 0.043 | 0.092 | 0.025 | 0.011 | 0 | 0.039 | 0 |
| | *Ceriodaphnia* sp. | 0.075 | 0 | 0 | 0.068 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Leptadora kindtii* | 0 | 0 | 0 | 0 | 0.065 | 0 | 0 | 0 | 0 | 0 |
| | *Scapholeberis* sp. | 0 | 0 | 0 | 0 | 0 | 0.0059 | 0 | 0 | 0 | 0 |
| Rotifera | *Keratella cochlearis* | 1.3 | 0.62 | 1.4 | 1.5 | 1.2 | 0.40 | 0.28 | 1.3 | 1.4 | 0.86 |
| | *Kellicottia longispina* | 0.16 | 0.088 | 0.067 | 0.12 | 0.10 | 0.13 | 0.14 | 0.35 | 0.18 | 0.16 |
| | *Polyarthra remata* | 0.0063 | 0 | 0 | 0.087 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Polyarthra vulgaris* | 0 | 0.0044 | 0.0063 | 0.0057 | 0.0045 | 0.0033 | 0.0029 | 0.0058 | 0.0070 | 0.0077 |
| | *Gastropus stylifer* | 0 | 0 | 0.012 | 0.032 | 0.016 | 0 | 0.021 | 0.011 | 0.038 | 0.028 |
| | *Ascomorpha ovalis* | 0.024 | 0.041 | 0.083 | 0.043 | 0.051 | 0.050 | 0.033 | 0.033 | 0.039 | 0.029 |
| | *Collotheca* sp. | 0.71 | 0.41 | 0.48 | 0.80 | 0.47 | 0.61 | 0.58 | 0.83 | 0.69 | 0.92 |
| | *Monostyla* sp. | 0 | 0 | 0 | 0.012 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table D.50:** **Descriptive Statistics for Zooplankton from Koocanusa Reservoir Upstream (T2) and Downstream (T4) of the Elk River, August 2014**

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of organisms/L) | | T2 | 5 | 66.6 | 96.5 | 106 | 93.0 | 15.4 |
| | | T4 | 5 | 57.8 | 72.5 | 89.7 | 72.9 | 14.4 |
| Biomass (µg/L dw) | | T2 | 5 | 62.2 | 97.3 | 106 | 91.1 | 18.2 |
| | | T4 | 5 | 58.0 | 91.1 | 133 | 87.6 | 31.1 |
| Richness (no. of taxa) | | T2 | 5 | 18.0 | 21.0 | 23.0 | 20.8 | 1.79 |
| | | T4 | 5 | 19.0 | 21.0 | 22.0 | 20.4 | 1.34 |
| Major Group Density (no. of organisms/L) | Copepod | T2 | 5 | 17.3 | 24.1 | 30.3 | 24.5 | 5.19 |
| | | T4 | 5 | 14.8 | 25.6 | 29.5 | 22.8 | 6.22 |
| | Cladocera | T2 | 5 | 1.33 | 2.06 | 2.46 | 1.98 | 0.421 |
| | | T4 | 5 | 0.87 | 1.58 | 2.09 | 1.56 | 0.448 |
| | Rotifera | T2 | 5 | 47.9 | 70.0 | 79.9 | 66.5 | 11.9 |
| | | T4 | 5 | 41.0 | 41.6 | 62.5 | 48.6 | 10.2 |
| Major Group Relative Density (%) | Copepod | T2 | 5 | 22.8 | 26 | 31.4 | 26.4 | 3.54 |
| | | T4 | 5 | 25.5 | 29.8 | 40.7 | 31.1 | 5.720 |
| | Cladocera | T2 | 5 | 1.76 | 2.04 | 2.55 | 2.13 | 0.303 |
| | | T4 | 5 | 1.46 | 2.44 | 2.53 | 2.13 | 0.484 |
| | Rotifera | T2 | 5 | 66.0 | 72.0 | 75.5 | 71.5 | 3.74 |
| | | T4 | 5 | 56.9 | 68.7 | 72.0 | 66.8 | 5.84 |
| Major Group Biomass (µg/L dw) | Copepod | T2 | 5 | 47.6 | 78.3 | 84.0 | 71.3 | 15.5 |
| | | T4 | 5 | 42.5 | 72.4 | 118 | 70.9 | 29.4 |
| | Cladocera | T2 | 5 | 11.6 | 16.0 | 19.5 | 15.5 | 3.12 |
| | | T4 | 5 | 7.46 | 13.4 | 19.9 | 13.6 | 4.44 |
| | Rotifera | T2 | 5 | 3.03 | 4.22 | 5.53 | 4.27 | 0.889 |
| | | T4 | 5 | 2.50 | 2.65 | 4.07 | 3.12 | 0.765 |
| Major Group Relative Biomass (%) | Copepod | T2 | 5 | 74.9 | 77.7 | 80.5 | 78.0 | 2.46 |
| | | T4 | 5 | 73.3 | 79.9 | 88.1 | 79.9 | 5.95 |
| | Cladocera | T2 | 5 | 13.8 | 18.4 | 20.1 | 17.2 | 2.60 |
| | | T4 | 5 | 10.0 | 15.6 | 22.1 | 16.2 | 5.17 |
| | Rotifera | T2 | 5 | 3.89 | 4.88 | 5.69 | 4.73 | 0.695 |
| | | T4 | 5 | 1.91 | 4.24 | 4.56 | 3.83 | 1.10 |

**Table D.51:** **Descriptive Statistics for Zooplankton from Koocanusa Reservoir Upstream (T2) and Downstream (T4) of the Elk River, August 2015**

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of organisms/L) | | TN | 5 | 3.07 | 5.48 | 12.4 | 6.44 | 3.49 |
| | | T4 | 5 | 2.55 | 3.74 | 3.95 | 3.49 | 0.583 |
| Biomass (µg/L dw) | | TN | 5 | 3.13 | 5.96 | 8.92 | 6.11 | 2.10 |
| | | T4 | 5 | 1.45 | 2.21 | 4.19 | 2.68 | 1.21 |
| Richness (no. of taxa) | | TN | 5 | 16.0 | 18.0 | 18.0 | 17.4 | 0.894 |
| | | T4 | 5 | 11.0 | 15.0 | 16.0 | 14.0 | 2.00 |
| Major Group Density (no. of organisms/L) | Copepod | TN | 5 | 0.852 | 1.22 | 2.71 | 1.45 | 0.732 |
| | | T4 | 5 | 0.593 | 0.799 | 1.03 | 0.808 | 0.215 |
| | Cladocera | TN | 5 | 0.217 | 0.423 | 0.94 | 0.505 | 0.281 |
| | | T4 | 5 | 0.071 | 0.106 | 0.17 | 0.118 | 0.043 |
| | Rotifera | TN | 5 | 2.00 | 3.76 | 8.70 | 4.49 | 2.52 |
| | | T4 | 5 | 1.88 | 2.70 | 3.06 | 2.56 | 0.458 |
| Major Group Relative Density (%) | Copepod | TN | 5 | 18.4 | 23.0 | 27.8 | 23.1 | 3.47 |
| | | T4 | 5 | 15.9 | 24.2 | 26.4 | 23.2 | 4.24 |
| | Cladocera | TN | 5 | 6.40 | 7.09 | 11 | 7.84 | 1.84 |
| | | T4 | 5 | 2.36 | 2.76 | 4.63 | 3.36 | 1.05 |
| | Rotifera | TN | 5 | 64.3 | 70.4 | 74.6 | 69.0 | 4.27 |
| | | T4 | 5 | 69.3 | 71.4 | 81.8 | 73.5 | 4.89 |
| Major Group Biomass (µg/L dw) | Copepod | TN | 5 | 2.58 | 4.29 | 5.69 | 4.26 | 1.12 |
| | | T4 | 5 | 1.33 | 1.92 | 3.82 | 2.41 | 1.16 |
| | Cladocera | TN | 5 | 0.454 | 1.35 | 2.80 | 1.63 | 0.961 |
| | | T4 | 5 | 0.031 | 0.158 | 0.253 | 0.147 | 0.084 |
| | Rotifera | TN | 5 | 0.091 | 0.187 | 0.424 | 0.217 | 0.124 |
| | | T4 | 5 | 0.091 | 0.124 | 0.145 | 0.118 | 0.021 |
| Major Group Relative Biomass (%) | Copepod | TN | 5 | 62.3 | 72.9 | 82.6 | 71.8 | 8.69 |
| | | T4 | 5 | 83.3 | 91.0 | 93.7 | 89.3 | 4.20 |
| | Cladocera | TN | 5 | 14.5 | 23.8 | 35.1 | 24.8 | 8.50 |
| | | T4 | 5 | 2.12 | 6.03 | 8.70 | 5.64 | 3.08 |
| | Rotifera | TN | 5 | 2.55 | 3.29 | 4.75 | 3.40 | 0.84 |
| | | T4 | 5 | 2.97 | 4.72 | 8.00 | 5.07 | 2.08 |

### **Table D.52:** Descriptive Statistics for Zooplankton from Koocanusa Reservoir Upstream (T2) and Downstream (T4) of the Elk River, August 2016

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of organisms/L) | | TN | 5 | 20.7 | 25.2 | 30.2 | 25.8 | 3.62 |
| | | T4 | 5 | 21.2 | 37.7 | 41.8 | 33.2 | 8.99 |
| Biomass (µg/L dw) | | TN | 5 | 44.6 | 49.0 | 64.4 | 53.2 | 9.81 |
| | | T4 | 5 | 36.4 | 48.7 | 96.7 | 61.3 | 27.4 |
| Richness (no. of taxa) | | TN | 5 | 16.0 | 17.0 | 20.0 | 17.4 | 1.67 |
| | | T4 | 5 | 16.0 | 17.0 | 17.0 | 16.6 | 0.548 |
| Major Group Density (no. of organisms/L) | Copepod | TN | 5 | 4.15 | 5.6 | 7.92 | 5.85 | 1.41 |
| | | T4 | 5 | 5.80 | 13.2 | 13.6 | 10.8 | 3.53 |
| | Cladocera | TN | 5 | 2.71 | 3.23 | 4.59 | 3.52 | 0.756 |
| | | T4 | 5 | 0.094 | 1.36 | 4.65 | 2.05 | 1.74 |
| | Rotifera | TN | 5 | 13.3 | 16.6 | 20.7 | 16.4 | 3.16 |
| | | T4 | 5 | 14 | 21.7 | 25.9 | 20.3 | 4.96 |
| Major Group Relative Density (%) | Copepod | TN | 5 | 19.7 | 21.2 | 31.4 | 22.7 | 4.90 |
| | | T4 | 5 | 27.4 | 32.5 | 35.1 | 32.2 | 2.90 |
| | Cladocera | TN | 5 | 10.2 | 15.6 | 16.3 | 13.8 | 2.90 |
| | | T4 | 5 | 0.24 | 6.42 | 11.1 | 6.07 | 3.94 |
| | Rotifera | TN | 5 | 52.9 | 64.4 | 68.5 | 63.5 | 6.27 |
| | | T4 | 5 | 56.3 | 62.6 | 66.2 | 61.8 | 4.65 |
| Major Group Biomass (µg/L dw) | Copepod | TN | 5 | 11.20 | 16.3 | 22.9 | 16.5 | 4.22 |
| | | T4 | 5 | 21.3 | 46.9 | 55.4 | 39.4 | 14.9 |
| | Cladocera | TN | 5 | 27.0 | 32.7 | 46.6 | 35.7 | 7.86 |
| | | T4 | 5 | 0.516 | 14.3 | 47.9 | 20.9 | 18.0 |
| | Rotifera | TN | 5 | 0.748 | 0.97 | 1.29 | 1.01 | 0.206 |
| | | T4 | 5 | 0.734 | 1.01 | 1.25 | 0.99 | 0.184 |
| Major Group Relative Biomass (%) | Copepod | TN | 5 | 24.3 | 33.3 | 37.2 | 31.1 | 6.06 |
| | | T4 | 5 | 49.4 | 64.0 | 96.4 | 66.8 | 17.7 |
| | Cladocera | TN | 5 | 60.6 | 64.1 | 73.9 | 67.0 | 6.07 |
| | | T4 | 5 | 1.06 | 33.7 | 49.6 | 31.4 | 18.2 |
| | Rotifera | TN | 5 | 1.16 | 2.08 | 2.63 | 1.97 | 0.542 |
| | | T4 | 5 | 1.05 | 2.02 | 2.57 | 1.83 | 0.679 |

**Table D.53: Mean Skewness and Kurtosis Values of Zooplankton Lowest Practical Level Density Matrix by Transformation for the Area Upstream and Downstream of the Elk River Sampled in 2014, 2015, and 2016 (n= 30)**

| Transformation | Endpoint | Skewness (mean) | Kurtosis (mean) |
|---|---|---|---|
| None | Area\Row | 2.191 | 5.009 |
| | Taxa\Col | 1.342 | 1.244 |
| $Log_{10}$ | Area\Row | 1.315 | 1.811 |
| | Taxa\Col | 0.778 | -0.104 |
| Square root | Area\Row | 1.050 | 0.819 |
| | Taxa\Col | 0.526 | -0.613 |
| Fourth root | Area\Row | -0.096 | -0.620 |
| | Taxa\Col | -0.164 | -0.707 |
| Power 2 | Area\Row | 3.082 | 9.968 |
| | Taxa\Col | 2.380 | 6.052 |
| Power 4 | Area\Row | 3.695 | 14.178 |
| | Taxa\Col | 3.443 | 13.158 |

▨ - mean skewness and kurtosis values closest to zero.

**Table D.54:** **Non-Metric Multidimensional Scaling (NMDS) Results for Zooplankton Community Data (Lowest Practical Level) Displaying Percent Variance Explained by Each Axis, Monte Carlo Randomization p-values of Axis Significance, and Axis Scores for Areas Upstream and Downstream of the Elk River Sampled in 2014 to 2016**

| Year | Station Identifier | | 4th Root Transformation | | Non-transformed | |
|---|---|---|---|---|---|---|
| | | | NMDS-1 | NMDS-2 | NMDS-1 | NMDS-2[a] |
| 2014 | Upstream of Elk River | T2-2 | -1.03 | -0.24 | 0.94 | - |
| | | T2-3 | -0.96 | -0.45 | 1.09 | - |
| | | T2-4 | -1.00 | -0.49 | 1.15 | - |
| | | T2-5 | -0.94 | -0.41 | 1.06 | - |
| | | T2-6 | -1.00 | -0.44 | 1.17 | - |
| | Downstream of Elk River | T4-2 | -0.95 | -0.19 | 1.11 | - |
| | | T4-3 | -0.79 | -0.31 | 1.05 | - |
| | | T4-4 | -0.72 | -0.29 | 0.81 | - |
| | | T4-5 | -0.74 | -0.39 | 0.84 | - |
| | | T4-6 | -0.85 | -0.52 | 0.99 | - |
| 2015 | Upstream of Elk River | TN-1 | 0.39 | -0.31 | -0.56 | - |
| | | TN-2 | 0.72 | -0.12 | -1.08 | - |
| | | TN-3 | 0.86 | -0.19 | -1.10 | - |
| | | TN-4 | 0.81 | -0.37 | -1.15 | - |
| | | TN-5 | 1.19 | -0.24 | -1.57 | - |
| | Downstream of Elk RIver | T4-2 | 1.25 | 0.05 | -1.46 | - |
| | | T4-3 | 1.31 | 0.28 | -1.30 | - |
| | | T4-4 | 1.74 | 0.25 | -1.79 | - |
| | | T4-5 | 1.96 | -0.66 | -1.59 | - |
| | | T4-6 | 1.32 | -0.39 | -1.52 | - |
| 2016 | Upstream of Elk RIver | TN-1 | -0.11 | 0.60 | 0.21 | - |
| | | TN-2 | -0.18 | 0.56 | 0.20 | - |
| | | TN-3 | -0.11 | 0.52 | 0.07 | - |
| | | TN-4 | -0.14 | 0.31 | 0.24 | - |
| | | TN-5 | -0.22 | 0.46 | 0.25 | - |
| | Downstream of Elk River | T4-2 | -0.40 | 0.59 | 0.48 | - |
| | | T4-3 | -0.45 | 0.55 | 0.52 | - |
| | | T4-4 | -0.42 | 0.73 | 0.49 | - |
| | | T4-5 | -0.29 | 0.47 | 0.28 | - |
| | | T4-6 | -0.25 | 0.65 | 0.15 | - |
| **Final Stress** | | | **4.48** | | **5.75** | |
| **% Variance explained** | | | **91.7** | **6.9** | **90.7** | **-** |
| **Monte Carlo p-value** | | | **0.004** | **0.004** | **0.004** | **-** |

[a] A one dimensional (axis) solution was obtained because a two dimensional solution did not reduce stress by at least 5 units, which indicates that an additional axis does little to improve the monotonic relationship between the original dimensional space and the reduced dimensional space (McCune and Grace 2002).

**Table D.55: Pearson Correlations for Non-Metric Multidimensional Scaling (NMDS) Axis Scores, using Three Years (2014, 2015, 2016) of Zooplankton Community Data from the Upstream and Downstream Areas of the Elk River with Relative Zooplankton Taxon Density**

| Taxa | 4th Root Transformation | | | | Non-transformed | | | |
|---|---|---|---|---|---|---|---|---|
| | NMDS-1 (91.7%) | | NMDS-2 (6.9%) | | NMDS-1 (90.7%) | | NMDS-2 [a] | |
| | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value |
| Calanoid nauplii | -0.916 | 0.000 | -0.050 | 0.794 | 0.740 | 0.000 | - | - |
| Calanoid copepodids | -0.890 | 0.000 | -0.157 | 0.408 | 0.709 | 0.000 | - | - |
| Cyclopoid nauplii | -0.880 | 0.000 | -0.337 | 0.069 | 0.774 | 0.000 | - | - |
| Cyclopoid copepodids | -0.899 | 0.000 | -0.035 | 0.853 | 0.781 | 0.000 | - | - |
| *Diaptomus sicilis* | 0.182 | 0.336 | 0.502 | 0.005 | 0.087 | 0.647 | - | - |
| *Diaptomus oregonensis* | -0.910 | 0.000 | -0.165 | 0.385 | 0.711 | 0.000 | - | - |
| *Epischura lacustris* | 0.048 | 0.802 | 0.606 | 0.000 | 0.084 | 0.657 | - | - |
| *Cyclops bicuspidatus* | -0.961 | 0.000 | 0.077 | 0.685 | 0.893 | 0.000 | - | - |
| *Daphnia galeata* | -0.791 | 0.000 | 0.272 | 0.146 | 0.523 | 0.003 | - | - |
| *Bosmina longirostris* | 0.251 | 0.182 | 0.530 | 0.003 | 0.046 | 0.811 | - | - |
| *Diaphanosoma birgei* | -0.155 | 0.414 | -0.752 | 0.000 | 0.316 | 0.089 | - | - |
| *Leptadora kindtii* | -0.658 | 0.000 | -0.578 | 0.001 | 0.589 | 0.001 | - | - |
| *Keratella* sp. | -0.927 | 0.000 | 0.121 | 0.524 | 0.793 | 0.000 | - | - |
| *Kellicottia longispina* | -0.666 | 0.000 | 0.635 | 0.000 | 0.414 | 0.023 | - | - |
| *Polyarthra remata* | 0.366 | 0.047 | -0.758 | 0.000 | -0.439 | 0.015 | - | - |
| *Polyarthra vulgaris* | -0.803 | 0.000 | -0.490 | 0.006 | 0.703 | 0.000 | - | - |
| *Gastropus stylifer* | -0.781 | 0.000 | -0.369 | 0.045 | 0.670 | 0.000 | - | - |
| *Keratella crassa* | -0.690 | 0.000 | -0.613 | 0.000 | 0.589 | 0.001 | - | - |
| *Ascomorpha ovalis* | -0.871 | 0.000 | -0.301 | 0.106 | 0.698 | 0.000 | - | - |
| *Collotheca* sp. | -0.954 | 0.000 | -0.110 | 0.562 | 0.880 | 0.000 | - | - |
| *Synchaeta* sp. | -0.293 | 0.116 | -0.828 | 0.000 | 0.468 | 0.009 | - | - |

🟧 Pearson correlation coefficients greater than an absolute value of 0.5.

▨ Pearson correlation with p-value less than 0.05.

[a] A one dimensional (axis) solution was obtained because a two dimensional solution did not reduce stress by at least 5 units, which indicates that an additional axis does little to improve the monotonic relationship between the original dimensional space and the reduced dimensional space (McCune and Grace 2002).

# APPENDIX E

# BENTHIC INVERTEBRATE DATA

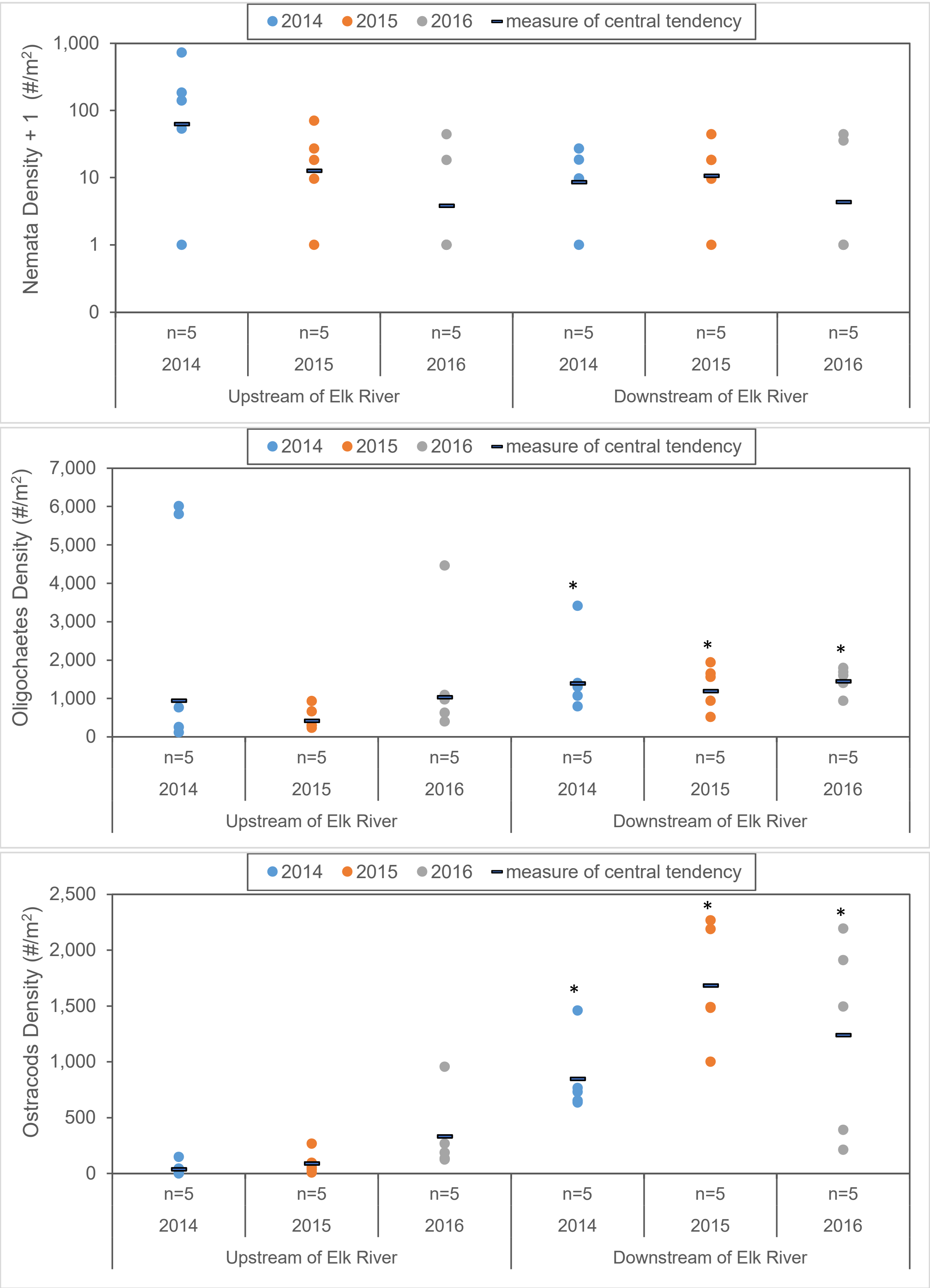

**Figure E.1:** **Nemata, Oligochaetes, Ostracods, Chironomids, and Bivalve Molluscs Density (No. of Organisms/m$^2$) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016

' * ' indicates the downstream area was significantly different from the upstream area in the same year.

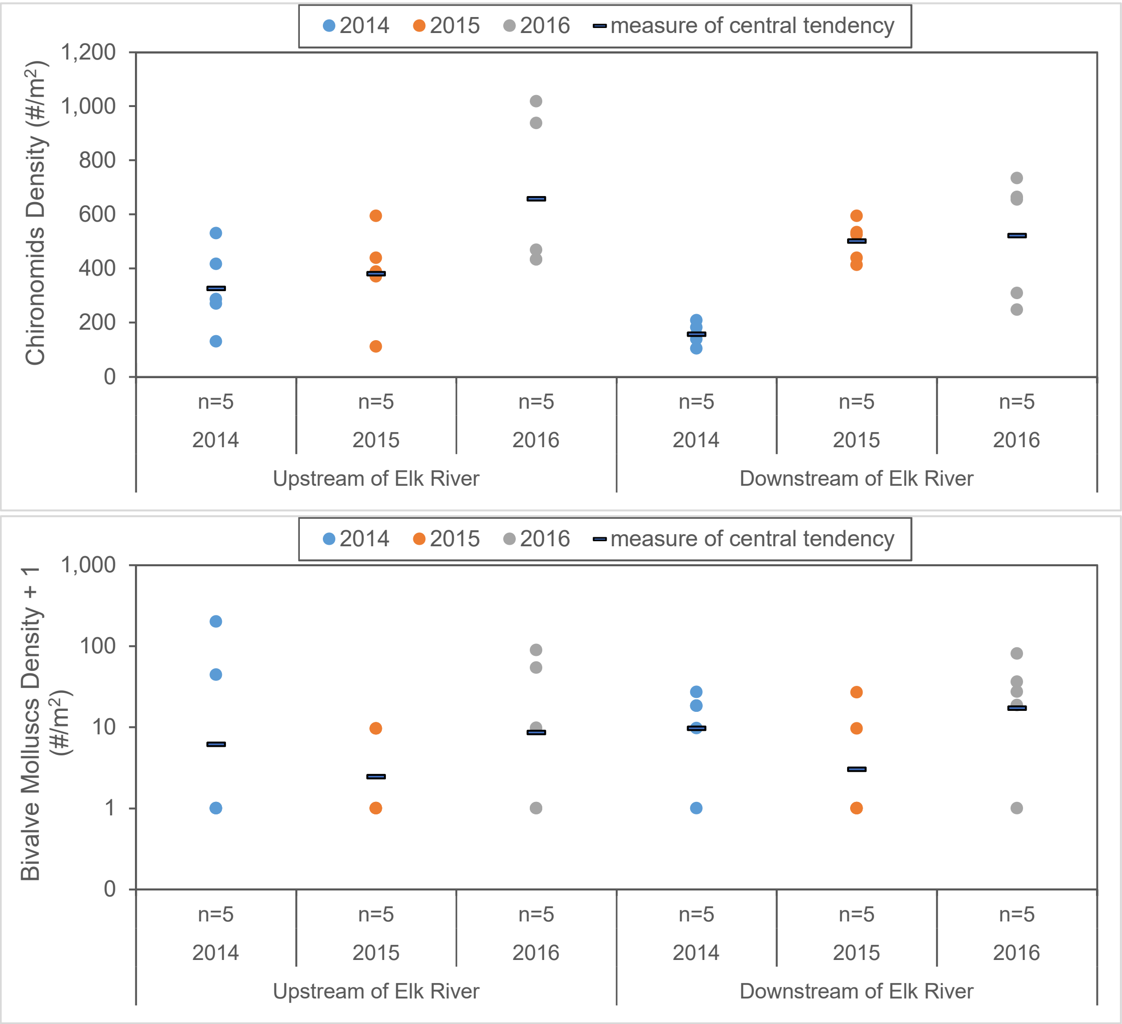

**Figure E.1:** **Nemata, Oligochaetes, Ostracods, Chironomids, and Bivalve Molluscs Density (No. of Organisms/m$^2$) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

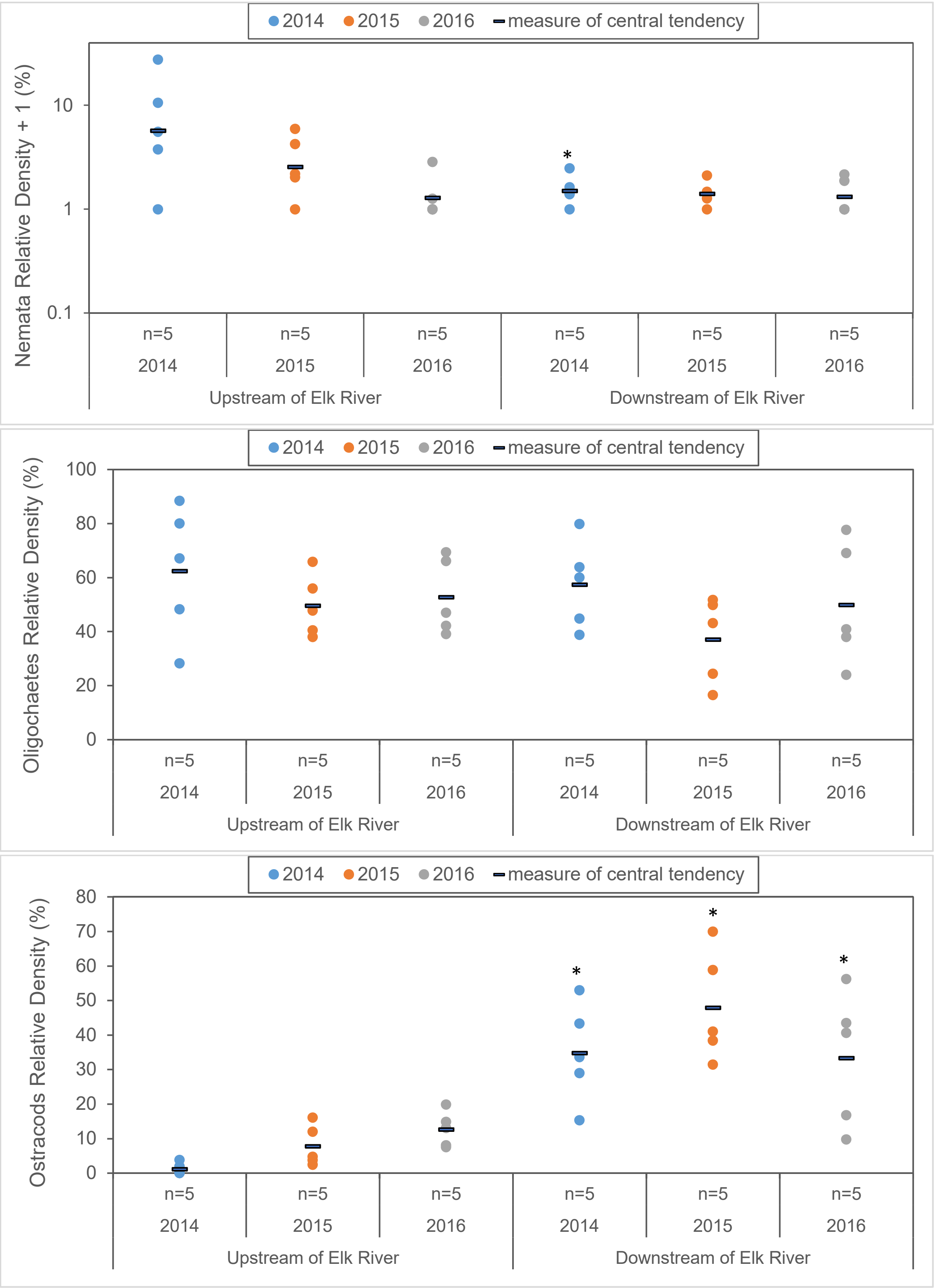

**Figure E.2:** **Nemata, Oligochaetes, Ostracods, Chironomids, and Bivalve Molluscs Relative Density (%) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

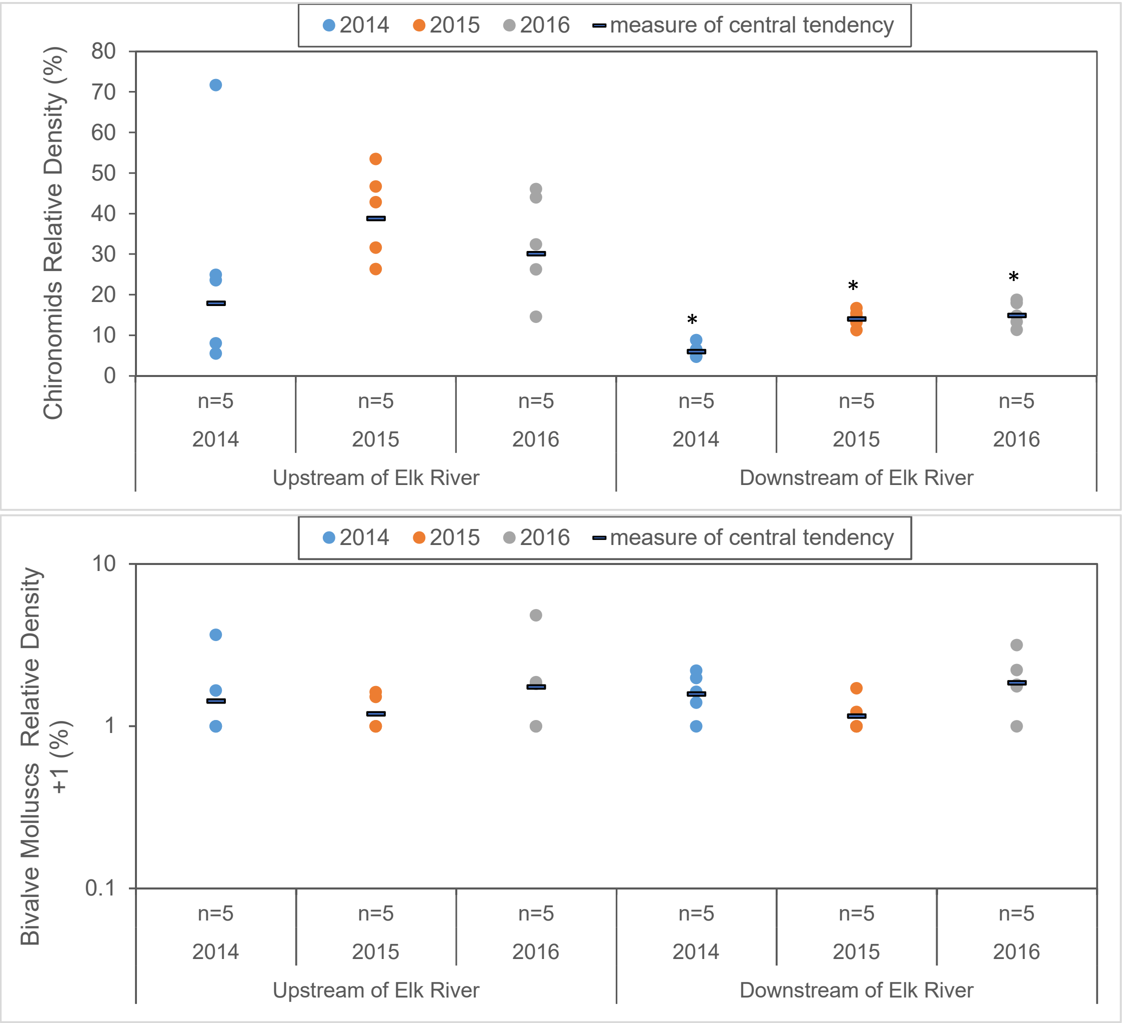

**Figure E.2:** **Nemata, Oligochaetes, Ostracods, Chironomids, and Bivalve Molluscs Relative Density (%) in Koocanusa Reservoir, August 2014 to 2016**

Notes: The upstream location was relocated further upstream from the mouth of the Elk River in August 2015 and 2016
' * ' indicates the downstream area was significantly different from the upstream area in the same year.

## Table E.1: Benthic Sampling Locations in Koocanusa Reservoir, August 2014

| Station Identifier | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Average Ponar Fullness | Sample Texture | Macrophytes in Sample | Algae in Sample | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | % Fullness | | | | |
| Upstream of Elk River | T2-2 | 629650 | 5450400 | 30.1 | 25% | 100% sand and finer | sparce organic matter | No | mostly clay, hard packed on bottom |
| | T2-3 | 629417 | 5450394 | 19.2 | 33% | 100% sand and finer | minimal organic matter | No | hard packed clay with minimal material on top |
| | T2-4 | 629235 | 5450445 | 19.5 | 33% | 100% sand and finer | minimal organic matter | No | - |
| | T2-5 | 629059 | 5450389 | 20.0 | 75% | 100% sand and finer, more organics than T2-2-4 | some dead organic matter | No | - |
| | T2-6 | 628883 | 5450370 | 18.3 | 100% | 100% sand and finer | dead organic matter common | No | - |
| Downstream of Elk River | T4-2 | 630076 | 5441806 | 27.8 | 100% | 100% sand and finer | No | No | - |
| | T4-3 | 629798 | 5441984 | 27.4 | 100% | 100% sand and finer | No | No | - |
| | T4-4 | 629703 | 5441675 | 26.4 | 100% | 100% sand and finer | No | No | - |
| | T4-5 | 629487 | 5441751 | 25.8 | 100% | 100% sand and finer | No | No | - |
| | T4-6 | 629403 | 5441477 | 30.5 | 100% | 100% sand and finer | No | No | - |

**Table E.2:** **Benthic Sampling Locations in Koocanusa Reservoir, August 2015**

| Station Identifier | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Average Ponar Fullness (%) | Sample Texture | Macrophytes in Sample | Algae in Sample |
|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | |
| Upstream of Elk River | TN-1 | 627377 | 5453471 | 13.5 | 75% | 90% sand and finer, 10% organics | No | No |
| | TN-2 | 627270 | 5453644 | 12.4 | 75% | 90% sand and finer, 10% organics | No | No |
| | TN-3 | 627341 | 5453711 | 13.2 | 100% | 90% sand and finer, 10% organics | No | No |
| | TN-4 | 627329 | 5453862 | 12.9 | 75% | 90% sand and finer, 10% organics | No | No |
| | TN-5 | 627211 | 5453978 | 13.4 | 100% | 90% sand and finer, 10% organics | No | No |
| Downstream of Elk River | T4-2 | 630082 | 5441810 | 24.2 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-3 | 629825 | 5442010 | 22.8 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-4 | 629715 | 5441648 | 22.7 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-5 | 629500 | 5441738 | 22.2 | 100% | 90% sand and finer, 10% organics | No | No |
| | T4-6 | 629511 | 5441551 | 23.2 | 100% | 90% sand and finer, 10% organics | No | No |

## Table E.3: Benthic Sampling Locations in Koocanusa Reservoir, August 2016

| Station Identifier | | UTM (NAD 83, Zone 11U) | | Station Depth (m) | Average Ponar Fullness (%) | Sample Texture | Macrophytes in Sample | Algae in Sample |
|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | |
| Upstream of Elk River | TN-1 | 627369 | 5453492 | 15 | 50% | 100% sand and finer, minimal organics | No | Sparse |
| | TN-2 | 627256 | 5453672 | 14 | 75% - 100% | 100% sand and finer, minimal organics | No | Sparse |
| | TN-3 | 627367 | 5453710 | 15 | 75% - 100% | 100% sand and finer, 10% organics | No | Sparse |
| | TN-4 | 627333 | 5453882 | 15 | 75% - 100% | 100% sand and finer, minimal organics | No | Sparse |
| | TN-5 | 627200 | 5454005 | 15 | 75% - 100% | 100% sand and finer, minimal organics | No | Sparse |
| Downstream of Elk River | T4-2 | 630115 | 5441812 | 24 | 100% | 100% sand and finer | No | No |
| | T4-3 | 629831 | 5442006 | 25 | 100% | 100% sand and finer | No | No |
| | T4-4 | 629695 | 5441699 | 25 | 100% | 100% sand and finer | No | No |
| | T4-5 | 629494 | 5441783 | 24 | 100% | 100% sand and finer, minimal organics | No | Sparse |
| | T4-6 | 629430 | 5441547 | 25 | 100% | 100% sand and finer | No | No |

**Table E.4: Taxonomic Level and Primary Taxonomic References used by ZEAS Inc. for Identification of Benthic Macroinvertebrates**

| TAXON | LEVEL | REFERENCE |
|---|---|---|
| **FLATWORMS** | class/family/species | Pennak 1989 |
| **NEMATODES/** | phylum | Pennak 1989 |
| **NEMERTEANS** | phylum | Pennak 1989 |
| Hydra | genus | Pennak 1989 |
| **ANNELIDS** | | |
| Oligochaeta/Polychaete | species | Wetzel et al. 2000; Kathman and Brinkhurst 1999; Brinkhurst 1986 |
| Leeches | species | Klemm 1991 |
| **ARTHROPODS** | | |
| Mites | Genus/family/order | Pennak 1989; Thorp and Covich 1991 |
| Crustaceans | | Pennak 1989; Thorp and Covich 1991 |
| Isopods | genus | |
| Harpacticoids | order | |
| Ostracods | class | |
| Crayfish | species | Crocker & Barr 1968; Thorp and Covich 1991 |
| Amphipods | Genus/species | Bousfield 1967; Thorp and Covich 1991 |
| *Gammarus* | species | Holsinger 1976; Bousfield 1967 |
| *Hyalella* | genus | Bousfield 1967 |
| **INSECTS** | genus | Merritt et al. 2008; Hilsenhoff 1995 |
| Beetles | genus | Merritt et al. 2008; Archangelsky 1997 |
| *Elmidae* | species | Hilsenhoff & Schmude 1992; Brown 1972 |
| *Dytiscidae* | genus/species | Larson et al. 2000 |
| Caddisflies | genus | Wiggins 1996; Merritt et al. 2008 |
| Hydropsyche | species | Schefter & Wiggins 1986; Schuster & Etnier 1978 |
| Dragonflies/damselflies | genus/species | Needham et al. 2014; Walker & Corbet 1978; Westfall & May 1996; Walker 1953, 1958; Hilsenhoff 1995 |
| Mayflies | genus | Edmunds et al. 1976; Merrit et al. 2008 |
| Baetidae | genus/species | McCafferty 2000; McCafferty & Waltz 1990; Waltz 1994; Ide 1937 |
| | | McCafferty & Waltz 1990; Morihara & McCafferty 1979 |
| *Ephemerella* | species | Allen & Edwards 1965 |
| Ephemeridae | species | McCafferty 1976 |
| *Eurylophella* | species | Allen & Edmunds 1963 |
| *Stenonema* | species | Bednarik & McCafferty 1979 |
| Stoneflies | genus | Merrit et al. 2008; Stewart & Stark 2002, 1988 |
| *Isoperla* | species | Hitchcock 1974 |
| Leuctridae | species | Harper & Hynes 1971a |
| Nemouridae | species | Harper & Hynes 1971b |
| Perlidae | species | Hitchcock 1974 |
| Taeniopterygidae | species | Fullington & Stewart 1980; Harper & Hynes 1971c |
| True Flies | genus | Andersen et al. 2013; Merritt et al. 2008; Hilsenhoff 1995 |
| Chironomidae | genus/species | Epler 2001, Maschwitz and Cook. 2000; Oliver and Dillon 1990; Oliver and Roussel 1983; Simpson et al. 1983; Wiederholm 1983; Simpson and Adler et al., 2004; Bode 1980;Jackson 1976 |
| Simuliidae | family/genus | Merritt et al. 2008 |
| **MOLLUSCS** | | |
| Snails | genus/species | Frest and Johannes 1999; Jokinen 1992; Clarke 1981; Burch 1989 |
| Clams *Cyclocalyx* | genus | Clarke 1981 |
| *Sphaerium* | species | Clarke 1981; Mackie and Huggins 1983;Lee and Foighil 2003. |

## Table E.4: Taxonomic Level and Primary Taxonomic References used by ZEAS Inc. for Identification of Benthic Macroinvertebrates

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## Table E.4: Taxonomic Level and Primary Taxonomic References used by ZEAS Inc. for Identification of Benthic Macroinvertebrates

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## Table E.5: Benthic Invertebrate (LPL) Density (No. of Organisms per m$^2$) in Koocanusa Reservoir, August 2014

| Organism | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Nematodes | P. Nemata | 0 | 139 | 52 | 722 | 183 | 17 | 26 | 8.7 | 8.7 | 0 |
| Oligochaetes | S.F. Naidinae | | | | | | | | | | |
| | *Dero digitata* | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Uncinais uncinata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 0 |
| | S.F. Tubificinae | | | | | | | | | | |
| | *Aulodrilus limnobius* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 61 | 0 |
| | *Limnodrilus hoffmeisteri* | 8.7 | 8.7 | 113 | 748 | 965 | 87 | 0 | 61 | 61 | 426 |
| | *Limnodrilus udekemianus* | 0 | 8.7 | 78 | 252 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Tubifex tubifex* | 0 | 17 | 0 | 1,504 | 583 | 130 | 43 | 0 | 0 | 0 |
| | immatures with hair chaetae[a] | 52 | 174 | 461 | 1,252 | 2,704 | 765 | 626 | 983 | 974 | 1,991 |
| | immatures without hair chaetae[a] | 35 | 43 | 113 | 2,252 | 1548 | 87 | 122 | 200 | 243 | 991 |
| Ostracods | Cl. Ostracoda | 0 | 0 | 43 | 148 | 0 | 1,461 | 765 | 730 | 635 | 652 |
| Insects | F. Ceratopogonidae | 0 | 0 | 9.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | F. Chironomidae | | | | | | | | | | |
| | Chironomid pupae[b] | 0 | 0 | 0 | 0 | **8.7** | 0 | 0 | 0 | **8.7** | 0 |
| | S.F. Chironominae | | | | | | | | | | |
| | *Chironomus* | 78 | 0 | 52 | 87 | 183 | 26 | 26 | 17 | 8.7 | 35 |
| | *Harnischia* | 8.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Phaenopsectra* | 8.7 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Tanytarsus* | 26 | 0 | 0 | 26 | 0 | 17 | 0 | 0 | 8.7 | 8.7 |
| | S.F. Diamesinae | | | | | | | | | | |
| | *Protanypus* | 0 | 0 | 0 | 0 | 0 | 8.7 | 0 | 0 | 0 | 0 |
| | S.F. Prodiamesinae | | | | | | | | | | |
| | *Monodiamesa* | 8.7 | 8.7 | 0 | 0 | 17 | 0 | 8.7 | 0 | 0 | 8.7 |
| | S.F. Tanypodinae | | | | | | | | | | |
| | *Procladius* | 157 | 122 | 217 | 287 | 322 | 130 | 122 | 87 | 113 | 157 |
| Bivalve Mollusc | F. Sphaeriidae | | | | | | | | | | |
| | *Cyclocalyx* | 0 | 0 | 0 | 52 | 26 | 0 | 8.7 | 26 | 8.7 | 0 |
| | *Cyclocalyx/Neopisidium* | 0 | 0 | 0 | 148 | 17 | 17 | 8.7 | 0 | 0 | 0 |
| Other | Cl. Turbellaria | 0 | 0 | 0 | 8.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cl. Arachnida | 0 | 0 | 0 | 0 | 0 | 9.0 | 9.0 | 0 | 0 | 0 |
| **Total Number of Organisms** | | **400** | **522** | **1,139** | **7,504** | **6,557** | **2,757** | **1,766** | **2,174** | **2,191** | **4,270** |
| **Total Number of Taxa** | | **10** | **8** | **9** | **14** | **10** | **12** | **11** | **9** | **11** | **8** |

[a] Immature Tubificinae were combined for data analyses

[b] Bold entries excluded from taxon count

**Table E.6:** **Benthic Invertebrate (LPL) Density (No. of Organisms per m$^2$) in Koocanusa Reservoir, August 2015**

| Organism | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Nematodes | P. Nemata | 68.97 | - | 26 | 8.6 | 17 | 8.6 | 43 | 17 | - | 17 |
| Oligochaetes | S.F. Naidinae | | | | | | | | | | |
| | *Dero digitata* | - | - | - | - | 17 | - | - | - | - | - |
| | S.F. Tubificinae | | | | | | | | | | |
| | *Limnodrilus hoffmeisteri* | - | - | - | - | - | - | - | - | 146.6 | 163.8 |
| | *Limnodrilus udekemianus* | 43 | 60 | 78 | 34 | 43 | - | - | - | - | - |
| | immatures with hair chaetae[a] | 603.4 | 155.2 | 181 | 198.3 | 594.8 | 258.6 | 629.3 | 870.7 | 1,276 | 1,052 |
| | immatures without hair chaetae[a] | 17 | 17 | 43 | 60 | 276 | 258.6 | 310.3 | 689.7 | 224.1 | 724.1 |
| Ostracods | F. Candonidae | | | | | | | | | | |
| | *Candona* | 17 | - | 60 | 8.6 | 52 | - | 26 | 8.6 | - | 60 |
| | F. Cyprididae | | | | | | | | | | |
| | *Isocypris* | 34 | 8.6 | 17 | 8.6 | 155 | - | - | - | - | - |
| | F. Cytherideidae | | | | | | | | | | |
| | *Cytherissa lacustris* | - | - | 8.6 | 8.6 | 8.6 | 2,190 | 2,241 | 1,474 | 1,000 | 1,431 |
| | F. Limnocytheridae | | | | | | | | | | |
| | *Limnocythere* | - | - | 8.6 | 8.6 | 52 | - | - | - | - | - |
| Insects | F. Chironomidae | | | | | | | | | | |
| | chironomid pupae[b] | - | - | - | - | **17** | - | - | **17** | **17** | **17** |
| | S.F. Chironominae | | | | | | | | | | |
| | *Chironomus* | - | 8.6 | 17 | 8.6 | - | 34 | 103 | 52 | 26 | 17 |
| | *Harnischia* | 26 | 17 | 17 | 17 | 8.6 | - | 8.6 | - | 17 | 17 |
| | *Phaenopsectra* | - | - | - | - | - | - | 26 | - | - | - |
| | *Tanytarsus* | 8.6 | - | 34 | 17 | 8.6 | 26 | 78 | 103 | 147 | 164 |
| | S.F. Diamesinae | | | | | | | | | | |
| | *Protanypus* | - | - | - | - | - | - | - | 8.6 | - | - |
| | S.F. Orthocladiinae | | | | | | | | | | |
| | *Heterotrissocladius* | - | - | 8.6 | 17 | 17 | 78 | 26 | 17 | 17 | 26 |
| | S.F. Tanypodinae | | | | | | | | | | |
| | *Procladius* | 560 | 86 | 293 | 328 | 388 | 276 | 353 | 328 | 310 | 198 |
| Bivalve Molluscs | F. Sphaeriidae | | | | | | | | | | |
| | *Cyclocalyx* | 8.6 | - | - | - | 8.6 | - | 8.6 | 8.6 | - | - |
| | *Cyclocalyx/Neopisidium* | - | - | - | - | - | - | - | 17 | - | - |
| **Total Number of Organisms** | | **1,388** | **353** | **793** | **724** | **1,664** | **3,129** | **3,853** | **3,612** | **3,181** | **3,888** |
| **Total Number of Taxa** | | **10** | **7** | **13** | **13** | **14** | **8** | **12** | **12** | **9** | **11** |

[a] Immature Tubificinae were combined for data analyses

[b] Bold entries excluded from taxon count

## Table E.7: Benthic Invertebrate (LPL) Density (No. of Organisms per m$^2$) in Koocanusa Reservoir, August 2016

| Organism | | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **TN-1** | **TN-2** | **TN-3** | **TN-4** | **TN-5** | **T4-2** | **T4-3** | **T4-4** | **T4-5** | **T4-6** |
| Nematodes | P. Nemata | 0 | 0 | 43 | 0 | 17 | 43 | 34 | 0 | 0 | 0 |
| Oligochaetes | S.F. Tubificinae | | | | | | | | | | |
| | *Aulodrilus limnobius* | 53 | 0 | 97 | 0 | 0 | 0 | 0 | 88 | 80 | 0 |
| | *Limnodrilus hoffmeisteri* | 0 | 0 | 53 | 0 | 442 | 142 | 0 | 0 | 0 | 336 |
| | *Limnodrilus udekemianus* | 53 | 248 | 150 | 62 | 221 | 0 | 0 | 0 | 0 | 0 |
| | Tubifex tubifex | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | immatures with hair chaetae | 876 | 345 | 531 | 319 | 3,124 | 628 | 796 | 770 | 1,204 | 504 |
| | immatures without hair chae | 106 | 0 | 142 | 18 | 673 | 628 | 142 | 938 | 319 | 850 |
| Ostracods | F. Candonidae | | | | | | | | | | |
| | *Candona* | 88 | 195 | 115 | 106 | 690 | 177 | 53 | 177 | 106 | 27 |
| | F. Cyprididae | | | | | | | | | | |
| | *Isocypris* | 18 | 71 | 27 | 27 | 124 | 8.8 | 8.8 | 0 | 0 | 18 |
| | F. Cytherideidae | | | | | | | | | | |
| | *Cytherissa lacustris* | 18 | 0 | 44 | 0 | 142 | 1,310 | 2,133 | 1,735 | 283 | 168 |
| Insects | F. Chironomidae | | | | | | | | | | |
| | chironomid pupae[b] | **8.8** | **8.8** | **35** | **0** | **18** | **44** | **44** | **62** | **8.8** | **8.8** |
| | S.F. Chironominae | | | | | | | | | | |
| | *Chironomus* | 53 | 18 | 451 | 168 | 460 | 124 | 35 | 62 | 18 | 124 |
| | *Cryptotendipes* | 27 | 0 | 0 | 8.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| | *Harnischia* | 18 | 35 | 18 | 18 | 0 | 18 | 0 | 62 | 18 | 0 |
| | *Phaenopsectra* | 0 | 0 | 44 | 0 | 0 | 8.8 | 0 | 8.8 | 0 | 0 |
| | *Tanytarsus* | 71 | 18 | 133 | 0 | 124 | 88 | 44 | 80 | 18 | 35 |
| | S.F. Diamesinae | | | | | | | | | | |
| | *Protanypus* | 0 | 8.8 | 0 | 0 | 0 | 0 | 8.8 | 0 | 0 | 8.8 |
| | S.F. Orthocladiinae | | | | | | | | | | |
| | *Heterotrissocladius* | 0 | 0 | 18 | 0 | 0 | 195 | 274 | 283 | 71 | 18 |
| | S.F. Prodiamesinae | | | | | | | | | | |
| | *Monodiamesa* | 8.8 | 8.8 | 0 | 8.8 | 0 | 8.8 | 8.8 | 0 | 0 | 0 |
| | S.F. Tanypodinae | | | | | | | | | | |
| | *Procladius* | 248 | 336 | 319 | 265 | 336 | 177 | 319 | 97 | 177 | 53 |
| Bivalve Molluscs | F. Sphaeriidae | | | | | | | | | | |
| | *Cyclocalyx* | 0 | 0 | 88 | 8.8 | 0 | 80 | 0 | 8.8 | 0 | 0 |
| | *Cyclocalyx/Neopisidium* | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 27 | 18 | 27 |
| Arachnida | F. Lebertiidae | | | | | | | | | | |
| | *Lebertia* | 0 | 8.8 | 0 | 8.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Number of Organisms** | | **1,646** | **1,327** | **2,309** | **1,009** | **6,424** | **3,680** | **3,902** | **4,398** | **2,319** | **2,177** |
| **Total Number of Taxa** | | **13** | **11** | **16** | **11** | **12** | **15** | **12** | **13** | **11** | **12** |

[a] Immature Tubificinae were combined for data analyses

[b] Bold entries excluded from taxon count

**Table E.8:** Densities (No. of Organisms per m$^2$) of Major Benthic Invertebrate Groups, August 2014

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Nematodes | 0 | 139 | 52 | 722 | 183 | 17 | 26 | 9 | 9 | 0 |
| Oligochaetes | 113 | 252 | 765 | 6,009 | 5,800 | 1,070 | 791 | 1,304 | 1,400 | 3,409 |
| Ostracods | 0 | 0 | 43 | 148 | 0 | 1,461 | 765 | 730 | 635 | 652 |
| Insects | 287 | 130 | 279 | 417 | 530 | 183 | 157 | 104 | 139 | 209 |
| Bivalve Molluscs | 0 | 0 | 0 | 200 | 43 | 17 | 17 | 26 | 9 | 0 |
| Other (Flatworms, Arachnids) | 0 | 0 | 0 | 9 | 0 | 9 | 9 | 0 | 0 | 0 |
| **Total Number of Organisms** | **400** | **522** | **1,139** | **7,504** | **6,557** | **2,757** | **1,766** | **2,174** | **2,191** | **4,270** |
| **Total Number of Groups** | **2** | **3** | **4** | **6** | **4** | **6** | **6** | **5** | **5** | **3** |

**Table E.9:** Densities (No. of Organisms per m$^2$) of Major Benthic Invertebrate Community Groups, August 2015

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Nematodes | 69 | 0 | 26 | 9 | 17 | 9 | 43 | 17 | 0 | 17 |
| Oligochaetes | 664 | 233 | 302 | 293 | 931 | 517 | 940 | 1,560 | 1,647 | 1,940 |
| Ostracods | 52 | 9 | 95 | 34 | 267 | 2,190 | 2,267 | 1,483 | 1,000 | 1,491 |
| Insects | 595 | 112 | 371 | 388 | 440 | 414 | 595 | 526 | 534 | 440 |
| Bivalve Molluscs | 9 | 0 | 0 | 0 | 9 | 0 | 9 | 26 | 0 | 0 |
| **Total Number of Organisms** | **1,388** | **353** | **793** | **724** | **1,664** | **3,129** | **3,853** | **3,612** | **3,181** | **3,888** |
| **Total Number of Groups** | **5** | **3** | **4** | **4** | **5** | **4** | **5** | **5** | **3** | **4** |

## Table E.10: Densities (No. of Organisms per m$^2$) of Major Benthic Invertebrate Groups, August 2016

| Group | Upstream of Elk River | | | | | Downstream of Elk River | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 |
| Nematodes | 0 | 0 | 43 | 0 | 17 | 43 | 34 | 0 | 0 | 0 |
| Oligochaetes | 1,088 | 628 | 973 | 398 | 4,460 | 1,398 | 938 | 1,796 | 1,602 | 1,690 |
| Ostracods | 124 | 265 | 186 | 133 | 956 | 1,496 | 2,195 | 1,912 | 389 | 212 |
| Insects | 434 | 434 | 1,018 | 469 | 938 | 664 | 735 | 655 | 310 | 248 |
| Bivalve Molluscs | 0 | 0 | 88 | 9 | 53 | 80 | 0 | 35 | 18 | 27 |
| Arachnida | 0 | 8.8 | 0 | 8.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Number of Organisms** | **1,646** | **1,327** | **2,309** | **1,009** | **6,424** | **3,680** | **3,902** | **4,398** | **2,319** | **2,177** |
| **Total Number of Groups** | **3** | **3** | **5** | **4** | **5** | **5** | **4** | **4** | **4** | **4** |

## Table E.11: Relative Densities (%) of Benthic Invertebrates (LPL), August 2014

| | Organism | Upstream of Elk River | | | | | Downstream of Elk River | | | | | Summary Statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Minimum | | Median | | Maximum | | Mean | | SD | |
| | | T2-2 | T2-3 | T2-4 | T2-5 | T2-6 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 |
| Nematodes | **P. Nemata** | 0 | 27 | 4.6 | 10 | 2.8 | 0.63 | 1.5 | 0.40 | 0.40 | 0 | 0 | 0 | 27 | 1.5 | 27 | 1.5 | 8.7 | 0.58 | 11 | 0.55 |
| Oligochaetes | *Dero digitata* | 4.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.3 | 0 | 4.3 | 0 | 0.87 | 0 | 1.9 | 0 |
| | *Uncinais uncinata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.8 | 0 | 0 | 0 | 0 | 2.8 | 0 | 2.8 | 0 | 0.56 | 0 | 1.2 |
| | *Aulodrilus limnobius* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.8 | 2.8 | 0 | 0 | 0 | 0 | 2.8 | 0 | 2.8 | 0 | 1.1 | 0 | 1.5 |
| | ***Limnodrilus hoffmeisteri*** | 2.2 | 1.7 | 10 | 10 | 15 | 3.2 | 0 | 2.8 | 2.8 | 10 | 1.7 | 0 | 15 | 10.0 | 15 | 10.0 | 7.7 | 3.7 | 5.6 | 3.7 |
| | ***Limnodrilus udekemianus*** | 0 | 1.7 | 6.9 | 3.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.9 | 0 | 6.9 | 0 | 2.4 | 0 | 2.9 | 0 |
| | ***Tubifex tubifex*** | 0 | 3.3 | 0 | 20 | 8.9 | 4.7 | 2.5 | 0 | 0 | 0 | 0 | 0 | 20 | 4.7 | 20 | 4.7 | 6.5 | 1.4 | 8.4 | 2.1 |
| | **immatures with hair chaetae** | 13 | 33 | 40 | 17 | 41 | 28 | 35 | 45 | 44 | 47 | 13 | 28 | 41 | 47 | 41 | 47 | 29 | 40 | 13 | 8.1 |
| | **immatures without hair chaetae** | 8.7 | 8.3 | 9.9 | 30 | 24 | 3.2 | 6.9 | 9.2 | 11 | 23 | 8.3 | 3.2 | 30 | 23 | 30 | 23 | 16 | 11 | 10 | 7.6 |
| Ostracods | Cl. Ostracoda | 0 | 0 | 3.8 | 2.0 | 0 | 53 | 43 | 34 | 29 | 15 | 0 | 15 | 3.8 | 53 | 3.8 | 53 | 1.2 | 35 | 1.7 | 14 |
| Insects | F. Ceratopogonidae | 0 | 0 | 0.79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.79 | 0 | 0.79 | 0 | 0.16 | 0 | 0.35 | 0 |
| | Chironomid pupae | 0 | 0 | 0 | 0 | 0.13 | 0 | 0 | 0 | 0.40 | 0 | 0 | 0 | 0.13 | 0.40 | 0.13 | 0.40 | 0.027 | 0.079 | 0.059 | 0.18 |
| | ***Chironomus*** | 20 | 0 | 4.6 | 1.2 | 2.8 | 0.95 | 1.5 | 0.80 | 0 | 0.81 | 0 | 0.40 | 20 | 1.5 | 20 | 1.5 | 5.6 | 0.89 | 8.0 | 0.39 |
| | *Harnischia* | 2.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 | 0 | 2.2 | 0 | 0.43 | 0 | 0.97 | 0 |
| | *Phaenopsectra* | 2.2 | 0 | 0 | 0.23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 | 0 | 2.2 | 0 | 0.48 | 0 | 0.95 | 0 |
| | *Tanytarsus* | 6.5 | 0 | 0 | 0.35 | 0 | 0.63 | 0 | 0 | 0.40 | 0.20 | 0 | 0 | 6.5 | 0.63 | 6.5 | 0.63 | 1.4 | 0.25 | 2.9 | 0.27 |
| | *Protanypus* | 0 | 0 | 0 | 0 | 0 | 0.32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.32 | 0 | 0.32 | 0 | 0.063 | 0 | 0.14 |
| | *Monodiamesa* | 2.2 | 1.7 | 0 | 0 | 0.27 | 0 | 0.49 | 0 | 0 | 0.20 | 0 | 0 | 2.2 | 0.49 | 2.2 | 0.49 | 0.82 | 0.14 | 1.0 | 0.22 |
| | ***Procladius*** | 39 | 23 | 19 | 3.8 | 4.9 | 4.7 | 6.9 | 4.0 | 5.2 | 3.7 | 3.8 | 3.7 | 39 | 6.9 | 39 | 6.9 | 18 | 4.9 | 15 | 1.3 |
| Bivalve Molluscs | *Cyclocalyx* | 0 | 0 | 0 | 0.70 | 0.40 | 0 | 0.49 | 1.2 | 0.40 | 0 | 0 | 0 | 0.70 | 1.2 | 0.70 | 1.2 | 0.22 | 0.42 | 0.32 | 0.49 |
| | *Cyclocalyx/Neopisidium* | 0 | 0 | 0 | 2.0 | 0.27 | 0.63 | 0.49 | 0 | 0 | 0 | 0 | 0 | 2.0 | 0.63 | 2.0 | 0.63 | 0.45 | 0.22 | 0.86 | 0.31 |
| Other | Cl. Turbellaria | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0 | 0.12 | 0 | 0.023 | 0 | 0.052 | 0 |
| | Cl. Arachnida | 0 | 0 | 0 | 0 | 0 | 0.33 | 0.51 | 0 | 0 | 0 | 0 | 0 | 0 | 0.51 | 0 | 0.51 | 0 | 0.17 | 0 | 0.24 |

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of organisms at one or more stations within an area (as shown in Figure 6.3).

**Table E.12: Relative Densities (%) of Benthic Invertebrates (LPL), August 2015**

| Organism | | Upstream of Elk River | | | | | Downstream of Elk River | | | | | Summary Statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Minimum | | Median | | Maximum | | Mean | | SD | |
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 |
| Nematodes | **P. Nemata** | 5.0 | 0 | 3.3 | 1.2 | 1.0 | 0.28 | 1.1 | 0.48 | 0 | 0.44 | 0 | 0 | 5.0 | 1.1 | 5.0 | 1.1 | 2.1 | 0.46 | 2.0 | 0.41 |
| Oligochaetes | S.F. Naidinae | | | | | | | | | | | | | | | | | | | | |
| | *Dero digitata* | 0 | 0 | 0 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.0 | 0 | 1.0 | 0 | 0.21 | 0 | 0.46 | 0 |
| | S.F. Tubificinae | | | | | | | | | | | | | | | | | | | | |
| | *Limnodrilus hoffmeisteri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.6 | 4.2 | 0 | 0 | 0 | 4.6 | 0 | 4.6 | 0 | 1.8 | 0 | 2.4 |
| | ***Limnodrilus udekemianus*** | 3.1 | 17 | 9.8 | 4.8 | 2.6 | 0 | 0 | 0 | 0 | 0 | 2.6 | 0 | 17 | 0 | 17 | 0 | 7.5 | 0 | 6.1 | 0 |
| | **immatures with hair chaetae**[a] | 43 | 44 | 23 | 27 | 36 | 8.3 | 16 | 24 | 40 | 27 | 23 | 8.3 | 44 | 40 | 44 | 40 | 35 | 23 | 9.5 | 12 |
| | **immatures without hair chaetae**[a] | 1.2 | 4.9 | 5.4 | 8.3 | 17 | 8.3 | 8.1 | 19 | 7.0 | 19 | 1.2 | 7.0 | 17 | 19 | 17 | 19 | 7.3 | 12 | 5.8 | 6.1 |
| Ostracods | F. Candonidae | | | | | | | | | | | | | | | | | | | | |
| | ***Candona*** | 1.2 | 0 | 7.6 | 1.2 | 3.1 | 0 | 0.67 | 0.24 | 0 | 1.6 | 0 | 0 | 7.6 | 1.6 | 7.6 | 1.6 | 2.6 | 0.49 | 3.0 | 0.65 |
| | F. Cyprididae | | | | | | | | | | | | | | | | | | | | |
| | ***Isocypris*** | 2.5 | 2.4 | 2.2 | 1.2 | 9.3 | 0 | 0 | 0 | 0 | 0 | 1.2 | 0 | 9.3 | 0 | 9.3 | 0 | 3.5 | 0 | 3.3 | 0 |
| | F. Cytherideidae | | | | | | | | | | | | | | | | | | | | |
| | ***Cytherissa lacustris*** | 0 | 0 | 1.1 | 1.2 | 0.52 | 70 | 58 | 41 | 31 | 37 | 0 | 31 | 1.2 | 70 | 1.2 | 70 | 0.56 | 47 | 0.57 | 16 |
| | F. Limnocytheridae | | | | | | | | | | | | | | | | | | | | |
| | *Limnocythere* | 0 | 0 | 1.1 | 1.2 | 3.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.1 | 0 | 3.1 | 0 | 1.1 | 0 | 1.3 | 0 |
| Insects | F. Chironomidae | | | | | | | | | | | | | | | | | | | | |
| | chironomid pupae | 0 | 0 | 0 | 0 | 1.0 | 0 | 0 | 0.48 | 0.54 | 0.44 | 0 | 0 | 1.0 | 0.54 | 1.0 | 0.54 | 0.21 | 0.29 | 0.46 | 0.27 |
| | S.F. Chironominae | | | | | | | | | | | | | | | | | | | | |
| | *Chironomus* | 0 | 2.4 | 2.2 | 1.2 | 0 | 1.1 | 2.7 | 1.4 | 0.81 | 0.44 | 0 | 0.44 | 2.4 | 2.7 | 2.4 | 2.7 | 1.2 | 1.3 | 1.2 | 0.86 |
| | *Harnischia* | 1.9 | 4.9 | 2.2 | 2.4 | 0.52 | 0 | 0.22 | 0 | 0.54 | 0.44 | 0.52 | 0 | 4.9 | 0.54 | 4.9 | 0.54 | 2.4 | 0.24 | 1.6 | 0.25 |
| | *Phaenopsectra* | 0 | 0 | 0 | 0 | 0 | 0 | 0.67 | 0 | 0 | 0 | 0 | 0 | 0 | 0.67 | 0 | 0.67 | 0 | 0.13 | 0 | 0.30 |
| | *Tanytarsus* | 0.62 | 0 | 4.3 | 2.4 | 0.52 | 0.83 | 2.0 | 2.9 | 4.6 | 4.2 | 0 | 0.83 | 4.3 | 4.6 | 4.3 | 4.6 | 1.6 | 2.9 | 1.8 | 1.6 |
| | S.F. Diamesinae | | | | | | | | | | | | | | | | | | | | |
| | *Protanypus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.24 | 0 | 0 | 0 | 0 | 0 | 0.24 | 0 | 0.24 | 0 | 0.048 | 0 | 0.11 |
| | S.F. Orthocladiinae | | | | | | | | | | | | | | | | | | | | |
| | *Heterotrissocladius* | 0 | 0 | 1.1 | 2.4 | 1.0 | 2.5 | 0.67 | 0.48 | 0.54 | 0.67 | 0 | 0.48 | 2.4 | 2.5 | 2.4 | 2.5 | 0.90 | 0.97 | 0.98 | 0.85 |
| | S.F. Tanypodinae | | | | | | | | | | | | | | | | | | | | |
| | ***Procladius*** | 40 | 24 | 37 | 45 | 23 | 8.8 | 9.2 | 9.1 | 9.8 | 5.1 | 23 | 5.1 | 45 | 9.8 | 45 | 9.8 | 34 | 8.4 | 9.8 | 1.9 |
| Bivalve Molluscs | F. Sphaeriidae | | | | | | | | | | | | | | | | | | | | |
| | *Cyclocalyx* | 0.62 | 0 | 0 | 0 | 0.52 | 0 | 0.22 | 0.24 | 0 | 0 | 0 | 0 | 0.62 | 0.24 | 0.62 | 0.24 | 0.23 | 0.092 | 0.31 | 0.13 |
| | *Cyclocalyx/Neopisidium* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.48 | 0 | 0 | 0 | 0 | 0 | 0.48 | 0 | 0.48 | 0 | 0.095 | 0 | 0.21 |

[a] Immature Tubificinae were combined for data analyses

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of organisms at one or more stations within an area (as shown in Figure 6.3).

**Table E.13:** **Relative Densities (%) of Benthic Invertebrates (LPL), August 2016**

| Organism | | Upstream of Elk River | | | | | Downstream of Elk River | | | | | Summary Statistics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Minimum | | Median | | Maximum | | Mean | | SD | |
| | | TN-1 | TN-2 | TN-3 | TN-4 | TN-5 | T4-2 | T4-3 | T4-4 | T4-5 | T4-6 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 | T2 | T4 |
| Nematodes | P. Nemata | 0 | 0 | 1.9 | 0 | 0.27 | 1.2 | 0.88 | 0 | 0 | 0 | 0 | 0 | 1.9 | 1.2 | 1.9 | 1.2 | 0.43 | 0.41 | 0.81 | 0.57 |
| Oligochaetes | S.F. Tubificinae | | | | | | | | | | | | | | | | | | | | |
| | *Aulodrilus limnobius* | 3.2 | 0 | 4.2 | 0 | 0 | 0 | 0 | 2.0 | 3.4 | 0 | 0 | 0 | 4.2 | 3.4 | 4.2 | 3.4 | 1.5 | 1.1 | 2.1 | 1.6 |
| | ***Limnodrilus hoffmeisteri*** | 0 | 0 | 2.3 | 0 | 6.9 | 3.8 | 0 | 0 | 0 | 15 | 0 | 0 | 6.9 | 15 | 6.9 | 15 | 1.8 | 3.9 | 3.0 | 6.7 |
| | ***Limnodrilus udekemianus*** | 3.2 | 19 | 6.5 | 6.1 | 3.4 | 0 | 0 | 0 | 0 | 0 | 3.2 | 0 | 19 | 0 | 19 | 0 | 7.6 | 0 | 6.4 | 0 |
| | Tubifex tubifex | 0 | 2.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 | 0 | 2.7 | 0 | 0.53 | 0 | 1.2 | 0 |
| | **immatures with hair chaetae** | 53 | 26 | 23 | 32 | 49 | 17 | 20 | 18 | 52 | 23 | 23 | 17 | 53 | 52 | 53 | 52 | 36 | 26 | 14 | 15 |
| | **immatures without hair chaetae** | 6.5 | 0 | 6.1 | 1.8 | 10 | 17 | 3.6 | 21 | 14 | 39 | 0 | 3.6 | 10 | 39 | 10 | 39 | 5.0 | 19 | 4.1 | 13 |
| Ostracods | F. Candonidae | | | | | | | | | | | | | | | | | | | | |
| | ***Candona*** | 5.4 | 15 | 5.0 | 11 | 11 | 4.8 | 1.4 | 4.0 | 4.6 | 1.2 | 5.0 | 1.2 | 15 | 4.8 | 15 | 4.8 | 9.3 | 3.2 | 4.1 | 1.8 |
| | F. Cyprididae | | | | | | | | | | | | | | | | | | | | |
| | ***Isocypris*** | 1.1 | 5.3 | 1.1 | 2.6 | 1.9 | 0.24 | 0.23 | 0 | 0 | 0.81 | 1.1 | 0 | 5.3 | 0.81 | 5.3 | 0.81 | 2.4 | 0.26 | 1.7 | 0.33 |
| | F. Cytherideidae | | | | | | | | | | | | | | | | | | | | |
| | ***Cytherissa lacustris*** | 1.1 | 0 | 1.9 | 0 | 2.2 | 36 | 55 | 39 | 12 | 7.7 | 0 | 7.7 | 2.2 | 55 | 2.2 | 55 | 1.0 | 30 | 1.0 | 20 |
| Insects | F. Chironomidae | | | | | | | | | | | | | | | | | | | | |
| | chironomid pupae | 0.54 | 0.67 | 1.5 | 0 | 0.28 | 1.2 | 1.1 | 1.4 | 0.38 | 0.41 | 0 | 0.38 | 1.5 | 1.4 | 1.5 | 1.4 | 0.60 | 0.91 | 0.58 | 0.48 |
| | S.F. Chironominae | | | | | | | | | | | | | | | | | | | | |
| | ***Chironomus*** | 3.2 | 1.3 | 20 | 17 | 7.2 | 3.4 | 0.91 | 1.4 | 0.76 | 5.7 | 1.3 | 0.76 | 20 | 5.7 | 20 | 5.7 | 9.6 | 2.4 | 8.1 | 2.1 |
| | *Cryptotendipes* | 1.6 | 0 | 0 | 0.88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.6 | 0 | 1.6 | 0 | 0.50 | 0 | 0.73 | 0 |
| | *Harnischia* | 1.1 | 2.7 | 0.77 | 1.8 | 0 | 0.48 | 0 | 1.4 | 0.76 | 0 | 0 | 0 | 2.7 | 1.4 | 2.7 | 1.4 | 1.3 | 0.53 | 1.0 | 0.59 |
| | *Phaenopsectra* | 0 | 0 | 1.9 | 0 | 0 | 0.24 | 0 | 0.20 | 0 | 0 | 0 | 0 | 1.9 | 0.24 | 1.9 | 0.24 | 0.38 | 0.088 | 0.86 | 0.12 |
| | ***Tanytarsus*** | 4.3 | 1.3 | 5.7 | 0 | 1.9 | 2.4 | 1.1 | 1.8 | 0.76 | 1.6 | 0 | 0.76 | 5.7 | 2.4 | 5.7 | 2.4 | 2.7 | 1.5 | 2.3 | 0.63 |
| | S.F. Diamesinae | | | | | | | | | | | | | | | | | | | | |
| | *Protanypus* | 0 | 0.67 | 0 | 0 | 0 | 0 | 0.23 | 0 | 0 | 0.41 | 0 | 0 | 0.67 | 0.41 | 0.67 | 0.41 | 0.13 | 0.13 | 0.30 | 0.18 |
| | S.F. Orthocladiinae | | | | | | | | | | | | | | | | | | | | |
| | *Heterotrissocladius* | 0 | 0 | 0.77 | 0 | 0 | 5.3 | 7.0 | 6.4 | 3.1 | 0.81 | 0 | 0.81 | 0.77 | 7.0 | 0.77 | 7.0 | 0.15 | 4.53 | 0.34 | 2.6 |
| | S.F. Prodiamesinae | | | | | | | | | | | | | | | | | | | | |
| | *Monodiamesa* | 0.54 | 0.67 | 0 | 0.88 | 0 | 0.24 | 0.23 | 0 | 0 | 0 | 0 | 0 | 0.88 | 0.24 | 0.88 | 0.24 | 0.42 | 0.09 | 0.40 | 0.13 |
| | S.F. Tanypodinae | | | | | | | | | | | | | | | | | | | | |
| | ***Procladius*** | 15 | 25 | 14 | 26 | 5.2 | 4.8 | 8.2 | 2.2 | 7.6 | 2.4 | 5.2 | 2.2 | 26 | 8.2 | 26 | 8.2 | 17 | 5.1 | 8.8 | 2.8 |
| Bivalve Molluscs | F. Sphaeriidae | | | | | | | | | | | | | | | | | | | | |
| | *Cyclocalyx* | 0 | 0 | 3.8 | 0.88 | 0 | 2.2 | 0 | 0.20 | 0 | 0 | 0 | 0 | 3.8 | 2.2 | 3.8 | 2.2 | 0.94 | 0.47 | 1.7 | 0.95 |
| | *Cyclocalyx/Neopisidium* | 0 | 0 | 0 | 0 | 0.83 | 0 | 0 | 0.60 | 0.76 | 1.2 | 0 | 0 | 0.83 | 1.2 | 0.83 | 1.2 | 0.17 | 0.52 | 0.37 | 0.52 |
| Arachnida | F. Lebertiidae | | | | | | | | | | | | | | | | | | | | |
| | *Lebertia* | 0 | 0.67 | 0 | 0.88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.88 | 0 | 0.88 | 0 | 0.31 | 0 | 0.43 | 0 |

[a] Immature Tubificinae were combined for data analyses

Note: Summary statistics were provided to determine taxa (bolded) that comprise at least 5% of the total number of organisms at one or more stations within an area (as shown in Figure 6.3).

## Table E.14: Descriptive Statistics for Benthic Invertebrate Communities Sampled in Koocanusa Reservoir, August 2014

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of organisms/$m^2$) | | T2 | 5 | 400 | 1,139 | 7,504 | 3,224 | 3,502 |
| | | T4 | 5 | 1,766 | 2,191 | 4,270 | 2,631 | 981 |
| Richness (no. of taxa) | | T2 | 5 | 8.0 | 10 | 14 | 10 | 2.3 |
| | | T4 | 5 | 8.0 | 11 | 12 | 10 | 1.6 |
| Major Group Density (no. of organisms/$m^2$) | Nematodes | T2 | 5 | 0 | 139 | 722 | 219 | 290 |
| | | T4 | 5 | 0 | 8.7 | 26 | 12 | 9.9 |
| | Oligochaetes | T2 | 5 | 113 | 765 | 6,009 | 2,588 | 3,038 |
| | | T4 | 5 | 791 | 1,304 | 3,409 | 1,595 | 1,041 |
| | Ostracods | T2 | 5 | 0 | 0 | 148 | 38 | 64 |
| | | T4 | 5 | 635 | 730 | 1,461 | 849 | 346 |
| | Chironomids | T2 | 5 | 130 | 287 | 530 | 327 | 153 |
| | | T4 | 5 | 104 | 157 | 209 | 158 | 40 |
| | Bivalve Molluscs | T2 | 5 | 0 | 0 | 200 | 49 | 87 |
| | | T4 | 5 | 0 | 17 | 26 | 14 | 9.9 |
| Major Group Relative Density (%) | Nematodes | T2 | 5 | 0 | 4.6 | 27 | 8.7 | 11 |
| | | T4 | 5 | 0 | 0.40 | 1.5 | 0.58 | 0.55 |
| | Oligochaetes | T2 | 5 | 28 | 67 | 89 | 63 | 24 |
| | | T4 | 5 | 39 | 60 | 80 | 58 | 16 |
| | Ostracods | T2 | 5 | 0 | 0 | 3.8 | 1.2 | 1.7 |
| | | T4 | 5 | 15 | 34 | 53 | 35 | 14 |
| | Chironomids | T2 | 5 | 5.6 | 24 | 72 | 27 | 27 |
| | | T4 | 5 | 4.8 | 6.4 | 8.9 | 6.3 | 1.7 |
| | Bivalve Molluscs | T2 | 5 | 0 | 0 | 2.7 | 0.67 | 1.2 |
| | | T4 | 5 | 0 | 0.63 | 1.2 | 0.64 | 0.48 |

**Table E.15:** Descriptive Statistics for Benthic Invertebrate Communities Sampled in Koocanusa Reservoir, August 2015

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of organisms/$m^2$) | | TN | 5 | 353 | 793 | 1,664 | 984 | 531 |
| | | T4 | 5 | 3,129 | 3,612 | 3,888 | 3,533 | 361 |
| Richness (no. of taxa) | | TN | 5 | 7.0 | 13 | 14 | 11 | 2.9 |
| | | T4 | 5 | 8.0 | 11 | 12 | 10 | 1.8 |
| Major Group Density (no. of organisms/$m^2$) | Nematodes | TN | 5 | 0 | 17 | 69 | 24 | 27 |
| | | T4 | 5 | 0 | 17 | 43 | 17 | 16 |
| | Oligochaetes | TN | 5 | 233 | 302 | 931 | 484 | 302 |
| | | T4 | 5 | 517 | 1,560 | 1,940 | 1,321 | 578 |
| | Ostracods | TN | 5 | 8.6 | 52 | 267 | 91 | 103 |
| | | T4 | 5 | 1,000 | 1,491 | 2,267 | 1,686 | 534 |
| | Chironomids | TN | 5 | 112 | 388 | 595 | 381 | 174 |
| | | T4 | 5 | 414 | 526 | 595 | 502 | 74 |
| | Bivalve Molluscs | TN | 5 | 0 | 0 | 8.6 | 3.5 | 4.7 |
| | | T4 | 5 | 0 | 0 | 26 | 6.9 | 11 |
| Major Group Relative Density (%) | Nematodes | TN | 5 | 0 | 1.2 | 5.0 | 2.1 | 2.0 |
| | | T4 | 5 | 0 | 0.44 | 1.1 | 0.46 | 0.41 |
| | Oligochaetes | TN | 5 | 38 | 48 | 66 | 50 | 12 |
| | | T4 | 5 | 17 | 43 | 52 | 37 | 16 |
| | Ostracods | TN | 5 | 2.4 | 4.8 | 16 | 7.8 | 5.9 |
| | | T4 | 5 | 31 | 41 | 70 | 48 | 16 |
| | Chironomids | TN | 5 | 26 | 43 | 54 | 40 | 11 |
| | | T4 | 5 | 11 | 15 | 17 | 14 | 2.1 |
| | Bivalve Molluscs | TN | 5 | 0 | 0 | 0.62 | 0.23 | 0.31 |
| | | T4 | 5 | 0 | 0 | 0.72 | 0.19 | 0.31 |

**Table E.16:** **Descriptive Statistics for Benthic Invertebrate Communities Sampled in Koocanusa Reservoir, August 2016**

| Endpoint | | Area | Summary Statistics | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | n | Minimum | Median | Maximum | Mean | SD |
| Density (no. of organisms/$m^2$) | | TN | 5 | 1,018 | 1,646 | 6,424 | 2,547 | 2,220 |
| | | T4 | 5 | 2,177 | 3,680 | 4,398 | 3,295 | 992 |
| Richness (no. of taxa) | | TN | 5 | 12 | 12 | 16 | 13 | 1.7 |
| | | T4 | 5 | 11 | 12 | 15 | 13 | 1.5 |
| Major Group Density (no. of organisms/$m^2$) | Nematodes | TN | 5 | 0 | 0 | 43 | 12 | 19 |
| | | T4 | 5 | 0 | 0 | 43 | 16 | 22 |
| | Oligochaetes | TN | 5 | 398 | 973 | 4,460 | 1,510 | 1,672 |
| | | T4 | 5 | 938 | 1,602 | 1,796 | 1,485 | 339 |
| | Ostracods | TN | 5 | 124 | 186 | 956 | 333 | 353 |
| | | T4 | 5 | 212 | 1,496 | 2,195 | 1,241 | 895 |
| | Chironomids | TN | 5 | 434 | 469 | 1,018 | 658 | 293 |
| | | T4 | 5 | 248 | 655 | 735 | 522 | 225 |
| | Bivalve Molluscs | TN | 5 | 0 | 8.9 | 89 | 30 | 39 |
| | | T4 | 5 | 0 | 27 | 80 | 32 | 30 |
| Major Group Relative Density (%) | Nematodes | TN | 5 | 0 | 0 | 1.9 | 0.43 | 0.81 |
| | | T4 | 5 | 0 | 0 | 1.2 | 0.41 | 0.57 |
| | Oligochaetes | TN | 5 | 39 | 47 | 69 | 53 | 14 |
| | | T4 | 5 | 24 | 41 | 78 | 50 | 23 |
| | Ostracods | TN | 5 | 7.5 | 13 | 20 | 13 | 5.1 |
| | | T4 | 5 | 10 | 41 | 56 | 33 | 19 |
| | Chironomids | TN | 5 | 15 | 33 | 46 | 33 | 13 |
| | | T4 | 5 | 11 | 15 | 19 | 15 | 3.1 |
| | Bivalve Molluscs | TN | 5 | 0 | 0.83 | 3.8 | 1.1 | 1.6 |
| | | T4 | 5 | 0 | 0.81 | 2.2 | 0.99 | 0.79 |

### Table E.17: Mean Skewness and Kurtosis Values of Benthic Invertebrate (LPL) Density Matrix by Transformation, 2014 to 2016 (n = 30)

| Transformation | Endpoint | Skewness (mean) | Kurtosis (mean) |
|---|---|---|---|
| None | Area\Row | 2.607 | 6.738 |
| | Taxa\Col | 2.181 | 5.796 |
| Log$_{10}$ | Area\Row | 0.485 | -0.859 |
| | Taxa\Col | 0.334 | 0.053 |
| Square root | Area\Row | 1.885 | 3.297 |
| | Taxa\Col | 1.208 | 1.473 |
| Fourth root | Area\Row | 0.790 | -0.055 |
| | Taxa\Col | 0.472 | 0.004 |
| Power 2 | Area\Row | 3.019 | 9.179 |
| | Taxa\Col | 3.210 | 11.981 |
| Power 4 | Area\Row | 3.019 | 9.179 |
| | Taxa\Col | 3.210 | 11.981 |

▒ - mean skewness and kurtosis values closest to zero.

**Table E.18:** **Non-Metric Multidimensional Scaling (NMDS) Results for Benthic Invertebrate Community Data (LPL) Displaying Percent Variance Explained by Each Axis, Monte Carlo Randomization p-values of Axis Significance, and Axis Scores, 2014 to 2016**

| Year | Area | | Log$_{10}$ Transformation | | 4th Root Transformation | | Non-Transformed | |
|---|---|---|---|---|---|---|---|---|
| | | | NMDS-1 | NMDS-2 | NMDS-1 | NMDS-2 | NMDS-1 | NMDS-2 |
| 2014 | Upstream of Elk River | T2-2 | -0.41 | -1.62 | 0.92 | 1.45 | -1.80 | 0.80 |
| | | T2-3 | -2.09 | 0.45 | 1.92 | -0.96 | -1.75 | -0.19 |
| | | T2-4 | -0.85 | 0.32 | 0.77 | -0.48 | -0.54 | 0.10 |
| | | T2-5 | 0.15 | 1.01 | -0.37 | -0.96 | 1.25 | 1.11 |
| | | T2-6 | -0.98 | 1.26 | 0.56 | -1.50 | 1.16 | 1.14 |
| | Downstream of Elk River | T4-2 | 0.20 | 0.47 | -0.38 | -0.39 | 0.42 | -0.46 |
| | | T4-3 | -0.44 | 0.49 | 0.25 | -0.59 | -0.01 | -0.42 |
| | | T4-4 | -0.16 | 0.68 | -0.03 | -0.68 | 0.36 | -0.09 |
| | | T4-5 | -0.11 | 0.41 | -0.07 | -0.37 | 0.32 | -0.05 |
| | | T4-6 | -0.11 | -0.17 | 0.05 | 0.05 | 0.97 | 0.38 |
| 2015 | Upstream of Elk River | TN-1 | -0.50 | 0.11 | 0.44 | -0.15 | -0.71 | -0.22 |
| | | TN-2 | -1.11 | -1.09 | 1.33 | 0.83 | -1.85 | 0.15 |
| | | TN-3 | 0.04 | -0.41 | 0.13 | 0.48 | -1.11 | 0.02 |
| | | TN-4 | -0.03 | -0.56 | 0.22 | 0.59 | -1.25 | 0.00 |
| | | TN-5 | 0.11 | 0.04 | -0.06 | 0.03 | -0.23 | -0.04 |
| | Downstream of Elk River | T4-2 | 0.53 | -0.09 | -0.56 | 0.28 | 0.31 | -1.00 |
| | | T4-3 | 0.55 | 0.19 | -0.56 | 0.04 | 0.45 | -0.71 |
| | | T4-4 | 0.55 | 0.35 | -0.61 | -0.20 | 0.57 | -0.27 |
| | | T4-5 | 0.49 | -0.50 | -0.41 | 0.58 | 0.51 | -0.08 |
| | | T4-6 | 0.44 | -0.25 | -0.47 | 0.34 | 0.76 | -0.23 |
| 2016 | Upstream of Elk River | TN-1 | -0.11 | -0.68 | 0.29 | 0.54 | -0.17 | 0.15 |
| | | TN-2 | -0.09 | -0.78 | 0.34 | 0.70 | -0.49 | -0.14 |
| | | TN-3 | 0.59 | 0.23 | -0.51 | -0.04 | -0.11 | 0.35 |
| | | TN-4 | -0.73 | -0.41 | 0.84 | 0.27 | -0.87 | 0.29 |
| | | TN-5 | 0.31 | 0.69 | -0.49 | -0.66 | 1.17 | 0.41 |
| | Downstream of Elk River | T4-2 | 0.73 | 0.15 | -0.72 | -0.02 | 0.61 | -0.34 |
| | | T4-3 | 0.66 | -0.08 | -0.63 | 0.22 | 0.48 | -0.75 |
| | | T4-4 | 1.04 | -0.15 | -0.99 | 0.34 | 0.89 | -0.44 |
| | | T4-5 | 0.45 | -0.36 | -0.30 | 0.43 | 0.30 | 0.16 |
| | | T4-6 | 0.87 | 0.33 | -0.88 | -0.17 | 0.37 | 0.36 |
| **Final Stress** | | | **13.05** | | **12.95** | | **7.37** | |
| **% Variance explained** | | | **50.3** | **28.2** | **53.0** | **25.6** | **76.5** | **15.9** |
| **Monte Carlo p-value** | | | **0.004** | **0.008** | **0.008** | **0.004** | **0.004** | **0.004** |

**Table E.19: Pearson Correlations of Non-Metric Multidimensional Scaling (NMDS) Axis Scores, using Three Years (2014 to 2016) of Benthic Invertebrate Community Data from the Upstream and Downstream Areas of the Elk River with Relative Benthic Invertebrate Taxon Density**

| Taxa | | $Log_{10}$ Transformation | | | | 4th Root Transformation | | | | Non-transformed | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NMDS-1 (50.3%) | | NMDS-2 (28.2%) | | NMDS-1 (53.0%) | | NMDS-2 (25.6%) | | NMDS-1 (76.5%) | | NMDS-2 (15.9%) | |
| | | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value | Pearson r-value | Pearson p-value |
| Nematodes | Nemata | -0.177 | 0.350 | 0.710 | 0.000 | -0.003 | 0.989 | -0.711 | 0.000 | 0.250 | 0.182 | 0.471 | 0.009 |
| Oligochaetes | Oligocheata | 0.393 | 0.032 | 0.663 | 0.000 | -0.499 | 0.005 | -0.581 | 0.001 | 0.719 | 0.000 | 0.592 | 0.001 |
| Ostracods | Ostracoda | 0.778 | 0.000 | 0.159 | 0.400 | -0.811 | 0.000 | 0.048 | 0.801 | 0.536 | 0.002 | -0.719 | 0.000 |
| Insects | Chironomus sp. | 0.403 | 0.027 | 0.151 | 0.425 | -0.402 | 0.028 | -0.077 | 0.684 | 0.270 | 0.150 | 0.364 | 0.048 |
| | Harnischia sp. | 0.172 | 0.364 | -0.646 | 0.000 | 0.017 | 0.929 | 0.685 | 0.000 | -0.138 | 0.468 | -0.147 | 0.438 |
| | Phaenopsectra sp. | 0.330 | 0.075 | 0.036 | 0.851 | -0.288 | 0.123 | 0.070 | 0.713 | 0.104 | 0.585 | 0.122 | 0.522 |
| | Tanytarsus sp. | 0.811 | 0.000 | -0.171 | 0.366 | -0.733 | 0.000 | 0.363 | 0.049 | 0.402 | 0.028 | -0.131 | 0.491 |
| | Protanypus sp. | 0.295 | 0.113 | 0.042 | 0.826 | -0.290 | 0.121 | 0.025 | 0.896 | 0.137 | 0.472 | -0.234 | 0.213 |
| | Heterotrissocladius sp. | 0.721 | 0.000 | -0.108 | 0.570 | -0.661 | 0.000 | 0.296 | 0.112 | 0.287 | 0.125 | -0.445 | 0.014 |
| | Monodiamesa sp. | -0.393 | 0.032 | -0.122 | 0.522 | 0.406 | 0.026 | -0.015 | 0.938 | -0.050 | 0.794 | 0.259 | 0.166 |
| | Procladius sp. | 0.082 | 0.668 | 0.009 | 0.962 | -0.074 | 0.696 | 0.029 | 0.878 | 0.031 | 0.873 | -0.021 | 0.911 |
| Bivalve Molluscs | Sphaeriidae | 0.318 | 0.086 | 0.664 | 0.000 | -0.442 | 0.015 | -0.561 | 0.001 | 0.444 | 0.014 | 0.457 | 0.011 |
| Other | Arachnida | -0.155 | 0.414 | -0.038 | 0.843 | 0.153 | 0.419 | -0.002 | 0.990 | -0.105 | 0.582 | -0.149 | 0.432 |

🟧- Pearson correlation coefficients greater than an absolute value of 0.5.

▨- Pearson correlation with p-value less than 0.05.

# APPENDIX F
# FISH DATA

Angling

Burbot Trap

Gill Net

Hoop Net

Minnow Trap

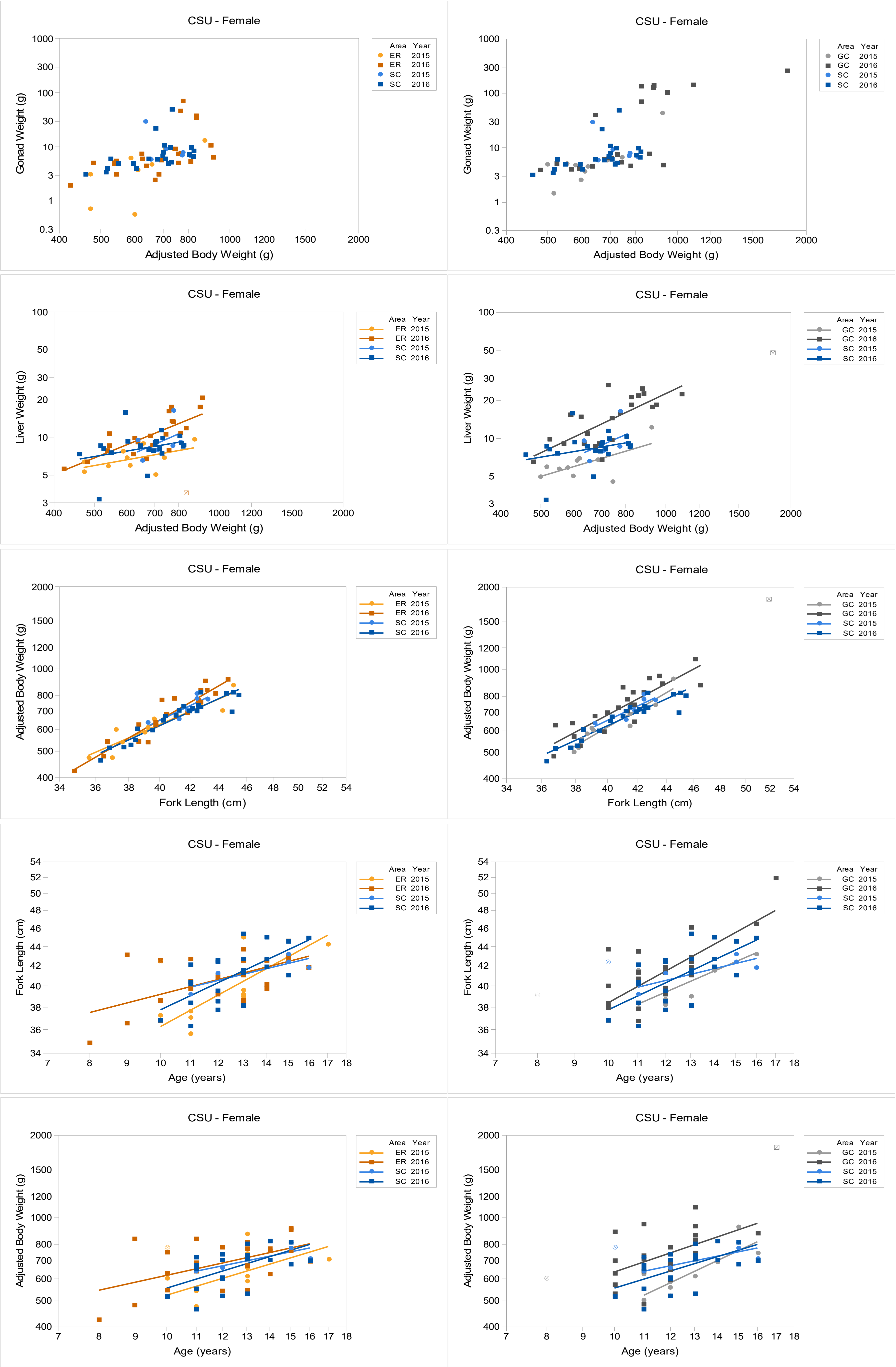

**Figure F.1: Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2015 and 2016 for Female Largescale Sucker (CSU)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons.

Statistical analyses were not conducted for relative gonad weight because few fish had developping gonads (the majority of fish had GSI < 1%; see Appendix Figure F.11).

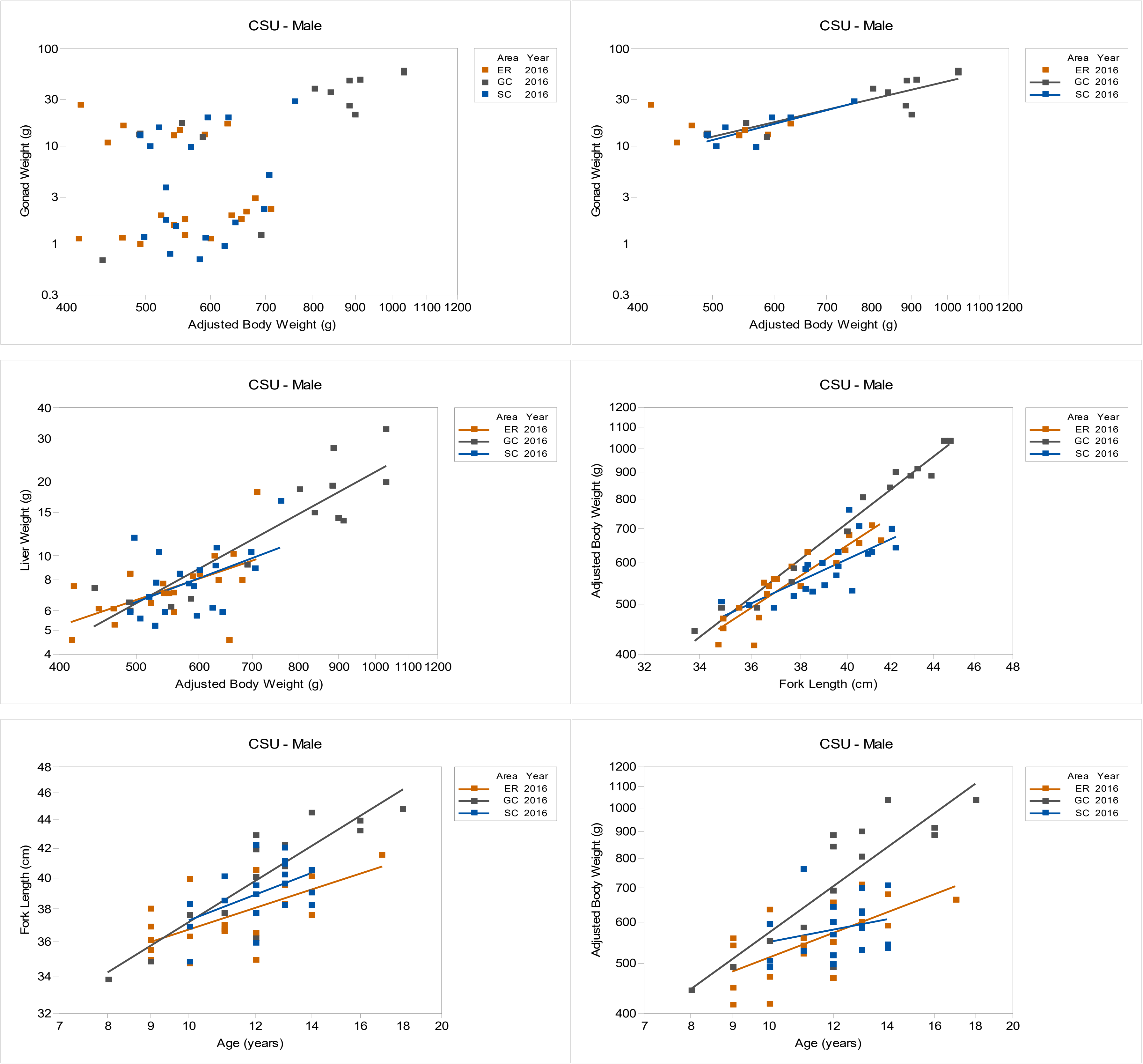

**Figure F.2: Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2016 for Male Largescale Sucker (CSU)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons.

Statistical analyses were conducted for relative gonad weight using on fish with developping gonads (the majority of fish had GSI < 1%) using ANOVA for ER vs SC and ANCOVA for GC vs SC.

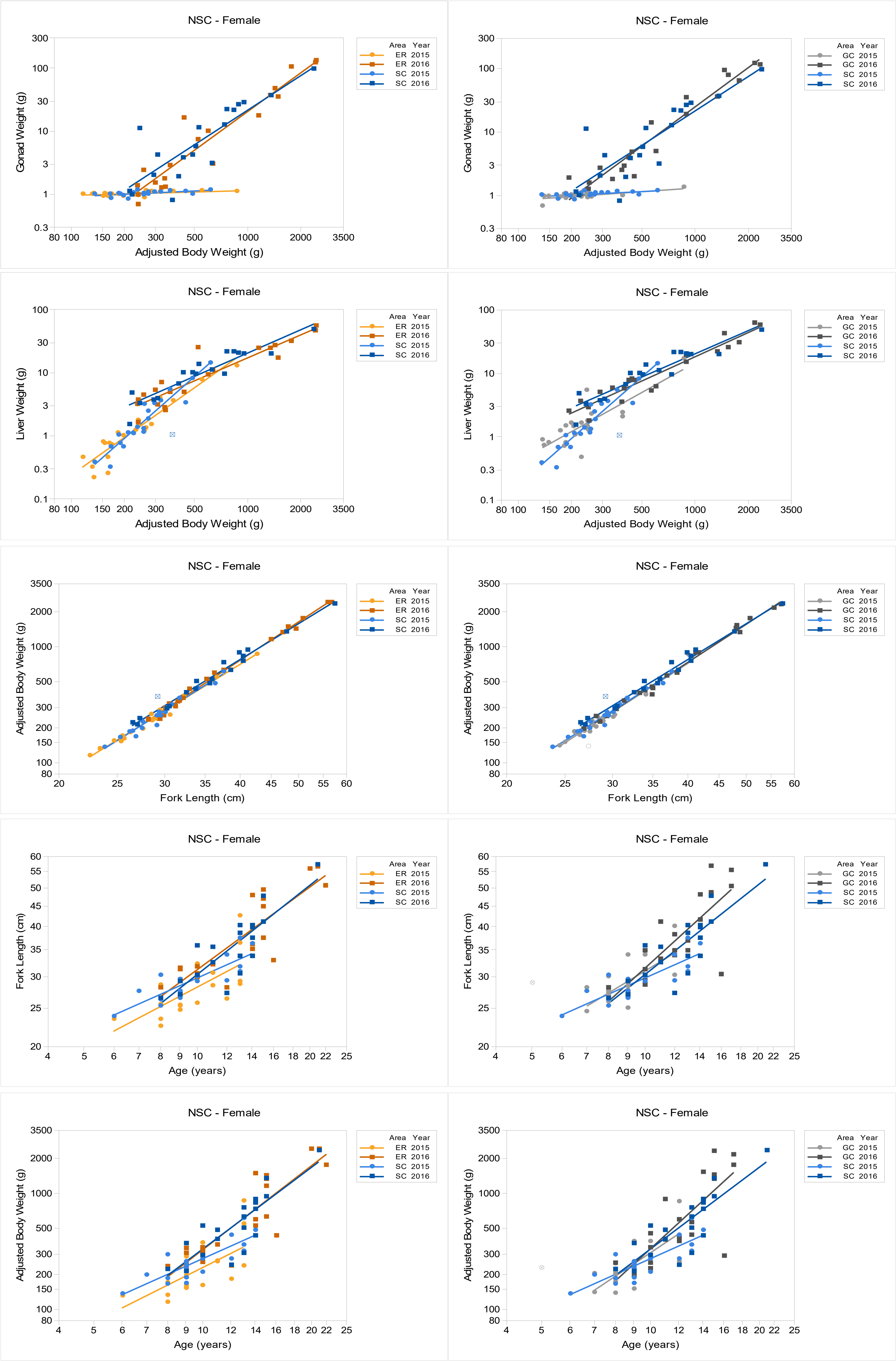

**Figure F.3:** **Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2015 and 2016 for Female Northern Pikeminnow (NSC)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons

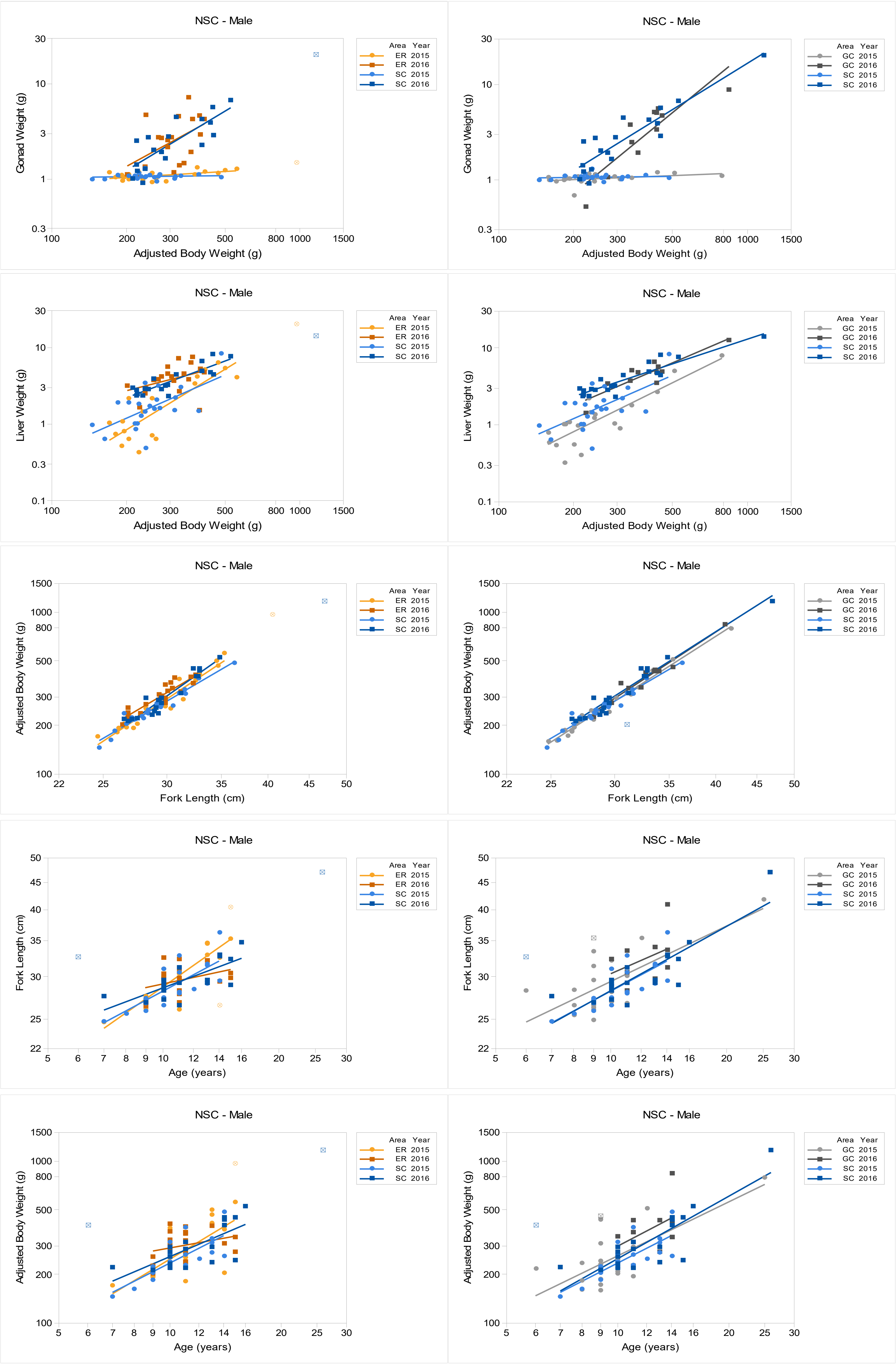

**Figure F.4:** Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2015 and 2016 for Male Northern Pikeminnow (NSC)

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons

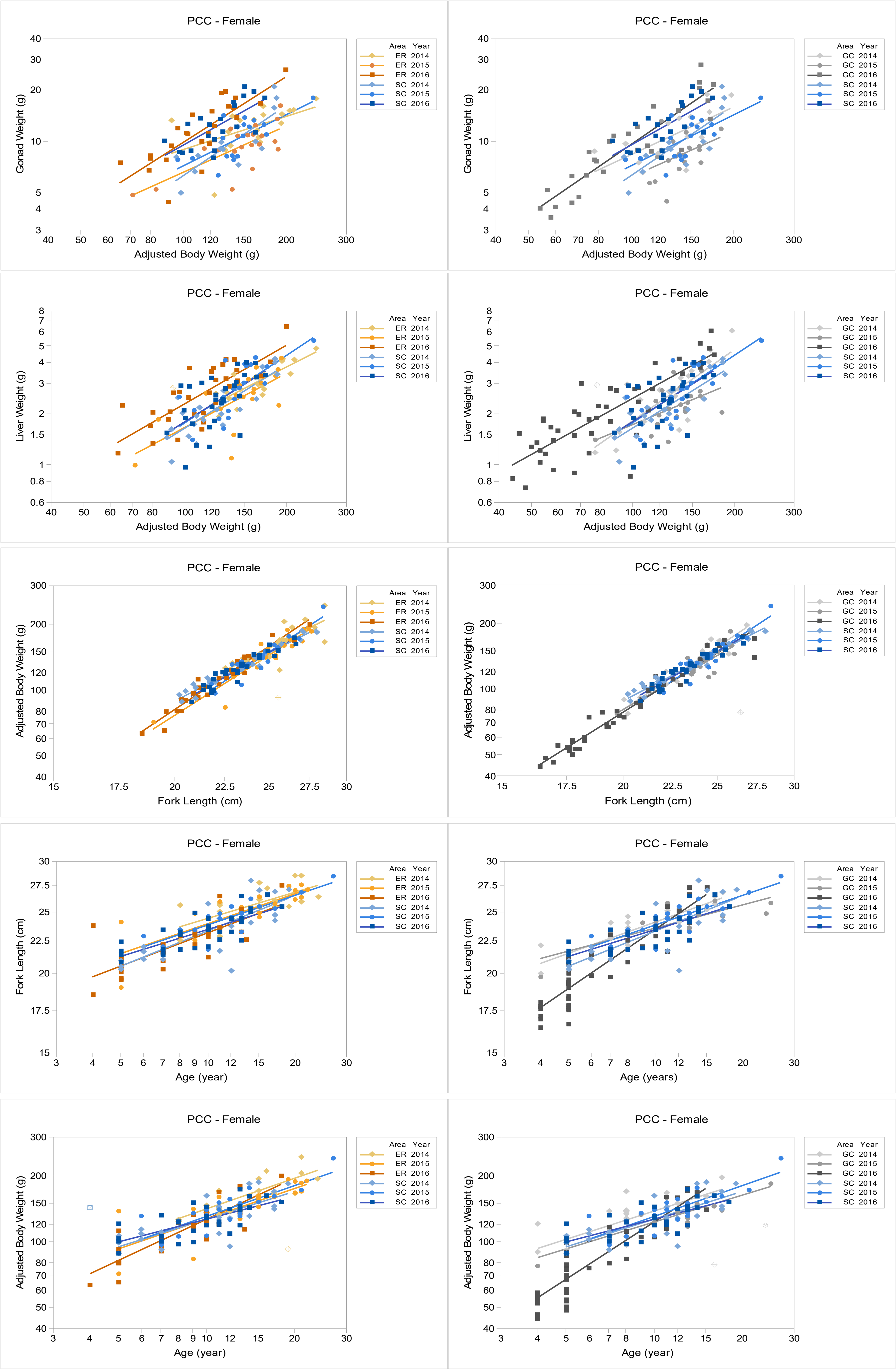

**Figure F.5: Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2014 to 2016 for Female Peamouth Chub (PCC)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons

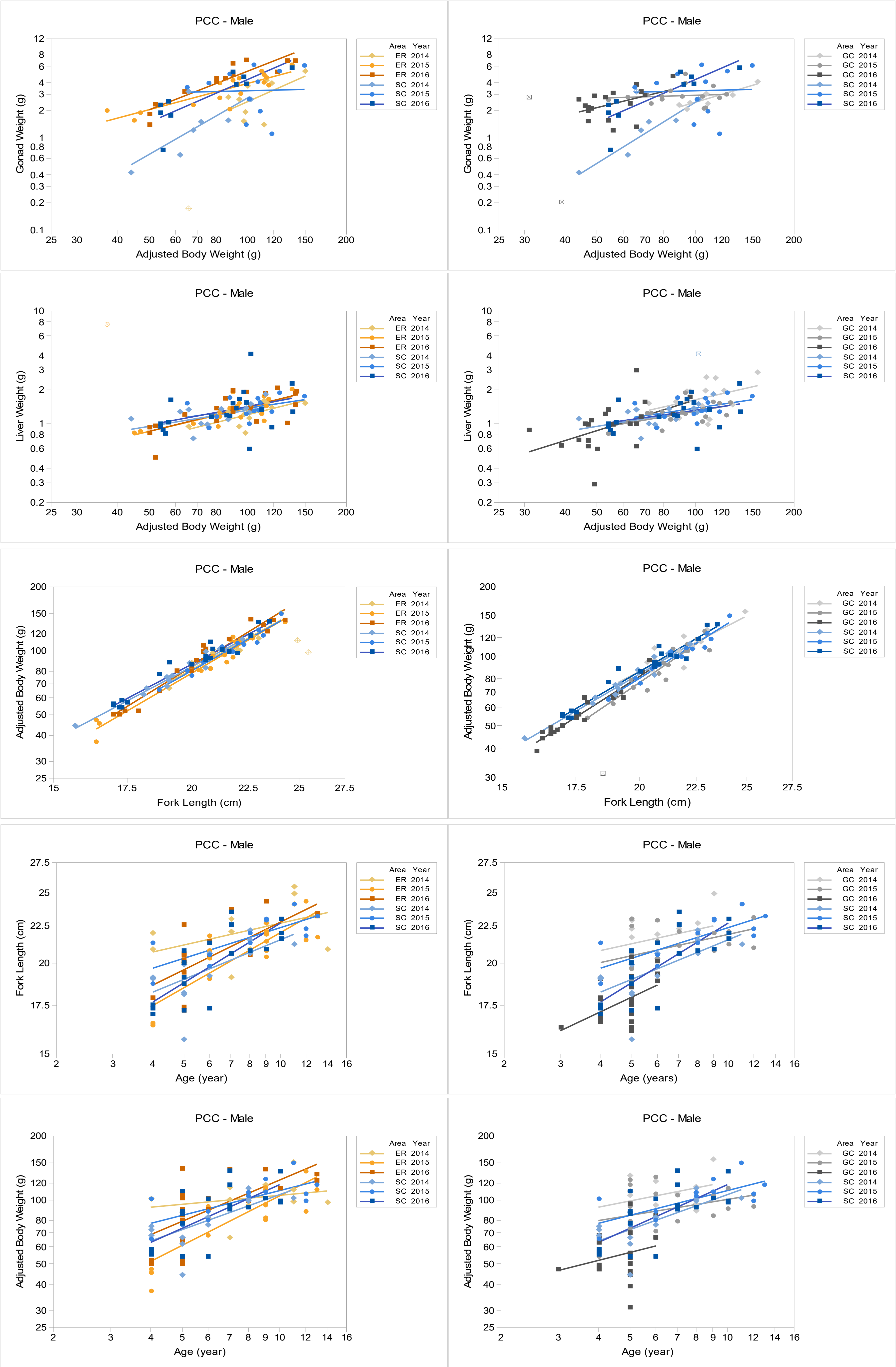

**Figure F.6:** Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2014 to 2016 for Male Peamouth Chub (PCC)

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons

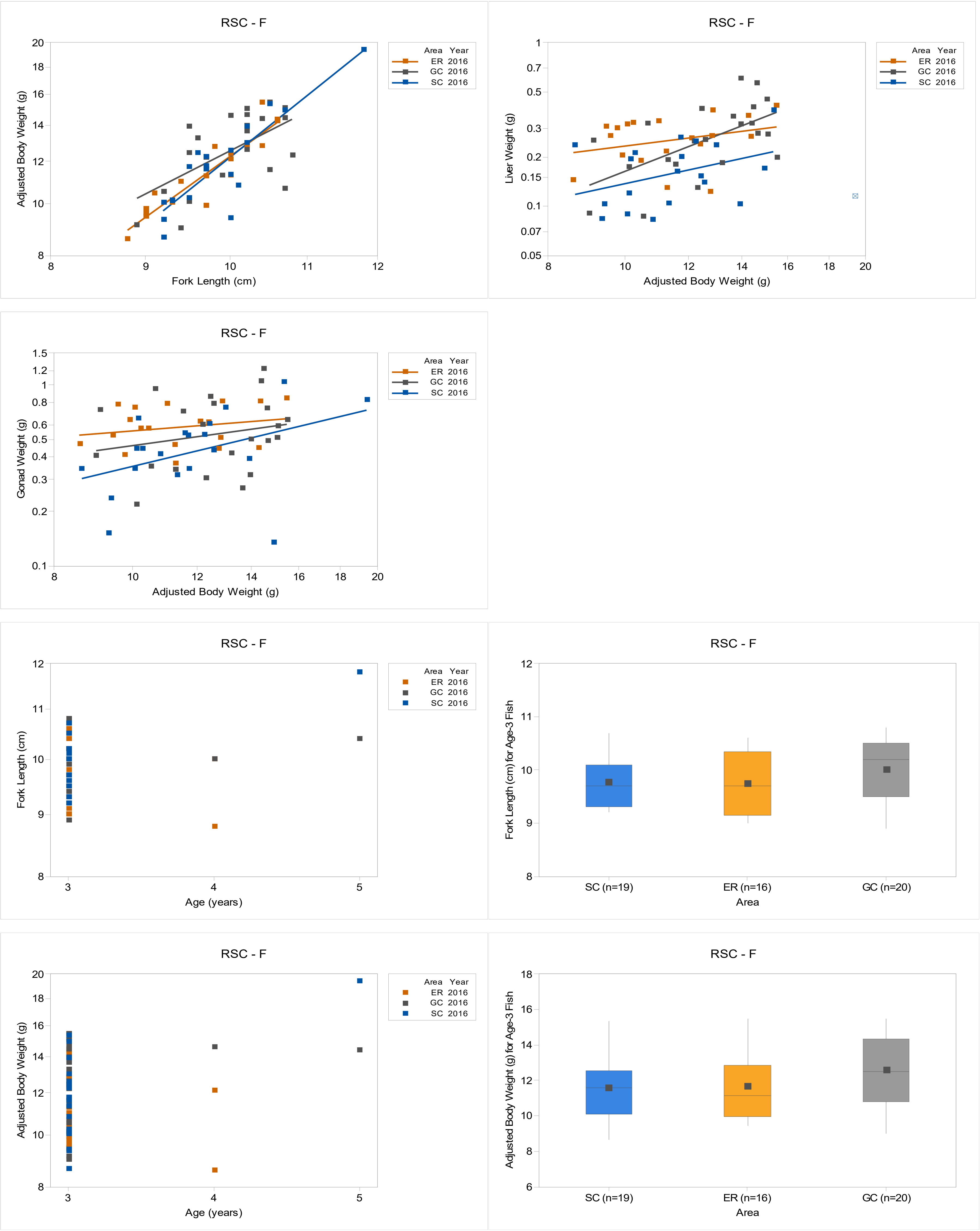

**Figure F.7: Scatterplots and Linear Regressions or Boxplots for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2016 for Female Redside Shiner (RSC)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Weight-at-age and Length-at-age were assessed statisiticall as the weight and length of age-3 fish

Boxplots: The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a square symbol.

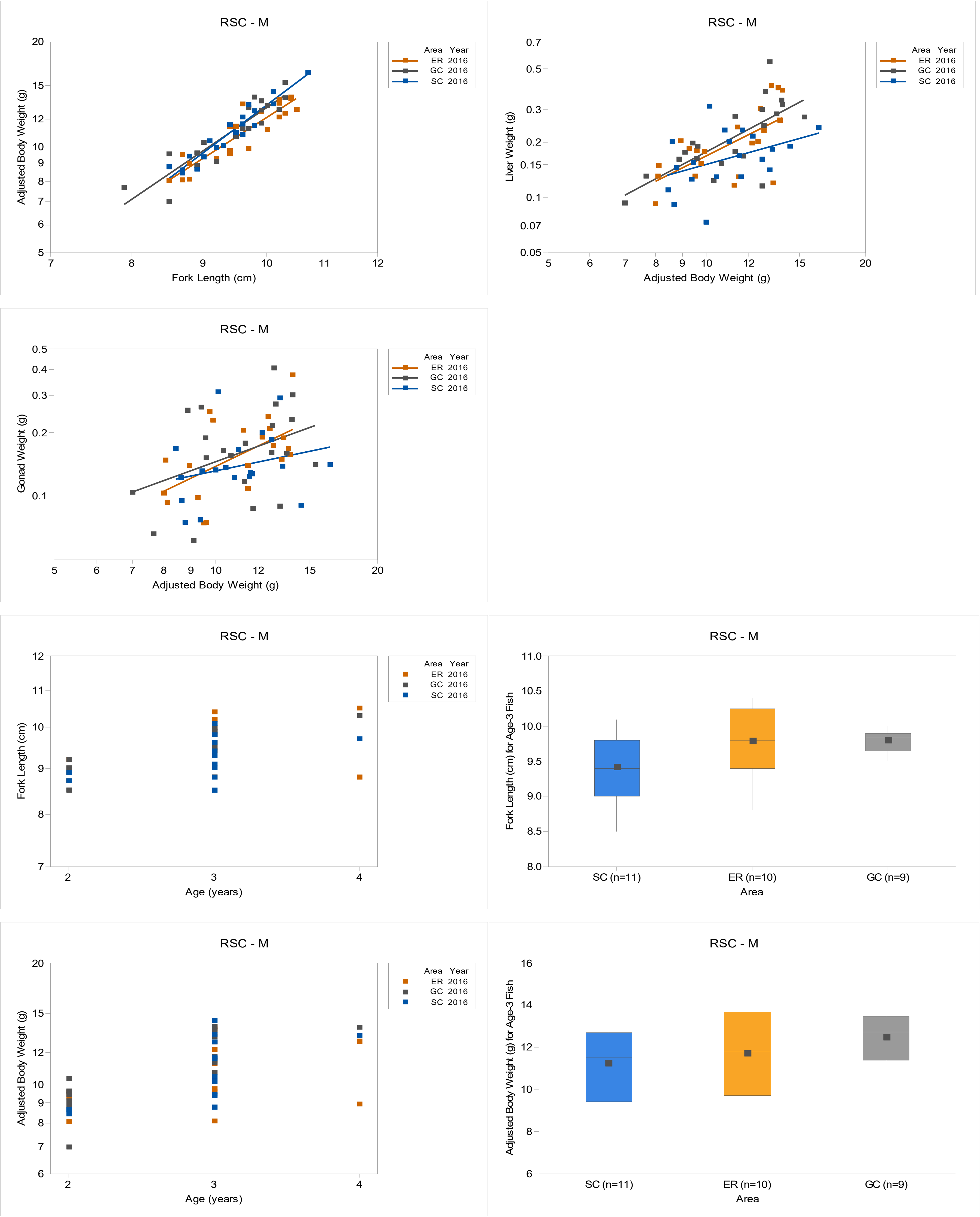

**Figure F.8: Scatterplots and Linear Regressions or Boxplots for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2016 for Male Redside Shiner (RSC)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Weight-at-age and Length-at-age were assessed statisiticall as the weight and length of age-3 fish

Boxplots: The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25 th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a square symbol.

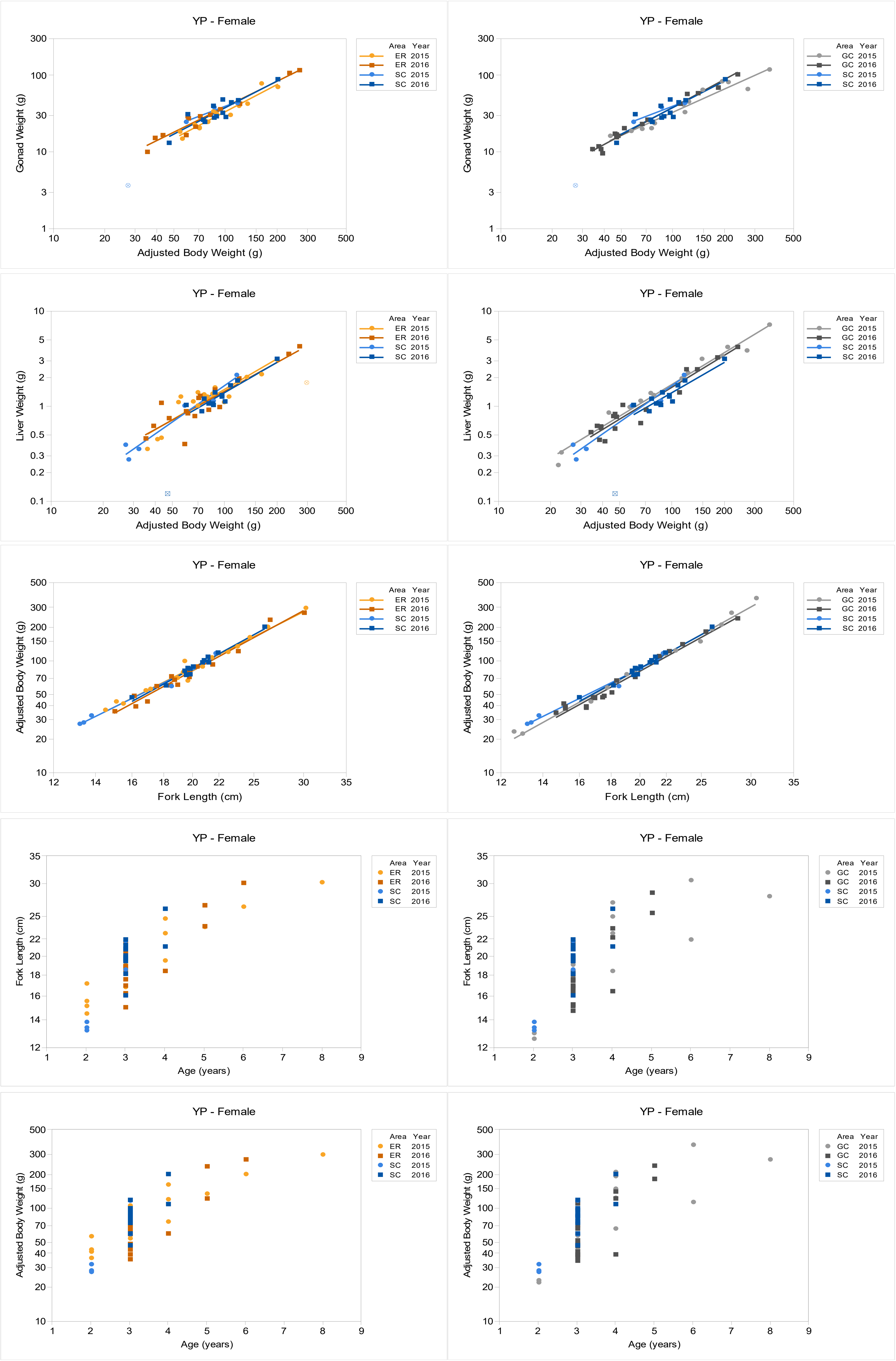

**Figure F.9:** **Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2015 and 2016 for Female Yellow Perch (YP)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons

Statistical analyses were not conducted for weight-at-age and length-at-age due to a limited range of ages observed and little overlap in ages between years

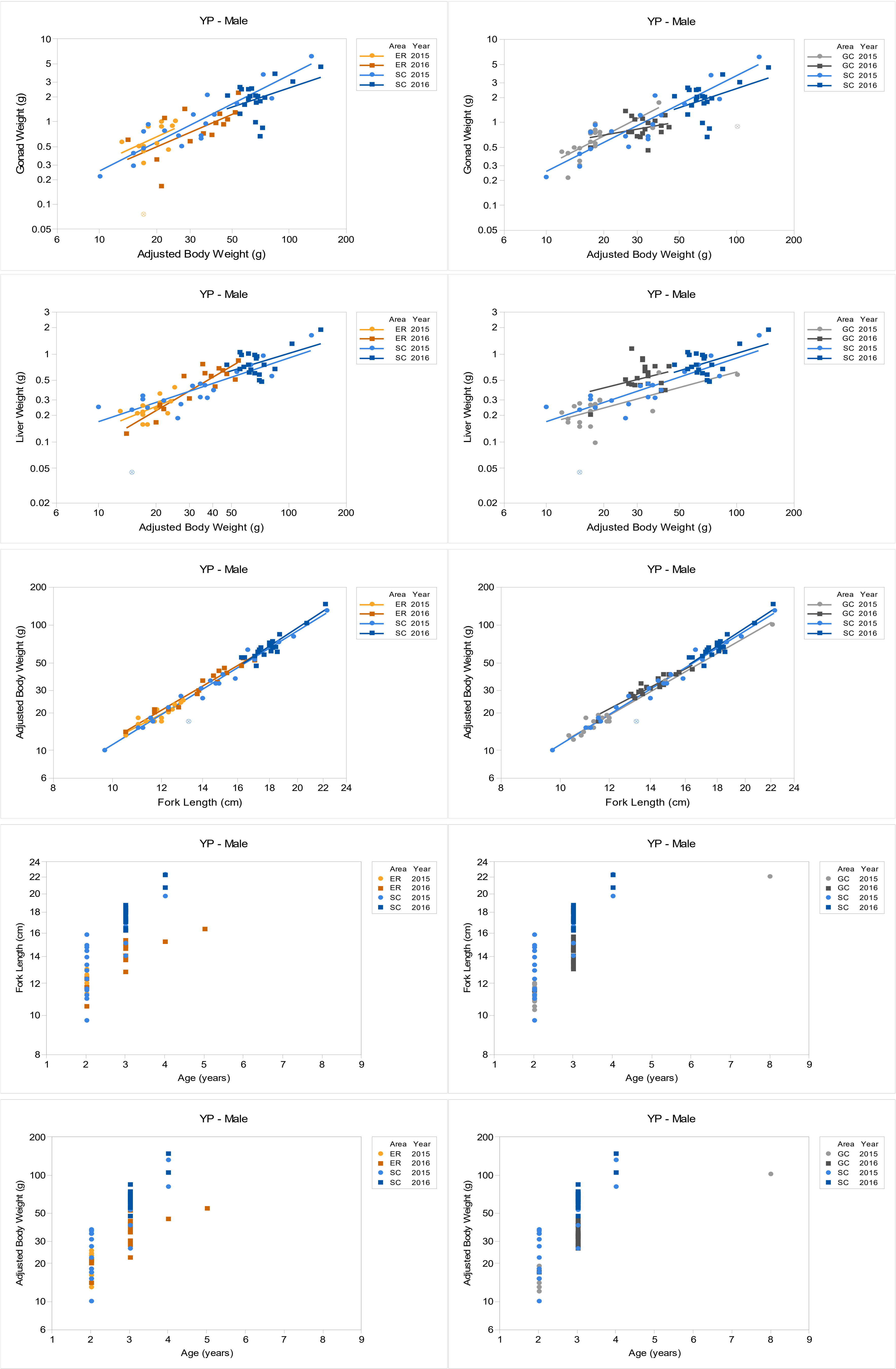

**Figure F.10:** **Scatterplots and Linear Regressions for Fish Morphometric Endpoints at the Downstream Areas (ER = Elk River and GC = Gold Creek) Compared to the Upstream Area (SC = Sand Creek) in Koocanusa Reservoir Based on Data Collected in 2015 and 2016 for Male Yellow Perch (YP)**

Notes:

Outliers (Studentized residuals with magnitude > 4) and influential observations that were excluded from the statistical comparisons are plotted with open symbols with an × through them.

Fish with worms were excluded from the gonad weight comparisons

Statistical analyses were not conducted for weight-at-age and length-at-age due to a limited range of ages observed and little overlap in ages between years

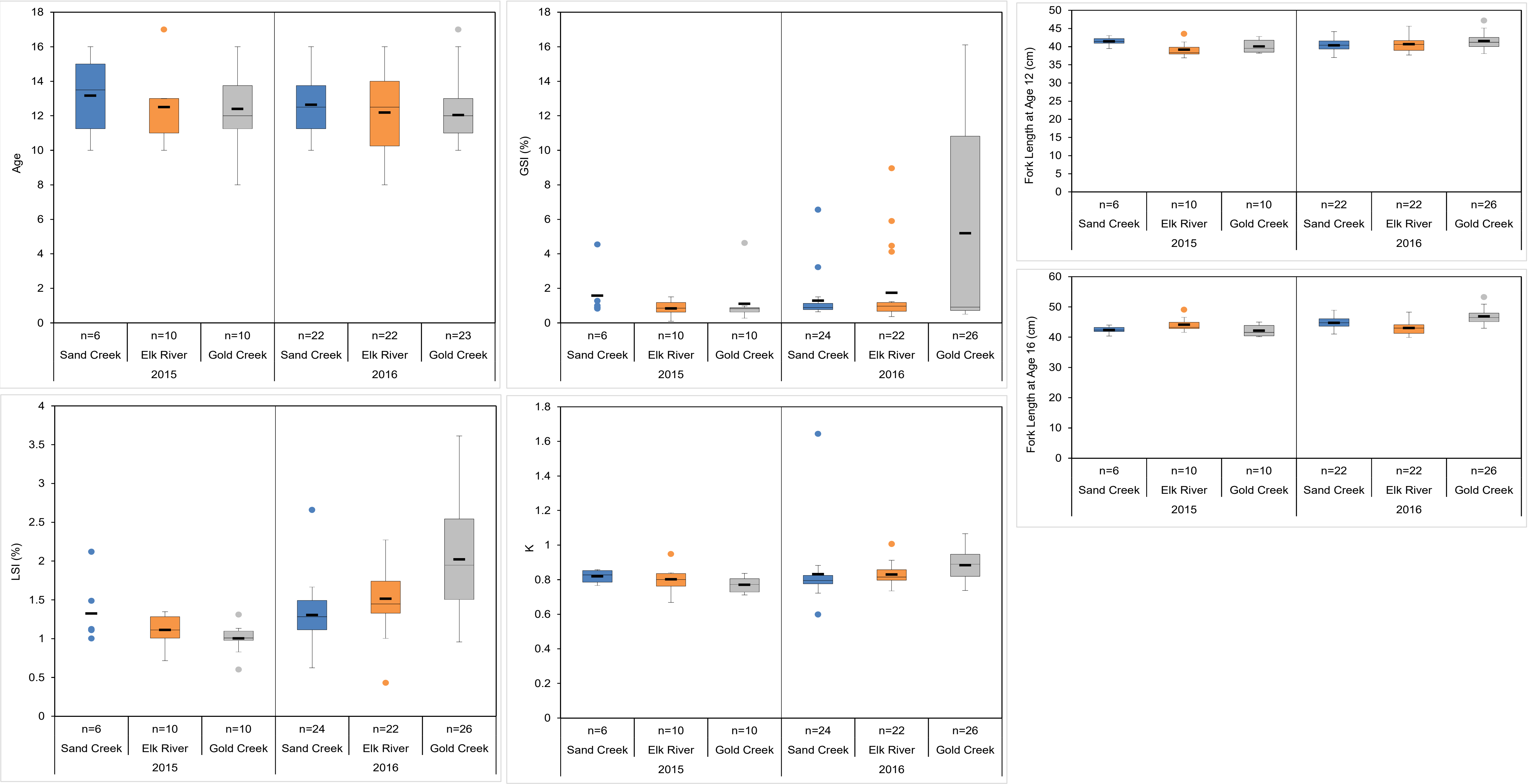

**Figure F.11:** Age (years), GSI (%), LSI (%), K, and Fork Length (cm)-at-Age (12 and 16 Years) for Female Largescale Sucker Collected in Koocanusa Reservoir, 2015 to 2016

Note: GSI - Gonadosomatic Index ([Gonad Weight / Adjusted Body Weight] x 100%); LSI - Liver Somatic Index ([Liver Weight / Adjusted Body Weight] x 100%); K - Condition Factor ([Adjusted Body Weight / (Total Length) $^3$] x 100). Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River. The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a dash.

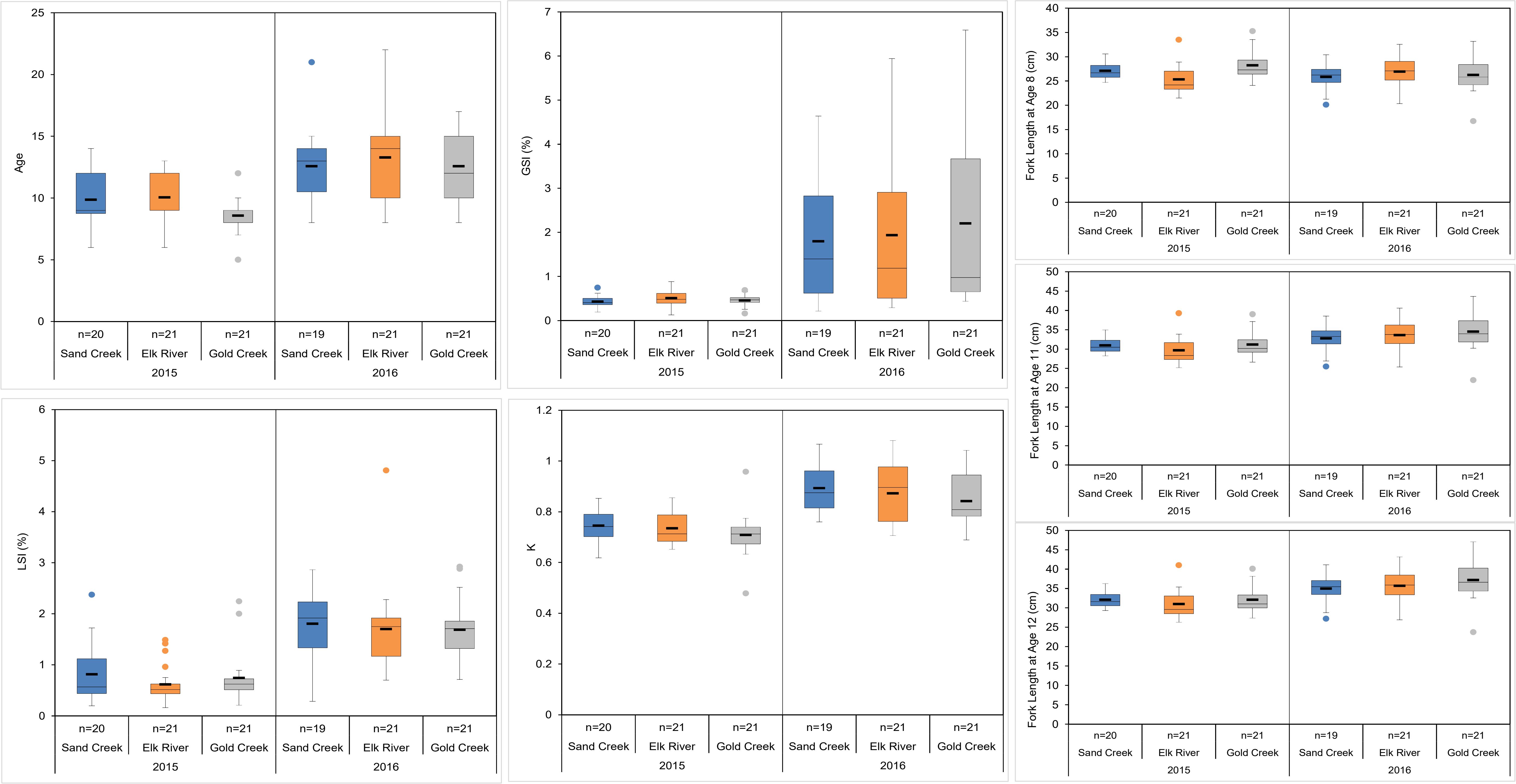

**Figure F.12:** **Age (years), GSI (%), LSI (%), K, and Fork Length (cm)-at-Age (8, 11, and 12 Years) for Female Northern Pikeminnow Collected in Koocanusa Reservoir, 2015 to 2016**

Note: GSI - Gonadosomatic Index ([Gonad Weight / Adjusted Body Weight] x 100%); LSI - Liver Somatic Index ([Liver Weight / Adjusted Body Weight] x 100%); K - Condition Factor ([Adjusted Body Weight / (Total Length) $^3$] x 100). Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River. The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a dash.

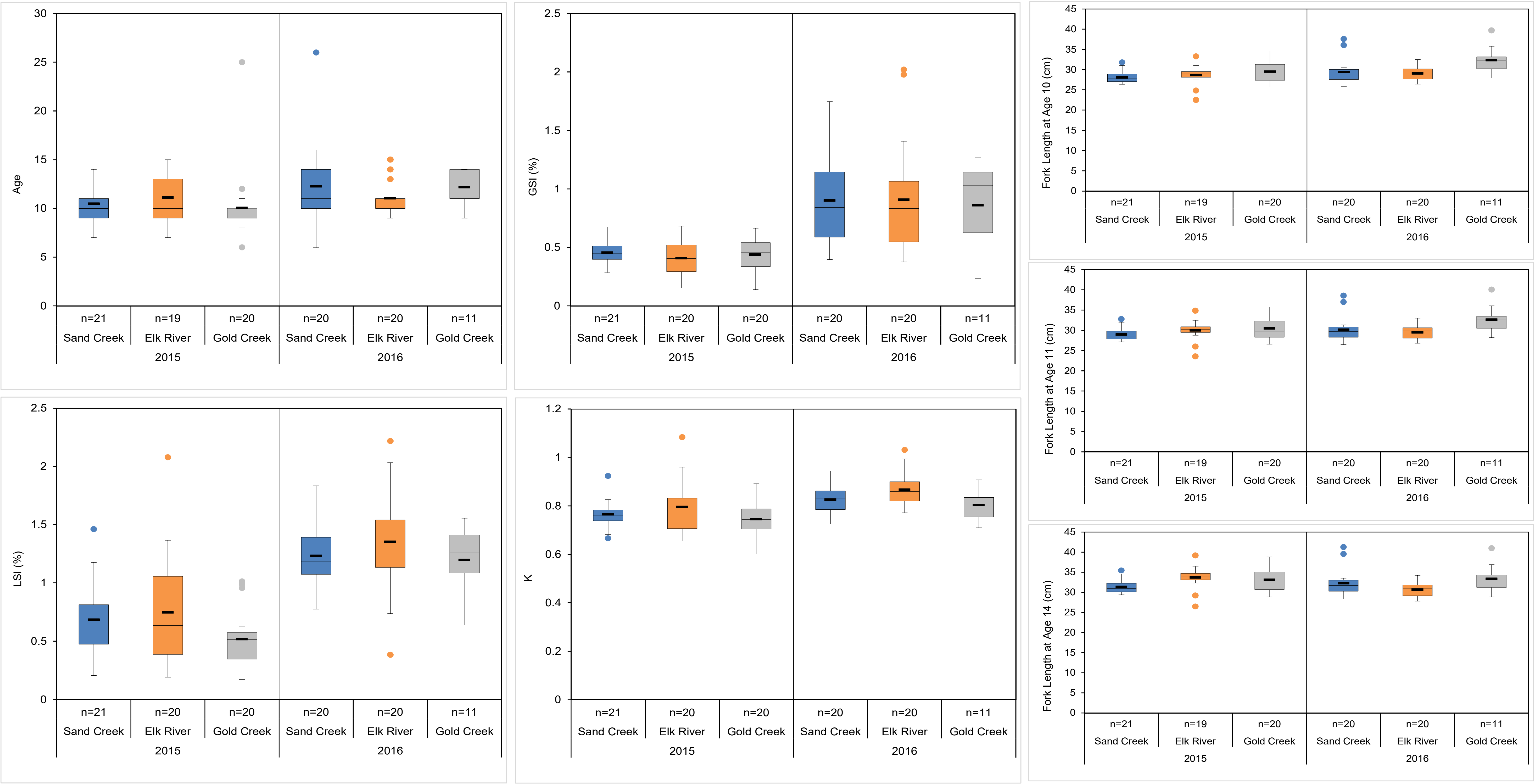

**Figure F.13:** **Age (years), GSI (%), LSI (%), K, and Fork Length (cm)-at-Age (10, 11, and 14 Years) for Male Northern Pikeminnow Collected in Koocanusa Reservoir, 2015 to 2016**

Note: GSI - Gonadosomatic Index ([Gonad Weight / Adjusted Body Weight] x 100%); LSI - Liver Somatic Index ([Liver Weight / Adjusted Body Weight] x 100%); K - Condition Factor ([Adjusted Body Weight / (Total Length)$^3$] x 100). Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River. The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a dash.

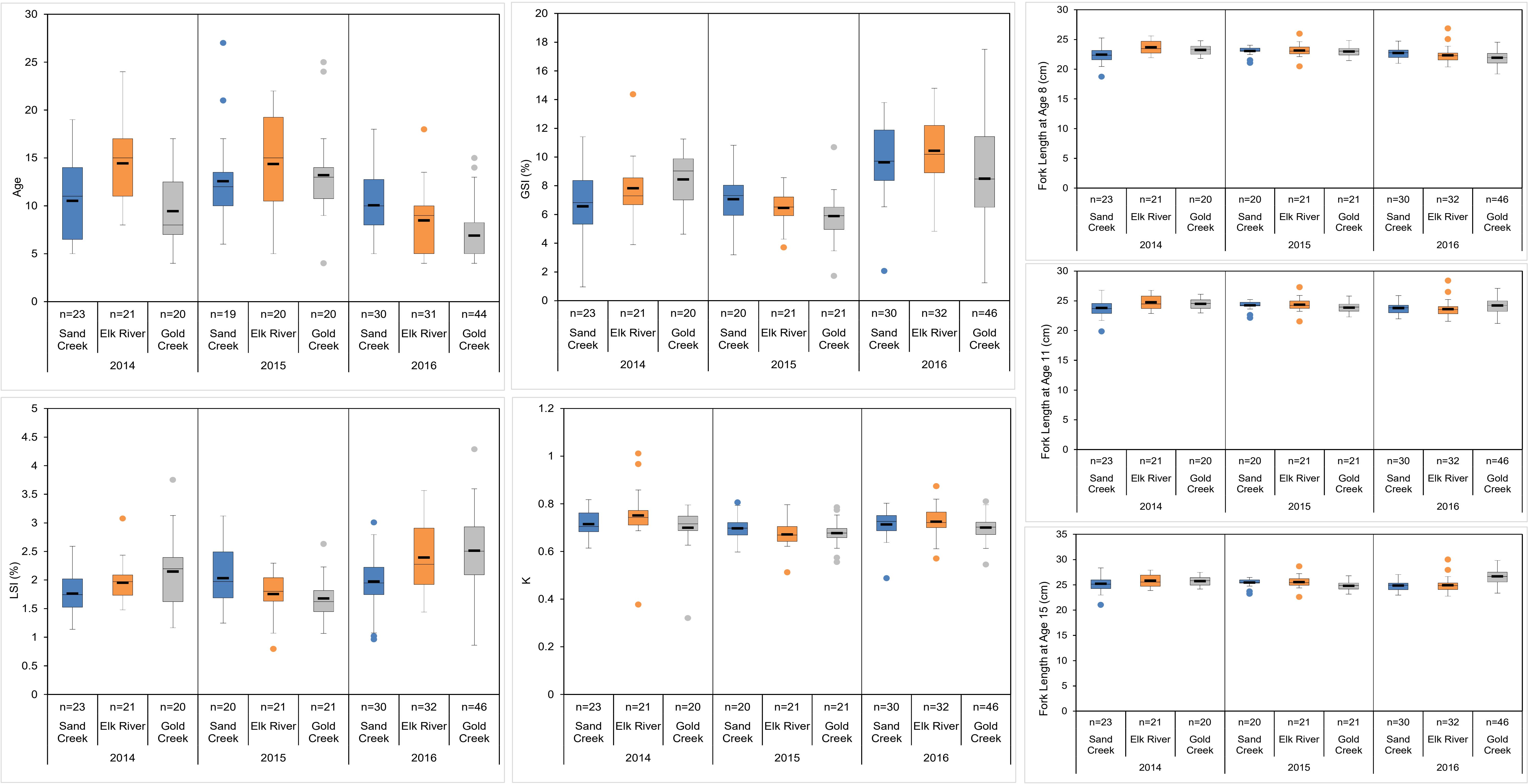

**Figure F.14: Age (years), GSI (%), LSI (%), K, and Fork Length (cm)-at-Age (8, 11, and 15 Years) for Female Peamouth Chub Collected in Koocanusa Reservoir, 2014 to 2016**

Note: GSI - Gonadosomatic Index ([Gonad Weight / Adjusted Body Weight] x 100%); LSI - Liver Somatic Index ([Liver Weight / Adjusted Body Weight] x 100%); K - Condition Factor ([Adjusted Body Weight / (Total Length)$^3$] x 100). Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River. The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a dash.

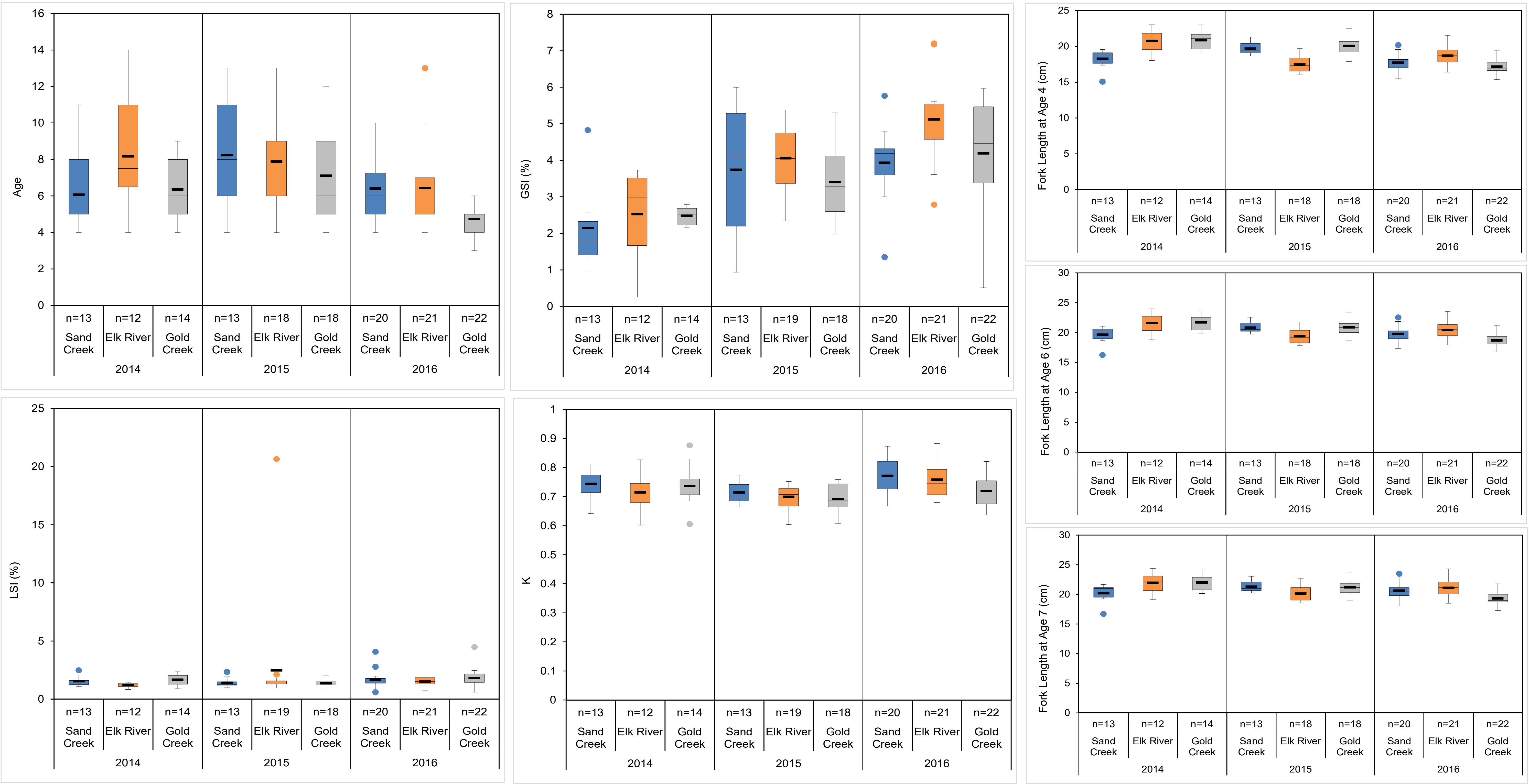

**Figure F.15:** **Age (years), GSI (%), LSI (%), K, and Fork Length (cm)-at-Age (4, 6, and 7 Years) for Male Peamouth Chub Collected in Koocanusa Reservoir, 2014 to 2016**

Note: GSI - Gonadosomatic Index ([Gonad Weight / Adjusted Body Weight] x 100%); LSI - Liver Somatic Index ([Liver Weight / Adjusted Body Weight] x 100%); K - Condition Factor ([Adjusted Body Weight / (Total Length) $^3$] x 100). Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River. The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a dash.

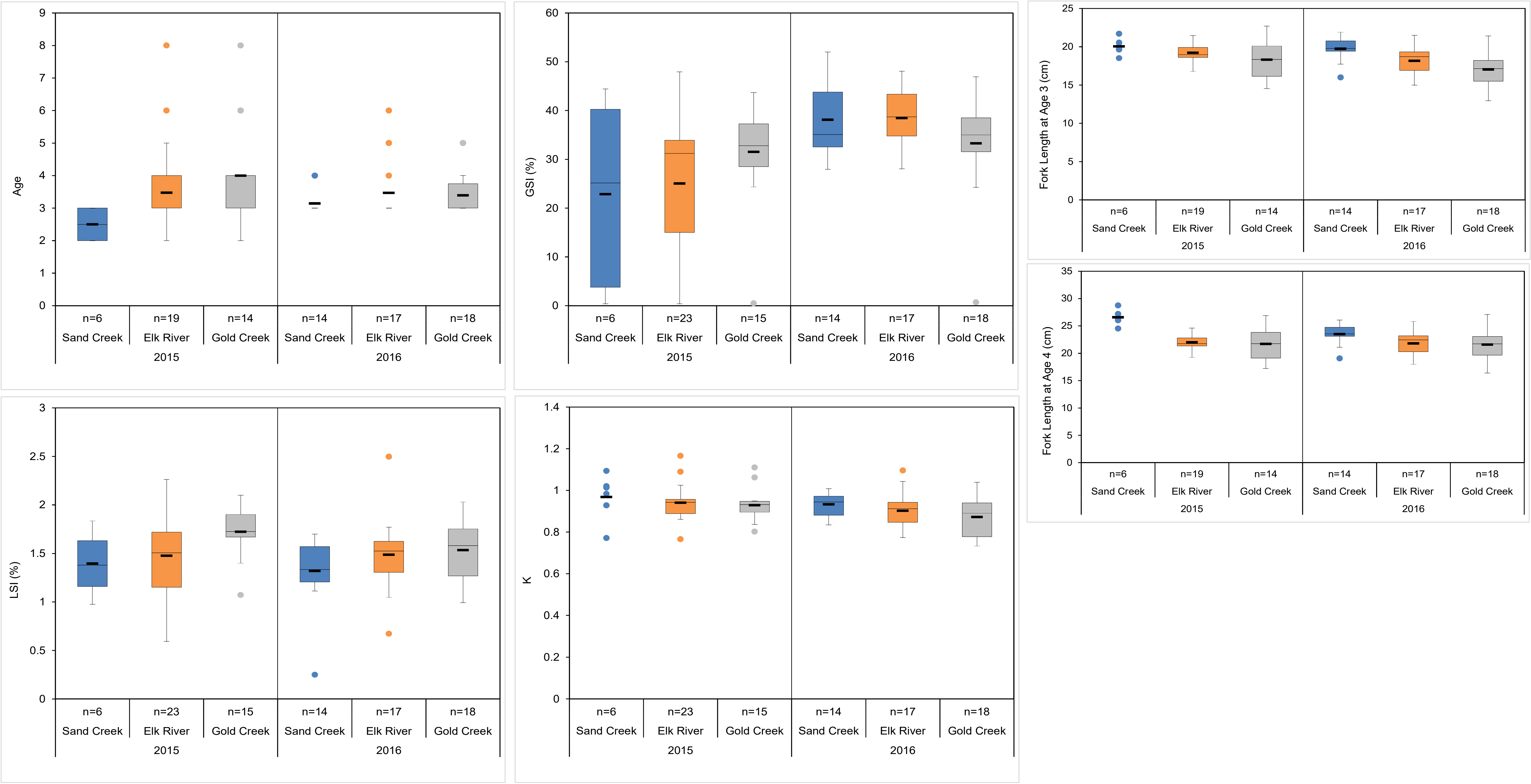

**Figure F.16:** **Age (years), GSI (%), LSI (%), K, and Fork Length (cm)-at-Age (3 and 4 Years) for Female Yellow Perch Collected in Koocanusa Reservoir, 2015 to 2016**

Note: GSI - Gonadosomatic Index ([Gonad Weight / Adjusted Body Weight] x 100%); LSI - Liver Somatic Index ([Liver Weight / Adjusted Body Weight] x 100%); K - Condition Factor ([Adjusted Body Weight / (Total Length)$^{3}$] x 100). Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River. The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a dash.

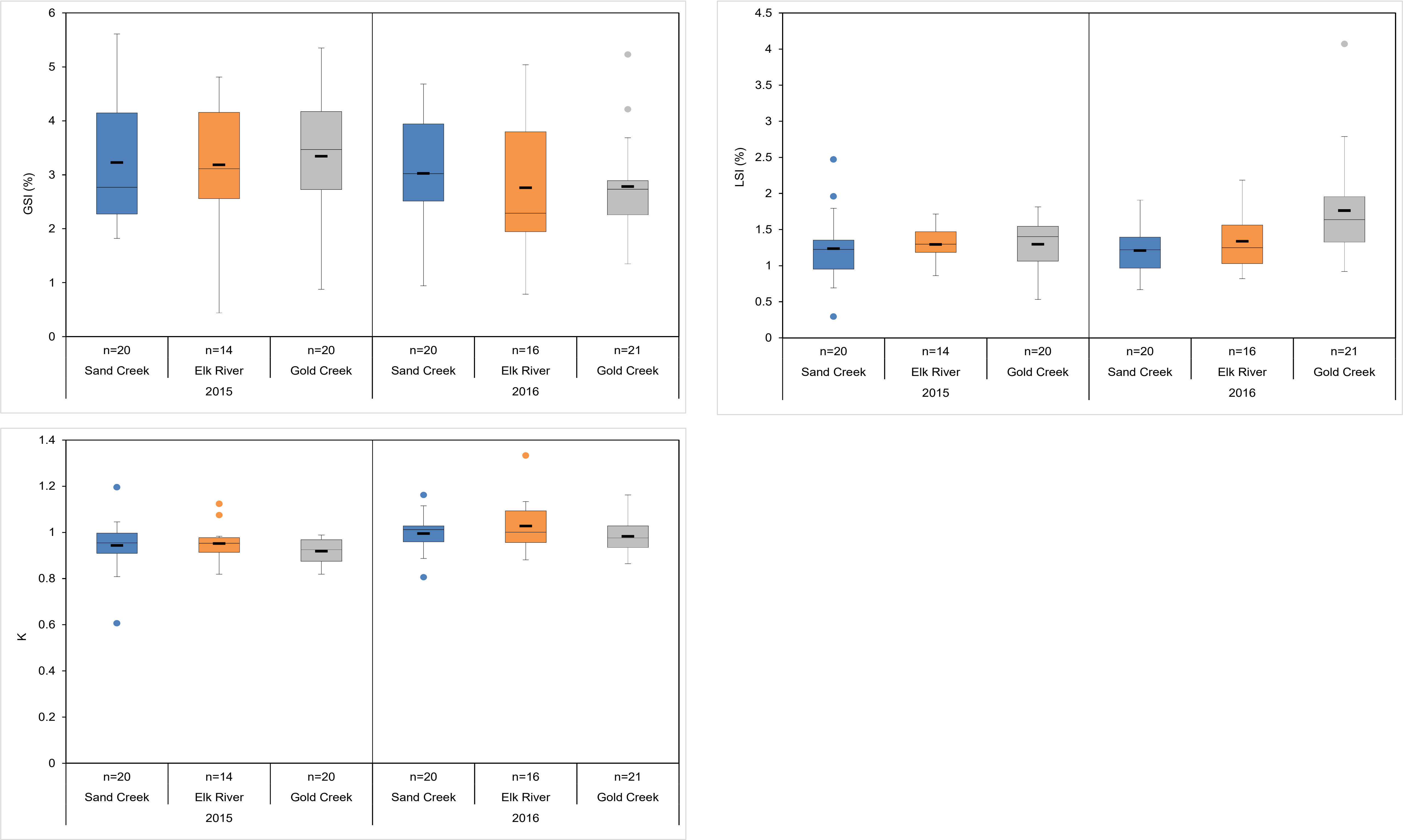

**Figure F.17:** **Age (years), GSI (%), LSI (%), and K for Male Yellow Perch Collected in Koocanusa Reservoir, 2015 to 2016**

Note: GSI - Gonadosomatic Index ([Gonad Weight / Adjusted Body Weight] x 100%); LSI - Liver Somatic Index ([Liver Weight / Adjusted Body Weight] x 100%); K - Condition Factor ([Adjusted Body Weight / (Total Length) $^3$] x 100). Sand Creek study area is upstream of the Elk River confluence, while the Elk River and Gold Creek study areas are downstream of the Elk River. The box represents the 25th percentile, median, and 75th percentile and the whiskers represent the minimum and maximum values; however, values 1.5 times the height of the box beyond the 25th and 75th percentiles are plotted as individual values in which case the whisker is truncated to the next value in the data set. The mean is plotted as a dash.

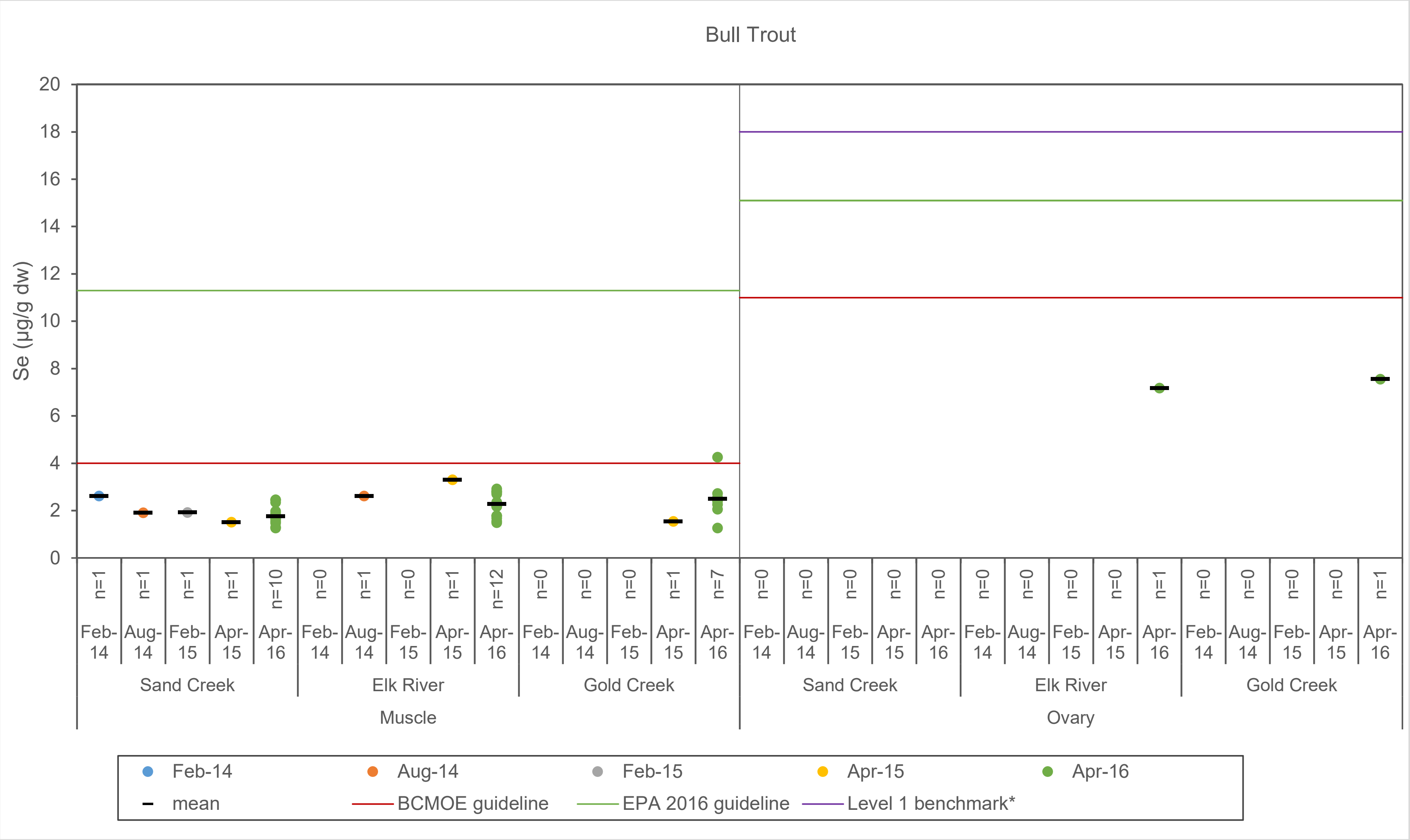

**Figure F.18:** **Muscle and Ovary Tissue Selenium Concentrations (µg/g dw) in Bull Trout Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, February 2014, 2015, April 2015, 2016, and August 2014**

Notes: * Level 1 benchmark for effects to fish reproduction (Teck 2014). Bull trout collected near Oestreich Road (OR-BT-01M-Feb-14) was added to the bull trout collected at Sand Creek

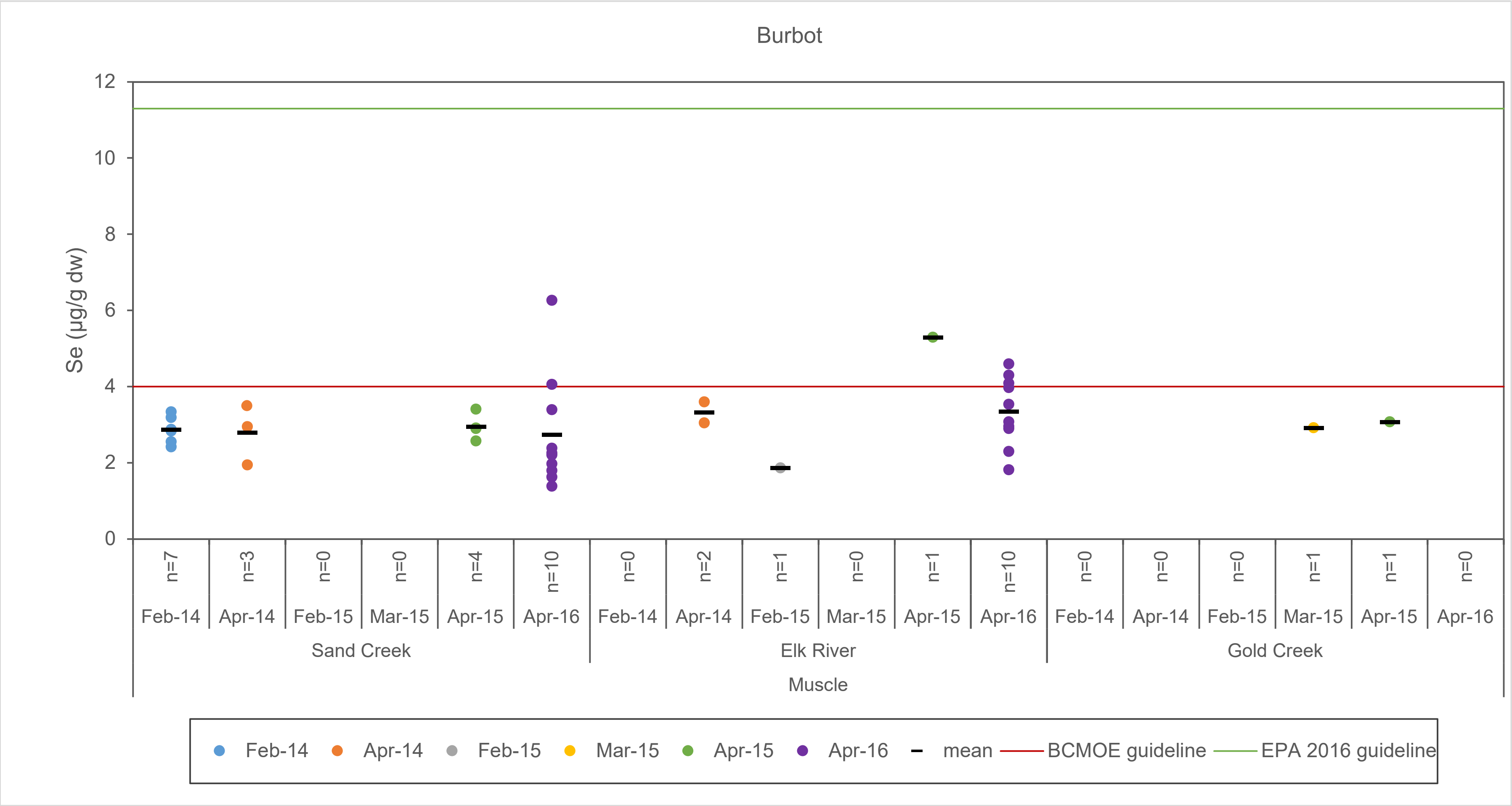

**Figure F.19:** **Muscle Tissue Selenium Concentrations (µg/g dw) in Burbot Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, February 2014, 2015, March 2015, and April 2014, 2015, 2016**

Note: Burbot collected near Oestreich Road (OR-BT-01M-Feb-14) was added to the burbot collected at Sand Creek

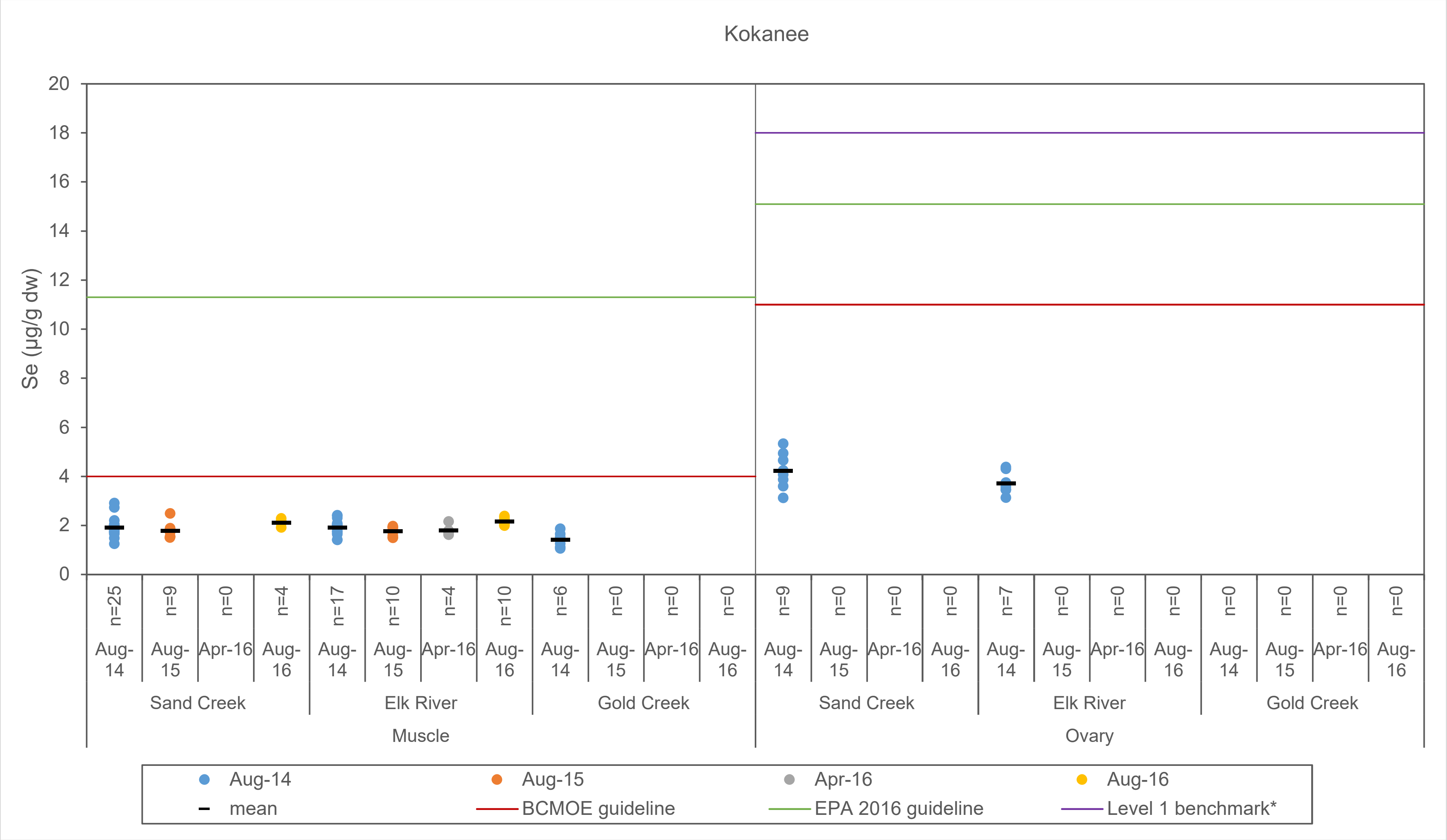

**Figure F.20: Muscle and Ovary Tissue Selenium Concentrations (µg/g dw) in Kokanee Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, in August 2014, 2015, 2016 and April 2016**

Note: * Level 1 benchmark for effects to fish reproduction (Teck 2014)

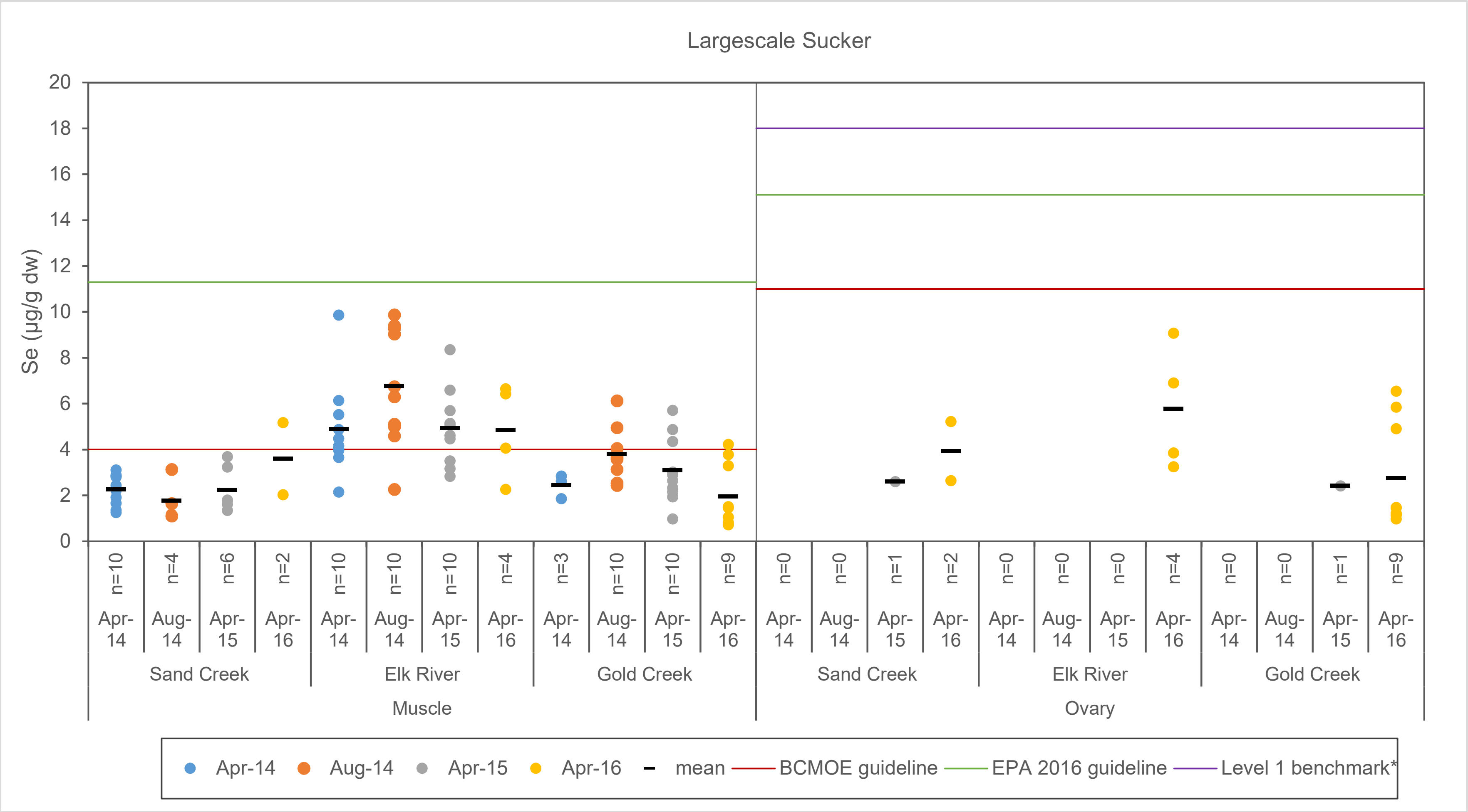

**Figure F.21:** **Muscle and Ovary Tissue Selenium Concentrations (µg/g dw) in Largescale Sucker Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, April 2014, 2015, 2016, and August 2014**

Note: * Level 1 benchmark for effects to fish reproduction (Teck 2014)

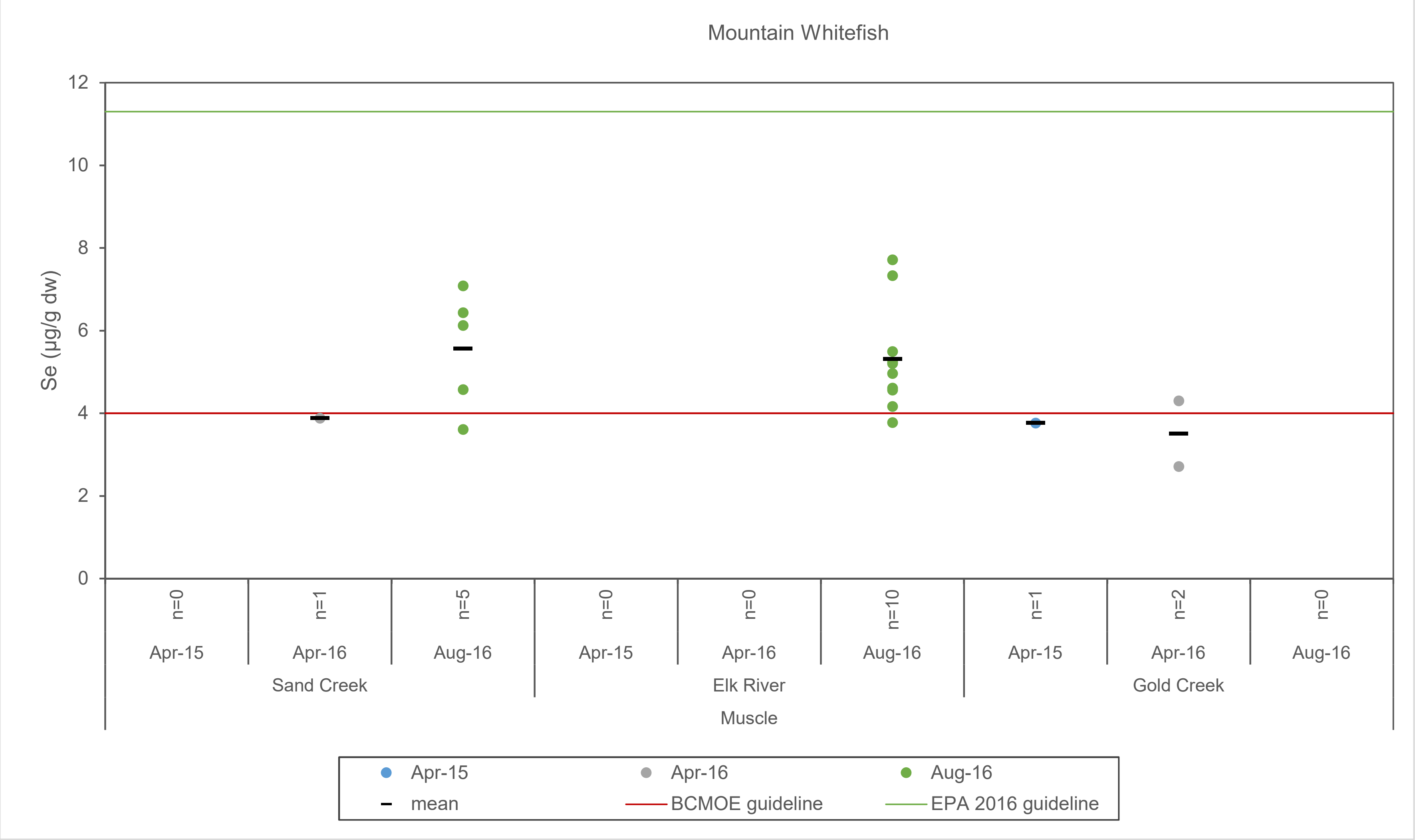

**Figure F.22:** **Muscle Tissue Selenium Concentrations (µg/g dw) in Mountain Whitefish Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, April 2015, 2016, and August 2016**

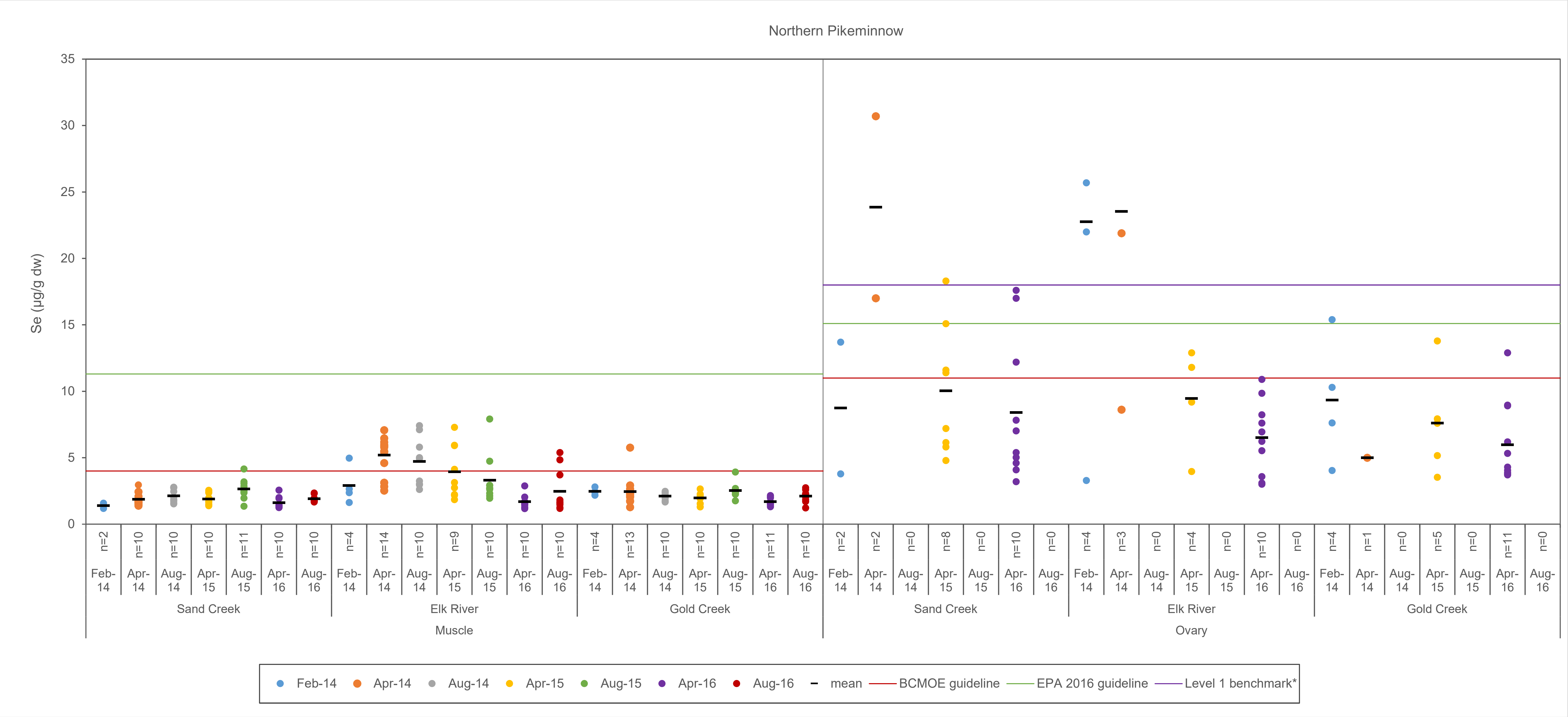

**Figure F.23:** **Muscle and Ovary Tissue Selenium Concentrations (µg/g dw) in Northern Pikeminnow Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, February 2014, April 2014, 2015, 2016, and August 2014, 2015 and 2016**

Note: * Level 1 benchmark for effects to fish reproduction (Teck 2014)

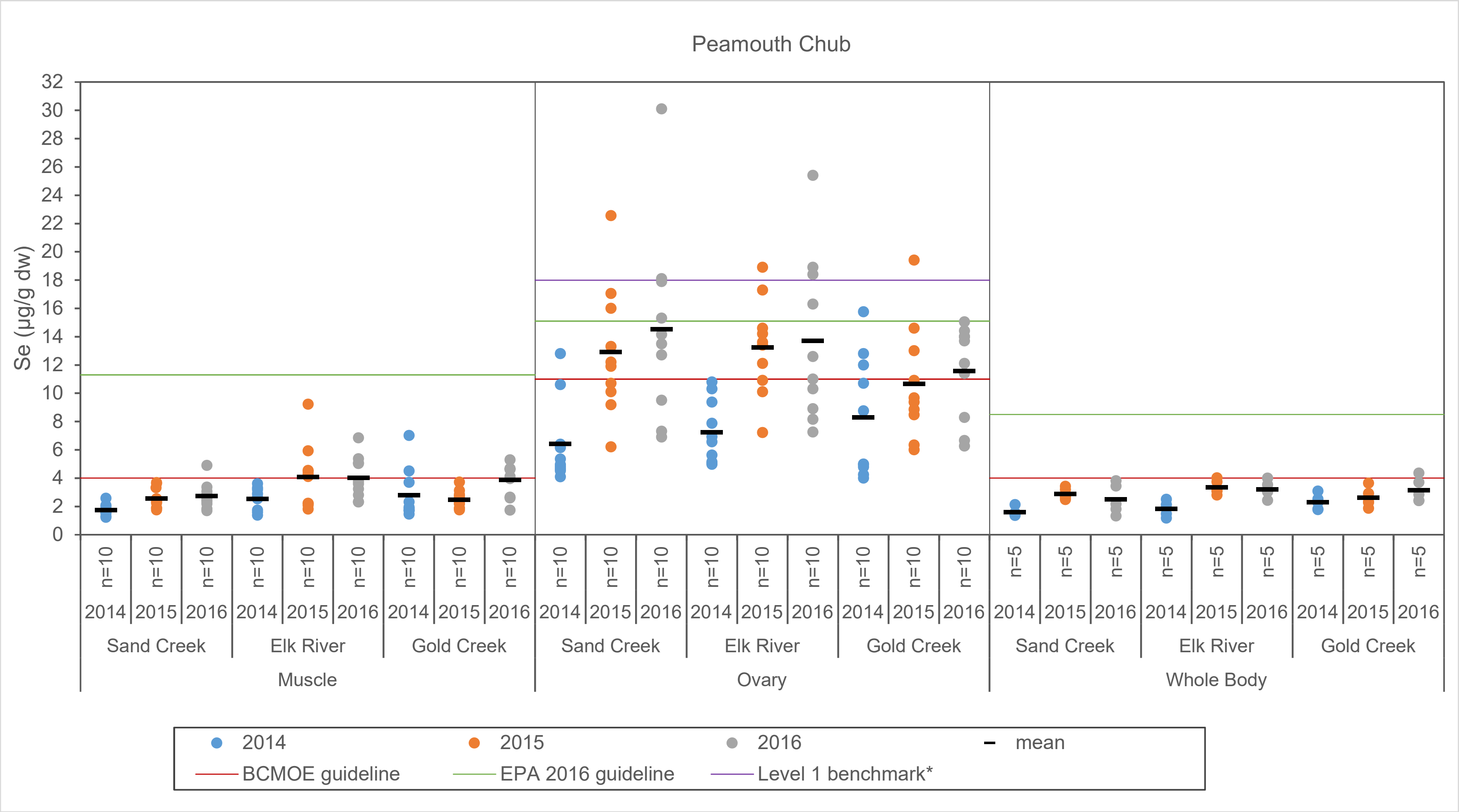

**Figure F.24:** **Muscle, Ovary and Whole Body Tissue Selenium Concentrations (µg/g dw) in Peamouth Chub Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, April 2014, 2015 and 2016**

Note: * Level 1 benchmark for effects to fish reproduction (Teck 2014)

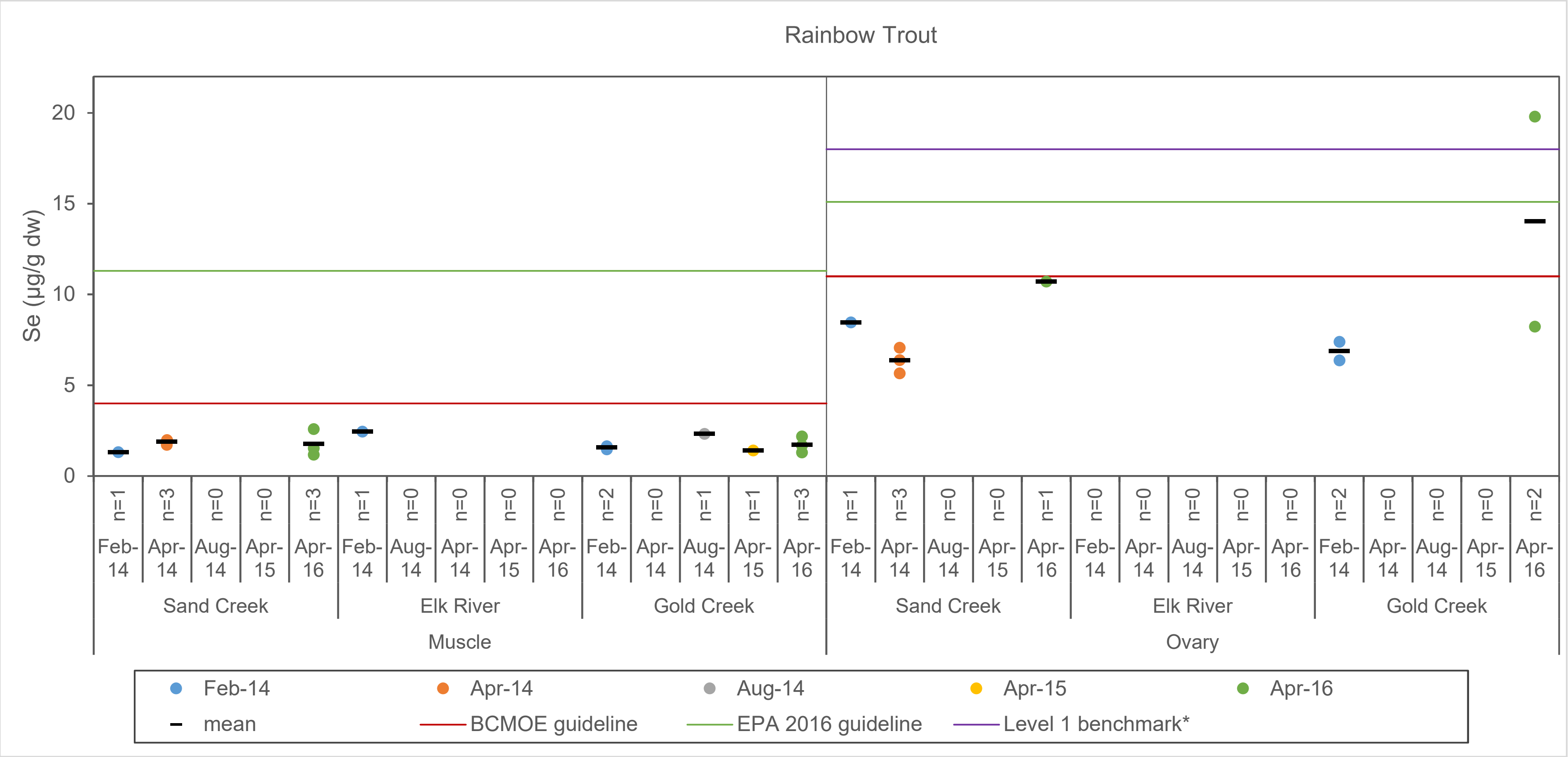

**Figure F.25:** **Muscle and Ovary Tissue Selenium Concentrations (µg/g dw) in Rainbow Trout Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, in February, April, and August 2014, April 2015, and April 2016**

Note: * Level 1 benchmark for effects to fish reproduction (Teck 2014)

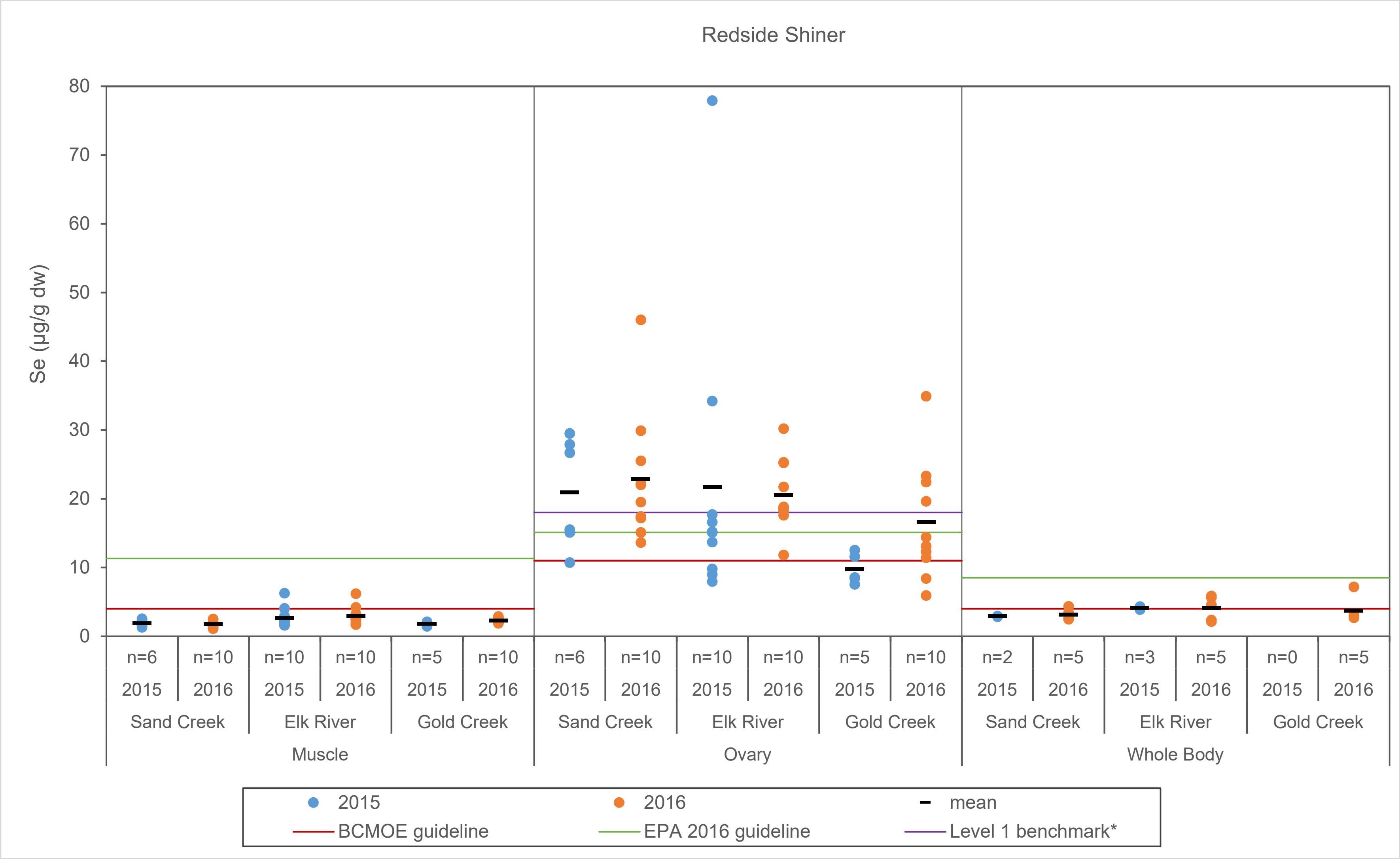

**Figure F.26:** **Muscle, Ovary and Whole Body Tissue Selenium Concentrations (µg/g dw) in Redside Shiner Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, April 2015 and 2016**

Note: * Level 1 benchmark for effects to fish reproduction (Teck 2014)

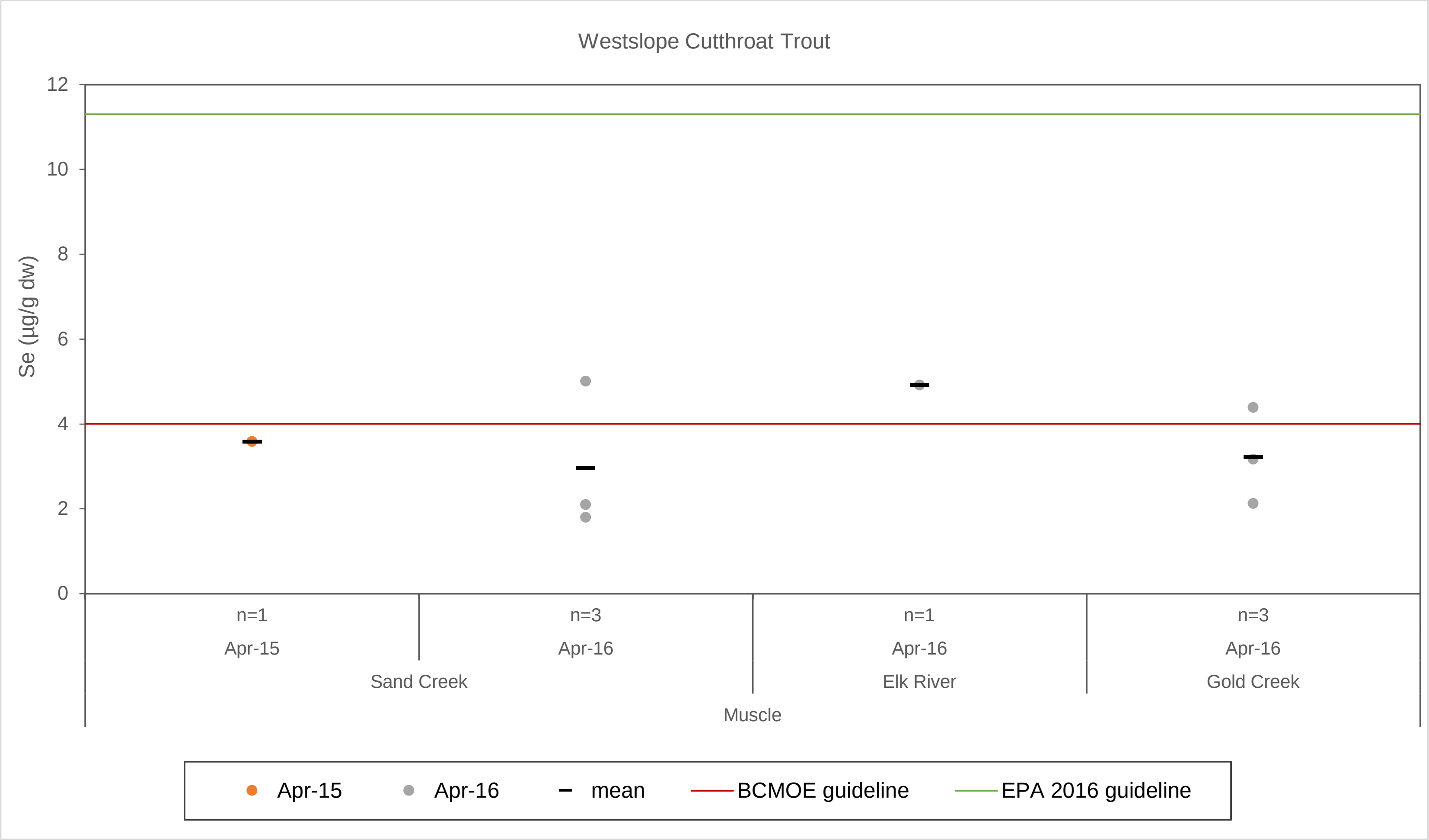

**Figure F.27:** **Muscle Tissue Selenium Concentrations (µg/g dw) in Westslope Cutthroat Trout Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, April 2015 and 2016**

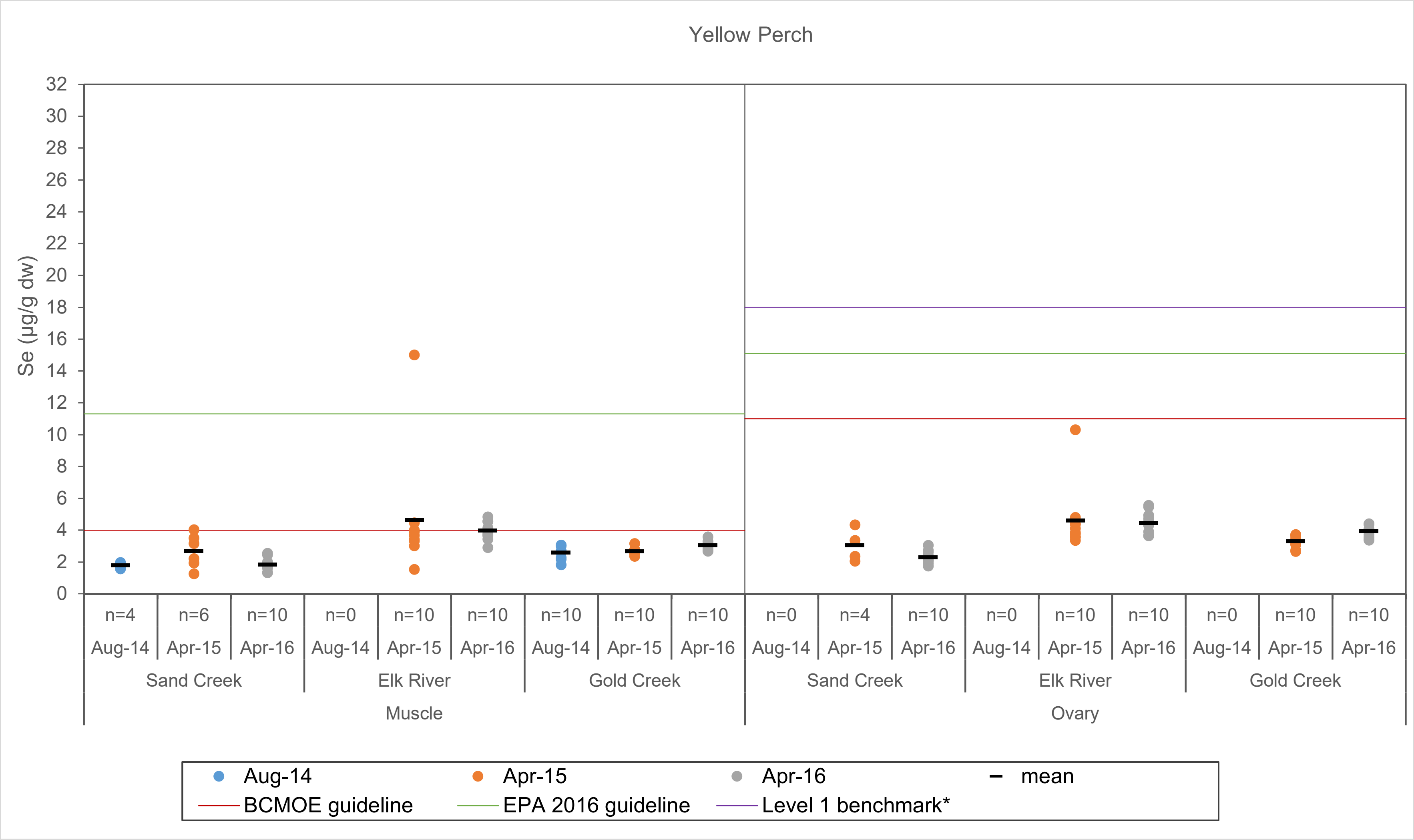

**Figure F.28:** **Muscle and Ovary Tissue Selenium Concentrations (µg/g dw) in Yellow Perch Collected Downstream (Elk River and Gold Creek) and Upstream (Sand Creek) of the Elk River in Koocanusa Reservoir, April 2014, 2015 and 2016**

Note: * Level 1 benchmark for effects to fish reproduction (Teck 2014)

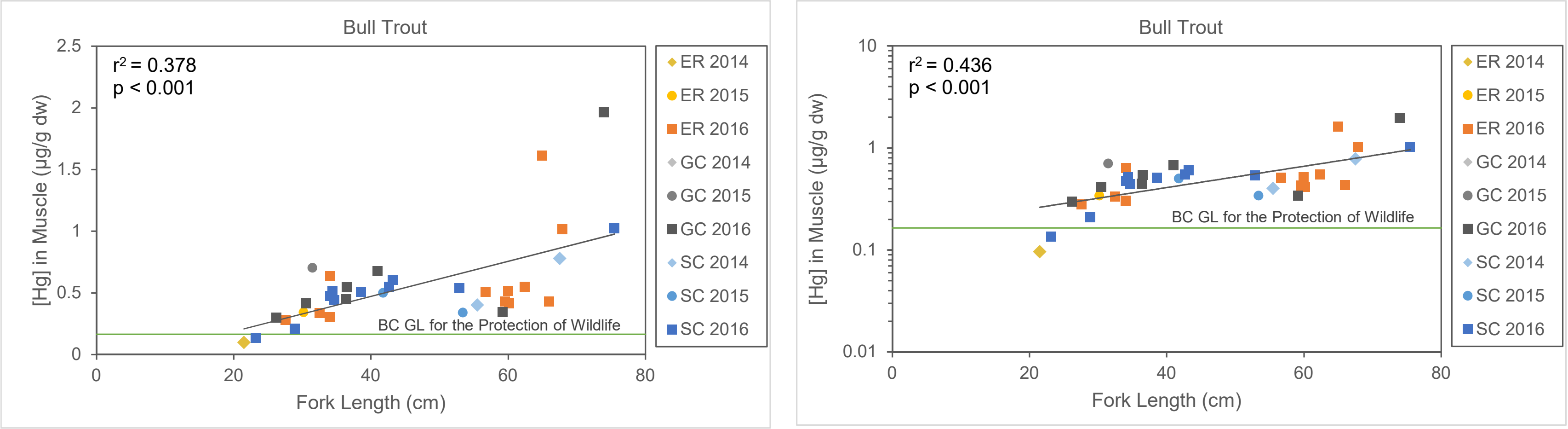

**Figure F.29: Mercury Concentrations (µg/g dw) in Bull Trout Muscle Relative to Fork Length (cm) in Koocanusa Reservoir, April 2014 to 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

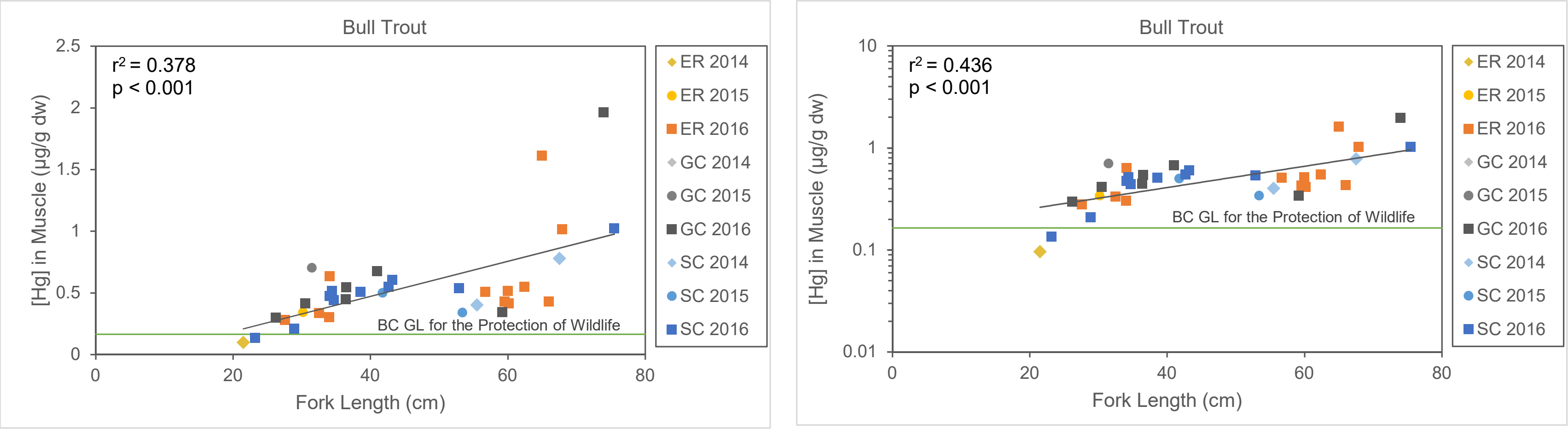

**Figure F.30: Mercury Concentrations (µg/g dw) in Bull Trout Muscle Relative to Fork Length (cm) in Koocanusa Reservoir, April 2014 to 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

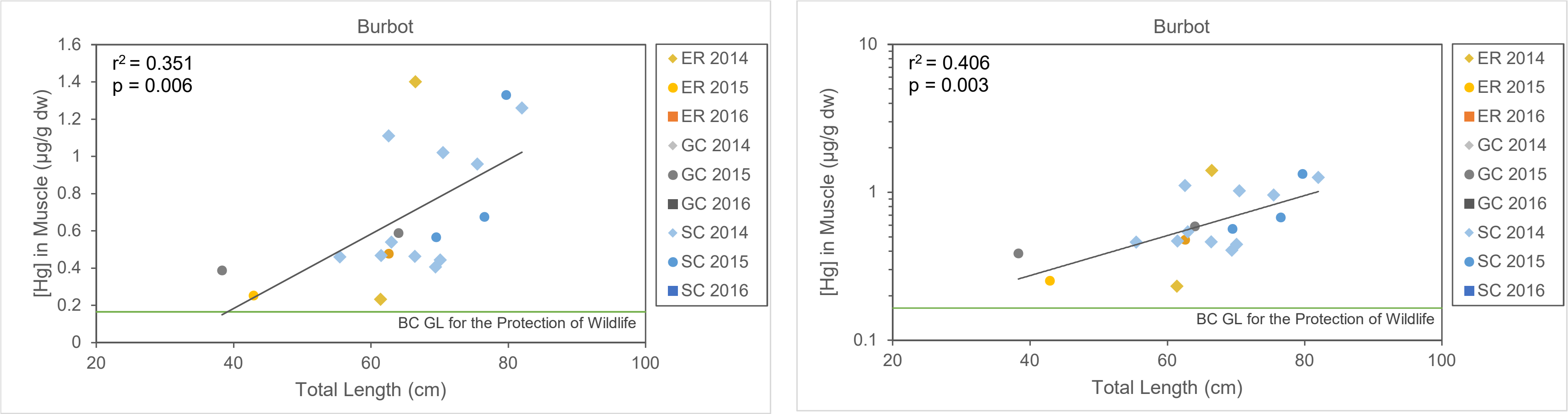

**Figure F.31:** **Mercury Concentrations (µg/g dw) in Burbot Muscle Relative to Total Length (cm) in Koocanusa Reservoir, 2014 - 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

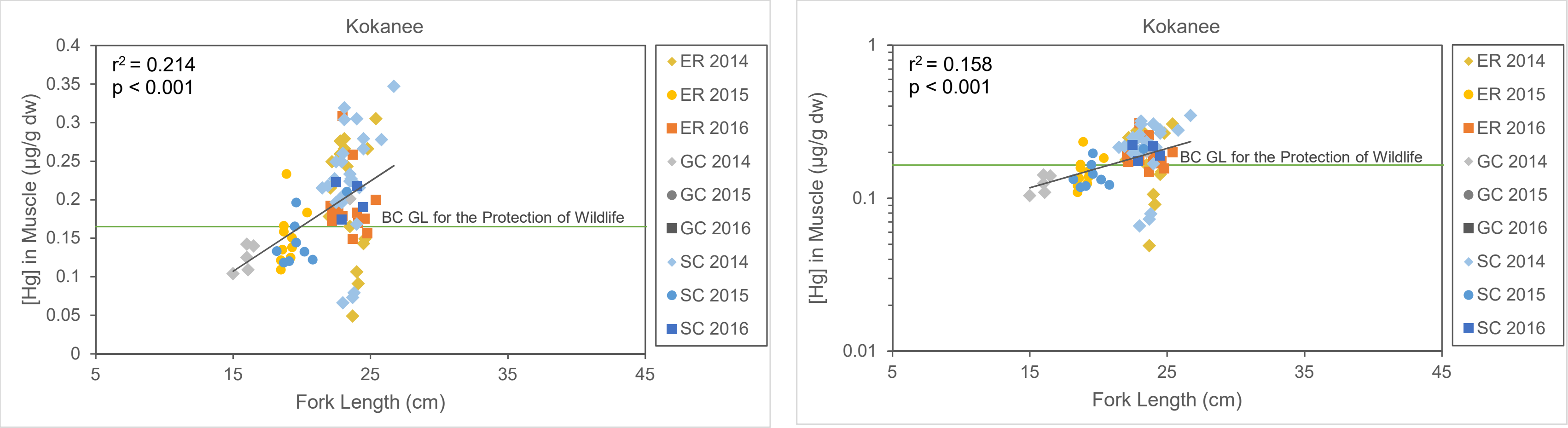

**Figure F.32:** **Mercury Concentrations in Kokanee Muscle Relative to Fork Length (cm) in Koocanusa Reservoir, 2014 to 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

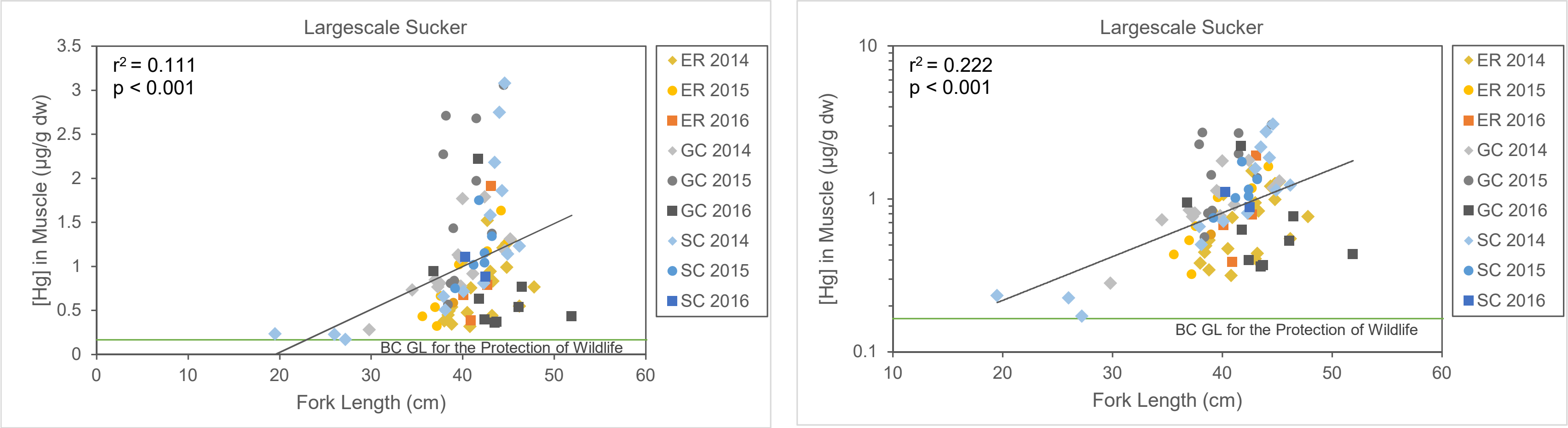

**Figure F.33:** **Mercury Concentrations in Largescale Sucker Muscle Relative to Fork Length (cm) in Koocanusa Reservoir, 2014 to 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

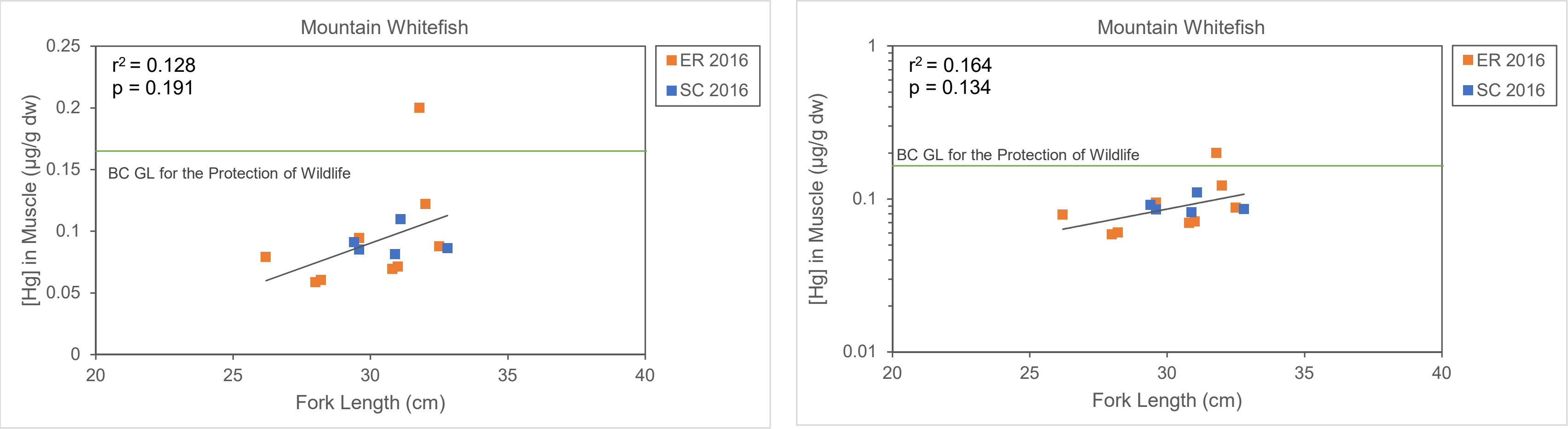

**Figure F.34:** **Mercury Concentrations (µg/g dw) in Mountain Whitefish Muscle Relative to Fork Length (cm) in Koocanusa Reservoir, August, 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

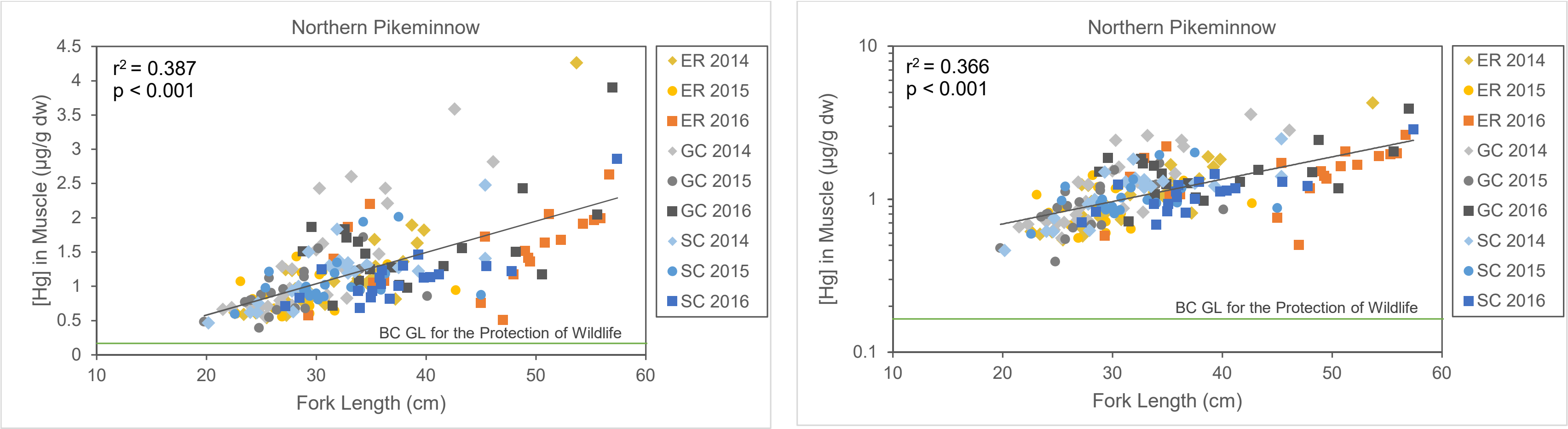

**Figure F.35:** **Mercury Concentrations in Northern Pikeminnow Muscle Relative to Fork Length (cm) in Koocanusa Reservoir, 2014 to 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

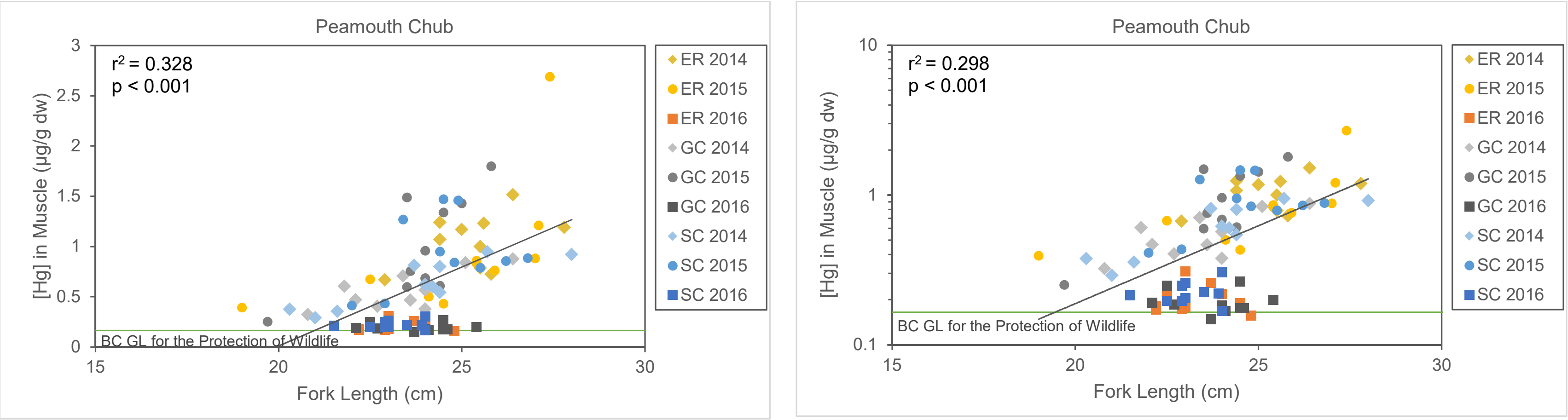

**Figure F.36:** **Mercury Concentrations (µg/g dw) in Peamouth Chub Muscle Relative to Fork Length (cm) in Koocanusa Reservoir, April, 2014, 2015, and 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

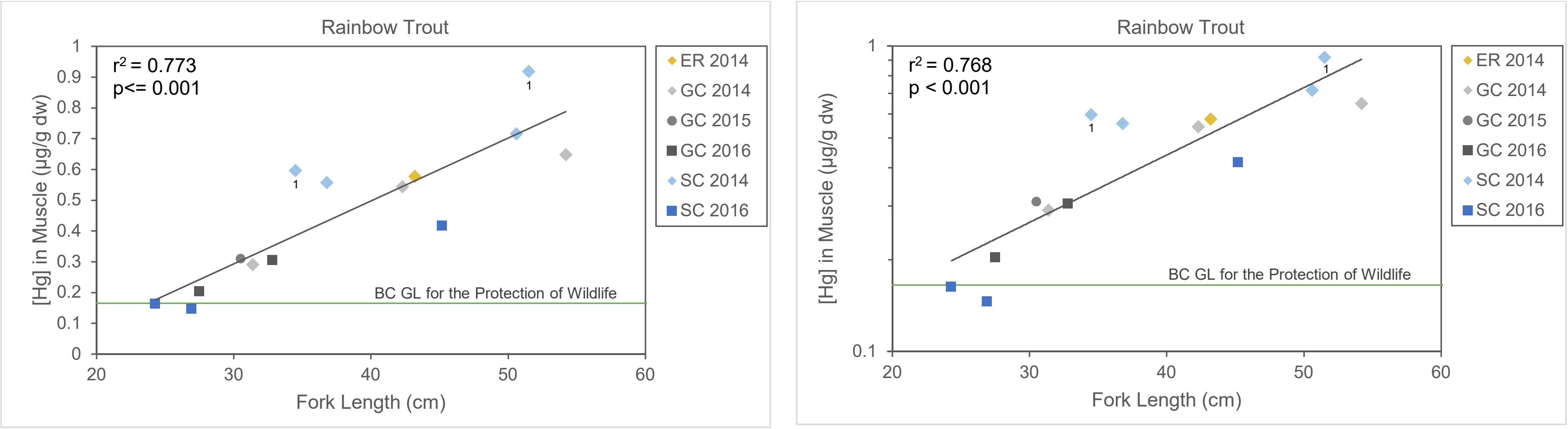

**Figure F.37:** **Mercury Concentrations (µg/g dw) in Rainbow Trout Muscle Relative to Fork Length (cm) in the Koocanusa Reservoir, February 2014, April 2014 to 2016, and August 2014**

[1] indicates that Total Length was used.

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

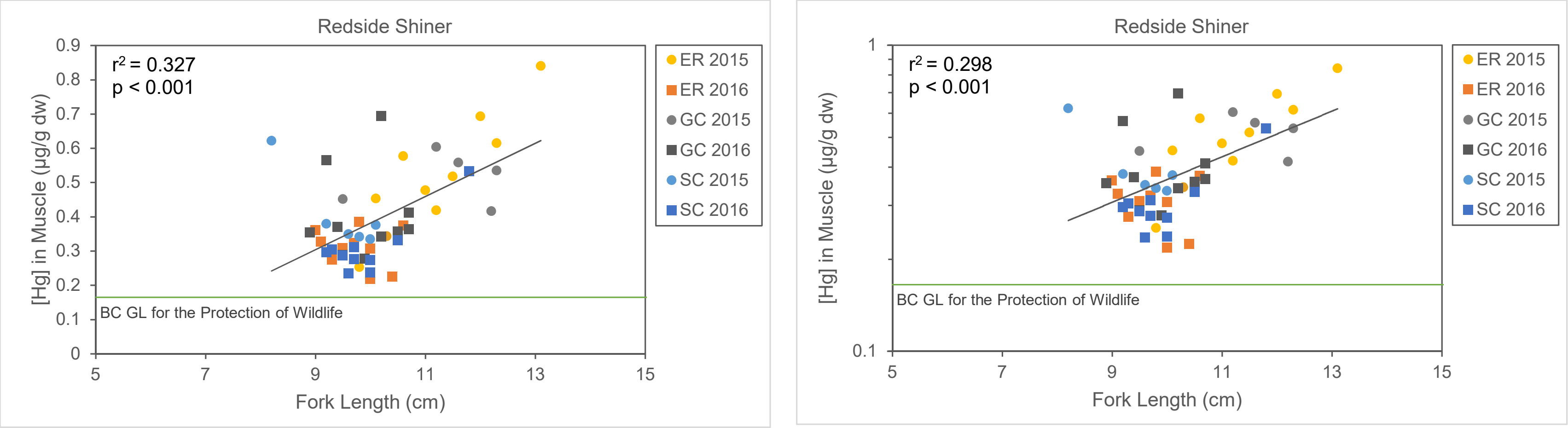

**Figure F.38: Mercury Concentrations (µg/g dw) in Redside Shiner Muscle Relative to Fork Length (cm) in the Koocanusa Reservoir, April 2015 to 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%. No data was available for redside shiners, so golden shiners were used for comparative purpose.

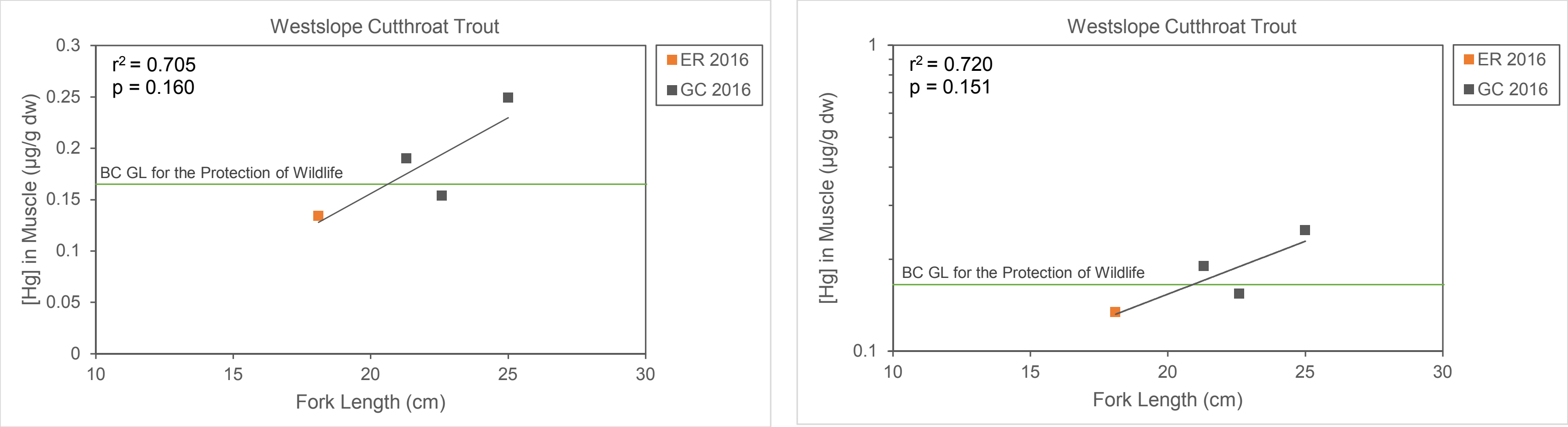

**Figure F.39:** **Mercury Concentrations (µg/g dw) in Westslope Cutthroat Trout Muscle Relative to Fork Length (cm) in the Koocanusa Reservoir, April 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

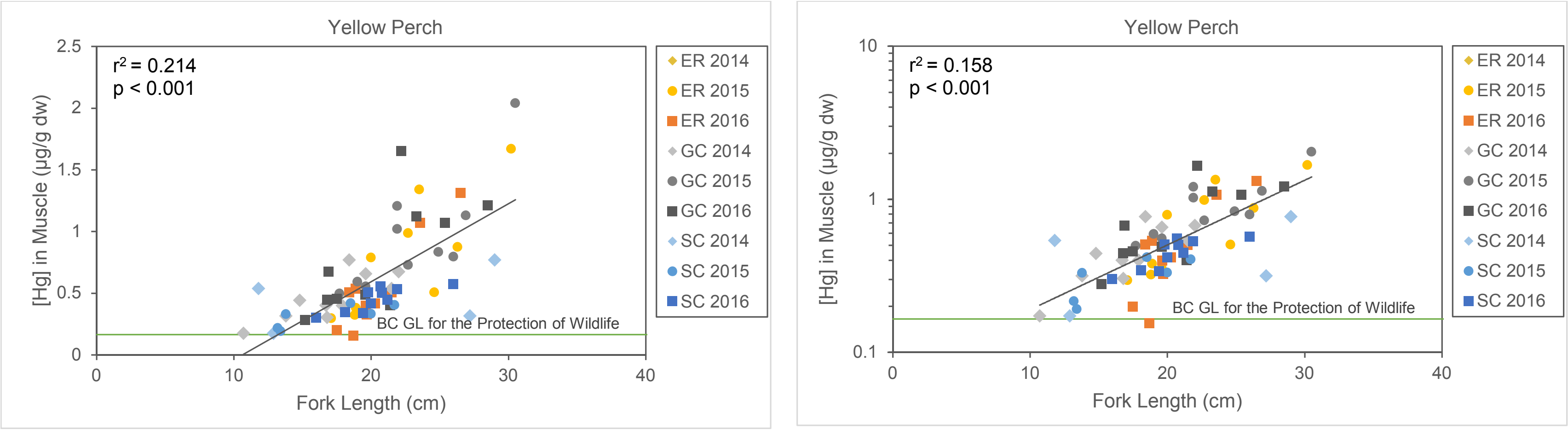

**Figure F.40:** **Mercury Concentrations (µg/g dw) in Yellow Perch Muscle Relative to Fork Length (cm) in the Koocanusa Reservoir, April 2014 to 2016**

Notes: Sand Creek (SC) study area is located upstream of the Elk River, while Elk River (ER) and Gold Creek (GC) study areas are located downstream of the Elk River confluence. Assuming all mercury is present as methyl-mercury (CCME 2000). The BC guideline for the protection of wildlife (0.033 µg/g ww) was converted to dry weight based on an average moisture content in fish muscle in Koocanusa Reservoir of approximately 80%.

# Angling

**Table F.1:** **Angling Records for Fish Caught in Koocanusa Reservoir, February 2014**

| Area | Station | Location (11U, NAD83) | | Multiple Attempts at Same Locations | Set Date | Date of Removal | Set Time | Removal Time | Angling Hours (hrs) | Depth Range (m) | | # of Lines | Effort (angling lines*days) | Bull Trout | | | Burbot | | | Largescale Sucker | | | Northern Pikeminnow | | | Peamouth Chub | | | Rainbow Trout | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Sand Creek | SC-AN1 | 625568 | 5460392 | - | 14-Feb-14 | 14-Feb-14 | 9:30 | 11:00 | 1.50 | 5.8 | 6.4 | 2 | 0.13 | 0 | 0 | 0.00 | 1 | 0 | 8.00 | 0 | 0 | 0.00 | 2 | 1 | 16.00 | 0 | 0 | 0.00 | 1 | 1 | 8.00 |
| | SC-AN2 | 625512 | 5460401 | - | 14-Feb-14 | 14-Feb-14 | 11:00 | 12:30 | 1.50 | 9.2 | 9.3 | 2 | 0.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 8.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN3 | 625457 | 5460374 | - | 14-Feb-14 | 14-Feb-14 | 12:45 | 14:10 | 1.42 | 9.7 | 10.2 | 2 | 0.12 | 0 | 0 | 0.00 | 1 | 0 | 8.47 | 0 | 0 | 0.00 | 1 | 0 | 8.47 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN4 | 625408 | 5460320 | - | 14-Feb-14 | 14-Feb-14 | 14:30 | 16:55 | 2.42 | 6.5 | 7.8 | 2 | 0.20 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 4.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN5 | 625409 | 5460209 | - | 15-Feb-14 | 15-Feb-14 | 9:05 | 10:30 | 1.42 | 4.6 | 4.8 | 2 | 0.12 | 0 | 0 | 0.00 | 1 | 0 | 8.47 | 0 | 0 | 0.00 | 1 | 0 | 8.47 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN6 | 625496 | 5460224 | - | 15-Feb-14 | 15-Feb-14 | 10:40 | 12:30 | 1.83 | 7.6 | 7.9 | 2 | 0.15 | 0 | 0 | 0.00 | 1 | 0 | 6.55 | 0 | 0 | 0.00 | 1 | 0 | 6.55 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN7 | 625574 | 5460281 | - | 15-Feb-14 | 15-Feb-14 | 12:40 | 13:05 | 0.42 | 6.9 | 11.8 | 2 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN8 | 625496 | 5460224 | - | 15-Feb-14 | 15-Feb-14 | 13:25 | 17:05 | 3.67 | 7.6 | 7.9 | 2 | 0.31 | 0 | 0 | 0.00 | 1 | 0 | 3.27 | 0 | 0 | 0.00 | 1 | 1 | 3.27 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **14.17** | **-** | **-** | **16** | **1.18** | **0** | **0** | **0.00** | **5** | **0** | **4.24** | **0** | **0** | **0.00** | **8** | **3** | **6.78** | **0** | **0** | **0.00** | **1** | **1** | **0.85** |
| Elk River | ER-AN1 | 627746 | 5447354 | 1a | 17-Feb-14 | 17-Feb-14 | 9:10 | 11:05 | 1.92 | 9.2 | 2.5 | 2 | 0.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 18.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 1b | 18-Feb-14 | 18-Feb-14 | 9:25 | 11:30 | 2.08 | 9.2 | 2.5 | 2 | 0.17 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 5.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 1c | 20-Feb-14 | 20-Feb-14 | 12:50 | 13:55 | 1.08 | 9.2 | 2.5 | 2 | 0.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN2 | 627826 | 5447449 | 2a | 17-Feb-14 | 17-Feb-14 | 11:15 | 12:45 | 1.50 | 8.3 | 3.2 | 2 | 0.13 | 1 | 0 | 8.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 8.00 | 1 | 0 | 8.00 | 0 | 0 | 0.00 |
| | | | | 2b | 18-Feb-14 | 18-Feb-14 | 11:45 | 13:05 | 1.33 | 8.3 | 3.2 | 2 | 0.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 2c | 20-Feb-14 | 20-Feb-14 | 14:05 | 15:30 | 1.42 | 8.3 | 3.2 | 2 | 0.12 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN3 | 627898 | 5447536 | - | 17-Feb-14 | 17-Feb-14 | 13:00 | 16:45 | 3.75 | 4.0 | 12.2 | 2 | 0.31 | 1 | 0 | 3.20 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 2 | 12.80 | 0 | 0 | 0.00 | 1 | 1 | 3.20 |
| | ER-AN4 | 627889 | 5447474 | - | 18-Feb-14 | 18-Feb-14 | 13:30 | 15:00 | 1.50 | 11.4 | 11.5 | 2 | 0.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 8.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN5 | 627930 | 5447457 | - | 18-Feb-14 | 18-Feb-14 | 15:35 | 17:30 | 1.92 | 10.8 | 11.2 | 2 | 0.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN6 | 627920 | 5447498 | - | 20-Feb-14 | 20-Feb-14 | 15:40 | 17:30 | 1.83 | 11.4 | 11.6 | 2 | 0.15 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **18.33** | **-** | **-** | **20** | **1.53** | **2** | **0** | **1.31** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **10** | **5** | **6.55** | **1** | **0** | **0.65** | **1** | **1** | **0.65** |
| Gold Creek | GC-AN1 | 629355 | 5436958 | 1a | 11-Feb-14 | 11-Feb-14 | 9:30 | 13:00 | 3.50 | 3.5 | 3.2 | 2 | 0.29 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 13.71 | 0 | 0 | 0.00 | 1 | 1 | 3.43 |
| | | | | 1b | 12-Feb-14 | 12-Feb-14 | 9:15 | 10:20 | 1.08 | 3.5 | 3.2 | 2 | 0.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN2 | 629438 | 5436997 | 2a | 11-Feb-14 | 11-Feb-14 | 13:05 | 14:45 | 1.67 | 5.0 | 4.8 | 2 | 0.14 | 1 | 0 | 7.20 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 21.60 | 0 | 0 | 0.00 | 1 | 1 | 7.20 |
| | | | | 2b | 12-Feb-14 | 12-Feb-14 | 10:30 | 12:20 | 1.83 | 5.0 | 4.8 | 2 | 0.15 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN3 | 629451 | 5437078 | - | 12-Feb-14 | 12-Feb-14 | 12:45 | 13:50 | 1.08 | 5.2 | 5.0 | 2 | 0.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 1 | 33.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN4 | 629354 | 5437061 | - | 16-Feb-14 | 16-Feb-14 | 9:45 | 11:55 | 2.17 | 4.7 | 4.5 | 2 | 0.18 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN5 | 629265 | 5437036 | - | 12-Feb-14 | 12-Feb-14 | 13:55 | 15:00 | 1.08 | 3.3 | 3.2 | 2 | 0.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN6 | 629136 | 5437013 | 6a | 11-Feb-14 | 11-Feb-14 | 14:55 | 18:00 | 3.08 | 1.2 | 1.0 | 2 | 0.26 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 3.89 | 8 | 3 | 31.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 6b | 12-Feb-14 | 12-Feb-14 | 15:05 | 16:05 | 1.00 | 1.2 | 1.0 | 2 | 0.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 6c | 16-Feb-14 | 16-Feb-14 | 12:25 | 14:20 | 1.92 | 1.2 | 1.0 | 2 | 0.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 18.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN7 | 629111 | 5436941 | - | 16-Feb-14 | 16-Feb-14 | 14:30 | 15:30 | 1.00 | 3.0 | 2.2 | 2 | 0.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 24.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN8 | 629455 | 5437021 | 8a | 12-Feb-14 | 12-Feb-14 | 16:40 | 18:10 | 1.50 | 6.2 | 5.4 | 2 | 0.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 1 | 24.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 8b | 16-Feb-14 | 16-Feb-14 | 15:35 | 16:55 | 1.33 | 6.2 | 5.4 | 2 | 0.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN9 | 629016 | 5436983 | - | 20-Feb-14 | 20-Feb-14 | 8:30 | 10:50 | 2.33 | 1.2 | 0.8 | 2 | 0.19 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN10 | 629461 | 5436861 | - | 20-Feb-14 | 20-Feb-14 | 10:55 | 12:40 | 1.75 | 4.7 | 4.2 | 2 | 0.15 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **26.33** | **-** | **-** | **30** | **2.19** | **1** | **0** | **0.46** | **0** | **0** | **0.00** | **1** | **0** | **0.46** | **26** | **8** | **11.85** | **0** | **0** | **0.00** | **2** | **2** | **0.91** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

**Table F.2: Angling Records for Fish Caught in Koocanusa Reservoir, April 2014**

| Area | Station | Location (11U, NAD83) | | Set Date | Date of Removal | Set Time | Removal Time | Angling Hours (hrs) | Depth Range (m) | | # of Lines | Effort (angling lines*days) | Mountain Whitefish | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* |
| Sand Creek | SC-AN1 | 624826 | 5461123 | 10-Apr-14 | 10-Apr-14 | 15:30 | 16:30 | 1.00 | 0.5 | 2.0 | 2 | 0.08 | 0 | 0 | 0.00 |
| | SC-AN2 | 623391 | 5461316 | 11-Apr-14 | 11-Apr-14 | 14:00 | 15:00 | 1.00 | 1.0 | 2.0 | 2 | 0.08 | 0 | 0 | 0.00 |
| | SC-AN3 | 625665 | 5458082 | 16-Apr-14 | 16-Apr-14 | 13:45 | 15:45 | 2.00 | 1.0 | 3.0 | 2 | 0.17 | 1 | 0 | 6.00 |
| | **TOTAL** | | | | | | | **4.00** | **-** | **-** | **6** | **0.33** | **1** | **0** | **3.00** |
| Elk River | ER-AN1 | 629076 | 5447937 | 11-Apr-14 | 11-Apr-14 | 12:00 | 13:00 | 1.00 | 3.0 | 6.0 | 2 | 0.08 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **1.00** | **-** | **-** | **2** | **0.08** | **0** | **0** | **0.00** |
| Gold Creek | GC-AN1 | 630602 | 5437926 | 11-Apr-14 | 11-Apr-14 | 13:15 | 13:45 | 0.50 | 1.5 | 8.0 | 2 | 0.04 | 0 | 0 | 0.00 |
| | GC-AN2 | 629455 | 5436996 | 11-Apr-14 | 11-Apr-14 | 14:30 | 15:00 | 0.50 | 0.5 | 1.5 | 2 | 0.04 | 0 | 0 | 0.00 |
| | GC-AN3 | 629551 | 5436990 | 14-Apr-14 | 15-Apr-14 | 10:20 | 11:00 | 24.67 | 0.5 | 1.0 | 2 | 2.06 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **25.67** | **-** | **-** | **6** | **2.14** | **0** | **0** | **0.00** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

**Table F.3:** **Angling Records for Fish Caught in Koocanusa Reservoir, August 2014**

| Area | Station | Location[b] (NAD 83, Zone 11U) | | | | Set Date | Date of Removal | Start Time | End Time | Angling Hours (hrs) | Depth Range (m) | | # of Lines | Effort (angling lines*days) | Kokanee | | | Northern Pikeminnow | | | Rainbow Trout | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Start Easting | Start Northing | End Easting | End Northing | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE[a] | Catch | Mortalities/ Sacrificed | CPUE[a] | Catch | Mortalities/ Sacrificed | CPUE[a] |
| Sand Creek | SC-AN1 | 625507 | 5457828 | 626557 | 5458377 | 21-Aug-14 | 21-Aug-14 | 14:00 | 15:30 | 1.50 | 17.0 | - | 4 | 0.25 | 0 | 0 | 0.0 | 0 | 0 | 0.0 | 0 | 0 | 0.0 |
| | **TOTAL** | | | | | | | | | **1.50** | **-** | **-** | **4** | **0.25** | **0** | **0** | **0.0** | **0** | **0** | **0.0** | **0** | **0** | **0.0** |
| Elk River | ER-AN1 | 627144 | 5446434 | 627111 | 5444962 | 20-Aug-14 | 20-Aug-14 | 15:45 | 17:00 | 1.25 | 22.4 | 10.6 | 4 | 0.21 | 0 | 0 | 0.0 | 0 | 0 | 0.0 | 0 | 0 | 0.0 |
| | ER-AN2 | 627112 | 5446484 | 626971 | 5446843 | 21-Aug-14 | 21-Aug-14 | 15:45 | 17:00 | 1.25 | 21.1 | - | 4 | 0.21 | 2 | 2 | 9.6 | 0 | 0 | 0.0 | 0 | 0 | 0.0 |
| | ER-AN3 | 626812 | 5446531 | 626992 | 5445507 | 24-Aug-14 | 24-Aug-14 | 16:00 | 17:30 | 1.50 | 23.1 | 29.1 | 4 | 0.25 | 0 | 0 | 0.0 | 0 | 0 | 0.0 | 0 | 0 | 0.0 |
| | **TOTAL** | | | | | | | | | **4.00** | **-** | **-** | **12** | **0.67** | **2** | **2** | **3.0** | **0** | **0** | **0.0** | **0** | **0** | **0.0** |
| Gold Creek | GC-AN1 | 630340 | 5437123 | 630357 | 5436999 | 25-Aug-14 | 25-Aug-14 | 14:45 | 17:30 | 2.75 | 20.2 | - | 4 | 0.46 | 5 | 5 | 10.9 | 2 | 0 | 4.4 | 0 | 0 | 0.0 |
| | GC-AN2 | 630424 | 5436918 | 630365 | 5437418 | 26-Aug-14 | 26-Aug-14 | 9:30 | 11:10 | 1.67 | 25.2 | - | 4 | 0.28 | 4 | 1 | 14.4 | 0 | 0 | 0.0 | 1 | 0 | 3.6 |
| | **TOTAL** | | | | | | | | | **4.42** | **-** | **-** | **8** | **0.74** | **9** | **6** | **12.2** | **2** | **0** | **2.7** | **1** | **0** | **1.4** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

[b] Angling completed by downrigging, so start and end coordinates were included.

## Table F.4: Angling Records for Fish Caught in Koocanusa Reservoir, February 2015

| Area | Station | Location (11U, NAD83) | | Date | Start Time | End Time | Angling Hours (hrs) | Depth (m) | # of Lines | Effort (angling lines*day) | Northern Pikeminnow | | | Peamouth Chub | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] |
| Sand Creek | SC-AN-01 | 625664 | 5457717 | 27-Feb-15 | 15:15 | 15:45 | 0.50 | 8.0 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-02 | 625593 | 5457919 | 27-Feb-15 | 15:50 | 16:00 | 0.08 | 5.6 | 2 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-03 | 625572 | 5460007 | 28-Feb-15 | 13:55 | 14:40 | 0.75 | 11.1 | 2 | 0.06 | 3 | 2 | 48.00 | 0 | 0 | 0.00 |
| | SC-AN-04 | 625667 | 5457940 | 27-Feb-15 | 15:28 | 16:05 | 0.63 | 9.3 | 2 | 0.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-05 | 625588 | 5459659 | 28-Feb-15 | 14:55 | 15:30 | 0.58 | 8.7 | 2 | 0.05 | 0 | 0 | 0.00 | 2 | 0 | 41.38 |
| | **Total** | | | | | | | | **10** | **0.21** | **3** | **2** | **14.17** | **2** | **0** | **9.45** |
| Elk River | ER-AN-01 | 628264 | 5447815 | 25-Feb-15 | 12:28 | 12:45 | 0.28 | 7.4 | 2 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-02 | 628004 | 5447777 | 25-Feb-15 | 13:00 | 13:55 | 0.92 | 9.1 | 2 | 0.08 | 2 | 0 | 26.09 | 0 | 0 | 0.00 |
| | ER-AN-03 | 627999 | 5447715 | 25-Feb-15 | 14:00 | 14:25 | 0.42 | 9.0 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-04 | 628023 | 5447632 | 25-Feb-15 | 14:25 | 14:35 | 0.17 | 11.8 | 2 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-05 | 627955 | 5447598 | 25-Feb-15 | 14:45 | 15:15 | 0.33 | 7.7 | 2 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-06 | 628135 | 5447318 | 25-Feb-15 | 15:20 | 16:00 | 0.67 | 8.0 | 2 | 0.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-07 | 628403 | 5447898 | 26-Feb-15 | 10:15 | 10:50 | 0.58 | 6.1 | 2 | 0.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-08 | 627367 | 5446821 | 26-Feb-15 | 11:00 | 11:28 | 0.47 | 7.6 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-09 | 628026 | 5447752 | 26-Feb-15 | 11:34 | 12:15 | 0.68 | 13.9 | 2 | 0.06 | 1 | 1 | 17.65 | 0 | 0 | 0.00 |
| | ER-AN-10 | 628085 | 5447701 | 26-Feb-15 | 15:02 | 16:03 | 1.02 | 11.3 | 2 | 0.09 | 1 | 0 | 11.76 | 0 | 0 | 0.00 |
| | ER-AN-11 | 627739 | 5447144 | 25-Feb-15 | 12:25 | 13:10 | 0.75 | 9.0 | 2 | 0.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-12 | 628037 | 5447767 | 25-Feb-15 | 13:15 | 14:40 | 1.42 | 17.1 | 2 | 0.12 | 5 | 0 | 42.25 | 0 | 0 | 0.00 |
| | ER-AN-13 | 628093 | 5447713 | 25-Feb-15 | 14:44 | 15:07 | 0.38 | 10.1 | 2 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-14 | 627853 | 5447475 | 25-Feb-15 | 15:15 | 15:40 | 0.42 | 8.2 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-15 | 627619 | 5446850 | 25-Feb-15 | 15:45 | 16:00 | 0.25 | 11.1 | 2 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-16 | 628009 | 5447807 | 26-Feb-15 | 10:10 | 12:00 | 1.83 | 15.5 | 2 | 0.15 | 5 | 0 | 32.79 | 1 | 0 | 6.56 |
| | ER-AN-17 | 628486 | 5447969 | 26-Feb-15 | 13:51 | 14:35 | 0.73 | 5.5 | 2 | 0.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-18 | 628142 | 5447640 | 26-Feb-15 | 14:42 | 16:00 | 1.30 | 7.2 | 2 | 0.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **Total** | | | | | | | | **36** | **1.05** | **14** | **1** | **13.31** | **1** | **0** | **0.95** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

**Table F.5:** **Angling Records for Fish Caught in Koocanusa Reservoir, April 2015**

| Area | Station | Location (11U, NAD83) | | Set Date | Date of Removal | Set Time | Removal Time | Angling Hours (hrs) | Depth (m) | # of Lines | Effort (angling lines*days) | Bull Trout | | | Kokanee | | | Northern Pikeminnow | | | Peamouth Chub | | | Rainbow Trout | | | Westslope Cutthroat Trout | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE[a] | Catch | Mortalities/ Sacrificed | CPUE[a] | Catch | Mortalities/ Sacrificed | CPUE[a] | Catch | Mortalities/ Sacrificed | CPUE[a] | Catch | Mortalities/ Sacrificed | CPUE[a] | Catch | Mortalities/ Sacrificed | CPUE[a] |
| Sand Creek | SC-AN-01 | 626157 | 5458225 | 21-Apr-15 | 21-Apr-15 | 15:24 | 16:00 | 0.60 | 3.1 | 2 | 0.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-02 | 625558 | 5459677 | 21-Apr-15 | 21-Apr-15 | 16:13 | 16:30 | 0.28 | 9.7 | 2 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-03 | 625572 | 5459797 | 24-Apr-15 | 24-Apr-15 | 10:00 | 10:30 | 0.50 | 11.8 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 24.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-04 | 625586 | 5460100 | 24-Apr-15 | 24-Apr-15 | 10:32 | 10:48 | 0.27 | 10.0 | 2 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 45.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-05 | 625530 | 5460095 | 24-Apr-15 | 24-Apr-15 | 11:20 | 11:50 | 0.50 | 8.0 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-06 | 625530 | 5460095 | 24-Apr-15 | 24-Apr-15 | 12:00 | 13:00 | 1.00 | 2.0 | 2 | 0.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-07 | 625672 | 5457982 | 24-Apr-15 | 24-Apr-15 | 13:00 | 14:00 | 1.00 | 7.1 | 2 | 0.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 15 | 10 | 180.00 | 7 | 7 | 84.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-08 | 625682 | 5457986 | 27-Apr-15 | 27-Apr-15 | 12:15 | 13:25 | 1.17 | 7.1 | 2 | 0.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 12 | 8 | 123.43 | 8 | 8 | 82.29 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-09 | 625672 | 5457982 | 28-Apr-15 | 28-Apr-15 | 12:00 | 13:00 | 1.00 | 7.1 | 2 | 0.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 7 | 1 | 84.00 | 3 | 3 | 36.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-10 | 626088 | 5458109 | 28-Apr-15 | 28-Apr-15 | 13:04 | 13:30 | 0.43 | 5.0 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-11 | 625672 | 5457985 | 28-Apr-15 | 28-Apr-15 | 13:33 | 14:03 | 0.50 | 6.9 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 96.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-12 | 625496 | 5459952 | 28-Apr-15 | 28-Apr-15 | 14:14 | 14:40 | 0.43 | 7.1 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 2 | 83.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-13 | 625596 | 5459952 | 28-Apr-15 | 28-Apr-15 | 14:45 | 15:00 | 0.25 | 7.5 | 2 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 192.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-14 | 625768 | 5458158 | 30-Apr-15 | 30-Apr-15 | 10:50 | 14:30 | 3.67 | 8.0 | 4 | 0.61 | 1 | 0 | 1.64 | 1 | 0 | 1.64 | 28 | 0 | 45.82 | 21 | 20 | 34.36 | 0 | 0 | 0.00 | 1 | 0 | 1.64 |
| | **TOTAL** | | | | | | | **11.60** | **-** | **30** | **1.27** | **1** | **0** | **0.79** | **1** | **0** | **0.79** | **72** | **20** | **56.59** | **42** | **40** | **33.01** | **0** | **0** | **0.00** | **1** | **0** | **0.79** |
| Elk River | ER-AN-01 | 630086 | 5447278 | 21-Apr-15 | 21-Apr-15 | 16:15 | 16:45 | 0.50 | 3.3 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 96.00 | 2 | 2 | 48.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-02 | 627966 | 5447846 | 22-Apr-15 | 22-Apr-15 | 2:30 | 3:15 | 0.75 | 14.3 | 2 | 0.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 6 | 96.00 | 5 | 5 | 80.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-03 | 628008 | 5447765 | 23-Apr-15 | 23-Apr-15 | 12:00 | 13:35 | 1.58 | 10.8 | 2 | 0.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 13 | 12 | 98.53 | 2 | 2 | 15.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-04 | 628091 | 5448031 | 26-Apr-15 | 26-Apr-15 | 13:30 | 14:00 | 0.50 | 11.7 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 48.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-05 | 628001 | 5447719 | 27-Apr-15 | 27-Apr-15 | 11:25 | 14:00 | 2.58 | 9.1 | 2 | 0.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 14 | 8 | 65.03 | 4 | 4 | 18.58 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-06 | 629693 | 5447046 | 28-Apr-15 | 28-Apr-15 | 11:00 | 15:45 | 4.75 | 4.5 | 2 | 0.40 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 72 | 44 | 181.89 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-07 | 629296 | 5447268 | 29-Apr-15 | 29-Apr-15 | 10:50 | 13:00 | 2.17 | 4.1 | 2 | 0.18 | 0 | 0 | 0.00 | 1 | 0 | 5.54 | 5 | 2 | 27.69 | 26 | 17 | 144.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-AN-08 | 627940 | 5447831 | 29-Apr-15 | 29-Apr-15 | 13:30 | 14:00 | 0.50 | 5.1 | 2 | 0.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 2 | 72.00 | 1 | 0 | 24.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **13.33** | | **16** | **1.11** | **0** | **0** | **0.00** | **1** | **0** | **0.90** | **45** | **34** | **40.50** | **114** | **76** | **102.60** | **0** | **0** | **0.00** | **0** | **0** | **0.00** |
| Gold Creek | GC-AN-01 | 628366 | 5436651 | 22-Apr-15 | 22-Apr-15 | - | - | 3.50 | - | 2 | 0.29 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 11 | 7 | 37.71 | 2 | 2 | 6.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-02 | 628366 | 5436651 | 23-Apr-15 | 23-Apr-15 | - | - | 2.50 | - | 2 | 0.21 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 7 | 7 | 33.60 | 6 | 6 | 28.80 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-03 | 628366 | 5436651 | 24-Apr-15 | 24-Apr-15 | - | - | 0.15 | - | 2 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 80.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-04 | 628366 | 5436651 | 25-Apr-15 | 25-Apr-15 | - | - | 2.50 | - | 2 | 0.21 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 19.20 | 23 | 23 | 110.40 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-05 | 628366 | 5436651 | 26-Apr-15 | 26-Apr-15 | - | - | 3.50 | - | 2 | 0.29 | 1 | 0 | 3.43 | 0 | 0 | 0.00 | 14 | 7 | 48.00 | 20 | 5 | 68.57 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-06 | 628366 | 5436651 | 27-Apr-15 | 27-Apr-15 | - | - | 3.00 | - | 2 | 0.25 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 8.00 | 24 | 8 | 96.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-07 | 628366 | 5436651 | 29-Apr-15 | 29-Apr-15 | - | - | 2.00 | - | 2 | 0.17 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 12 | 6 | 72.00 | 9 | 4 | 54.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-08 | 628366 | 5436651 | 30-Apr-15 | 30-Apr-15 | - | - | 2.00 | - | 2 | 0.17 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 10 | 5 | 60.00 | 8 | 3 | 48.00 | 1 | 0 | 6.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **19.15** | **-** | **16** | **1.60** | **1** | **0** | **0.63** | **0** | **0** | **0.00** | **61** | **39** | **38.22** | **92** | **51** | **57.65** | **1** | **0** | **0.05** | **0** | **0** | **0.00** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

## Table F.6: Angling Records for Fish Caught in Koocanusa Reservoir, August 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Date of Removal | Set Time | Removal Time | Angling Hours (hrs) | Depth (m) | # of Lines | Effort (angling lines*days) | Northern Pikeminnow | | | Peamouth Chub | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Sand Creek | SC-AN-01 | 625682 | 5457999 | 21-Aug-15 | 21-Aug-15 | 12:00 | 13:00 | 1.00 | 8.0 | 3 | 0.12 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-02 | 626095 | 5458104 | 21-Aug-15 | 21-Aug-15 | 13:00 | 13:35 | 0.58 | 11.0 | 3 | 0.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-AN-03 | 625441 | 5457931 | 21-Aug-15 | 21-Aug-15 | 13:45 | 14:30 | 0.75 | 4.0 | 3 | 0.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **2.33** | **-** | **9** | **0.29** | **0** | **0** | **0.00** | **0** | **0** | **0.00** |
| Elk River | ER-AN-01 | 631946 | 5447054 | 23-Aug-15 | 23-Aug-15 | 11:30 | 12:20 | 0.83 | 2.5 | 3 | 0.10 | 0 | 0 | 0.00 | 1 | 0 | 9.60 |
| | ER-AN-02 | 627989 | 5447769 | 23-Aug-15 | 23-Aug-15 | 13:00 | 15:00 | 2.00 | 14.3 | 3 | 0.25 | 20 | 10 | 80.00 | 1 | 0 | 4.00 |
| | **TOTAL** | | | | | | | **2.83** | **-** | **6** | **0.35** | **20** | **10** | **56.47** | **2** | **0** | **5.65** |
| Gold Creek | GC-AN-01 | 629080 | 5436438 | 24-Aug-15 | 24-Aug-15 | 17:00 | 17:20 | 0.33 | 5.0 | 3 | 0.04 | 3 | 2 | 72.00 | 0 | 0 | 0.00 |
| | GC-AN-02 | 629125 | 5436442 | 24-Aug-15 | 24-Aug-15 | 16:30 | 16:45 | 0.25 | 9.0 | 3 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-AN-03 | 629080 | 5436438 | 25-Aug-15 | 25-Aug-15 | 12:00 | 14:30 | 2.50 | 5.0 | 1 | 0.10 | 7 | 2 | 67.20 | 0 | 0 | 0.00 |
| | GC-AN-04 | 629738 | 5436579 | 25-Aug-15 | 25-Aug-15 | 14:30 | 15:30 | 1.00 | 7.5 | 3 | 0.13 | 8 | 2 | 64.00 | 0 | 0 | 0.00 |
| | GC-AN-05 | 629125 | 5436442 | 25-Aug-15 | 25-Aug-15 | 15:30 | 16:00 | 0.50 | 9.0 | 3 | 0.06 | 1 | 1 | 16.00 | 0 | 0 | 0.00 |
| | GC-AN-06 | 629080 | 5436438 | 25-Aug-15 | 25-Aug-15 | 16:00 | 16:30 | 0.50 | 5.0 | 3 | 0.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **5.08** | **-** | **16** | **0.43** | **19** | **7** | **44.49** | **0** | **0** | **0.00** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

**Table F.7:** **Angling Records for Fish Caught in Koocanusa Reservoir, April 2016**

| Area | Station | Location (11U, NAD83) | | Set Date | Date of Removal | Set Time | Removal Time | Angling Hours (hrs) | Depth (m) | # of Lines | Effort (angling lines*days) | Bull Trout | | | Northern Pikeminnow | | | Peamouth Chub | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Sand Creek | SC-AN-01 | 625685 | 5458167 | 21-Apr-16 | 21-Apr-16 | 12:35 | 13:50 | 1.3 | 2.0 | 2 | 0.10 | 1 | 0 | 9.6 | 0 | 0 | 0 | 4 | 3 | 38 |
| | SC-AN-02 | 625687 | 5457183 | 23-Apr-16 | 23-Apr-16 | 12:25 | 13:30 | 1.1 | 2.5 | 2 | 0.09 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SC-AN-03 | 625809 | 5458141 | 25-Apr-16 | 25-Apr-16 | 11:38 | 12:20 | 0.70 | 2.2 | 2 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SC-AN-04 | 625774 | 5458453 | 26-Apr-16 | 26-Apr-16 | 10:55 | 11:32 | 0.62 | 2.2 | 2 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | **3.7** | **-** | **8** | **0.30** | **1** | **0** | **3.3** | **0** | **0** | **0** | **4** | **3** | **13** |
| Elk River | ER-AN-01 | 628214 | 5447728 | 19-Apr-16 | 19-Apr-16 | 15:00 | 17:00 | 2.0 | 1.4 | 2 | 0.17 | 2 | 0 | 12 | 2 | 1 | 12 | 14 | 14 | 84 |
| | ER-AN-02 | 628214 | 5447728 | 22-Apr-16 | 22-Apr-16 | 10:50 | 11:15 | 0.42 | 2.1 | 2 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ER-AN-03 | 628175 | 5446621 | 25-Apr-16 | 25-Apr-16 | 11:15 | 12:10 | 0.92 | 2.1 | 2 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | **2.4** | **-** | **4** | **0.20** | **2** | **0** | **9.9** | **2** | **1** | **9.9** | **14** | **14** | **70** |
| Gold Creek | GC-AN-01 | 630438 | 5437311 | 19-Apr-16 | 19-Apr-16 | 13:10 | 15:10 | 2.0 | 2.0 - 4.0 | 3 | 0.25 | 0 | 0 | 0 | 5 | 3 | 20 | 0 | 0 | 0 |
| | GC-AN-02 | 629909 | 5437050 | 20-Apr-16 | 20-Apr-16 | 11:00 | 12:15 | 1.2 | 2.5 | 3 | 0.16 | 0 | 0 | 0 | 1 | 1 | 6.4 | 1 | 1 | 6.4 |
| | GC-AN-03 | 629997 | 5436957 | 21-Apr-16 | 21-Apr-16 | 10:15 | 11:15 | 1.0 | 3.0 | 3 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 32 |
| | GC-AN-04 | 629675 | 5437202 | 22-Apr-16 | 22-Apr-16 | 12:20 | 13:00 | 0.67 | 2.6 | 2 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GC-AN-05 | 630135 | 5436998 | 25-Apr-16 | 25-Apr-16 | 12:15 | 13:00 | 0.75 | 1.8 | 2 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GC-AN-06 | 630582 | 5437252 | 27-Apr-16 | 27-Apr-16 | 13:40 | 14:05 | 0.42 | 1.4 | 2 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GC-AN-07 | 630347 | 5436979 | 27-Apr-16 | 27-Apr-16 | 13:50 | 14:15 | 0.42 | 9.1 | 2 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GC-AN-08 | 629792 | 5436940 | 27-Apr-16 | 27-Apr-16 | 14:20 | 15:15 | 0.92 | 2.6 | 2 | 0.08 | 0 | 0 | 0 | 1 | 1 | 13 | 9 | 0 | 118 |
| | | | | 27-Apr-16 | 27-Apr-16 | 15:45 | 16:10 | 0.42 | | 2 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 403 |
| | **TOTAL** | | | | | | | **7.8** | **-** | **21** | **0.83** | **0** | **0** | **0** | **7** | **5** | **8.4** | **28** | **5** | **34** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

# Burbot Trap

## Table F.8: Burbot Trap Records for Fish Caught in Koocanusa Reservoir, February 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth (m) | Effort (fishing days) | Bull Trout | | | Burbot | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] |
| Sand Creek | SC-TS-01 | 625496 | 5460224 | 27-Feb-15 | 28-Feb-15 | 13:50 | 12:02 | 23.20 | 5.8 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 12:02 | 16:15 | 28.26 | | 1.18 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-02 | 625525 | 5460063 | 27-Feb-15 | 28-Feb-15 | 13:58 | 11:55 | 21.95 | 10.6 | 0.91 | 1 | 0 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 11:55 | 16:20 | 16.42 | | 0.68 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-03 | 624214 | 5461070 | 27-Feb-15 | 28-Feb-15 | 14:20 | 11:15 | 20.92 | 7.0 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 11:15 | 16:45 | 29.50 | | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-04 | 624587 | 5460913 | 27-Feb-15 | 28-Feb-15 | 14:30 | 11:00 | 20.50 | 6.5 | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 11:00 | 16:50 | 29.38 | | 1.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 0 | 4.90 | 0 | 0 | 0.00 |
| | SC-TS-05 | 625563 | 5460313 | 27-Feb-15 | 28-Feb-15 | 14:45 | 11:50 | 21.08 | 8.6 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 11:50 | 16:20 | 28.50 | | 1.19 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-06 | 623320 | 5461268 | 27-Feb-15 | 28-Feb-15 | 14:02 | 10:00 | 20.68 | 6.8 | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 624654 | 5460835 | 28-Feb-15 | 28-Feb-15 | 10:43 | 14:30 | 3.78 | | 0.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 625576 | 5459960 | 28-Feb-15 | 1-Mar-15 | 14:30 | 14:05 | 23.58 | 12.5 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-07 | 623531 | 5461219 | 27-Feb-15 | 28-Feb-15 | 14:07 | 10:18 | 20.75 | 6.0 | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 624832 | 5460760 | 28-Feb-15 | 28-Feb-15 | 10:52 | 14:30 | 3.37 | 6.1 | 0.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 625557 | 5459812 | 28-Feb-15 | 1-Mar-15 | 14:30 | 17:00 | 26.50 | 10.0 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-08 | 624881 | 5460734 | 27-Feb-15 | 28-Feb-15 | 14:39 | 11:34 | 20.92 | 6.1 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 11:34 | 16:40 | 29.10 | | 1.21 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.65 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-09 | 625180 | 5460511 | 27-Feb-15 | 28-Feb-15 | 14:44 | 11:42 | 20.97 | 6.7 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 11:42 | 16:50 | 29.20 | | 1.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-10 | 625355 | 5460439 | 27-Feb-15 | 28-Feb-15 | 14:56 | 11:46 | 20.83 | 7.1 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 11:46 | 16:25 | 28.48 | | 1.19 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **487.9** | **-** | **20.3** | **1** | **0** | **0.05** | **0** | **0** | **0.00** | **2** | **0** | **0.10** | **6** | **0** | **0.30** | **0** | **0** | **0.00** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the burbot trap sets in one area.

## **Table F.8:** Burbot Trap Records for Fish Caught in Koocanusa Reservoir, February 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth (m) | Effort (fishing days) | Bull Trout | | | Burbot | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] |
| Elk River | ER-TS-01 | 628245 | 5448001 | 24-Feb-15 | 25-Feb-15 | 14:05 | 9:30 | 19.42 | 6.5 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.24 | 0 | 0 | 0.00 |
| | | 627948 | 5447976 | 25-Feb-15 | 26-Feb-15 | 9:30 | 9:20 | 23.83 | 6.0 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:20 | 10:10 | 23.83 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-02 | 628143 | 5448014 | 24-Feb-15 | 25-Feb-15 | 14:30 | 9:35 | 19.08 | 8.5 | 0.80 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 26-Feb-15 | 9:35 | 9:05 | 23.50 | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.02 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:05 | 9:35 | 24.50 | | 1.02 | 0 | 0 | 0.00 | 1 | 0 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Feb-15 | 28-Feb-15 | 9:35 | 9:25 | 28.83 | | 1.20 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 9:25 | 9:30 | 24.08 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-03 | 628086 | 5448023 | 24-Feb-15 | 25-Feb-15 | 14:45 | 9:35 | 18.83 | 9.9 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 26-Feb-15 | 9:35 | 9:10 | 23.67 | 7.5 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 628360 | 5447878 | 26-Feb-15 | 27-Feb-15 | 9:10 | 9:25 | 24.25 | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-04 | 628019 | 5448045 | 24-Feb-15 | 25-Feb-15 | 14:50 | 9:40 | 18.83 | 11.5 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 26-Feb-15 | 9:40 | 9:15 | 23.42 | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:15 | 10:05 | 24.83 | | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-05 | 628128 | 5447850 | 24-Feb-15 | 25-Feb-15 | 15:05 | 9:45 | 18.67 | 7.9 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 628051 | 5447896 | 25-Feb-15 | 26-Feb-15 | 9:45 | 9:25 | 23.67 | 10.3 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:25 | 10:20 | 24.92 | | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-06 | 628073 | 5447854 | 24-Feb-15 | 25-Feb-15 | 15:15 | 9:50 | 18.58 | 10.1 | 0.77 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.58 |
| | | | | 25-Feb-15 | 26-Feb-15 | 9:50 | 9:30 | 23.67 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 628191 | 5447609 | 26-Feb-15 | 27-Feb-15 | 9:30 | 10:15 | 24.75 | 6.0 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-07 | 627980 | 5447838 | 24-Feb-15 | 25-Feb-15 | 15:35 | 9:55 | 18.33 | 12.8 | 0.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 26-Feb-15 | 9:55 | 9:35 | 11.67 | | 0.49 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 2.06 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:35 | 10:30 | 24.92 | | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-08 | 628013 | 5447754 | 24-Feb-15 | 25-Feb-15 | 15:40 | 10:00 | 18.33 | 11.6 | 0.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 26-Feb-15 | 10:00 | 9:40 | 24.67 | | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:40 | 10:32 | 24.87 | | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-09 | 627986 | 5447704 | 24-Feb-15 | 25-Feb-15 | 16:00 | 10:05 | 18.08 | 7.6 | 0.75 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 26-Feb-15 | 10:05 | 9:45 | 23.67 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 628119 | 5447263 | 26-Feb-15 | 27-Feb-15 | 9:45 | 10:30 | 24.75 | 10.0 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-10 | 627634 | 5446839 | 24-Feb-15 | 25-Feb-15 | 14:23 | 9:55 | 19.53 | 10.1 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 627537 | 5447111 | 25-Feb-15 | 26-Feb-15 | 10:50 | 9:07 | 22.28 | 6.7 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.08 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:07 | 9:29 | 24.37 | | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.98 | 1 | 0 | 0.98 |
| | ER-TS-11 | 627650 | 5447055 | 24-Feb-15 | 25-Feb-15 | 14:52 | 10:11 | 19.32 | 9.0 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 25-Feb-15 | 10:11 | 11:00 | 0.82 | | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 627582 | 5447186 | 25-Feb-15 | 26-Feb-15 | 11:00 | 9:14 | 22.23 | 6.5 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:14 | 9:31 | 24.12 | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the burbot trap sets in one area.

## Table F.8: Burbot Trap Records for Fish Caught in Koocanusa Reservoir, February 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth (m) | Effort (fishing days) | Bull Trout | | | Burbot | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] | Catch | Mortalities / Sacrificed | CPUE [a] |
| Elk River | ER-TS-12 | 627770 | 5447055 | 24-Feb-15 | 25-Feb-15 | 14:57 | 10:19 | 19.37 | 9.9 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 25-Feb-15 | 10:19 | 11:05 | 0.76 | | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 627623 | 5447211 | 25-Feb-15 | 26-Feb-15 | 11:05 | 9:18 | 22.22 | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:18 | 9:56 | 24.63 | | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-13 | 627842 | 5447297 | 24-Feb-15 | 25-Feb-15 | 15:19 | 10:24 | 19.08 | 9.2 | 0.80 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 25-Feb-15 | 10:24 | 11:13 | 0.82 | | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 627764 | 5447335 | 25-Feb-15 | 26-Feb-15 | 11:13 | 9:24 | 22.18 | 7.8 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:24 | 10:00 | 24.40 | | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-14 | 628049 | 5447339 | 24-Feb-15 | 25-Feb-15 | 15:31 | 10:20 | 18.82 | 11.2 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 25-Feb-15 | 10:20 | 11:26 | 1.10 | | 0.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 627950 | 5447591 | 25-Feb-15 | 26-Feb-15 | 11:26 | 9:31 | 22.08 | 8.3 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:31 | 10:15 | 24.73 | | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-15 | 627977 | 5447558 | 24-Feb-15 | 25-Feb-15 | 15:47 | 10:15 | 18.47 | 9.6 | 0.77 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Feb-15 | 25-Feb-15 | 10:15 | 11:31 | 1.60 | | 0.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | 627881 | 5447591 | 25-Feb-15 | 26-Feb-15 | 11:31 | 9:37 | 21.77 | 7.9 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Feb-15 | 27-Feb-15 | 9:37 | 10:19 | 24.70 | | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.97 | 0 | 0 | 0.00 |
| | ER-TS-16 | 628185 | 5448034 | 27-Feb-15 | 28-Feb-15 | 11:05 | 9:10 | 22.08 | 8.2 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-17 | 628168 | 5447967 | 27-Feb-15 | 28-Feb-15 | 11:05 | 9:20 | 22.25 | 7.4 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 9:20 | 9:35 | 24.25 | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-18 | 628099 | 5448009 | 27-Feb-15 | 28-Feb-15 | 11:15 | 9:15 | 22.00 | 9.6 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 9:15 | 9:40 | 25.42 | | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-19 | 628103 | 5447969 | 27-Feb-15 | 28-Feb-15 | 11:23 | 9:05 | 21.73 | 9.1 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Feb-15 | 1-Mar-15 | 9:05 | 9:25 | 24.33 | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **1,206** | **-** | **50.2** | **0** | **0** | **0.00** | **1** | **0** | **0.02** | **1** | **1** | **0.02** | **5** | **0** | **0.10** | **4** | **0** | **0.08** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the burbot trap sets in one area.

# Table F.9: Burbot Trap Records for Fish Caught in Koocanusa Reservoir, April 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth (m) | Effort (fishing days) | Bull Trout | | | Burbot | | | Kokanee | | | Largescale Sucker | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Sand Creek | SC-TS-01 | 625547 | 5460109 | 21-Apr-15 | 22-Apr-15 | 13:58 | 14:05 | 24.12 | 11.0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-02 | 625534 | 5460259 | 21-Apr-15 | 22-Apr-15 | 14:03 | 13:58 | 23.92 | 10.0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-03 | 625356 | 5460119 | 21-Apr-15 | 22-Apr-15 | 14:14 | 13:48 | 23.57 | 3.5 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-04 | 623509 | 5461906 | 21-Apr-15 | 22-Apr-15 | 14:30 | 11:40 | 21.17 | 1.7 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-05 | 625567 | 5459677 | 21-Apr-15 | 22-Apr-15 | 14:51 | 14:12 | 23.35 | 10.0 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-06 | 625480 | 5460604 | 22-Apr-15 | 23-Apr-15 | 11:50 | 10:35 | 22.75 | 4.0 | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-07 | 625356 | 5460119 | 22-Apr-15 | 23-Apr-15 | 13:50 | 10:40 | 20.83 | 3.5 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.30 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-08 | 625423 | 5460460 | 22-Apr-15 | 23-Apr-15 | 14:00 | 10:43 | 20.72 | 8.4 | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-09 | 625595 | 5459980 | 22-Apr-15 | 23-Apr-15 | 14:09 | 10:52 | 20.72 | 7.9 | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-10 | 625444 | 5459481 | 22-Apr-15 | 23-Apr-15 | 14:18 | 11:05 | 20.78 | 7.1 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-11 | 625480 | 5460601 | 23-Apr-15 | 24-Apr-15 | 11:50 | 9:23 | 21.55 | 4.0 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-12 | 625356 | 5460119 | 23-Apr-15 | 25-Apr-15 | 10:41 | 9:15 | 46.57 | 8.4 | 1.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.52 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-13 | 625408 | 5460112 | 23-Apr-15 | 24-Apr-15 | 10:47 | 9:30 | 22.72 | 3.5 | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 3.17 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-14 | 625587 | 5459676 | 23-Apr-15 | 24-Apr-15 | 11:00 | 9:00 | 22.00 | 8.6 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-15 | 625631 | 5459348 | 23-Apr-15 | 24-Apr-15 | 11:12 | 9:45 | 22.55 | 6.5 | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-16 | 625621 | 5459678 | 24-Apr-15 | 26-Apr-15 | 9:05 | 12:22 | 51.28 | - | 2.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.47 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-17 | 625632 | 5460602 | 25-Apr-15 | 26-Apr-15 | 9:15 | 12:08 | 26.88 | 1.4 | 1.12 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.79 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.89 | 0 | 0 | 0.00 |
| | SC-TS-18 | 625408 | 5460112 | 24-Apr-15 | 26-Apr-15 | 9:32 | 12:18 | 50.77 | 3.5 | 2.12 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 2 | 2.36 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-19 | 625408 | 5460072 | 24-Apr-15 | 26-Apr-15 | 9:40 | 12:15 | 50.58 | 3.6 | 2.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-20 | 625633 | 5459979 | 24-Apr-15 | 26-Apr-15 | 9:55 | 12:18 | 50.38 | 3.6 | 2.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-21 | 625632 | 5460602 | 26-Apr-15 | 27-Apr-15 | 12:08 | 11:00 | 22.87 | 1.4 | 0.95 | 0 | 0 | 0.00 | 1 | 0 | 1.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 3.15 | 3 | 3 | 3.15 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-22 | 625408 | 5460112 | 26-Apr-15 | 27-Apr-15 | 12:13 | 11:11 | 22.97 | 3.5 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-23 | 625408 | 5460072 | 26-Apr-15 | 27-Apr-15 | 12:15 | 11:17 | 23.03 | 3.6 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-24 | 625633 | 5459979 | 26-Apr-15 | 27-Apr-15 | 12:18 | 11:22 | 23.07 | 3.6 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 2.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-25 | 625621 | 5459678 | 26-Apr-15 | 27-Apr-15 | 12:22 | 11:29 | 23.12 | 2.1 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-26 | 625624 | 5460600 | 27-Apr-15 | 28-Apr-15 | 11:06 | 9:43 | 22.62 | 1.7 | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-27 | 625494 | 5460052 | 27-Apr-15 | 28-Apr-15 | 11:15 | 9:47 | 22.53 | 3.7 | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-28 | 625487 | 5459992 | 27-Apr-15 | 28-Apr-15 | 11:20 | 9:52 | 22.53 | 3.6 | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-29 | 625649 | 5459969 | 27-Apr-15 | 28-Apr-15 | 11:25 | 9:56 | 22.52 | 3.4 | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-30 | 626355 | 5458286 | 27-Apr-15 | 28-Apr-15 | 12:10 | 10:07 | 21.95 | 2.9 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-31 | 625621 | 5459678 | 28-Apr-15 | 29-Apr-15 | 9:44 | 9:23 | 23.65 | 1.7 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-32 | 625501 | 5460017 | 28-Apr-15 | 29-Apr-15 | 9:49 | 9:39 | 23.83 | 4.0 | 0.99 | 0 | 0 | 0.00 | 1 | 0 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-33 | 625487 | 5459925 | 28-Apr-15 | 29-Apr-15 | 9:53 | 10:02 | 24.15 | 3.5 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-34 | 625649 | 5459969 | 28-Apr-15 | 29-Apr-15 | 9:57 | 9:55 | 23.97 | 3.1 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-35 | 626298 | 5458238 | 28-Apr-15 | 29-Apr-15 | 10:10 | 10:20 | 24.17 | 1.6 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-36 | 625628 | 5460608 | 29-Apr-15 | 30-Apr-15 | 9:35 | 9:20 | 23.75 | 1.8 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.02 | 2 | 2 | 2.02 | 0 | 0 | 0.00 | 1 | 1 | 1.01 |
| | SC-TS-37 | 625480 | 5460041 | 29-Apr-15 | 30-Apr-15 | 9:52 | 9:30 | 23.63 | 4.0 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.02 | 0 | 0 | 0.00 | 1 | 0 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-38 | 625626 | 5459990 | 29-Apr-15 | 30-Apr-15 | 10:00 | 9:39 | 23.65 | 2.4 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-39 | 625514 | 5459938 | 29-Apr-15 | 30-Apr-15 | 10:05 | 9:43 | 23.63 | - | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 | 0 | 0 | 0.00 |
| | SC-TS-40 | 626218 | 5458182 | 29-Apr-15 | 30-Apr-15 | 10:20 | 9:52 | 23.53 | 2.5 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-41 | 625628 | 5460608 | 30-Apr-15 | 1-May-15 | 9:22 | 9:10 | 23.80 | 1.7 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-42 | 625469 | 5460028 | 30-Apr-15 | 1-May-15 | 9:35 | 9:15 | 23.67 | 3.8 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-43 | 625495 | 5459961 | 30-Apr-15 | 1-May-15 | 9:41 | 9:17 | 23.60 | 3.7 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 |
| | SC-TS-44 | 625514 | 5459959 | 30-Apr-15 | 1-May-15 | 9:44 | 9:20 | 23.60 | 5.5 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-TS-45 | 625218 | 5458182 | 30-Apr-15 | 1-May-15 | 9:53 | 9:44 | 23.85 | 2.5 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 4.03 | 2 | 0 | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **1,170.88** | **-** | **48.79** | **0** | **0** | **0.00** | **2** | **0** | **0.04** | **1** | **0** | **0.02** | **2** | **0** | **0.04** | **34** | **14** | **0.70** | **8** | **6** | **0.16** | **2** | **2** | **0.04** | **2** | **2** | **0.04** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the burbot trap sets in one area.

## Table F.9: Burbot Trap Records for Fish Caught in Koocanusa Reservoir, April 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth (m) | Effort (fishing days) | Bull Trout | | | Burbot | | | Kokanee | | | Largescale Sucker | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Elk River | ER-TS-01 | 628091 | 5448031 | 21-Apr-15 | 22-Apr-15 | 11:55 | 9:55 | 22.00 | 11.7 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 8 | 4 | 8.73 | 13 | 13 | 14.18 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 9:35 | 9:20 | 23.75 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.02 | 3 | 3 | 3.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:20 | 9:00 | 23.67 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 26-Apr-15 | 9:00 | 9:15 | 48.25 | | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 2 | 1.99 | 12 | 9 | 5.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Apr-15 | 27-Apr-15 | 9:15 | 9:15 | 24.00 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 2.00 | 5 | 5 | 5.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Apr-15 | 28-Apr-15 | 9:15 | 9:00 | 23.75 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.01 | 0 | 0 | 0.00 |
| | | | | 28-Apr-15 | 29-Apr-15 | 9:00 | 9:00 | 24.00 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 9 | 2 | 9.00 | 3 | 1 | 3.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 29-Apr-15 | 30-Apr-15 | 9:00 | 8:50 | 23.83 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 8:50 | 8:35 | 23.75 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.02 | 1 | 0 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-2 | 627995 | 5447702 | 21-Apr-15 | 22-Apr-15 | 12:00 | 9:35 | 21.58 | 12.0 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-3 | 628657 | 5447489 | 21-Apr-15 | 22-Apr-15 | 12:16 | 10:05 | 21.82 | 6.5 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 10:05 | 9:30 | 23.42 | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 | 3 | 3 | 3.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:30 | 9:05 | 23.58 | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 25-Apr-15 | 9:05 | 9:31 | 24.43 | | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 25-Apr-15 | 27-Apr-15 | 9:31 | 9:20 | 47.82 | | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 1 | 1.51 | 2 | 2 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Apr-15 | 28-Apr-15 | 9:20 | 9:13 | 23.88 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Apr-15 | 29-Apr-15 | 9:13 | 9:15 | 24.03 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 2 | 5.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 29-Apr-15 | 30-Apr-15 | 9:15 | 9:00 | 23.75 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 9:00 | 8:50 | 23.83 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-4 | 629172 | 5447671 | 21-Apr-15 | 22-Apr-15 | 12:25 | 10:10 | 21.75 | 6.0 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-5 | 629390 | 5447553 | 21-Apr-15 | 22-Apr-15 | 13:30 | 10:15 | 20.75 | 4.0 | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-6 | 628103 | 5448006 | 22-Apr-15 | 23-Apr-15 | 11:35 | 9:22 | 21.78 | 11.6 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:22 | 9:00 | 23.63 | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 26-Apr-15 | 9:00 | 9:10 | 48.17 | | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.50 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Apr-15 | 27-Apr-15 | 9:10 | 9:00 | 23.83 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-7 | 628044 | 5447991 | 22-Apr-15 | 23-Apr-15 | 11:40 | 9:10 | 21.50 | 11.6 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:10 | 8:50 | 23.67 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-8 | 627967 | 5447868 | 22-Apr-15 | 23-Apr-15 | 11:50 | 9:05 | 21.25 | 11.2 | 0.89 | 1 | 0 | 1.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:05 | 8:45 | 23.67 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 26-Apr-15 | 8:45 | 9:05 | 48.33 | | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 1.49 | 0 | 0 | 0.00 |
| | | | | 26-Apr-15 | 27-Apr-15 | 9:05 | 9:05 | 24.00 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Apr-15 | 28-Apr-15 | 9:05 | 8:50 | 23.75 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Apr-15 | 29-Apr-15 | 8:50 | 8:51 | 24.02 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 29-Apr-15 | 30-Apr-15 | 8:51 | 8:45 | 23.90 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 8:45 | 8:35 | 23.83 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-9 | 627914 | 5447802 | 25-Apr-15 | 26-Apr-15 | 10:45 | 9:00 | 22.25 | 1.6 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 26-Apr-15 | 27-Apr-15 | 9:00 | 8:55 | 23.92 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-10 | 628157 | 5448080 | 27-Apr-15 | 28-Apr-15 | 10:45 | 9:05 | 22.33 | 7.9 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Apr-15 | 29-Apr-15 | 9:05 | 9:05 | 24.00 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 29-Apr-15 | 30-Apr-15 | 9:05 | 8:50 | 23.75 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 8:50 | 8:40 | 23.83 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-TS-11 | 628256 | 5447600 | 27-Apr-15 | 28-Apr-15 | 10:50 | 9:15 | 22.42 | 7.9 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 28-Apr-15 | 29-Apr-15 | 9:15 | 9:10 | 23.92 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 29-Apr-15 | 30-Apr-15 | 9:10 | 8:55 | 23.75 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 8:55 | 8:50 | 23.92 | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **1,147.07** | **-** | **47.79** | **1** | **0** | **0.02** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **48** | **17** | **1.00** | **45** | **37** | **0.94** | **4** | **4** | **0.08** | **0** | **0** | **0.00** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the burbot trap sets in one area.

## Table F.9: Burbot Trap Records for Fish Caught in Koocanusa Reservoir, April 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth (m) | Effort (fishing days) | Bull Trout | | | Burbot | | | Kokanee | | | Largescale Sucker | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Gold Creek | GC-TS-01 | 630547 | 5437203 | 21-Apr-15 | 22-Apr-15 | 13:20 | 8:00 | 18.67 | 13.0 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 8:00 | 8:40 | 24.67 | | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-02 | 630428 | 5437026 | 21-Apr-15 | 22-Apr-15 | 13:25 | 8:05 | 18.67 | 12.0 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-03 | 630112 | 5437359 | 21-Apr-15 | 22-Apr-15 | 13:30 | 8:15 | 18.75 | 11.0 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-04 | 629677 | 5436738 | 21-Apr-15 | 22-Apr-15 | 13:35 | 8:20 | 18.75 | 6.0 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-05 | 629950 | 5436858 | 21-Apr-15 | 22-Apr-15 | 13:40 | 8:30 | 18.83 | 8.0 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.27 | 1 | 1 | 1.27 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 8:35 | 9:20 | 24.75 | | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 26-Apr-15 | 9:55 | 10:00 | 48.08 | | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.50 |
| | | | | 26-Apr-15 | 27-Apr-15 | 10:00 | 9:50 | 23.83 | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.01 |
| | | | | 27-Apr-15 | 29-Apr-15 | 9:55 | 9:45 | 47.83 | | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-06 | 630129 | 5437143 | 22-Apr-15 | 23-Apr-15 | 8:10 | 8:55 | 24.75 | 10.0 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-07 | 630077 | 5437468 | 22-Apr-15 | 23-Apr-15 | 8:17 | 9:05 | 24.80 | 4.0 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-08 | 629779 | 5437137 | 22-Apr-15 | 23-Apr-15 | 8:25 | 9:15 | 24.83 | 6.5 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-09 | 629842 | 5437399 | 23-Apr-15 | 24-Apr-15 | 8:50 | 10:15 | 25.42 | 3.5 | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 26-Apr-15 | 10:15 | 9:55 | 47.67 | 4.0 | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-10 | 629553 | 5436652 | 23-Apr-15 | 24-Apr-15 | 8:55 | 9:50 | 24.92 | 4.1 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-11 | 629527 | 5437373 | 23-Apr-15 | 24-Apr-15 | 9:10 | 10:05 | 24.92 | 4.7 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 5 | 4.82 | 5 | 5 | 4.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 25-Apr-15 | 10:10 | 9:45 | 23.58 | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-12 | 629326 | 5436845 | 23-Apr-15 | 24-Apr-15 | 9:20 | 9:45 | 24.42 | 1.4 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 6 | 5.90 | 6 | 6 | 5.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 24-Apr-15 | 26-Apr-15 | 9:45 | 9:30 | 47.75 | | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.50 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-13 | 629514 | 5436620 | 24-Apr-15 | 26-Apr-15 | 9:50 | 10:05 | 48.25 | 4.0 | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-14 | 629264 | 5436804 | 26-Apr-15 | 27-Apr-15 | 9:40 | 9:20 | 23.67 | 21.0 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Apr-15 | 29-Apr-15 | 9:20 | 9:50 | 48.50 | | 2.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-15 | 629410 | 5437267 | 26-Apr-15 | 27-Apr-15 | 9:50 | 9:25 | 23.58 | 3.0 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Apr-15 | 29-Apr-15 | 9:25 | 9:30 | 48.08 | | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-16 | 629666 | 5437055 | 26-Apr-15 | 27-Apr-15 | 10:00 | 9:30 | 23.50 | 6.0 | 0.98 | 0 | 0 | 0.00 | 1 | 0 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Apr-15 | 29-Apr-15 | 9:35 | 9:40 | 48.08 | | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-17 | 629554 | 5436597 | 26-Apr-15 | 27-Apr-15 | 10:05 | 9:55 | 23.83 | 3.0 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 12 | 6 | 12.08 | 3 | 1 | 3.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 27-Apr-15 | 29-Apr-15 | 10:00 | 10:00 | 48.00 | | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-18 | 629791 | 5437209 | 29-Apr-15 | 30-Apr-15 | 9:35 | 9:45 | 24.17 | 7.0 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 1 | 3.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 9:45 | 9:05 | 23.33 | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-19 | 629690 | 5437033 | 29-Apr-15 | 30-Apr-15 | 9:40 | 9:50 | 24.17 | 6.6 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 9:50 | 9:10 | 23.33 | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-20 | 629646 | 5436845 | 29-Apr-15 | 30-Apr-15 | 9:50 | 9:55 | 24.08 | 5.1 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 9:55 | 9:15 | 23.33 | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-21 | 629270 | 5436820 | 29-Apr-15 | 30-Apr-15 | 9:55 | 9:35 | 23.67 | 1.4 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 4.06 |
| | | | | 30-Apr-15 | 1-May-15 | 9:35 | 8:55 | 23.33 | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-TS-22 | 629422 | 5436610 | 29-Apr-15 | 30-Apr-15 | 10:00 | 10:05 | 24.08 | 3.0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 10:05 | 9:20 | 23.25 | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.03 |
| | **TOTAL** | | | | | | | **1,128.13** | **-** | **47.01** | **0** | **0** | **0.00** | **1** | **0** | **0.02** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **30** | **18** | **0.64** | **17** | **14** | **0.36** | **1** | **1** | **0.02** | **7** | **7** | **0.15** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the burbot trap sets in one area.

# Gill Net

## Table F.10: Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Bull Trout | | | | | | | | | Kokanee | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | | 1" | 1.5" | 2" | | |
| Sand Creek | SC-GN-01 | 625783 | 5458145 | 60.96 | 19-Apr-16 | 19-Apr-16 | 11:45 | 15:00 | 3.2 | 1.98 | 0.5 | 1.5 | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 0 | 0 | 0 |
| | SC-GN-02 | 625372 | 5457031 | 22.86 | 19-Apr-16 | 19-Apr-16 | 12:35 | 15:10 | 2.6 | 0.59 | 1.0 | 1.0 | 1 | - | - | - | - | - | - | 0 | 1.7 | 0 | - | - | 0 | 0 |
| | SC-GN-03 | 625531 | 5460425 | 45.72 | 19-Apr-16 | 19-Apr-16 | 14:00 | 15:55 | 1.9 | 0.88 | 0.5 | 1.5 | - | - | - | - | 0 | 1 | 0 | 0 | 1.1 | - | - | - | - | - |
| | SC-GN-04 | 625685 | 5457327 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:55 | 11:45 | 1.8 | 0.56 | 1.0 | 1.5 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 12:10 | 14:39 | 2.5 | 0.76 | | | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | SC-GN-05 | 625751 | 5457345 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:15 | 13:28 | 2.2 | 0.68 | 0.3 | 0.8 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 13:45 | 14:54 | 1.2 | 0.35 | 0.5 | 0.8 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | SC-GN-06 | 625028 | 5459161 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:45 | 13:58 | 2.2 | 0.68 | 1.0 | 1.2 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | SC-GN-07 | 625660 | 5457294 | 60.96 | 23-Apr-16 | 23-Apr-16 | 8:51 | 10:41 | 1.8 | 1.12 | 1.0 | 1.5 | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 1 | 0 | 0.89 |
| | | | | 60.96 | 23-Apr-16 | 23-Apr-16 | 11:22 | 13:33 | 2.2 | 1.33 | | | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 0 | 0 | 0 |
| | SC-GN-08 | 625654 | 5457314 | 30.48 | 23-Apr-16 | 23-Apr-16 | 8:57 | 11:17 | 2.3 | 0.71 | 1.0 | 1.2 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:34 | 14:21 | 2.8 | 0.85 | | | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | SC-GN-09 | 625758 | 5457348 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:11 | 11:40 | 2.5 | 0.76 | 0.5 | 1.0 | 1 | - | - | - | - | - | - | 0 | 1.3 | 0 | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:51 | 14:28 | 2.6 | 0.80 | | | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | SC-GN-10 | 625739 | 5457355 | 30.48 | 24-Apr-16 | 24-Apr-16 | 8:58 | 11:36 | 2.6 | 0.80 | 1.0 | 1.5 | 1 | - | - | - | - | - | - | 0 | 1.2 | 0 | - | - | 0 | 0 |
| | SC-GN-11 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 9:05 | 11:57 | 2.9 | 0.87 | 1.0 | 1.5 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | SC-GN-12 | 625660 | 5457309 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:57 | 11:20 | 1.4 | 0.63 | 1.0 | 2.0 | - | - | - | - | 0 | 0 | 1 | 0 | 1.6 | - | - | - | - | - |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:25 | 12:10 | 0.75 | 0.34 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 12:15 | 13:26 | 1.2 | 0.54 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | SC-GN-13 | 625674 | 5457326 | 22.86 | 24-Apr-16 | 24-Apr-16 | 10:02 | 11:26 | 1.4 | 0.32 | 1.0 | 1.5 | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | SC-GN-14 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 12:05 | 14:46 | 2.7 | 0.82 | 1.0 | 2.0 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | SC-GN-15 | 625794 | 5458453 | 30.48 | 24-Apr-16 | 24-Apr-16 | 13:09 | 15:25 | 2.3 | 0.69 | 1.0 | 1.7 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | SC-GN-16 | 625114 | 5457743 | 45.72 | 24-Apr-16 | 24-Apr-16 | 13:43 | 15:44 | 2.0 | 0.92 | 1.2 | 1.8 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | SC-GN-17 | 625827 | 5458455 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:18 | 10:08 | 0.83 | 0.38 | 0.8 | 2.9 | - | - | - | - | 1 | 0 | 0 | 0 | 2.6 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 10:13 | 11:18 | 1.1 | 0.50 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:23 | 12:42 | 1.3 | 0.60 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:47 | 13:58 | 1.2 | 0.54 | | | - | - | - | - | 1 | 0 | 0 | 0 | 1.8 | - | - | - | - | - |
| | SC-GN-18 | 625728 | 5458540 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:44 | 11:06 | 1.4 | 0.62 | 1.0 | 2.4 | - | - | - | - | 0 | 0 | 1 | 0 | 1.6 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:11 | 12:32 | 1.4 | 0.62 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:35 | 12:57 | 0.37 | 0.17 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 13:02 | 13:50 | 0.80 | 0.37 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | SC-GN-19 | 625622 | 5458456 | 60.96 | 26-Apr-16 | 26-Apr-16 | 12:05 | 12:44 | 0.65 | 0.40 | 1.0 | 2.3 | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 0 | 0 | 0 |
| | SC-GN-20 | 625725 | 5458539 | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:10 | 13:06 | 0.93 | 0.21 | 0.0 | 2.8 | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | SC-GN-21 | 625802 | 5458384 | 60.96 | 26-Apr-16 | 26-Apr-16 | 13:07 | 13:42 | 0.58 | 0.36 | 2.2 | 3.0 | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | | **60** | **22.73** | **-** | **-** | **3** | **0** | **0** | **0** | **2** | **1** | **2** | **0** | **0.38** | **0** | **0** | **1** | **0** | **0.045** |
| Elk River | ER-GN-01 | 628295 | 5447959 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:20 | 14:30 | 3.2 | 1.45 | 1.5 | 1.6 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-02 | 628238 | 5447790 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:30 | 14:40 | 3.2 | 1.45 | 1.6 | 1.8 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | | | 14:40 | 17:15 | 2.6 | 1.18 | | | - | - | - | - | 0 | 1 | 0 | 1 | 0.85 | - | - | - | - | - |
| | ER-GN-03 | 628016 | 5447693 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:45 | 14:55 | 3.2 | 0.97 | 4.8 | 10.2 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | ER-GN-04 | 627973 | 5447966 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:55 | 15:15 | 3.3 | 1.02 | 4.5 | 3.2 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | 0 |
| | ER-GN-05 | 628112 | 5447595 | 30.48 | 19-Apr-16 | 19-Apr-16 | 12:10 | 15:20 | 3.2 | 0.97 | 1.8 | 4.8 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | 0 |
| | ER-GN-06 | 627974 | 5447832 | 30.48 | 19-Apr-16 | 19-Apr-16 | 15:15 | 16:25 | 1.2 | 0.36 | 3.3 | 6.8 | - | - | - | 1 | - | - | - | 0 | 2.8 | - | - | - | - | - |
| | ER-GN-07 | 628142 | 5447702 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:05 | 12:00 | 2.9 | 1.33 | 2.0 | 2.1 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-08 | 628077 | 5447436 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:15 | 12:15 | 3.0 | 0.91 | 4.6 | 6.7 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | 0 |
| | ER-GN-09 | 628104 | 5447315 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:25 | 12:25 | 3.0 | 0.91 | 3.2 | 6.2 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | ER-GN-10 | 627865 | 5447460 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:45 | 12:40 | 2.9 | 0.89 | 1.9 | 3.7 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | 0 |
| | ER-GN-11 | 627988 | 5447682 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 13:00 | 3.2 | 1.45 | 2.8 | 7.2 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-12 | 627957 | 5447866 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:00 | 11:35 | 2.6 | 1.18 | 4.5 | 4.3 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-13 | 627836 | 5447470 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:15 | 11:45 | 2.5 | 0.76 | 1.4 | 2.0 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | 0 |
| | ER-GN-14 | 627514 | 5447123 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:20 | 12:00 | 2.7 | 0.81 | 1.8 | 2.1 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | 0 |
| | ER-GN-15 | 628503 | 5447217 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.81 | 1.1 | 2.0 | - | - | - | 2 | - | - | - | 1 | 2.5 | - | - | - | - | - |
| | ER-GN-16 | 627730 | 5447290 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:45 | 12:45 | 3.0 | 1.37 | 2.1 | 1.9 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-17 | 627874 | 5447466 | 45.72 | 22-Apr-16 | 22-Apr-16 | 8:55 | 11:15 | 2.3 | 1.07 | 1.6 | 4.2 | - | - | - | - | 0 | 1 | 0 | 1 | 0.94 | - | - | - | - | - |
| | ER-GN-18 | 628238 | 5446900 | 60.96 | 22-Apr-16 | 22-Apr-16 | 9:10 | 11:30 | 2.3 | 1.42 | 0.8 | 2.1 | - | - | 2 | - | - | - | - | 0 | 1.4 | - | - | 4 | 4 | 2.8 |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Bull Trout | | | | | | | | | Kokanee | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | | Mortalities/ Sacrificed | CPUE[a] | Catch | | | Mortalities/ Sacrificed | CPUE[a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | | 1" | 1.5" | 2" | | |
| Elk River | ER-GN-19 | 628012 | 5446581 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:30 | 3.2 | 1.45 | 1.4 | 5.8 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-20 | 628321 | 5446690 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:45 | 3.4 | 1.04 | 1.8 | 3.0 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | ER-GN-21 | 628145 | 5447522 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:00 | 11:05 | 2.1 | 0.95 | 1.2 | 2.1 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-22 | 627842 | 5447463 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:10 | 11:20 | 2.2 | 0.66 | 1.9 | 3.9 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | ER-GN-23 | 628186 | 5446813 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:20 | 11:45 | 2.4 | 1.10 | 1.4 | 3.9 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-24 | 628485 | 5447166 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:10 | 11:00 | 1.8 | 0.84 | 2.0 | 2.4 | - | - | - | - | 0 | 1 | 1 | 1 | 2.4 | - | - | - | - | - |
| | ER-GN-25 | 628146 | 5446559 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:15 | 10:20 | 1.1 | 0.50 | 0.8 | 4.1 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | ER-GN-26 | 627836 | 5447486 | 30.48 | 25-Apr-16 | 25-Apr-16 | 12:30 | 13:10 | 0.67 | 0.20 | 1.5 | 2.9 | 1 | - | - | - | - | - | - | 0 | 4.9 | 0 | - | - | 0.0 | 0 |
| | ER-GN-27 | 628450 | 5447156 | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:45 | 13:50 | 1.1 | 0.25 | 1.1 | 3.4 | - | 1 | - | - | - | - | - | 0 | 4.0 | - | 0 | - | 0 | 0 |
| | ER-GN-28 | 628595 | 5447346 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:10 | 9:50 | 0.67 | 0.15 | 2.3 | 2.3 | - | 2 | - | - | - | - | - | 0 | 13 | - | 0 | - | 0 | 0 |
| | **TOTAL** | | | | | | | | **71** | **27.45** | **-** | **-** | **1** | **3** | **2** | **3** | **0** | **3** | **1** | **4** | **1.1** | **0** | **0** | **4** | **4** | **0.28** |
| Gold Creek | GC-GN-01 | 630004 | 5437333 | 45.72 | 19-Apr-16 | 19-Apr-16 | 10:45 | 13:00 | 2.3 | 1.03 | 3.2 | 3.1 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 19-Apr-16 | 19-Apr-16 | 13:05 | 15:25 | 2.3 | 1.07 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-02 | 630484 | 5437202 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:10 | 15:10 | 4.0 | 1.83 | 6.2 | 6.3 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | 0 | 0 |
| | GC-GN-03 | 629920 | 5437070 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:25 | 15:40 | 4.3 | 0.97 | 2.0 | 2.1 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-04 | 629943 | 5437079 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:40 | 15:45 | 4.1 | 0.93 | 2.3 | 2.5 | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | GC-GN-05 | 629909 | 5437049 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 11:50 | 2.0 | 0.91 | 2.3 | 2.7 | - | - | - | - | 1 | 0 | 1 | 1 | 2.2 | - | - | - | - | - |
| | | | | 45.72 | 20-Apr-16 | 20-Apr-16 | 12:15 | 14:10 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-06 | 630147 | 5436926 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:55 | 13:00 | 3.1 | 1.41 | 4.1 | 4.3 | - | - | - | - | 0 | 1 | 0 | 1 | 0.71 | - | - | - | - | - |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 11:45 | 13:40 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-07 | 630468 | 5437262 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:00 | 13:40 | 3.7 | 0.84 | 2.5 | 6.5 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-08 | 630499 | 5437243 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:05 | 14:00 | 3.9 | 0.90 | 2.5 | 6.5 | - | 1 | - | - | - | - | - | 1 | 1.1 | - | 0 | - | 0 | 0 |
| | GC-GN-09 | 630028 | 5437022 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:20 | 11:20 | 2.0 | 0.91 | 2.9 | 3.5 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-10 | 630258 | 5436950 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:25 | 11:50 | 2.4 | 1.10 | 3.5 | 6.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 12:00 | 13:45 | 1.7 | 0.80 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-11 | 630520 | 5437231 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.61 | 5.0 | 6.5 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:15 | 13:55 | 1.7 | 0.38 | | | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-12 | 630463 | 5437277 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:35 | 12:20 | 2.8 | 0.63 | 5.5 | 6.3 | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:25 | 14:05 | 1.7 | 0.38 | | | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | GC-GN-13 | 629984 | 5437073 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 10:30 | 1.2 | 0.53 | 2.7 | 3.3 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:35 | 12:00 | 1.4 | 0.65 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:05 | 13:15 | 1.2 | 0.53 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-14 | 630009 | 5437026 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:25 | 10:35 | 1.2 | 0.53 | 2.8 | 3.5 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-15 | 630069 | 5437092 | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:40 | 12:15 | 1.6 | 0.72 | 4.0 | 3.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-16 | 630149 | 5436978 | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:20 | 13:30 | 1.2 | 0.53 | 4.0 | 4.9 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-17 | 630486 | 5437262 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:30 | 11:00 | 1.5 | 0.34 | 4.0 | 6.7 | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 22-Apr-16 | 22-Apr-16 | 11:10 | 13:10 | 2.0 | 0.46 | | | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | GC-GN-18 | 630460 | 5437287 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:40 | 11:40 | 2.0 | 0.46 | 4.0 | 6.5 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-19 | 630665 | 5436958 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:30 | 11:30 | 2.0 | 0.91 | 4.0 | 8.5 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-20 | 630541 | 5437190 | 45.72 | 23-Apr-16 | 23-Apr-16 | 11:50 | 14:00 | 2.2 | 0.99 | 4.0 | 8.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-21 | 630656 | 5437117 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:40 | 11:45 | 2.1 | 0.48 | 3.0 | 7.5 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-22 | 630161 | 5436918 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:45 | 12:00 | 2.3 | 0.51 | 1.5 | 5.0 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-23 | 629888 | 5437089 | 45.72 | 23-Apr-16 | 23-Apr-16 | 10:10 | 12:30 | 2.3 | 1.07 | 3.5 | 1.8 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 23-Apr-16 | 23-Apr-16 | 12:35 | 14:35 | 2.0 | 0.91 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-24 | 630257 | 5437394 | 22.86 | 23-Apr-16 | 23-Apr-16 | 10:25 | 13:00 | 2.6 | 0.59 | 2.0 | 6.2 | - | 0 | - | - | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | GC-GN-25 | 630144 | 5436893 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:10 | 14:05 | 1.9 | 0.44 | 1.2 | 2.5 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-26 | 629827 | 5437340 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:15 | 14:25 | 2.2 | 0.50 | 2.0 | 2.4 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-27 | 630144 | 5436881 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:30 | 11:45 | 2.3 | 0.51 | 1.3 | 2.3 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:50 | 13:30 | 1.7 | 0.38 | | | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | GC-GN-28 | 629902 | 5437132 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:20 | 11:10 | 1.8 | 0.84 | 3.4 | 2.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:15 | 13:10 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-29 | 630036 | 5437104 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:25 | 11:00 | 1.6 | 0.72 | 4.0 | 3.5 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:05 | 13:20 | 2.3 | 1.03 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## Table F.10: Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Bull Trout | | | | | | | | | Kokanee | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | | Mortalities/ Sacrificed | CPUE[a] | Catch | | | Mortalities/ Sacrificed | CPUE[a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | | 1" | 1.5" | 2" | | |
| Gold Creek | GC-GN-30 | 630110 | 5436878 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:35 | 11:15 | 1.7 | 0.38 | 1.8 | 2.3 | 0 | - | - | - | - | - | - | 0 | 0 | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:20 | 13:50 | 2.5 | 0.57 | | | 1 | - | - | - | - | - | - | 1 | 1.7 | 0 | - | - | 0 | 0 |
| | GC-GN-31 | 630298 | 5437358 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:40 | 12:00 | 2.3 | 0.53 | 2.5 | 6.3 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-32 | 629824 | 5437340 | 22.86 | 24-Apr-16 | 24-Apr-16 | 12:15 | 14:15 | 2.0 | 0.46 | 2.0 | 2.5 | - | - | - | 2 | - | - | - | 2 | 4.4 | - | - | - | - | - |
| | GC-GN-33 | 629829 | 5437312 | 22.86 | 25-Apr-16 | 25-Apr-16 | 9:35 | 10:45 | 1.2 | 0.27 | 2.5 | 3.0 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 10:55 | 12:05 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:10 | 13:20 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-34 | 630014 | 5437330 | 60.96 | 25-Apr-16 | 25-Apr-16 | 9:40 | 10:40 | 1.0 | 0.61 | 4.0 | 4.6 | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 10:55 | 11:50 | 0.92 | 0.56 | | | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 11:55 | 13:00 | 1.1 | 0.66 | | | - | - | 0 | - | - | - | - | 0 | 0 | - | - | 0 | 0 | 0 |
| | GC-GN-35 | 629824 | 5437090 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:45 | 11:05 | 1.3 | 0.61 | 2.0 | 3.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:10 | 13:05 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-36 | 629826 | 5436965 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:50 | 11:15 | 1.4 | 0.65 | 3.5 | 2.5 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:20 | 13:15 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-37 | 629814 | 5437364 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:30 | 10:40 | 1.2 | 0.27 | 3.6 | 3.3 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 10:45 | 12:30 | 1.8 | 0.40 | | | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:35 | 14:10 | 1.6 | 0.36 | | | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-38 | 629874 | 5436986 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:40 | 12:15 | 2.6 | 1.18 | 3.0 | 3.8 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-39 | 629964 | 5436935 | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:20 | 14:05 | 1.7 | 0.80 | 3.0 | 4.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-40 | 630108 | 5436880 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:45 | 12:00 | 2.3 | 1.03 | 2.7 | 5.6 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:05 | 14:00 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-41 | 629906 | 5437398 | 22.86 | 27-Apr-16 | 27-Apr-16 | 9:25 | 10:15 | 0.83 | 0.19 | 3.7 | 4.8 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-42 | 629438 | 5437371 | 22.86 | 27-Apr-16 | 27-Apr-16 | 10:30 | 12:15 | 1.7 | 0.40 | 2.0 | 4.2 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-43 | 629813 | 5437215 | 22.86 | 27-Apr-16 | 27-Apr-16 | 12:20 | 13:30 | 1.2 | 0.27 | 2.3 | 2.4 | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 27-Apr-16 | 27-Apr-16 | 13:35 | 14:45 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-44 | 629950 | 5437225 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:30 | 10:30 | 1.0 | 0.46 | 3.8 | 3.2 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-45 | 629910 | 5437404 | 45.72 | 27-Apr-16 | 27-Apr-16 | 10:55 | 12:30 | 1.6 | 0.72 | 2.8 | 5.4 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 12:40 | 14:20 | 1.7 | 0.76 | | | - | - | - | - | 0 | 1 | 0 | 1 | 1.3 | - | - | - | - | - |
| | GC-GN-46 | 630143 | 5436876 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:35 | 11:00 | 1.4 | 0.65 | 3.7 | 6.6 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-47 | 630050 | 5436990 | 45.72 | 27-Apr-16 | 27-Apr-16 | 11:05 | 13:15 | 2.2 | 0.99 | 5.9 | 5.3 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:20 | 14:35 | 1.3 | 0.57 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-48 | 630698 | 5437142 | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:45 | 15:20 | 1.6 | 0.72 | 1.4 | 2.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | GC-GN-49 | 630126 | 5437420 | 45.72 | 27-Apr-16 | 27-Apr-16 | 14:05 | 15:45 | 1.7 | 0.76 | 1.2 | 6.6 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | - | - | - |
| | **TOTAL** | | | | | | | | **144** | **51.24** | **-** | **-** | **1** | **1** | **0** | **2** | **1** | **2** | **1** | **7** | **0.15** | **0** | **0** | **0** | **0** | **0** |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Largescale Sucker | | | | | | | | | Mountain Whitefish | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | | 2" | 2.5" | 3" | | |
| Sand Creek | SC-GN-01 | 625783 | 5458145 | 60.96 | 19-Apr-16 | 19-Apr-16 | 11:45 | 15:00 | 3.2 | 1.98 | 0.5 | 1.5 | - | - | 1 | - | - | - | - | 1 | 0.50 | 0 | - | - | 0 | 0 |
| | SC-GN-02 | 625372 | 5457031 | 22.86 | 19-Apr-16 | 19-Apr-16 | 12:35 | 15:10 | 2.6 | 0.59 | 1.0 | 1.0 | 1 | - | - | - | - | - | - | 0 | 1.7 | - | - | - | - | - |
| | SC-GN-03 | 625531 | 5460425 | 45.72 | 19-Apr-16 | 19-Apr-16 | 14:00 | 15:55 | 1.9 | 0.88 | 0.5 | 1.5 | - | - | - | - | 1 | 2 | 0 | 3 | 3.4 | - | - | 0 | 0 | 0 |
| | SC-GN-04 | 625685 | 5457327 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:55 | 11:45 | 1.8 | 0.56 | 1.0 | 1.5 | 2 | - | - | - | - | - | - | 0 | 3.6 | - | - | - | - | - |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 12:10 | 14:39 | 2.5 | 0.76 | | | 1 | - | - | - | - | - | - | 0 | 1.3 | - | - | - | - | - |
| | SC-GN-05 | 625751 | 5457345 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:15 | 13:28 | 2.2 | 0.68 | 0.3 | 0.8 | 11 | - | - | - | - | - | - | 0 | 16 | - | - | - | - | - |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 13:45 | 14:54 | 1.2 | 0.35 | 0.5 | 0.8 | 2 | - | - | - | - | - | - | 0 | 5.7 | - | - | - | - | - |
| | SC-GN-06 | 625028 | 5459161 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:45 | 13:58 | 2.2 | 0.68 | 1.0 | 1.2 | 2 | - | - | - | - | - | - | 1 | 3.0 | - | - | - | - | - |
| | SC-GN-07 | 625660 | 5457294 | 60.96 | 23-Apr-16 | 23-Apr-16 | 8:51 | 10:41 | 1.8 | 1.12 | 1.0 | 1.5 | - | - | 3 | - | - | - | - | 0 | 2.7 | 0 | - | - | 0 | 0 |
| | | | | 60.96 | 23-Apr-16 | 23-Apr-16 | 11:22 | 13:33 | 2.2 | 1.33 | | | - | - | 5 | - | - | - | - | 0 | 3.8 | 0 | - | - | 0 | 0 |
| | SC-GN-08 | 625654 | 5457314 | 30.48 | 23-Apr-16 | 23-Apr-16 | 8:57 | 11:17 | 2.3 | 0.71 | 1.0 | 1.2 | 1 | - | - | - | - | - | - | 0 | 1.4 | - | - | - | - | - |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:34 | 14:21 | 2.8 | 0.85 | | | 1 | - | - | - | - | - | - | 0 | 1.2 | - | - | - | - | - |
| | SC-GN-09 | 625758 | 5457348 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:11 | 11:40 | 2.5 | 0.76 | 0.5 | 1.0 | 3 | - | - | - | - | - | - | 0 | 4.0 | - | - | - | - | - |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:51 | 14:28 | 2.6 | 0.80 | | | 3 | - | - | - | - | - | - | 0 | 3.8 | - | - | - | - | - |
| | SC-GN-10 | 625739 | 5457355 | 30.48 | 24-Apr-16 | 24-Apr-16 | 8:58 | 11:36 | 2.6 | 0.80 | 1.0 | 1.5 | 2 | - | - | - | - | - | - | 0 | 2.5 | - | - | - | - | - |
| | SC-GN-11 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 9:05 | 11:57 | 2.9 | 0.87 | 1.0 | 1.5 | 3 | - | - | - | - | - | - | 0 | 3.4 | - | - | - | - | - |
| | SC-GN-12 | 625660 | 5457309 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:57 | 11:20 | 1.4 | 0.63 | 1.0 | 2.0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:25 | 12:10 | 0.75 | 0.34 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 12:15 | 13:26 | 1.2 | 0.54 | | | - | - | - | - | 1 | 0 | 0 | 0 | 1.8 | - | - | 0 | 0 | 0 |
| | SC-GN-13 | 625674 | 5457326 | 22.86 | 24-Apr-16 | 24-Apr-16 | 10:02 | 11:26 | 1.4 | 0.32 | 1.0 | 1.5 | - | 1 | - | - | - | - | - | 0 | 3.1 | - | - | - | - | - |
| | SC-GN-14 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 12:05 | 14:46 | 2.7 | 0.82 | 1.0 | 2.0 | 3 | - | - | - | - | - | - | 0 | 3.7 | - | - | - | - | - |
| | SC-GN-15 | 625794 | 5458453 | 30.48 | 24-Apr-16 | 24-Apr-16 | 13:09 | 15:25 | 2.3 | 0.69 | 1.0 | 1.7 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | SC-GN-16 | 625114 | 5457743 | 45.72 | 24-Apr-16 | 24-Apr-16 | 13:43 | 15:44 | 2.0 | 0.92 | 1.2 | 1.8 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | SC-GN-17 | 625827 | 5458455 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:18 | 10:08 | 0.83 | 0.38 | 0.8 | 2.9 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 10:13 | 11:18 | 1.1 | 0.50 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:23 | 12:42 | 1.3 | 0.60 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:47 | 13:58 | 1.2 | 0.54 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | SC-GN-18 | 625728 | 5458540 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:44 | 11:06 | 1.4 | 0.62 | 1.0 | 2.4 | - | - | - | - | 1 | 0 | 0 | 0 | 1.6 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:11 | 12:32 | 1.4 | 0.62 | | | - | - | - | - | 0 | 1 | 0 | 0 | 1.6 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:35 | 12:57 | 0.37 | 0.17 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 13:02 | 13:50 | 0.80 | 0.37 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | SC-GN-19 | 625622 | 5458456 | 60.96 | 26-Apr-16 | 26-Apr-16 | 12:05 | 12:44 | 0.65 | 0.40 | 1.0 | 2.3 | - | - | 1 | - | - | - | - | 0 | 2.5 | 0 | - | - | 0 | 0 |
| | SC-GN-20 | 625725 | 5458539 | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:10 | 13:06 | 0.93 | 0.21 | 0.0 | 2.8 | - | 1 | - | - | - | - | - | 0 | 4.7 | - | - | - | - | - |
| | SC-GN-21 | 625802 | 5458384 | 60.96 | 26-Apr-16 | 26-Apr-16 | 13:07 | 13:42 | 0.58 | 0.36 | 2.2 | 3.0 | - | - | 2 | - | - | - | - | 0 | 5.6 | 0 | - | - | 0 | 0 |
| | **TOTAL** | | | | | | | | **60** | **22.73** | **-** | **-** | **35** | **2** | **12** | **0** | **3** | **3** | **0** | **5** | **2.4** | **0** | **0** | **0** | **0** | **0** |
| Elk River | ER-GN-01 | 628295 | 5447959 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:20 | 14:30 | 3.2 | 1.45 | 1.5 | 1.6 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | ER-GN-02 | 628238 | 5447790 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:30 | 14:40 | 3.2 | 1.45 | 1.6 | 1.8 | - | - | - | - | 1 | 2 | 0 | 3 | 2.1 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | | | 14:40 | 17:15 | 2.6 | 1.18 | | | - | - | - | - | 2 | 0 | 0 | 2 | 1.7 | - | - | 0 | 0 | 0 |
| | ER-GN-03 | 628016 | 5447693 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:45 | 14:55 | 3.2 | 0.97 | 4.8 | 10.2 | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | ER-GN-04 | 627973 | 5447966 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:55 | 15:15 | 3.3 | 1.02 | 4.5 | 3.2 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | ER-GN-05 | 628112 | 5447595 | 30.48 | 19-Apr-16 | 19-Apr-16 | 12:10 | 15:20 | 3.2 | 0.97 | 1.8 | 4.8 | 1 | - | - | - | - | - | - | 0 | 1.0 | - | - | - | - | - |
| | ER-GN-06 | 627974 | 5447832 | 30.48 | 19-Apr-16 | 19-Apr-16 | 15:15 | 16:25 | 1.2 | 0.36 | 3.3 | 6.8 | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | ER-GN-07 | 628142 | 5447702 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:05 | 12:00 | 2.9 | 1.33 | 2.0 | 2.1 | - | - | - | - | 1 | 0 | 0 | 1 | 0.75 | - | - | 0 | 0 | 0 |
| | ER-GN-08 | 628077 | 5447436 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:15 | 12:15 | 3.0 | 0.91 | 4.6 | 6.7 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | ER-GN-09 | 628104 | 5447315 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:25 | 12:25 | 3.0 | 0.91 | 3.2 | 6.2 | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | ER-GN-10 | 627865 | 5447460 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:45 | 12:40 | 2.9 | 0.89 | 1.9 | 3.7 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | ER-GN-11 | 627988 | 5447682 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 13:00 | 3.2 | 1.45 | 2.8 | 7.2 | - | - | - | - | 1 | 0 | 0 | 1 | 0.69 | - | - | 0 | 0 | 0 |
| | ER-GN-12 | 627957 | 5447866 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:00 | 11:35 | 2.6 | 1.18 | 4.5 | 4.3 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | ER-GN-13 | 627836 | 5447470 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:15 | 11:45 | 2.5 | 0.76 | 1.4 | 2.0 | 1 | - | - | - | - | - | - | 0 | 1.3 | - | - | - | - | - |
| | ER-GN-14 | 627514 | 5447123 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:20 | 12:00 | 2.7 | 0.81 | 1.8 | 2.1 | 2 | - | - | - | - | - | - | 1 | 2.5 | - | - | - | - | - |
| | ER-GN-15 | 628503 | 5447217 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.81 | 1.1 | 2.0 | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | ER-GN-16 | 627730 | 5447290 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:45 | 12:45 | 3.0 | 1.37 | 2.1 | 1.9 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | ER-GN-17 | 627874 | 5447466 | 45.72 | 22-Apr-16 | 22-Apr-16 | 8:55 | 11:15 | 2.3 | 1.07 | 1.6 | 4.2 | - | - | - | - | 1 | 0 | 0 | 0 | 0.94 | - | - | 0 | 0 | 0 |
| | ER-GN-18 | 628238 | 5446900 | 60.96 | 22-Apr-16 | 22-Apr-16 | 9:10 | 11:30 | 2.3 | 1.42 | 0.8 | 2.1 | - | - | 13 | - | - | - | - | 0 | 9.1 | 0 | - | - | 0 | 0 |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Largescale Sucker | | | | | | | | | Mountain Whitefish | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | | 2" | 2.5" | 3" | | |
| Elk River | ER-GN-19 | 628012 | 5446581 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:30 | 3.2 | 1.45 | 1.4 | 5.8 | - | - | - | - | 2 | 1 | 0 | 3 | 2.1 | - | - | 0 | 0 | 0 |
| | ER-GN-20 | 628321 | 5446690 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:45 | 3.4 | 1.04 | 1.8 | 3.0 | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | ER-GN-21 | 628145 | 5447522 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:00 | 11:05 | 2.1 | 0.95 | 1.2 | 2.1 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | ER-GN-22 | 627842 | 5447463 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:10 | 11:20 | 2.2 | 0.66 | 1.9 | 3.9 | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | ER-GN-23 | 628186 | 5446813 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:20 | 11:45 | 2.4 | 1.10 | 1.4 | 3.9 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | ER-GN-24 | 628485 | 5447166 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:10 | 11:00 | 1.8 | 0.84 | 2.0 | 2.4 | - | - | - | - | 0 | 1 | 0 | 0 | 1.2 | - | - | 0 | 0 | 0 |
| | ER-GN-25 | 628146 | 5446559 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:15 | 10:20 | 1.1 | 0.50 | 0.8 | 4.1 | - | - | - | - | 0 | 1 | 0 | 0 | 2.0 | - | - | 0 | 0 | 0 |
| | ER-GN-26 | 627836 | 5447486 | 30.48 | 25-Apr-16 | 25-Apr-16 | 12:30 | 13:10 | 0.67 | 0.20 | 1.5 | 2.9 | 6 | - | - | - | - | - | - | 0 | 30 | - | - | - | - | - |
| | ER-GN-27 | 628450 | 5447156 | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:45 | 13:50 | 1.1 | 0.25 | 1.1 | 3.4 | - | 1 | - | - | - | - | - | 0 | 4.0 | - | - | - | - | - |
| | ER-GN-28 | 628595 | 5447346 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:10 | 9:50 | 0.67 | 0.15 | 2.3 | 2.3 | - | 1 | - | - | - | - | - | 0 | 6.6 | - | - | - | - | - |
| | **TOTAL** | | | | | | | | **71** | **27.45** | **-** | **-** | **10** | **2** | **13** | **0** | **8** | **5** | **0** | **11** | **2.3** | **0** | **0** | **0** | **0** | **0** |
| Gold Creek | GC-GN-01 | 630004 | 5437333 | 45.72 | 19-Apr-16 | 19-Apr-16 | 10:45 | 13:00 | 2.3 | 1.03 | 3.2 | 3.1 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 19-Apr-16 | 19-Apr-16 | 13:05 | 15:25 | 2.3 | 1.07 | | | - | - | - | - | 2 | 0 | 0 | 1 | 1.9 | - | - | 0 | 0 | 0 |
| | GC-GN-02 | 630484 | 5437202 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:10 | 15:10 | 4.0 | 1.83 | 6.2 | 6.3 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | GC-GN-03 | 629920 | 5437070 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:25 | 15:40 | 4.3 | 0.97 | 2.0 | 2.1 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-04 | 629943 | 5437079 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:40 | 15:45 | 4.1 | 0.93 | 2.3 | 2.5 | - | 0 | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-05 | 629909 | 5437049 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 11:50 | 2.0 | 0.91 | 2.3 | 2.7 | - | - | - | - | 2 | 2 | 0 | 2 | 4.4 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 20-Apr-16 | 20-Apr-16 | 12:15 | 14:10 | 1.9 | 0.88 | | | - | - | - | - | 1 | 0 | 0 | 0 | 1.1 | - | - | 0 | 0 | 0 |
| | GC-GN-06 | 630147 | 5436926 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:55 | 13:00 | 3.1 | 1.41 | 4.1 | 4.3 | - | - | - | - | 1 | 6 | 0 | 7 | 5.0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 11:45 | 13:40 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | GC-GN-07 | 630468 | 5437262 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:00 | 13:40 | 3.7 | 0.84 | 2.5 | 6.5 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-08 | 630499 | 5437243 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:05 | 14:00 | 3.9 | 0.90 | 2.5 | 6.5 | - | 3 | - | - | - | - | - | 0 | 3.4 | - | - | - | - | - |
| | GC-GN-09 | 630028 | 5437022 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:20 | 11:20 | 2.0 | 0.91 | 2.9 | 3.5 | - | - | - | - | 7 | 2 | 0 | 2 | 9.8 | - | - | 1 | 0 | 1.1 |
| | GC-GN-10 | 630258 | 5436950 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:25 | 11:50 | 2.4 | 1.10 | 3.5 | 6.0 | - | - | - | - | 6 | 0 | 0 | 1 | 5.4 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 12:00 | 13:45 | 1.7 | 0.80 | | | - | - | - | - | 1 | 0 | 0 | 0 | 1.2 | - | - | 0 | 0 | 0 |
| | GC-GN-11 | 630520 | 5437231 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.61 | 5.0 | 6.5 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:15 | 13:55 | 1.7 | 0.38 | | | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-12 | 630463 | 5437277 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:35 | 12:20 | 2.8 | 0.63 | 5.5 | 6.3 | - | 2 | - | - | - | - | - | 0 | 3.2 | - | - | - | - | - |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:25 | 14:05 | 1.7 | 0.38 | | | - | 3 | - | - | - | - | - | 0 | 7.9 | - | - | - | - | - |
| | GC-GN-13 | 629984 | 5437073 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 10:30 | 1.2 | 0.53 | 2.7 | 3.3 | - | - | - | - | 7 | 0 | 0 | 2 | 13 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:35 | 12:00 | 1.4 | 0.65 | | | - | - | - | - | 4 | 1 | 0 | 3 | 7.7 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:05 | 13:15 | 1.2 | 0.53 | | | - | - | - | - | 0 | 1 | 0 | 1 | 1.9 | - | - | 0 | 0 | 0 |
| | GC-GN-14 | 630009 | 5437026 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:25 | 10:35 | 1.2 | 0.53 | 2.8 | 3.5 | - | - | - | - | 2 | 0 | 0 | 1 | 3.7 | - | - | 0 | 0 | 0 |
| | GC-GN-15 | 630069 | 5437092 | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:40 | 12:15 | 1.6 | 0.72 | 4.0 | 3.0 | - | - | - | - | 4 | 0 | 0 | 0 | 5.5 | - | - | 0 | 0 | 0 |
| | GC-GN-16 | 630149 | 5436978 | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:20 | 13:30 | 1.2 | 0.53 | 4.0 | 4.9 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | GC-GN-17 | 630486 | 5437262 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:30 | 11:00 | 1.5 | 0.34 | 4.0 | 6.7 | - | 5 | - | - | - | - | - | 0 | 15 | - | - | - | - | - |
| | | | | 22.86 | 22-Apr-16 | 22-Apr-16 | 11:10 | 13:10 | 2.0 | 0.46 | | | - | 5 | - | - | - | - | - | 0 | 11 | - | - | - | - | - |
| | GC-GN-18 | 630460 | 5437287 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:40 | 11:40 | 2.0 | 0.46 | 4.0 | 6.5 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-19 | 630665 | 5436958 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:30 | 11:30 | 2.0 | 0.91 | 4.0 | 8.5 | - | - | - | - | 0 | 1 | 0 | 1 | 1.1 | - | - | 0 | 0 | 0 |
| | GC-GN-20 | 630541 | 5437190 | 45.72 | 23-Apr-16 | 23-Apr-16 | 11:50 | 14:00 | 2.2 | 0.99 | 4.0 | 8.0 | - | - | - | - | 0 | 1 | 0 | 1 | 1.0 | - | - | 0 | 0 | 0 |
| | GC-GN-21 | 630656 | 5437117 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:40 | 11:45 | 2.1 | 0.48 | 3.0 | 7.5 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-22 | 630161 | 5436918 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:45 | 12:00 | 2.3 | 0.51 | 1.5 | 5.0 | 1 | - | - | - | - | - | - | 0 | 1.9 | - | - | - | - | - |
| | GC-GN-23 | 629888 | 5437089 | 45.72 | 23-Apr-16 | 23-Apr-16 | 10:10 | 12:30 | 2.3 | 1.07 | 3.5 | 1.8 | - | - | - | - | 1 | 2 | 0 | 2 | 2.8 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 23-Apr-16 | 23-Apr-16 | 12:35 | 14:35 | 2.0 | 0.91 | | | - | - | - | - | 0 | 4 | 0 | 4 | 4.4 | - | - | 0 | 0 | 0 |
| | GC-GN-24 | 630257 | 5437394 | 22.86 | 23-Apr-16 | 23-Apr-16 | 10:25 | 13:00 | 2.6 | 0.59 | 2.0 | 6.2 | - | 3 | - | - | - | - | - | 0 | 5.1 | - | - | - | - | - |
| | GC-GN-25 | 630144 | 5436893 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:10 | 14:05 | 1.9 | 0.44 | 1.2 | 2.5 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-26 | 629827 | 5437340 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:15 | 14:25 | 2.2 | 0.50 | 2.0 | 2.4 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-27 | 630144 | 5436881 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:30 | 11:45 | 2.3 | 0.51 | 1.3 | 2.3 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:50 | 13:30 | 1.7 | 0.38 | | | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | GC-GN-28 | 629902 | 5437132 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:20 | 11:10 | 1.8 | 0.84 | 3.4 | 2.0 | - | - | - | - | 0 | 1 | 0 | 1 | 1.2 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:15 | 13:10 | 1.9 | 0.88 | | | - | - | - | - | 2 | 0 | 0 | 1 | 2.3 | - | - | 0 | 0 | 0 |
| | GC-GN-29 | 630036 | 5437104 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:25 | 11:00 | 1.6 | 0.72 | 4.0 | 3.5 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:05 | 13:20 | 2.3 | 1.03 | | | - | - | - | - | 1 | 1 | 0 | 1 | 1.9 | - | - | 0 | 0 | 0 |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Largescale Sucker | | | | | | | | | Mountain Whitefish | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | | 2" | 2.5" | 3" | | |
| Gold Creek | GC-GN-30 | 630110 | 5436878 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:35 | 11:15 | 1.7 | 0.38 | 1.8 | 2.3 | 0 | - | - | - | - | - | - | 0 | 0 | - | - | - | - | - |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:20 | 13:50 | 2.5 | 0.57 | | | 1 | - | - | - | - | - | - | 0 | 1.7 | - | - | - | - | - |
| | GC-GN-31 | 630298 | 5437358 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:40 | 12:00 | 2.3 | 0.53 | 2.5 | 6.3 | - | - | - | 1 | - | - | - | 0 | 1.9 | - | 0 | - | 0 | 0 |
| | GC-GN-32 | 629824 | 5437340 | 22.86 | 24-Apr-16 | 24-Apr-16 | 12:15 | 14:15 | 2.0 | 0.46 | 2.0 | 2.5 | - | - | - | 1 | - | - | - | 0 | 2.2 | - | 0 | - | 0 | 0 |
| | GC-GN-33 | 629829 | 5437312 | 22.86 | 25-Apr-16 | 25-Apr-16 | 9:35 | 10:45 | 1.2 | 0.27 | 2.5 | 3.0 | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 10:55 | 12:05 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:10 | 13:20 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | 0 | 0 |
| | GC-GN-34 | 630014 | 5437330 | 60.96 | 25-Apr-16 | 25-Apr-16 | 9:40 | 10:40 | 1.0 | 0.61 | 4.0 | 4.6 | - | - | 2 | - | - | - | - | 0 | 3.3 | 0 | - | - | 0 | 0 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 10:55 | 11:50 | 0.92 | 0.56 | | | - | - | 4 | - | - | - | - | 0 | 7.2 | 1 | - | - | 1 | 1.8 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 11:55 | 13:00 | 1.1 | 0.66 | | | - | - | 7 | - | - | - | - | 0 | 11 | 0 | - | - | 0 | 0 |
| | GC-GN-35 | 629824 | 5437090 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:45 | 11:05 | 1.3 | 0.61 | 2.0 | 3.0 | - | - | - | - | 0 | 2 | 0 | 2 | 3.3 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:10 | 13:05 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | GC-GN-36 | 629826 | 5436965 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:50 | 11:15 | 1.4 | 0.65 | 3.5 | 2.5 | - | - | - | - | 0 | 1 | 0 | 1 | 1.5 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:20 | 13:15 | 1.9 | 0.88 | | | - | - | - | - | 1 | 0 | 0 | 0 | 1.1 | - | - | 0 | 0 | 0 |
| | GC-GN-37 | 629814 | 5437364 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:30 | 10:40 | 1.2 | 0.27 | 3.6 | 3.3 | - | - | - | 1 | - | - | - | 0 | 3.7 | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 10:45 | 12:30 | 1.8 | 0.40 | | | - | - | - | 4 | - | - | - | 0 | 10 | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:35 | 14:10 | 1.6 | 0.36 | | | - | - | - | 1 | - | - | - | 0 | 2.8 | - | 0 | - | 0 | 0 |
| | GC-GN-38 | 629874 | 5436986 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:40 | 12:15 | 2.6 | 1.18 | 3.0 | 3.8 | - | - | - | - | 3 | 0 | 0 | 1 | 2.5 | - | - | 0 | 0 | 0 |
| | GC-GN-39 | 629964 | 5436935 | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:20 | 14:05 | 1.7 | 0.80 | 3.0 | 4.0 | - | - | - | - | 1 | 0 | 0 | 0 | 1.2 | - | - | 0 | 0 | 0 |
| | GC-GN-40 | 630108 | 5436880 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:45 | 12:00 | 2.3 | 1.03 | 2.7 | 5.6 | - | - | - | - | 5 | 0 | 0 | 2 | 4.9 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:05 | 14:00 | 1.9 | 0.88 | | | - | - | - | - | 0 | 2 | 0 | 2 | 2.3 | - | - | 0 | 0 | 0 |
| | GC-GN-41 | 629906 | 5437398 | 22.86 | 27-Apr-16 | 27-Apr-16 | 9:25 | 10:15 | 0.83 | 0.19 | 3.7 | 4.8 | - | - | - | 3 | - | - | - | 0 | 16 | - | 0 | - | 0 | 0 |
| | GC-GN-42 | 629438 | 5437371 | 22.86 | 27-Apr-16 | 27-Apr-16 | 10:30 | 12:15 | 1.7 | 0.40 | 2.0 | 4.2 | - | - | - | 8 | - | - | - | 0 | 20 | - | 0 | - | 0 | 0 |
| | GC-GN-43 | 629813 | 5437215 | 22.86 | 27-Apr-16 | 27-Apr-16 | 12:20 | 13:30 | 1.2 | 0.27 | 2.3 | 2.4 | - | - | - | 4 | - | - | - | 0 | 15 | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 27-Apr-16 | 27-Apr-16 | 13:35 | 14:45 | 1.2 | 0.27 | | | - | - | - | 2 | - | - | - | 0 | 7.5 | - | 0 | - | 0 | 0 |
| | GC-GN-44 | 629950 | 5437225 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:30 | 10:30 | 1.0 | 0.46 | 3.8 | 3.2 | - | - | - | - | 1 | 0 | 0 | 0 | 2.2 | - | - | 0 | 0 | 0 |
| | GC-GN-45 | 629910 | 5437404 | 45.72 | 27-Apr-16 | 27-Apr-16 | 10:55 | 12:30 | 1.6 | 0.72 | 2.8 | 5.4 | - | - | - | - | 1 | 0 | 0 | 0 | 1.4 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 12:40 | 14:20 | 1.7 | 0.76 | | | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | GC-GN-46 | 630143 | 5436876 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:35 | 11:00 | 1.4 | 0.65 | 3.7 | 6.6 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 |
| | GC-GN-47 | 630050 | 5436990 | 45.72 | 27-Apr-16 | 27-Apr-16 | 11:05 | 13:15 | 2.2 | 0.99 | 5.9 | 5.3 | - | - | - | - | 0 | 2 | 0 | 0 | 2.0 | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:20 | 14:35 | 1.3 | 0.57 | | | - | - | - | - | 1 | 0 | 0 | 0 | 1.7 | - | - | 0 | 0 | 0 |
| | GC-GN-48 | 630698 | 5437142 | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:45 | 15:20 | 1.6 | 0.72 | 1.4 | 2.0 | - | - | - | - | 2 | 0 | 0 | 0 | 2.8 | - | - | 0 | 0 | 0 |
| | GC-GN-49 | 630126 | 5437420 | 45.72 | 27-Apr-16 | 27-Apr-16 | 14:05 | 15:45 | 1.7 | 0.76 | 1.2 | 6.6 | - | - | - | - | 3 | 2 | 1 | 1 | 6.6 | - | - | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | | **144** | **51.24** | **-** | **-** | **2** | **21** | **13** | **25** | **59** | **31** | **1** | **40** | **3.4** | **1** | **0** | **1** | **1** | **0.052** |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Longnose Sucker | | | Northern Pikeminnow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 4" | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | |
| Sand Creek | SC-GN-01 | 625783 | 5458145 | 60.96 | 19-Apr-16 | 19-Apr-16 | 11:45 | 15:00 | 3.2 | 1.98 | 0.5 | 1.5 | - | - | - | - | - | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-02 | 625372 | 5457031 | 22.86 | 19-Apr-16 | 19-Apr-16 | 12:35 | 15:10 | 2.6 | 0.59 | 1.0 | 1.0 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | SC-GN-03 | 625531 | 5460425 | 45.72 | 19-Apr-16 | 19-Apr-16 | 14:00 | 15:55 | 1.9 | 0.88 | 0.5 | 1.5 | 1 | 0 | 1.1 | - | - | - | - | 0 | 1 | 1 | 2 | 2.3 |
| | SC-GN-04 | 625685 | 5457327 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:55 | 11:45 | 1.8 | 0.56 | 1.0 | 1.5 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 12:10 | 14:39 | 2.5 | 0.76 | | | - | - | - | 1 | - | - | - | - | - | - | 1 | 1.3 |
| | SC-GN-05 | 625751 | 5457345 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:15 | 13:28 | 2.2 | 0.68 | 0.3 | 0.8 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 13:45 | 14:54 | 1.2 | 0.35 | 0.5 | 0.8 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | SC-GN-06 | 625028 | 5459161 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:45 | 13:58 | 2.2 | 0.68 | 1.0 | 1.2 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | SC-GN-07 | 625660 | 5457294 | 60.96 | 23-Apr-16 | 23-Apr-16 | 8:51 | 10:41 | 1.8 | 1.12 | 1.0 | 1.5 | - | - | - | - | - | 24 | - | - | - | - | 5 | 21 |
| | | | | 60.96 | 23-Apr-16 | 23-Apr-16 | 11:22 | 13:33 | 2.2 | 1.33 | | | - | - | - | - | - | 13 | - | - | - | - | 2 | 9.8 |
| | SC-GN-08 | 625654 | 5457314 | 30.48 | 23-Apr-16 | 23-Apr-16 | 8:57 | 11:17 | 2.3 | 0.71 | 1.0 | 1.2 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:34 | 14:21 | 2.8 | 0.85 | | | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | SC-GN-09 | 625758 | 5457348 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:11 | 11:40 | 2.5 | 0.76 | 0.5 | 1.0 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:51 | 14:28 | 2.6 | 0.80 | | | - | - | - | 2 | - | - | - | - | - | - | 0 | 2.5 |
| | SC-GN-10 | 625739 | 5457355 | 30.48 | 24-Apr-16 | 24-Apr-16 | 8:58 | 11:36 | 2.6 | 0.80 | 1.0 | 1.5 | - | - | - | 1 | - | - | - | - | - | - | 0 | 1.2 |
| | SC-GN-11 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 9:05 | 11:57 | 2.9 | 0.87 | 1.0 | 1.5 | - | - | - | 1 | - | - | - | - | - | - | 0 | 1.1 |
| | SC-GN-12 | 625660 | 5457309 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:57 | 11:20 | 1.4 | 0.63 | 1.0 | 2.0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:25 | 12:10 | 0.75 | 0.34 | | | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 12:15 | 13:26 | 1.2 | 0.54 | | | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | SC-GN-13 | 625674 | 5457326 | 22.86 | 24-Apr-16 | 24-Apr-16 | 10:02 | 11:26 | 1.4 | 0.32 | 1.0 | 1.5 | - | - | - | - | 4 | - | - | - | - | - | 0 | 12 |
| | SC-GN-14 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 12:05 | 14:46 | 2.7 | 0.82 | 1.0 | 2.0 | - | - | - | 2 | - | - | - | - | - | - | 0 | 2.4 |
| | SC-GN-15 | 625794 | 5458453 | 30.48 | 24-Apr-16 | 24-Apr-16 | 13:09 | 15:25 | 2.3 | 0.69 | 1.0 | 1.7 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | SC-GN-16 | 625114 | 5457743 | 45.72 | 24-Apr-16 | 24-Apr-16 | 13:43 | 15:44 | 2.0 | 0.92 | 1.2 | 1.8 | 0 | 0 | 0 | - | - | - | - | 1 | 0 | 0 | 1 | 1.1 |
| | SC-GN-17 | 625827 | 5458455 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:18 | 10:08 | 0.83 | 0.38 | 0.8 | 2.9 | 0 | 0 | 0 | - | - | - | - | 3 | 1 | 0 | 4 | 10 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 10:13 | 11:18 | 1.1 | 0.50 | | | 0 | 0 | 0 | - | - | - | - | 0 | 2 | 0 | 2 | 4.0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:23 | 12:42 | 1.3 | 0.60 | | | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:47 | 13:58 | 1.2 | 0.54 | | | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | SC-GN-18 | 625728 | 5458540 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:44 | 11:06 | 1.4 | 0.62 | 1.0 | 2.4 | 0 | 0 | 0 | - | - | - | - | 2 | 0 | 1 | 3 | 4.8 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:11 | 12:32 | 1.4 | 0.62 | | | 0 | 0 | 0 | - | - | - | - | 3 | 0 | 0 | 3 | 4.9 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:35 | 12:57 | 0.37 | 0.17 | | | 0 | 0 | 0 | - | - | - | - | 1 | 0 | 0 | 1 | 6.0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 13:02 | 13:50 | 0.80 | 0.37 | | | 0 | 0 | 0 | - | - | - | - | 3 | 1 | 0 | 3 | 11 |
| | SC-GN-19 | 625622 | 5458456 | 60.96 | 26-Apr-16 | 26-Apr-16 | 12:05 | 12:44 | 0.65 | 0.40 | 1.0 | 2.3 | - | - | - | - | - | 3 | - | - | - | - | 0 | 7.6 |
| | SC-GN-20 | 625725 | 5458539 | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:10 | 13:06 | 0.93 | 0.21 | 0.0 | 2.8 | - | - | - | - | 2 | - | - | - | - | - | 0 | 9.4 |
| | SC-GN-21 | 625802 | 5458384 | 60.96 | 26-Apr-16 | 26-Apr-16 | 13:07 | 13:42 | 0.58 | 0.36 | 2.2 | 3.0 | - | - | - | - | - | 11 | - | - | - | - | 0 | 31 |
| | **TOTAL** | | | | | | | | **60** | **22.73** | **-** | **-** | **1** | **0** | **0.09** | **7** | **6** | **51** | **0** | **13** | **5** | **2** | **27** | **4.3** |
| Elk River | ER-GN-01 | 628295 | 5447959 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:20 | 14:30 | 3.2 | 1.45 | 1.5 | 1.6 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | ER-GN-02 | 628238 | 5447790 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:30 | 14:40 | 3.2 | 1.45 | 1.6 | 1.8 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | | | 14:40 | 17:15 | 2.6 | 1.18 | | | 0 | - | 0 | - | - | - | - | 1 | 1 | 0 | 2 | 1.7 |
| | ER-GN-03 | 628016 | 5447693 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:45 | 14:55 | 3.2 | 0.97 | 4.8 | 10.2 | - | - | - | - | - | - | 3 | - | - | - | 3 | 3.1 |
| | ER-GN-04 | 627973 | 5447966 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:55 | 15:15 | 3.3 | 1.02 | 4.5 | 3.2 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | ER-GN-05 | 628112 | 5447595 | 30.48 | 19-Apr-16 | 19-Apr-16 | 12:10 | 15:20 | 3.2 | 0.97 | 1.8 | 4.8 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | ER-GN-06 | 627974 | 5447832 | 30.48 | 19-Apr-16 | 19-Apr-16 | 15:15 | 16:25 | 1.2 | 0.36 | 3.3 | 6.8 | - | - | - | - | - | - | 9 | - | - | - | 9 | 25 |
| | ER-GN-07 | 628142 | 5447702 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:05 | 12:00 | 2.9 | 1.33 | 2.0 | 2.1 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | ER-GN-08 | 628077 | 5447436 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:15 | 12:15 | 3.0 | 0.91 | 4.6 | 6.7 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | ER-GN-09 | 628104 | 5447315 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:25 | 12:25 | 3.0 | 0.91 | 3.2 | 6.2 | - | - | - | - | - | - | 0 | - | - | - | 0 | 0 |
| | ER-GN-10 | 627865 | 5447460 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:45 | 12:40 | 2.9 | 0.89 | 1.9 | 3.7 | - | - | - | 6 | - | - | - | - | - | - | 2 | 6.7 |
| | ER-GN-11 | 627988 | 5447682 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 13:00 | 3.2 | 1.45 | 2.8 | 7.2 | 0 | - | 0 | - | - | - | - | 2 | 1 | 1 | 4 | 2.8 |
| | ER-GN-12 | 627957 | 5447866 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:00 | 11:35 | 2.6 | 1.18 | 4.5 | 4.3 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | ER-GN-13 | 627836 | 5447470 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:15 | 11:45 | 2.5 | 0.76 | 1.4 | 2.0 | - | - | - | 8 | - | - | - | - | - | - | 0 | 10 |
| | ER-GN-14 | 627514 | 5447123 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:20 | 12:00 | 2.7 | 0.81 | 1.8 | 2.1 | - | - | - | 4 | - | - | - | - | - | - | 0 | 4.9 |
| | ER-GN-15 | 628503 | 5447217 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.81 | 1.1 | 2.0 | - | - | - | - | - | - | 3 | - | - | - | 3 | 3.7 |
| | ER-GN-16 | 627730 | 5447290 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:45 | 12:45 | 3.0 | 1.37 | 2.1 | 1.9 | 0 | - | 0 | - | - | - | - | 3 | 0 | 0 | 3 | 2.2 |
| | ER-GN-17 | 627874 | 5447466 | 45.72 | 22-Apr-16 | 22-Apr-16 | 8:55 | 11:15 | 2.3 | 1.07 | 1.6 | 4.2 | 0 | - | 0 | - | - | - | - | 3 | 3 | 0 | 0 | 5.6 |
| | ER-GN-18 | 628238 | 5446900 | 60.96 | 22-Apr-16 | 22-Apr-16 | 9:10 | 11:30 | 2.3 | 1.42 | 0.8 | 2.1 | - | - | - | - | - | 13 | - | - | - | - | 3 | 9.1 |

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[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## Table F.10: Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Longnose Sucker | | | Northern Pikeminnow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | | | | | | | | | | | | 4" | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | |
| Elk River | ER-GN-19 | 628012 | 5446581 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:30 | 3.2 | 1.45 | 1.4 | 5.8 | 0 | - | 0 | - | - | - | - | 5 | 1 | 2 | 8 | 5.5 |
| | ER-GN-20 | 628321 | 5446690 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:45 | 3.4 | 1.04 | 1.8 | 3.0 | - | - | - | - | - | - | 9 | - | - | - | 9 | 8.6 |
| | ER-GN-21 | 628145 | 5447522 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:00 | 11:05 | 2.1 | 0.95 | 1.2 | 2.1 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | ER-GN-22 | 627842 | 5447463 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:10 | 11:20 | 2.2 | 0.66 | 1.9 | 3.9 | - | - | - | - | - | - | 17 | - | - | - | 8 | 26 |
| | ER-GN-23 | 628186 | 5446813 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:20 | 11:45 | 2.4 | 1.10 | 1.4 | 3.9 | 0 | - | 0 | - | - | - | - | 4 | 0 | 1 | 0 | 4.5 |
| | ER-GN-24 | 628485 | 5447166 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:10 | 11:00 | 1.8 | 0.84 | 2.0 | 2.4 | 0 | - | 0 | - | - | - | - | 1 | 0 | 0 | 0 | 1.2 |
| | ER-GN-25 | 628146 | 5446559 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:15 | 10:20 | 1.1 | 0.50 | 0.8 | 4.1 | 0 | - | 0 | - | - | - | - | 3 | 2 | 0 | 0 | 10 |
| | ER-GN-26 | 627836 | 5447486 | 30.48 | 25-Apr-16 | 25-Apr-16 | 12:30 | 13:10 | 0.67 | 0.20 | 1.5 | 2.9 | - | - | - | 8 | - | - | - | - | - | - | 0 | 39 |
| | ER-GN-27 | 628450 | 5447156 | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:45 | 13:50 | 1.1 | 0.25 | 1.1 | 3.4 | - | - | - | - | 9 | - | - | - | - | - | 0 | 36 |
| | ER-GN-28 | 628595 | 5447346 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:10 | 9:50 | 0.67 | 0.15 | 2.3 | 2.3 | - | - | - | - | 14 | - | - | - | - | - | 1 | 92 |
| | **TOTAL** | | | | | | | | **71** | **27.45** | **-** | **-** | **0** | **0** | **0** | **26** | **23** | **13** | **41** | **22** | **8** | **4** | **55** | **10** |
| Gold Creek | GC-GN-01 | 630004 | 5437333 | 45.72 | 19-Apr-16 | 19-Apr-16 | 10:45 | 13:00 | 2.3 | 1.03 | 3.2 | 3.1 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 19-Apr-16 | 19-Apr-16 | 13:05 | 15:25 | 2.3 | 1.07 | | | 0 | 0 | 0 | - | - | - | - | 2 | 0 | 0 | 2 | 1.9 |
| | GC-GN-02 | 630484 | 5437202 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:10 | 15:10 | 4.0 | 1.83 | 6.2 | 6.3 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-03 | 629920 | 5437070 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:25 | 15:40 | 4.3 | 0.97 | 2.0 | 2.1 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | GC-GN-04 | 629943 | 5437079 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:40 | 15:45 | 4.1 | 0.93 | 2.3 | 2.5 | - | - | - | - | 4 | - | - | - | - | - | 0 | 4.3 |
| | GC-GN-05 | 629909 | 5437049 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 11:50 | 2.0 | 0.91 | 2.3 | 2.7 | 0 | - | 0 | - | - | - | - | 1 | 1 | 1 | 3 | 3.3 |
| | | | | 45.72 | 20-Apr-16 | 20-Apr-16 | 12:15 | 14:10 | 1.9 | 0.88 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-06 | 630147 | 5436926 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:55 | 13:00 | 3.1 | 1.41 | 4.1 | 4.3 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 11:45 | 13:40 | 1.9 | 0.88 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-07 | 630468 | 5437262 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:00 | 13:40 | 3.7 | 0.84 | 2.5 | 6.5 | - | - | - | 4 | - | - | - | - | - | - | 0 | 4.8 |
| | GC-GN-08 | 630499 | 5437243 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:05 | 14:00 | 3.9 | 0.90 | 2.5 | 6.5 | - | - | - | - | 11 | - | - | - | - | - | 0 | 12 |
| | GC-GN-09 | 630028 | 5437022 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:20 | 11:20 | 2.0 | 0.91 | 2.9 | 3.5 | 0 | - | 0 | - | - | - | - | 0 | 1 | 0 | 1 | 1.1 |
| | GC-GN-10 | 630258 | 5436950 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:25 | 11:50 | 2.4 | 1.10 | 3.5 | 6.0 | 0 | - | 0 | - | - | - | - | 2 | 0 | 0 | 2 | 1.8 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 12:00 | 13:45 | 1.7 | 0.80 | | | 0 | - | 0 | - | - | - | - | 1 | 0 | 0 | 1 | 1.2 |
| | GC-GN-11 | 630520 | 5437231 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.61 | 5.0 | 6.5 | - | - | - | 3 | - | - | - | - | - | - | 0 | 4.9 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:15 | 13:55 | 1.7 | 0.38 | | | - | - | - | 7 | - | - | - | - | - | - | 0 | 18 |
| | GC-GN-12 | 630463 | 5437277 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:35 | 12:20 | 2.8 | 0.63 | 5.5 | 6.3 | - | - | - | - | 4 | - | - | - | - | - | 0 | 6.4 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:25 | 14:05 | 1.7 | 0.38 | | | - | - | - | - | 3 | - | - | - | - | - | 0 | 7.9 |
| | GC-GN-13 | 629984 | 5437073 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 10:30 | 1.2 | 0.53 | 2.7 | 3.3 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:35 | 12:00 | 1.4 | 0.65 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 1 | 1 | 1.5 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:05 | 13:15 | 1.2 | 0.53 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-14 | 630009 | 5437026 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:25 | 10:35 | 1.2 | 0.53 | 2.8 | 3.5 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-15 | 630069 | 5437092 | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:40 | 12:15 | 1.6 | 0.72 | 4.0 | 3.0 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-16 | 630149 | 5436978 | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:20 | 13:30 | 1.2 | 0.53 | 4.0 | 4.9 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-17 | 630486 | 5437262 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:30 | 11:00 | 1.5 | 0.34 | 4.0 | 6.7 | - | - | - | - | 4 | - | - | - | - | - | 0 | 12 |
| | | | | 22.86 | 22-Apr-16 | 22-Apr-16 | 11:10 | 13:10 | 2.0 | 0.46 | | | - | - | - | - | 3 | - | - | - | - | - | 0 | 6.6 |
| | GC-GN-18 | 630460 | 5437287 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:40 | 11:40 | 2.0 | 0.46 | 4.0 | 6.5 | - | - | - | 2 | - | - | - | - | - | - | 0 | 4.4 |
| | GC-GN-19 | 630665 | 5436958 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:30 | 11:30 | 2.0 | 0.91 | 4.0 | 8.5 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-20 | 630541 | 5437190 | 45.72 | 23-Apr-16 | 23-Apr-16 | 11:50 | 14:00 | 2.2 | 0.99 | 4.0 | 8.0 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-21 | 630656 | 5437117 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:40 | 11:45 | 2.1 | 0.48 | 3.0 | 7.5 | - | - | - | 2 | - | - | - | - | - | - | 0 | 4.2 |
| | GC-GN-22 | 630161 | 5436918 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:45 | 12:00 | 2.3 | 0.51 | 1.5 | 5.0 | - | - | - | 1 | - | - | - | - | - | - | 0 | 1.9 |
| | GC-GN-23 | 629888 | 5437089 | 45.72 | 23-Apr-16 | 23-Apr-16 | 10:10 | 12:30 | 2.3 | 1.07 | 3.5 | 1.8 | 0 | - | 0 | - | - | - | - | 4 | 0 | 1 | 5 | 4.7 |
| | | | | 45.72 | 23-Apr-16 | 23-Apr-16 | 12:35 | 14:35 | 2.0 | 0.91 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-24 | 630257 | 5437394 | 22.86 | 23-Apr-16 | 23-Apr-16 | 10:25 | 13:00 | 2.6 | 0.59 | 2.0 | 6.2 | - | - | - | - | 5 | - | - | - | - | - | 0 | 8.5 |
| | GC-GN-25 | 630144 | 5436893 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:10 | 14:05 | 1.9 | 0.44 | 1.2 | 2.5 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | GC-GN-26 | 629827 | 5437340 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:15 | 14:25 | 2.2 | 0.50 | 2.0 | 2.4 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | GC-GN-27 | 630144 | 5436881 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:30 | 11:45 | 2.3 | 0.51 | 1.3 | 2.3 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:50 | 13:30 | 1.7 | 0.38 | | | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | GC-GN-28 | 629902 | 5437132 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:20 | 11:10 | 1.8 | 0.84 | 3.4 | 2.0 | 0 | - | 0 | - | - | - | - | 0 | 1 | 0 | 1 | 1.2 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:15 | 13:10 | 1.9 | 0.88 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-29 | 630036 | 5437104 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:25 | 11:00 | 1.6 | 0.72 | 4.0 | 3.5 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:05 | 13:20 | 2.3 | 1.03 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Longnose Sucker | | | Northern Pikeminnow | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 4" | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | 5" | | |
| Gold Creek | GC-GN-30 | 630110 | 5436878 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:35 | 11:15 | 1.7 | 0.38 | 1.8 | 2.3 | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:20 | 13:50 | 2.5 | 0.57 | | | - | - | - | 0 | - | - | - | - | - | - | 0 | 0 |
| | GC-GN-31 | 630298 | 5437358 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:40 | 12:00 | 2.3 | 0.53 | 2.5 | 6.3 | - | - | - | - | - | - | 2 | - | - | - | 2 | 3.7 |
| | GC-GN-32 | 629824 | 5437340 | 22.86 | 24-Apr-16 | 24-Apr-16 | 12:15 | 14:15 | 2.0 | 0.46 | 2.0 | 2.5 | - | - | - | - | - | - | 2 | - | - | - | 2 | 4.4 |
| | GC-GN-33 | 629829 | 5437312 | 22.86 | 25-Apr-16 | 25-Apr-16 | 9:35 | 10:45 | 1.2 | 0.27 | 2.5 | 3.0 | - | - | - | - | - | - | 2 | - | - | - | 2 | 7.5 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 10:55 | 12:05 | 1.2 | 0.27 | | | - | - | - | - | - | - | 2 | - | - | - | 2 | 7.5 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:10 | 13:20 | 1.2 | 0.27 | | | - | - | - | - | - | - | 2 | - | - | - | 2 | 7.5 |
| | GC-GN-34 | 630014 | 5437330 | 60.96 | 25-Apr-16 | 25-Apr-16 | 9:40 | 10:40 | 1.0 | 0.61 | 4.0 | 4.6 | - | - | - | - | - | 7 | - | - | - | - | 1 | 11 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 10:55 | 11:50 | 0.92 | 0.56 | | | - | - | - | - | - | 1 | - | - | - | - | 0 | 1.8 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 11:55 | 13:00 | 1.1 | 0.66 | | | - | - | - | - | - | 1 | - | - | - | - | 0 | 1.5 |
| | GC-GN-35 | 629824 | 5437090 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:45 | 11:05 | 1.3 | 0.61 | 2.0 | 3.0 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:10 | 13:05 | 1.9 | 0.88 | | | 0 | - | 0 | - | - | - | - | 1 | 0 | 0 | 1 | 1.1 |
| | GC-GN-36 | 629826 | 5436965 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:50 | 11:15 | 1.4 | 0.65 | 3.5 | 2.5 | 0 | - | 0 | - | - | - | - | 0 | 0 | 1 | 1 | 1.5 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:20 | 13:15 | 1.9 | 0.88 | | | 0 | - | 0 | - | - | - | - | 1 | 0 | 1 | 2 | 2.3 |
| | GC-GN-37 | 629814 | 5437364 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:30 | 10:40 | 1.2 | 0.27 | 3.6 | 3.3 | - | - | - | - | - | - | 2 | - | - | - | 2 | 7.5 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 10:45 | 12:30 | 1.8 | 0.40 | | | - | - | - | - | - | - | 4 | - | - | - | 4 | 10 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:35 | 14:10 | 1.6 | 0.36 | | | - | - | - | - | - | - | 0 | - | - | - | 0 | 0 |
| | GC-GN-38 | 629874 | 5436986 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:40 | 12:15 | 2.6 | 1.18 | 3.0 | 3.8 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-39 | 629964 | 5436935 | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:20 | 14:05 | 1.7 | 0.80 | 3.0 | 4.0 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-40 | 630108 | 5436880 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:45 | 12:00 | 2.3 | 1.03 | 2.7 | 5.6 | 0 | - | 0 | - | - | - | - | 1 | 1 | 1 | 1 | 2.9 |
| | | | | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:05 | 14:00 | 1.9 | 0.88 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-41 | 629906 | 5437398 | 22.86 | 27-Apr-16 | 27-Apr-16 | 9:25 | 10:15 | 0.83 | 0.19 | 3.7 | 4.8 | - | - | - | - | - | - | 0 | - | - | - | 0 | 0 |
| | GC-GN-42 | 629438 | 5437371 | 22.86 | 27-Apr-16 | 27-Apr-16 | 10:30 | 12:15 | 1.7 | 0.40 | 2.0 | 4.2 | - | - | - | - | - | - | 0 | - | - | - | 0 | 0 |
| | GC-GN-43 | 629813 | 5437215 | 22.86 | 27-Apr-16 | 27-Apr-16 | 12:20 | 13:30 | 1.2 | 0.27 | 2.3 | 2.4 | - | - | - | - | - | - | 1 | - | - | - | 1 | 3.7 |
| | | | | 22.86 | 27-Apr-16 | 27-Apr-16 | 13:35 | 14:45 | 1.2 | 0.27 | | | - | - | - | - | - | - | 0 | - | - | - | 0 | 0 |
| | GC-GN-44 | 629950 | 5437225 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:30 | 10:30 | 1.0 | 0.46 | 3.8 | 3.2 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-45 | 629910 | 5437404 | 45.72 | 27-Apr-16 | 27-Apr-16 | 10:55 | 12:30 | 1.6 | 0.72 | 2.8 | 5.4 | 0 | - | 0 | - | - | - | - | 1 | 0 | 0 | 1 | 1.4 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 12:40 | 14:20 | 1.7 | 0.76 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-46 | 630143 | 5436876 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:35 | 11:00 | 1.4 | 0.65 | 3.7 | 6.6 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-47 | 630050 | 5436990 | 45.72 | 27-Apr-16 | 27-Apr-16 | 11:05 | 13:15 | 2.2 | 0.99 | 5.9 | 5.3 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:20 | 14:35 | 1.3 | 0.57 | | | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-48 | 630698 | 5437142 | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:45 | 15:20 | 1.6 | 0.72 | 1.4 | 2.0 | 0 | - | 0 | - | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | GC-GN-49 | 630126 | 5437420 | 45.72 | 27-Apr-16 | 27-Apr-16 | 14:05 | 15:45 | 1.7 | 0.76 | 1.2 | 6.6 | 0 | - | 0 | - | - | - | - | 0 | 1 | 1 | 1 | 2.6 |
| | **TOTAL** | | | | | | | | **144** | **51.24** | **-** | **-** | **0** | **0** | **0** | **19** | **34** | **9** | **17** | **14** | **5** | **7** | **41** | **2.6** |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## Table F.10: Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Peamouth Chub | | | | | | | | Rainbow Trout | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | | |
| Sand Creek | SC-GN-01 | 625783 | 5458145 | 60.96 | 19-Apr-16 | 19-Apr-16 | 11:45 | 15:00 | 3.2 | 1.98 | 0.5 | 1.5 | - | - | 4 | - | - | - | 4 | 2.0 | - | - | 2 | - | - | - | 2 | 1.0 |
| | SC-GN-02 | 625372 | 5457031 | 22.86 | 19-Apr-16 | 19-Apr-16 | 12:35 | 15:10 | 2.6 | 0.59 | 1.0 | 1.0 | 10 | - | - | - | - | - | 0 | 17 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-03 | 625531 | 5460425 | 45.72 | 19-Apr-16 | 19-Apr-16 | 14:00 | 15:55 | 1.9 | 0.88 | 0.5 | 1.5 | - | - | - | - | 1 | 0 | 1 | 1.1 | - | - | - | - | 0 | 0 | 0 | 0 |
| | SC-GN-04 | 625685 | 5457327 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:55 | 11:45 | 1.8 | 0.56 | 1.0 | 1.5 | 5 | - | - | - | - | - | 1 | 8.9 | 0 | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 12:10 | 14:39 | 2.5 | 0.76 | | | 3 | - | - | - | - | - | 0 | 4.0 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-05 | 625751 | 5457345 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:15 | 13:28 | 2.2 | 0.68 | 0.3 | 0.8 | 16 | - | - | - | - | - | 0 | 24 | 0 | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 13:45 | 14:54 | 1.2 | 0.35 | 0.5 | 0.8 | 5 | - | - | - | - | - | 0 | 14 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-06 | 625028 | 5459161 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:45 | 13:58 | 2.2 | 0.68 | 1.0 | 1.2 | 1 | - | - | - | - | - | 0 | 1.5 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-07 | 625660 | 5457294 | 60.96 | 23-Apr-16 | 23-Apr-16 | 8:51 | 10:41 | 1.8 | 1.12 | 1.0 | 1.5 | - | - | 29 | - | - | - | 22 | 26 | - | - | 0 | - | - | - | 0 | 0 |
| | | | | 60.96 | 23-Apr-16 | 23-Apr-16 | 11:22 | 13:33 | 2.2 | 1.33 | | | - | - | 23 | - | - | - | 15 | 17 | - | - | 0 | - | - | - | 0 | 0 |
| | SC-GN-08 | 625654 | 5457314 | 30.48 | 23-Apr-16 | 23-Apr-16 | 8:57 | 11:17 | 2.3 | 0.71 | 1.0 | 1.2 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:34 | 14:21 | 2.8 | 0.85 | | | 4 | - | - | - | - | - | 0 | 4.7 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-09 | 625758 | 5457348 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:11 | 11:40 | 2.5 | 0.76 | 0.5 | 1.0 | 16 | - | - | - | - | - | 0 | 21 | 0 | - | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:51 | 14:28 | 2.6 | 0.80 | | | 11 | - | - | - | - | - | 0 | 14 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-10 | 625739 | 5457355 | 30.48 | 24-Apr-16 | 24-Apr-16 | 8:58 | 11:36 | 2.6 | 0.80 | 1.0 | 1.5 | 39 | - | - | - | - | - | 0 | 49 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-11 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 9:05 | 11:57 | 2.9 | 0.87 | 1.0 | 1.5 | 4 | - | - | - | - | - | 0 | 4.6 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-12 | 625660 | 5457309 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:57 | 11:20 | 1.4 | 0.63 | 1.0 | 2.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:25 | 12:10 | 0.75 | 0.34 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 12:15 | 13:26 | 1.2 | 0.54 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | SC-GN-13 | 625674 | 5457326 | 22.86 | 24-Apr-16 | 24-Apr-16 | 10:02 | 11:26 | 1.4 | 0.32 | 1.0 | 1.5 | - | 25 | - | - | - | - | 25 | 78 | - | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-14 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 12:05 | 14:46 | 2.7 | 0.82 | 1.0 | 2.0 | 52 | - | - | - | - | - | 0 | 64 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-15 | 625794 | 5458453 | 30.48 | 24-Apr-16 | 24-Apr-16 | 13:09 | 15:25 | 2.3 | 0.69 | 1.0 | 1.7 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | - | 0 | 0 |
| | SC-GN-16 | 625114 | 5457743 | 45.72 | 24-Apr-16 | 24-Apr-16 | 13:43 | 15:44 | 2.0 | 0.92 | 1.2 | 1.8 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | SC-GN-17 | 625827 | 5458455 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:18 | 10:08 | 0.83 | 0.38 | 0.8 | 2.9 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 10:13 | 11:18 | 1.1 | 0.50 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:23 | 12:42 | 1.3 | 0.60 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:47 | 13:58 | 1.2 | 0.54 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | SC-GN-18 | 625728 | 5458540 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:44 | 11:06 | 1.4 | 0.62 | 1.0 | 2.4 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 1 | 1 | 1.6 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:11 | 12:32 | 1.4 | 0.62 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:35 | 12:57 | 0.37 | 0.17 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 13:02 | 13:50 | 0.80 | 0.37 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | SC-GN-19 | 625622 | 5458456 | 60.96 | 26-Apr-16 | 26-Apr-16 | 12:05 | 12:44 | 0.65 | 0.40 | 1.0 | 2.3 | - | - | 63 | - | - | - | 0 | 159 | - | - | 1 | - | - | - | 0 | 2.5 |
| | SC-GN-20 | 625725 | 5458539 | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:10 | 13:06 | 0.93 | 0.21 | 0.0 | 2.8 | - | 187 | - | - | - | - | 0 | 876 | - | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-21 | 625802 | 5458384 | 60.96 | 26-Apr-16 | 26-Apr-16 | 13:07 | 13:42 | 0.58 | 0.36 | 2.2 | 3.0 | - | - | 69 | - | - | - | 0 | 194 | - | - | 0 | - | - | - | 0 | 0 |
| | **TOTAL** | | | | | | | | **60** | **22.73** | **-** | **-** | **166** | **212** | **188** | **0** | **1** | **0** | **68** | **46** | **0** | **0** | **3** | **0** | **0** | **1** | **3** | **0.15** |
| Elk River | ER-GN-01 | 628295 | 5447959 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:20 | 14:30 | 3.2 | 1.45 | 1.5 | 1.6 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-02 | 628238 | 5447790 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:30 | 14:40 | 3.2 | 1.45 | 1.6 | 1.8 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | | | 14:40 | 17:15 | 2.6 | 1.18 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-03 | 628016 | 5447693 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:45 | 14:55 | 3.2 | 0.97 | 4.8 | 10.2 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | ER-GN-04 | 627973 | 5447966 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:55 | 15:15 | 3.3 | 1.02 | 4.5 | 3.2 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | - | 0 | 0 |
| | ER-GN-05 | 628112 | 5447595 | 30.48 | 19-Apr-16 | 19-Apr-16 | 12:10 | 15:20 | 3.2 | 0.97 | 1.8 | 4.8 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | - | 0 | 0 |
| | ER-GN-06 | 627974 | 5447832 | 30.48 | 19-Apr-16 | 19-Apr-16 | 15:15 | 16:25 | 1.2 | 0.36 | 3.3 | 6.8 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | ER-GN-07 | 628142 | 5447702 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:05 | 12:00 | 2.9 | 1.33 | 2.0 | 2.1 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-08 | 628077 | 5447436 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:15 | 12:15 | 3.0 | 0.91 | 4.6 | 6.7 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | - | 0 | 0 |
| | ER-GN-09 | 628104 | 5447315 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:25 | 12:25 | 3.0 | 0.91 | 3.2 | 6.2 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | ER-GN-10 | 627865 | 5447460 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:45 | 12:40 | 2.9 | 0.89 | 1.9 | 3.7 | 6 | - | - | - | - | - | 3 | 6.7 | 0 | - | - | - | - | - | 0 | 0 |
| | ER-GN-11 | 627988 | 5447682 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 13:00 | 3.2 | 1.45 | 2.8 | 7.2 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-12 | 627957 | 5447866 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:00 | 11:35 | 2.6 | 1.18 | 4.5 | 4.3 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-13 | 627836 | 5447470 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:15 | 11:45 | 2.5 | 0.76 | 1.4 | 2.0 | 16 | - | - | - | - | - | 1 | 21 | 0 | - | - | - | - | - | 0 | 0 |
| | ER-GN-14 | 627514 | 5447123 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:20 | 12:00 | 2.7 | 0.81 | 1.8 | 2.1 | 3 | - | - | - | - | - | 1 | 3.7 | 0 | - | - | - | - | - | 0 | 0 |
| | ER-GN-15 | 628503 | 5447217 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.81 | 1.1 | 2.0 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | ER-GN-16 | 627730 | 5447290 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:45 | 12:45 | 3.0 | 1.37 | 2.1 | 1.9 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-17 | 627874 | 5447466 | 45.72 | 22-Apr-16 | 22-Apr-16 | 8:55 | 11:15 | 2.3 | 1.07 | 1.6 | 4.2 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-18 | 628238 | 5446900 | 60.96 | 22-Apr-16 | 22-Apr-16 | 9:10 | 11:30 | 2.3 | 1.42 | 0.8 | 2.1 | - | - | 57 | - | - | - | 57 | 40 | - | - | 1 | - | - | - | 0 | 0.70 |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## Table F.10: Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Peamouth Chub | | | | | | | | Rainbow Trout | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | | |
| Elk River | ER-GN-19 | 628012 | 5446581 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:30 | 3.2 | 1.45 | 1.4 | 5.8 | - | - | - | - | 1 | 1 | 2 | 1.4 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-20 | 628321 | 5446690 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:45 | 3.4 | 1.04 | 1.8 | 3.0 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 1 | - | - | 0 | 0.96 |
| | ER-GN-21 | 628145 | 5447522 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:00 | 11:05 | 2.1 | 0.95 | 1.2 | 2.1 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-22 | 627842 | 5447463 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:10 | 11:20 | 2.2 | 0.66 | 1.9 | 3.9 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | ER-GN-23 | 628186 | 5446813 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:20 | 11:45 | 2.4 | 1.10 | 1.4 | 3.9 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-24 | 628485 | 5447166 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:10 | 11:00 | 1.8 | 0.84 | 2.0 | 2.4 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-25 | 628146 | 5446559 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:15 | 10:20 | 1.1 | 0.50 | 0.8 | 4.1 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-26 | 627836 | 5447486 | 30.48 | 25-Apr-16 | 25-Apr-16 | 12:30 | 13:10 | 0.67 | 0.20 | 1.5 | 2.9 | 6 | - | - | - | - | - | 0 | 30 | 0 | - | - | - | - | - | 0 | 0 |
| | ER-GN-27 | 628450 | 5447156 | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:45 | 13:50 | 1.1 | 0.25 | 1.1 | 3.4 | - | 46 | - | - | - | - | 9 | 186 | - | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-28 | 628595 | 5447346 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:10 | 9:50 | 0.67 | 0.15 | 2.3 | 2.3 | - | 41 | - | - | - | - | 0 | 269 | - | 0 | - | - | - | - | 0 | 0 |
| | **TOTAL** | | | | | | | | **71** | **27.45** | **-** | **-** | **31** | **87** | **57** | **0** | **1** | **1** | **73** | **19** | **0** | **0** | **1** | **1** | **0** | **0** | **0** | **0.057** |
| Gold Creek | GC-GN-01 | 630004 | 5437333 | 45.72 | 19-Apr-16 | 19-Apr-16 | 10:45 | 13:00 | 2.3 | 1.03 | 3.2 | 3.1 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 19-Apr-16 | 19-Apr-16 | 13:05 | 15:25 | 2.3 | 1.07 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-02 | 630484 | 5437202 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:10 | 15:10 | 4.0 | 1.83 | 6.2 | 6.3 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-03 | 629920 | 5437070 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:25 | 15:40 | 4.3 | 0.97 | 2.0 | 2.1 | 0 | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | - | 0 | 0 |
| | GC-GN-04 | 629943 | 5437079 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:40 | 15:45 | 4.1 | 0.93 | 2.3 | 2.5 | - | 24 | - | - | - | - | 24 | 26 | - | - | - | - | - | - | 0 | 0 |
| | GC-GN-05 | 629909 | 5437049 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 11:50 | 2.0 | 0.91 | 2.3 | 2.7 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 20-Apr-16 | 20-Apr-16 | 12:15 | 14:10 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-06 | 630147 | 5436926 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:55 | 13:00 | 3.1 | 1.41 | 4.1 | 4.3 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 11:45 | 13:40 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-07 | 630468 | 5437262 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:00 | 13:40 | 3.7 | 0.84 | 2.5 | 6.5 | 6 | - | - | - | - | - | 0 | 7.2 | 0 | - | - | - | - | - | 0 | 0 |
| | GC-GN-08 | 630499 | 5437243 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:05 | 14:00 | 3.9 | 0.90 | 2.5 | 6.5 | - | 12 | - | - | - | - | 12 | 13 | - | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-09 | 630028 | 5437022 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:20 | 11:20 | 2.0 | 0.91 | 2.9 | 3.5 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-10 | 630258 | 5436950 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:25 | 11:50 | 2.4 | 1.10 | 3.5 | 6.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 12:00 | 13:45 | 1.7 | 0.80 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-11 | 630520 | 5437231 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.61 | 5.0 | 6.5 | 2 | - | - | - | - | - | 1 | 3.3 | 0 | - | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:15 | 13:55 | 1.7 | 0.38 | | | 6 | - | - | - | - | - | 0 | 16 | 0 | - | - | - | - | - | 0 | 0 |
| | GC-GN-12 | 630463 | 5437277 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:35 | 12:20 | 2.8 | 0.63 | 5.5 | 6.3 | - | 6 | - | - | - | - | 6 | 9.5 | - | 0 | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:25 | 14:05 | 1.7 | 0.38 | | | - | 4 | - | - | - | - | 4 | 10 | - | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-13 | 629984 | 5437073 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 10:30 | 1.2 | 0.53 | 2.7 | 3.3 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:35 | 12:00 | 1.4 | 0.65 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:05 | 13:15 | 1.2 | 0.53 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-14 | 630009 | 5437026 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:25 | 10:35 | 1.2 | 0.53 | 2.8 | 3.5 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-15 | 630069 | 5437092 | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:40 | 12:15 | 1.6 | 0.72 | 4.0 | 3.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-16 | 630149 | 5436978 | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:20 | 13:30 | 1.2 | 0.53 | 4.0 | 4.9 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-17 | 630486 | 5437262 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:30 | 11:00 | 1.5 | 0.34 | 4.0 | 6.7 | - | 14 | - | - | - | - | 14 | 41 | - | 0 | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 22-Apr-16 | 22-Apr-16 | 11:10 | 13:10 | 2.0 | 0.46 | | | - | 8 | - | - | - | - | 8 | 17 | - | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-18 | 630460 | 5437287 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:40 | 11:40 | 2.0 | 0.46 | 4.0 | 6.5 | 26 | - | - | - | - | - | 0 | 57 | 0 | - | - | - | - | - | 0 | 0 |
| | GC-GN-19 | 630665 | 5436958 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:30 | 11:30 | 2.0 | 0.91 | 4.0 | 8.5 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-20 | 630541 | 5437190 | 45.72 | 23-Apr-16 | 23-Apr-16 | 11:50 | 14:00 | 2.2 | 0.99 | 4.0 | 8.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-21 | 630656 | 5437117 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:40 | 11:45 | 2.1 | 0.48 | 3.0 | 7.5 | 3 | - | - | - | - | - | 1 | 6.3 | 0 | - | - | - | - | - | 0 | 0 |
| | GC-GN-22 | 630161 | 5436918 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:45 | 12:00 | 2.3 | 0.51 | 1.5 | 5.0 | 8 | - | - | - | - | - | 0 | 16 | 0 | - | - | - | - | - | 0 | 0 |
| | GC-GN-23 | 629888 | 5437089 | 45.72 | 23-Apr-16 | 23-Apr-16 | 10:10 | 12:30 | 2.3 | 1.07 | 3.5 | 1.8 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 23-Apr-16 | 23-Apr-16 | 12:35 | 14:35 | 2.0 | 0.91 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-24 | 630257 | 5437394 | 22.86 | 23-Apr-16 | 23-Apr-16 | 10:25 | 13:00 | 2.6 | 0.59 | 2.0 | 6.2 | - | 23 | - | - | - | - | 17 | 39 | - | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-25 | 630144 | 5436893 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:10 | 14:05 | 1.9 | 0.44 | 1.2 | 2.5 | 19 | - | - | - | - | - | 1 | 43 | 1 | - | - | - | - | - | 1 | 2.3 |
| | GC-GN-26 | 629827 | 5437340 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:15 | 14:25 | 2.2 | 0.50 | 2.0 | 2.4 | 13 | - | - | - | - | - | 1 | 26 | 0 | - | - | - | - | - | 0 | 0 |
| | GC-GN-27 | 630144 | 5436881 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:30 | 11:45 | 2.3 | 0.51 | 1.3 | 2.3 | 1 | - | - | - | - | - | 0 | 1.9 | 0 | - | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:50 | 13:30 | 1.7 | 0.38 | | | 14 | - | - | - | - | - | 0 | 37 | 1 | - | - | - | - | - | 1 | 2.6 |
| | GC-GN-28 | 629902 | 5437132 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:20 | 11:10 | 1.8 | 0.84 | 3.4 | 2.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:15 | 13:10 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-29 | 630036 | 5437104 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:25 | 11:00 | 1.6 | 0.72 | 4.0 | 3.5 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:05 | 13:20 | 2.3 | 1.03 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Peamouth Chub | | | | | | | | Rainbow Trout | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | | | 1" | 1.5" | 2" | 2.5" | 3" | 4" | | |
| Gold Creek | GC-GN-30 | 630110 | 5436878 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:35 | 11:15 | 1.7 | 0.38 | 1.8 | 2.3 | 4 | - | - | - | - | - | 0 | 10 | 0 | - | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:20 | 13:50 | 2.5 | 0.57 | | | 23 | - | - | - | - | - | 0 | 40 | 1 | - | - | - | - | - | 1 | 1.7 |
| | GC-GN-31 | 630298 | 5437358 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:40 | 12:00 | 2.3 | 0.53 | 2.5 | 6.3 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | GC-GN-32 | 629824 | 5437340 | 22.86 | 24-Apr-16 | 24-Apr-16 | 12:15 | 14:15 | 2.0 | 0.46 | 2.0 | 2.5 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 1 | - | - | 1 | 2.2 |
| | GC-GN-33 | 629829 | 5437312 | 22.86 | 25-Apr-16 | 25-Apr-16 | 9:35 | 10:45 | 1.2 | 0.27 | 2.5 | 3.0 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 10:55 | 12:05 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:10 | 13:20 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | GC-GN-34 | 630014 | 5437330 | 60.96 | 25-Apr-16 | 25-Apr-16 | 9:40 | 10:40 | 1.0 | 0.61 | 4.0 | 4.6 | - | - | 13 | - | - | - | 13 | 21 | - | - | 0 | - | - | - | 0 | 0 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 10:55 | 11:50 | 0.92 | 0.56 | | | - | - | 5 | - | - | - | 4 | 8.9 | - | - | 0 | - | - | - | 0 | 0 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 11:55 | 13:00 | 1.1 | 0.66 | | | - | - | 7 | - | - | - | 0 | 11 | - | - | 0 | - | - | - | 0 | 0 |
| | GC-GN-35 | 629824 | 5437090 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:45 | 11:05 | 1.3 | 0.61 | 2.0 | 3.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:10 | 13:05 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-36 | 629826 | 5436965 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:50 | 11:15 | 1.4 | 0.65 | 3.5 | 2.5 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:20 | 13:15 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-37 | 629814 | 5437364 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:30 | 10:40 | 1.2 | 0.27 | 3.6 | 3.3 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 10:45 | 12:30 | 1.8 | 0.40 | | | - | - | - | 1 | - | - | 0 | 2.5 | - | - | - | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:35 | 14:10 | 1.6 | 0.36 | | | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | GC-GN-38 | 629874 | 5436986 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:40 | 12:15 | 2.6 | 1.18 | 3.0 | 3.8 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-39 | 629964 | 5436935 | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:20 | 14:05 | 1.7 | 0.80 | 3.0 | 4.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-40 | 630108 | 5436880 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:45 | 12:00 | 2.3 | 1.03 | 2.7 | 5.6 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:05 | 14:00 | 1.9 | 0.88 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-41 | 629906 | 5437398 | 22.86 | 27-Apr-16 | 27-Apr-16 | 9:25 | 10:15 | 0.83 | 0.19 | 3.7 | 4.8 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | GC-GN-42 | 629438 | 5437371 | 22.86 | 27-Apr-16 | 27-Apr-16 | 10:30 | 12:15 | 1.7 | 0.40 | 2.0 | 4.2 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | GC-GN-43 | 629813 | 5437215 | 22.86 | 27-Apr-16 | 27-Apr-16 | 12:20 | 13:30 | 1.2 | 0.27 | 2.3 | 2.4 | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | | | | 22.86 | 27-Apr-16 | 27-Apr-16 | 13:35 | 14:45 | 1.2 | 0.27 | | | - | - | - | 0 | - | - | 0 | 0 | - | - | - | 0 | - | - | 0 | 0 |
| | GC-GN-44 | 629950 | 5437225 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:30 | 10:30 | 1.0 | 0.46 | 3.8 | 3.2 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-45 | 629910 | 5437404 | 45.72 | 27-Apr-16 | 27-Apr-16 | 10:55 | 12:30 | 1.6 | 0.72 | 2.8 | 5.4 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 12:40 | 14:20 | 1.7 | 0.76 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-46 | 630143 | 5436876 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:35 | 11:00 | 1.4 | 0.65 | 3.7 | 6.6 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-47 | 630050 | 5436990 | 45.72 | 27-Apr-16 | 27-Apr-16 | 11:05 | 13:15 | 2.2 | 0.99 | 5.9 | 5.3 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:20 | 14:35 | 1.3 | 0.57 | | | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-48 | 630698 | 5437142 | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:45 | 15:20 | 1.6 | 0.72 | 1.4 | 2.0 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | GC-GN-49 | 630126 | 5437420 | 45.72 | 27-Apr-16 | 27-Apr-16 | 14:05 | 15:45 | 1.7 | 0.76 | 1.2 | 6.6 | - | - | - | - | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | | **144** | **51.24** | **-** | **-** | **125** | **91** | **25** | **1** | **0** | **0** | **106** | **6.2** | **3** | **0** | **0** | **1** | **0** | **0** | **4** | **0.12** |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Redside Shiner | | | Westslope Cutthroat Trout | | | | | | | Yellow Perch | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | | | | | Mortalities/ Sacrificed | CPUE ª | Catch | | | | | Mortalities/ Sacrificed | CPUE ª |
| | | Easting | Northing | | | | | | | | | | 1" | | | 1" | 1.5" | 2" | 2.5" | 3" | | | 1" | 1.5" | 2" | 2.5" | 3" | | |
| Sand Creek | SC-GN-01 | 625783 | 5458145 | 60.96 | 19-Apr-16 | 19-Apr-16 | 11:45 | 15:00 | 3.2 | 1.98 | 0.5 | 1.5 | - | - | - | - | - | 1 | - | - | 1 | 0.50 | - | - | 0 | - | - | 0 | 0 |
| | SC-GN-02 | 625372 | 5457031 | 22.86 | 19-Apr-16 | 19-Apr-16 | 12:35 | 15:10 | 2.6 | 0.59 | 1.0 | 1.0 | 1 | 0 | 1.7 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-03 | 625531 | 5460425 | 45.72 | 19-Apr-16 | 19-Apr-16 | 14:00 | 15:55 | 1.9 | 0.88 | 0.5 | 1.5 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | SC-GN-04 | 625685 | 5457327 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:55 | 11:45 | 1.8 | 0.56 | 1.0 | 1.5 | 6 | 6 | 11 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 12:10 | 14:39 | 2.5 | 0.76 | | | 1 | 1 | 1.3 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-05 | 625751 | 5457345 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:15 | 13:28 | 2.2 | 0.68 | 0.3 | 0.8 | 5 | 5 | 7.4 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 22-Apr-16 | 22-Apr-16 | 13:45 | 14:54 | 1.2 | 0.35 | 0.5 | 0.8 | 10 | 10 | 29 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-06 | 625028 | 5459161 | 30.48 | 22-Apr-16 | 22-Apr-16 | 11:45 | 13:58 | 2.2 | 0.68 | 1.0 | 1.2 | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-07 | 625660 | 5457294 | 60.96 | 23-Apr-16 | 23-Apr-16 | 8:51 | 10:41 | 1.8 | 1.12 | 1.0 | 1.5 | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 0 | - | - | 0 | 0 |
| | | | | 60.96 | 23-Apr-16 | 23-Apr-16 | 11:22 | 13:33 | 2.2 | 1.33 | | | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 4 | - | - | 4 | 3.0 |
| | SC-GN-08 | 625654 | 5457314 | 30.48 | 23-Apr-16 | 23-Apr-16 | 8:57 | 11:17 | 2.3 | 0.71 | 1.0 | 1.2 | 4 | 4 | 5.6 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:34 | 14:21 | 2.8 | 0.85 | | | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-09 | 625758 | 5457348 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:11 | 11:40 | 2.5 | 0.76 | 0.5 | 1.0 | 2 | 2 | 2.6 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | | | | 30.48 | 23-Apr-16 | 23-Apr-16 | 11:51 | 14:28 | 2.6 | 0.80 | | | 3 | 3 | 3.8 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-10 | 625739 | 5457355 | 30.48 | 24-Apr-16 | 24-Apr-16 | 8:58 | 11:36 | 2.6 | 0.80 | 1.0 | 1.5 | 4 | 4 | 5.0 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-11 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 9:05 | 11:57 | 2.9 | 0.87 | 1.0 | 1.5 | 1 | 1 | 1.1 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-12 | 625660 | 5457309 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:57 | 11:20 | 1.4 | 0.63 | 1.0 | 2.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:25 | 12:10 | 0.75 | 0.34 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 12:15 | 13:26 | 1.2 | 0.54 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | SC-GN-13 | 625674 | 5457326 | 22.86 | 24-Apr-16 | 24-Apr-16 | 10:02 | 11:26 | 1.4 | 0.32 | 1.0 | 1.5 | 0 | 0 | 0 | - | 0 | - | - | - | 0 | 0 | - | 0 | - | - | - | 0 | 0 |
| | SC-GN-14 | 625681 | 5457360 | 30.48 | 24-Apr-16 | 24-Apr-16 | 12:05 | 14:46 | 2.7 | 0.82 | 1.0 | 2.0 | 6 | 6 | 7.3 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-15 | 625794 | 5458453 | 30.48 | 24-Apr-16 | 24-Apr-16 | 13:09 | 15:25 | 2.3 | 0.69 | 1.0 | 1.7 | 46 | 46 | 67 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | SC-GN-16 | 625114 | 5457743 | 45.72 | 24-Apr-16 | 24-Apr-16 | 13:43 | 15:44 | 2.0 | 0.92 | 1.2 | 1.8 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | SC-GN-17 | 625827 | 5458455 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:18 | 10:08 | 0.83 | 0.38 | 0.8 | 2.9 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 10:13 | 11:18 | 1.1 | 0.50 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:23 | 12:42 | 1.3 | 0.60 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:47 | 13:58 | 1.2 | 0.54 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | SC-GN-18 | 625728 | 5458540 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:44 | 11:06 | 1.4 | 0.62 | 1.0 | 2.4 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:11 | 12:32 | 1.4 | 0.62 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 12:35 | 12:57 | 0.37 | 0.17 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 13:02 | 13:50 | 0.80 | 0.37 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | SC-GN-19 | 625622 | 5458456 | 60.96 | 26-Apr-16 | 26-Apr-16 | 12:05 | 12:44 | 0.65 | 0.40 | 1.0 | 2.3 | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 0 | - | - | 0 | 0 |
| | SC-GN-20 | 625725 | 5458539 | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:10 | 13:06 | 0.93 | 0.21 | 0.0 | 2.8 | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | - | - | 0 | 0 |
| | SC-GN-21 | 625802 | 5458384 | 60.96 | 26-Apr-16 | 26-Apr-16 | 13:07 | 13:42 | 0.58 | 0.36 | 2.2 | 3.0 | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 0 | - | - | 0 | 0 |
| | **TOTAL** | | | | | | | | **60** | **22.73** | **-** | **-** | **89** | **88** | **9.5** | **0** | **0** | **1** | **0** | **0** | **1** | **0.015** | **0** | **0** | **4** | **0** | **0** | **4** | **0.088** |
| Elk River | ER-GN-01 | 628295 | 5447959 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:20 | 14:30 | 3.2 | 1.45 | 1.5 | 1.6 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0.0 | 0 |
| | ER-GN-02 | 628238 | 5447790 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:30 | 14:40 | 3.2 | 1.45 | 1.6 | 1.8 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | | | 14:40 | 17:15 | 2.6 | 1.18 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-03 | 628016 | 5447693 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:45 | 14:55 | 3.2 | 0.97 | 4.8 | 10.2 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | ER-GN-04 | 627973 | 5447966 | 30.48 | 19-Apr-16 | 19-Apr-16 | 11:55 | 15:15 | 3.3 | 1.02 | 4.5 | 3.2 | - | - | - | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-05 | 628112 | 5447595 | 30.48 | 19-Apr-16 | 19-Apr-16 | 12:10 | 15:20 | 3.2 | 0.97 | 1.8 | 4.8 | 3 | 3 | 3.1 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-06 | 627974 | 5447832 | 30.48 | 19-Apr-16 | 19-Apr-16 | 15:15 | 16:25 | 1.2 | 0.36 | 3.3 | 6.8 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 1 | - | 1 | 2.8 |
| | ER-GN-07 | 628142 | 5447702 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:05 | 12:00 | 2.9 | 1.33 | 2.0 | 2.1 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-08 | 628077 | 5447436 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:15 | 12:15 | 3.0 | 0.91 | 4.6 | 6.7 | 1 | 1 | 1.1 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-09 | 628104 | 5447315 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:25 | 12:25 | 3.0 | 0.91 | 3.2 | 6.2 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | ER-GN-10 | 627865 | 5447460 | 30.48 | 20-Apr-16 | 20-Apr-16 | 9:45 | 12:40 | 2.9 | 0.89 | 1.9 | 3.7 | 3 | 3 | 3.4 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-11 | 627988 | 5447682 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 13:00 | 3.2 | 1.45 | 2.8 | 7.2 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-12 | 627957 | 5447866 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:00 | 11:35 | 2.6 | 1.18 | 4.5 | 4.3 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-13 | 627836 | 5447470 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:15 | 11:45 | 2.5 | 0.76 | 1.4 | 2.0 | 31 | 31 | 41 | 1 | - | - | - | - | 1 | 1.3 | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-14 | 627514 | 5447123 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:20 | 12:00 | 2.7 | 0.81 | 1.8 | 2.1 | 5 | 5 | 6.2 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-15 | 628503 | 5447217 | 30.48 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.81 | 1.1 | 2.0 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 1 | - | 1 | 1.2 |
| | ER-GN-16 | 627730 | 5447290 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:45 | 12:45 | 3.0 | 1.37 | 2.1 | 1.9 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-17 | 627874 | 5447466 | 45.72 | 22-Apr-16 | 22-Apr-16 | 8:55 | 11:15 | 2.3 | 1.07 | 1.6 | 4.2 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-18 | 628238 | 5446900 | 60.96 | 22-Apr-16 | 22-Apr-16 | 9:10 | 11:30 | 2.3 | 1.42 | 0.8 | 2.1 | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 1 | - | - | 1 | 0.70 |

ª CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## **Table F.10:** Gill Net Catch Records from Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Redside Shiner | | | Westslope Cutthroat Trout | | | | | | | Yellow Perch | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | | | | | | | | | | | | 1" | | | 1" | 1.5" | 2" | 2.5" | 3" | | | 1" | 1.5" | 2" | 2.5" | 3" | | |
| Elk River | ER-GN-19 | 628012 | 5446581 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:30 | 3.2 | 1.45 | 1.4 | 5.8 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-20 | 628321 | 5446690 | 30.48 | 22-Apr-16 | 22-Apr-16 | 9:20 | 12:45 | 3.4 | 1.04 | 1.8 | 3.0 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | ER-GN-21 | 628145 | 5447522 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:00 | 11:05 | 2.1 | 0.95 | 1.2 | 2.1 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-22 | 627842 | 5447463 | 30.48 | 23-Apr-16 | 23-Apr-16 | 9:10 | 11:20 | 2.2 | 0.66 | 1.9 | 3.9 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | ER-GN-23 | 628186 | 5446813 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:20 | 11:45 | 2.4 | 1.10 | 1.4 | 3.9 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-24 | 628485 | 5447166 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:10 | 11:00 | 1.8 | 0.84 | 2.0 | 2.4 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-25 | 628146 | 5446559 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:15 | 10:20 | 1.1 | 0.50 | 0.8 | 4.1 | - | - | - | - | - | - | - | 1 | 0 | 2.0 | - | - | - | - | 0 | 0 | 0 |
| | ER-GN-26 | 627836 | 5447486 | 30.48 | 25-Apr-16 | 25-Apr-16 | 12:30 | 13:10 | 0.67 | 0.20 | 1.5 | 2.9 | 30 | 2 | 148 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | ER-GN-27 | 628450 | 5447156 | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:45 | 13:50 | 1.1 | 0.25 | 1.1 | 3.4 | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | - | - | 0 | 0 |
| | ER-GN-28 | 628595 | 5447346 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:10 | 9:50 | 0.67 | 0.15 | 2.3 | 2.3 | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 0 | - | - | - | 0 | 0 |
| | **TOTAL** | | | | | | | | **71** | **27.45** | **-** | **-** | **73** | **45** | **34** | **1** | **0** | **0** | **0** | **1** | **1** | **0.11** | **0** | **0** | **1** | **2** | **0** | **3** | **0.16** |
| Gold Creek | GC-GN-01 | 630004 | 5437333 | 45.72 | 19-Apr-16 | 19-Apr-16 | 10:45 | 13:00 | 2.3 | 1.03 | 3.2 | 3.1 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 19-Apr-16 | 19-Apr-16 | 13:05 | 15:25 | 2.3 | 1.07 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-02 | 630484 | 5437202 | 45.72 | 19-Apr-16 | 19-Apr-16 | 11:10 | 15:10 | 4.0 | 1.83 | 6.2 | 6.3 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-03 | 629920 | 5437070 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:25 | 15:40 | 4.3 | 0.97 | 2.0 | 2.1 | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-04 | 629943 | 5437079 | 22.86 | 19-Apr-16 | 19-Apr-16 | 11:40 | 15:45 | 4.1 | 0.93 | 2.3 | 2.5 | - | - | - | - | - | - | - | - | 0 | 0 | - | 0 | - | - | - | 0 | 0 |
| | GC-GN-05 | 629909 | 5437049 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:50 | 11:50 | 2.0 | 0.91 | 2.3 | 2.7 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 20-Apr-16 | 20-Apr-16 | 12:15 | 14:10 | 1.9 | 0.88 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-06 | 630147 | 5436926 | 45.72 | 20-Apr-16 | 20-Apr-16 | 9:55 | 13:00 | 3.1 | 1.41 | 4.1 | 4.3 | - | - | - | - | - | - | - | 1 | 0 | 0.71 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 11:45 | 13:40 | 1.9 | 0.88 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 1 | 1 | 1.1 |
| | GC-GN-07 | 630468 | 5437262 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:00 | 13:40 | 3.7 | 0.84 | 2.5 | 6.5 | 2 | 2 | 2.4 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-08 | 630499 | 5437243 | 22.86 | 20-Apr-16 | 20-Apr-16 | 10:05 | 14:00 | 3.9 | 0.90 | 2.5 | 6.5 | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 4 | - | - | - | 4 | 4.5 |
| | GC-GN-09 | 630028 | 5437022 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:20 | 11:20 | 2.0 | 0.91 | 2.9 | 3.5 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-10 | 630258 | 5436950 | 45.72 | 21-Apr-16 | 21-Apr-16 | 9:25 | 11:50 | 2.4 | 1.10 | 3.5 | 6.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 21-Apr-16 | 21-Apr-16 | 12:00 | 13:45 | 1.7 | 0.80 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-11 | 630520 | 5437231 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:30 | 12:10 | 2.7 | 0.61 | 5.0 | 6.5 | 2 | 2 | 3.3 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:15 | 13:55 | 1.7 | 0.38 | | | 1 | 1 | 2.6 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-12 | 630463 | 5437277 | 22.86 | 21-Apr-16 | 21-Apr-16 | 9:35 | 12:20 | 2.8 | 0.63 | 5.5 | 6.3 | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 5 | - | - | - | 5 | 8.0 |
| | | | | 22.86 | 21-Apr-16 | 21-Apr-16 | 12:25 | 14:05 | 1.7 | 0.38 | | | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 5 | - | - | - | 5 | 13 |
| | GC-GN-13 | 629984 | 5437073 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:20 | 10:30 | 1.2 | 0.53 | 2.7 | 3.3 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:35 | 12:00 | 1.4 | 0.65 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:05 | 13:15 | 1.2 | 0.53 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-14 | 630009 | 5437026 | 45.72 | 22-Apr-16 | 22-Apr-16 | 9:25 | 10:35 | 1.2 | 0.53 | 2.8 | 3.5 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-15 | 630069 | 5437092 | 45.72 | 22-Apr-16 | 22-Apr-16 | 10:40 | 12:15 | 1.6 | 0.72 | 4.0 | 3.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-16 | 630149 | 5436978 | 45.72 | 22-Apr-16 | 22-Apr-16 | 12:20 | 13:30 | 1.2 | 0.53 | 4.0 | 4.9 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-17 | 630486 | 5437262 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:30 | 11:00 | 1.5 | 0.34 | 4.0 | 6.7 | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 2 | - | - | - | 0 | 5.8 |
| | | | | 22.86 | 22-Apr-16 | 22-Apr-16 | 11:10 | 13:10 | 2.0 | 0.46 | | | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 8 | - | - | - | 1 | 17 |
| | GC-GN-18 | 630460 | 5437287 | 22.86 | 22-Apr-16 | 22-Apr-16 | 9:40 | 11:40 | 2.0 | 0.46 | 4.0 | 6.5 | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-19 | 630665 | 5436958 | 45.72 | 23-Apr-16 | 23-Apr-16 | 9:30 | 11:30 | 2.0 | 0.91 | 4.0 | 8.5 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-20 | 630541 | 5437190 | 45.72 | 23-Apr-16 | 23-Apr-16 | 11:50 | 14:00 | 2.2 | 0.99 | 4.0 | 8.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-21 | 630656 | 5437117 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:40 | 11:45 | 2.1 | 0.48 | 3.0 | 7.5 | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-22 | 630161 | 5436918 | 22.86 | 23-Apr-16 | 23-Apr-16 | 9:45 | 12:00 | 2.3 | 0.51 | 1.5 | 5.0 | 3 | 3 | 5.8 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-23 | 629888 | 5437089 | 45.72 | 23-Apr-16 | 23-Apr-16 | 10:10 | 12:30 | 2.3 | 1.07 | 3.5 | 1.8 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 23-Apr-16 | 23-Apr-16 | 12:35 | 14:35 | 2.0 | 0.91 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-24 | 630257 | 5437394 | 22.86 | 23-Apr-16 | 23-Apr-16 | 10:25 | 13:00 | 2.6 | 0.59 | 2.0 | 6.2 | - | - | - | - | 0 | - | - | - | 0 | 0 | - | 3 | - | - | - | 1 | 5.1 |
| | GC-GN-25 | 630144 | 5436893 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:10 | 14:05 | 1.9 | 0.44 | 1.2 | 2.5 | 10 | 10 | 23 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-26 | 629827 | 5437340 | 22.86 | 23-Apr-16 | 23-Apr-16 | 12:15 | 14:25 | 2.2 | 0.50 | 2.0 | 2.4 | 3 | 3 | 6.1 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-27 | 630144 | 5436881 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:30 | 11:45 | 2.3 | 0.51 | 1.3 | 2.3 | 11 | 11 | 21 | 0 | - | - | - | - | 0 | 0 | 1 | - | - | - | - | 0 | 1.9 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:50 | 13:30 | 1.7 | 0.38 | | | 13 | 13 | 34 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-28 | 629902 | 5437132 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:20 | 11:10 | 1.8 | 0.84 | 3.4 | 2.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:15 | 13:10 | 1.9 | 0.88 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 1 | 1 | 1.1 |
| | GC-GN-29 | 630036 | 5437104 | 45.72 | 24-Apr-16 | 24-Apr-16 | 9:25 | 11:00 | 1.6 | 0.72 | 4.0 | 3.5 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 24-Apr-16 | 24-Apr-16 | 11:05 | 13:20 | 2.3 | 1.03 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

**Table F.10:** **Gill Net Catch Records from Koocanusa Reservoir, April 2016**

| Area | Station | Location (11U, NAD83) | | Net Length (m) | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Redside Shiner | | | Westslope Cutthroat Trout | | | | | | | Yellow Perch | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 1" | | | 1" | 1.5" | 2" | 2.5" | 3" | | | 1" | 1.5" | 2" | 2.5" | 3" | | |
| Gold Creek | GC-GN-30 | 630110 | 5436878 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:35 | 11:15 | 1.7 | 0.38 | 1.8 | 2.3 | 0 | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 |
| | | | | 22.86 | 24-Apr-16 | 24-Apr-16 | 11:20 | 13:50 | 2.5 | 0.57 | | | 17 | 17 | 30 | 2 | - | - | - | - | 0 | 3.5 | 0 | - | - | - | - | 0 | 0 |
| | GC-GN-31 | 630298 | 5437358 | 22.86 | 24-Apr-16 | 24-Apr-16 | 9:40 | 12:00 | 2.3 | 0.53 | 2.5 | 6.3 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | GC-GN-32 | 629824 | 5437340 | 22.86 | 24-Apr-16 | 24-Apr-16 | 12:15 | 14:15 | 2.0 | 0.46 | 2.0 | 2.5 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | GC-GN-33 | 629829 | 5437312 | 22.86 | 25-Apr-16 | 25-Apr-16 | 9:35 | 10:45 | 1.2 | 0.27 | 2.5 | 3.0 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 10:55 | 12:05 | 1.2 | 0.27 | | | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 25-Apr-16 | 25-Apr-16 | 12:10 | 13:20 | 1.2 | 0.27 | | | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | GC-GN-34 | 630014 | 5437330 | 60.96 | 25-Apr-16 | 25-Apr-16 | 9:40 | 10:40 | 1.0 | 0.61 | 4.0 | 4.6 | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 2 | - | - | 2 | 3.3 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 10:55 | 11:50 | 0.92 | 0.56 | | | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 2 | - | - | 2 | 3.6 |
| | | | | 60.96 | 25-Apr-16 | 25-Apr-16 | 11:55 | 13:00 | 1.1 | 0.66 | | | - | - | - | - | - | 0 | - | - | 0 | 0 | - | - | 0 | - | - | 0 | 0 |
| | GC-GN-35 | 629824 | 5437090 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:45 | 11:05 | 1.3 | 0.61 | 2.0 | 3.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:10 | 13:05 | 1.9 | 0.88 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-36 | 629826 | 5436965 | 45.72 | 25-Apr-16 | 25-Apr-16 | 9:50 | 11:15 | 1.4 | 0.65 | 3.5 | 2.5 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 25-Apr-16 | 25-Apr-16 | 11:20 | 13:15 | 1.9 | 0.88 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-37 | 629814 | 5437364 | 22.86 | 26-Apr-16 | 26-Apr-16 | 9:30 | 10:40 | 1.2 | 0.27 | 3.6 | 3.3 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 10:45 | 12:30 | 1.8 | 0.40 | | | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 26-Apr-16 | 26-Apr-16 | 12:35 | 14:10 | 1.6 | 0.36 | | | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | GC-GN-38 | 629874 | 5436986 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:40 | 12:15 | 2.6 | 1.18 | 3.0 | 3.8 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-39 | 629964 | 5436935 | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:20 | 14:05 | 1.7 | 0.80 | 3.0 | 4.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-40 | 630108 | 5436880 | 45.72 | 26-Apr-16 | 26-Apr-16 | 9:45 | 12:00 | 2.3 | 1.03 | 2.7 | 5.6 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 26-Apr-16 | 26-Apr-16 | 12:05 | 14:00 | 1.9 | 0.88 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-41 | 629906 | 5437398 | 22.86 | 27-Apr-16 | 27-Apr-16 | 9:25 | 10:15 | 0.83 | 0.19 | 3.7 | 4.8 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | GC-GN-42 | 629438 | 5437371 | 22.86 | 27-Apr-16 | 27-Apr-16 | 10:30 | 12:15 | 1.7 | 0.40 | 2.0 | 4.2 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | GC-GN-43 | 629813 | 5437215 | 22.86 | 27-Apr-16 | 27-Apr-16 | 12:20 | 13:30 | 1.2 | 0.27 | 2.3 | 2.4 | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | | | | 22.86 | 27-Apr-16 | 27-Apr-16 | 13:35 | 14:45 | 1.2 | 0.27 | | | - | - | - | - | - | - | 0 | - | 0 | 0 | - | - | - | 0 | - | 0 | 0 |
| | GC-GN-44 | 629950 | 5437225 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:30 | 10:30 | 1.0 | 0.46 | 3.8 | 3.2 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-45 | 629910 | 5437404 | 45.72 | 27-Apr-16 | 27-Apr-16 | 10:55 | 12:30 | 1.6 | 0.72 | 2.8 | 5.4 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 12:40 | 14:20 | 1.7 | 0.76 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-46 | 630143 | 5436876 | 45.72 | 27-Apr-16 | 27-Apr-16 | 9:35 | 11:00 | 1.4 | 0.65 | 3.7 | 6.6 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-47 | 630050 | 5436990 | 45.72 | 27-Apr-16 | 27-Apr-16 | 11:05 | 13:15 | 2.2 | 0.99 | 5.9 | 5.3 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | | | | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:20 | 14:35 | 1.3 | 0.57 | | | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-48 | 630698 | 5437142 | 45.72 | 27-Apr-16 | 27-Apr-16 | 13:45 | 15:20 | 1.6 | 0.72 | 1.4 | 2.0 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | GC-GN-49 | 630126 | 5437420 | 45.72 | 27-Apr-16 | 27-Apr-16 | 14:05 | 15:45 | 1.7 | 0.76 | 1.2 | 6.6 | - | - | - | - | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | | **144** | **51.24** | **-** | **-** | **62** | **62** | **9.9** | **2** | **0** | **0** | **0** | **1** | **0** | **0.056** | **1** | **27** | **4** | **0** | **2** | **22** | **0.87** |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

## Table F.11: Gill Net Catch Records from Koocanusa Reservoir, August 2016

| Area | Station | Location (11U, NAD83) | | Net Length | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Kokanee | | | | | | Largescale Sucker | | | | | | Mountain Whitefish | | | | | | Northern Pikeminnow | | | | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 2.5" | 3" | 4" | 5" | | | 2.5" | 3" | 4" | 5" | | | 2.5" | 3" | 4" | 5" | | | 2.5" | 3" | 4" | 5" | | | 2.5" | | |
| Sand Creek | SC-GN-01 | 626142 | 5458143 | 45.72 | 24-Aug-16 | 24-Aug-16 | 9:10 | 10:00 | 0.83 | 0.38 | 4.5 | 12.0 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.6 | - | 1 | 0 | 0 | 0 | 2.6 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-02 | 625900 | 5458121 | 45.72 | 24-Aug-16 | 24-Aug-16 | 10:05 | 10:50 | 0.75 | 0.34 | 4.5 | 12.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.9 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-03 | 625885 | 5458560 | 45.72 | 24-Aug-16 | 24-Aug-16 | 10:55 | 11:35 | 0.67 | 0.30 | 5.0 | 7.5 | - | 0 | 0 | 0 | 0 | 0 | - | 2 | 0 | 0 | 0 | 6.6 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 3.3 | - | - | - |
| | | | | 45.72 | 24-Aug-16 | 24-Aug-16 | 11:40 | 12:25 | 0.75 | 0.34 | | | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.9 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-04 | 625877 | 5458475 | 45.72 | 24-Aug-16 | 24-Aug-16 | 12:35 | 13:25 | 0.83 | 0.38 | 1.5 | 8.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | 5.2 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-05 | 625887 | 5458629 | 45.72 | 24-Aug-16 | 24-Aug-16 | 13:30 | 14:15 | 0.75 | 0.34 | 3.5 | 6.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | 5.8 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-06 | 625885 | 5458560 | 45.72 | 24-Aug-16 | 24-Aug-16 | 14:20 | 15:00 | 0.67 | 0.30 | 5.0 | 7.5 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 24-Aug-16 | 24-Aug-16 | 15:05 | 15:40 | 0.58 | 0.27 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-07 | 626163 | 5458248 | 45.72 | 24-Aug-16 | 24-Aug-16 | 9:15 | 10:15 | 1.0 | 0.46 | 4.0 | 11.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 2.2 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 2.2 | - | - | - |
| | | | | 45.72 | 24-Aug-16 | 24-Aug-16 | 10:20 | 11:00 | 0.67 | 0.30 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-08 | 626421 | 5458271 | 45.72 | 24-Aug-16 | 24-Aug-16 | 11:15 | 12:00 | 0.75 | 0.34 | 6.0 | 10.0 | - | 2 | 0 | 0 | 2 | 5.8 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-09 | 625951 | 5458529 | 45.72 | 24-Aug-16 | 24-Aug-16 | 12:05 | 12:50 | 0.75 | 0.34 | 3.5 | 9.0 | - | 0 | 0 | 0 | 0 | 0 | - | 3 | 1 | 0 | 0 | 12 | - | 0 | 0 | 0 | 0 | 0 | - | 2 | 0 | 0 | 2 | 5.8 | - | - | - |
| | | | | 45.72 | 24-Aug-16 | 24-Aug-16 | 12:55 | 13:40 | 0.75 | 0.34 | | | - | 0 | 0 | 0 | 0 | 0 | - | 2 | 0 | 0 | 0 | 5.8 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 24-Aug-16 | 24-Aug-16 | 13:45 | 14:30 | 0.75 | 0.34 | | | - | 0 | 0 | 0 | 0 | 0 | - | 9 | 2 | 0 | 0 | 32 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-10 | 626048 | 5458269 | 45.72 | 24-Aug-16 | 24-Aug-16 | 14:40 | 15:25 | 0.75 | 0.34 | 4.0 | 13.0 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.9 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-11 | 626352 | 5458367 | 22.86 | 24-Aug-16 | 24-Aug-16 | 9:20 | 10:20 | 1.0 | 0.23 | 4.0 | 7.6 | 0 | - | - | - | 0 | 0 | 3 | - | - | - | 0 | 13 | 1 | - | - | - | 0 | 4.4 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 22.86 | 24-Aug-16 | 24-Aug-16 | 10:25 | 11:20 | 0.92 | 0.21 | | | 0 | - | - | - | 0 | 0 | 1 | - | - | - | 0 | 4.8 | 0 | - | - | - | 0 | 0 | 1 | - | - | - | 1 | 4.8 | 0 | 0 | 0 |
| | SC-GN-12 | 626403 | 5458405 | 22.86 | 24-Aug-16 | 24-Aug-16 | 11:25 | 12:10 | 0.75 | 0.17 | 1.5 | 3.0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | SC-GN-13 | 626352 | 5458367 | 22.86 | 24-Aug-16 | 24-Aug-16 | 12:15 | 13:00 | 0.75 | 0.17 | 4.0 | 7.6 | 1 | - | - | - | 1 | 6 | 2 | - | - | - | 0 | 12 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | SC-GN-14 | 625912 | 5458589 | 22.86 | 24-Aug-16 | 24-Aug-16 | 13:10 | 14:00 | 0.83 | 0.19 | 2.5 | 6.4 | 0 | - | - | - | 0 | 0 | 2 | - | - | - | 0 | 10 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 2 | 0 | 10 |
| | SC-GN-15 | 625959 | 5458511 | 22.86 | 24-Aug-16 | 24-Aug-16 | 14:00 | 14:45 | 0.75 | 0.17 | 3.0 | 5.5 | 0 | - | - | - | 0 | 0 | 1 | - | - | - | 0 | 5.8 | 0 | - | - | - | 0 | 0 | 1 | - | - | - | 1 | 5.8 | 0 | 0 | 0 |
| | | | | 22.86 | 24-Aug-16 | 24-Aug-16 | 14:50 | 15:35 | 0.75 | 0.17 | | | 0 | - | - | - | 0 | 0 | 2 | - | - | - | 0 | 12 | 0 | - | - | - | 0 | 0 | 1 | - | - | - | 1 | 5.8 | 1 | 0 | 5.8 |
| | SC-GN-16 | 625954 | 5458493 | 45.72 | 28-Aug-16 | 28-Aug-16 | 13:10 | 14:00 | 0.83 | 0.38 | 3.0 | 5.5 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 1 | 0 | 0 | 5.2 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 14:00 | 14:50 | 0.83 | 0.38 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 2.6 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 15:05 | 15:50 | 0.75 | 0.34 | | | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.9 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 1 | 2.9 | - | - | - |
| | SC-GN-17 | 625929 | 5458559 | 45.72 | 28-Aug-16 | 28-Aug-16 | 13:05 | 13:50 | 0.75 | 0.34 | 4.0 | 6.0 | - | 0 | 0 | 0 | 0 | 0 | - | 7 | 1 | 0 | 0 | 23 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 13:55 | 14:40 | 0.75 | 0.34 | | | - | 0 | 0 | 0 | 0 | 0 | - | 2 | 0 | 0 | 0 | 5.8 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 2.9 | - | - | - |
| | SC-GN-18 | 625948 | 5458526 | 22.86 | 28-Aug-16 | 28-Aug-16 | 13:15 | 14:10 | 0.92 | 0.21 | 3.0 | 5.0 | 0 | - | - | - | 0 | 0 | 2 | - | - | - | 0 | 9.5 | 2 | - | - | - | 0 | 9.5 | 1 | - | - | - | 1 | 4.8 | 0 | 0 | 0 |
| | | | | 22.86 | 28-Aug-16 | 28-Aug-16 | 14:15 | 14:55 | 0.67 | 0.15 | | | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | | | | 22.86 | 28-Aug-16 | 28-Aug-16 | 15:05 | 15:45 | 0.67 | 0.15 | | | 1 | - | - | - | 1 | 7 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | SC-GN-19 | 625974 | 5458415 | 45.72 | 28-Aug-16 | 28-Aug-16 | 13:15 | 14:05 | 0.83 | 0.38 | 4.0 | 6.5 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | SC-GN-20 | 625889 | 5458523 | 45.72 | 28-Aug-16 | 28-Aug-16 | 14:15 | 15:00 | 0.75 | 0.34 | 3.0 | 5.5 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 15:00 | 15:40 | 0.67 | 0.30 | | | - | 0 | 0 | 0 | 0 | 0 | - | 3 | 1 | 0 | 0 | 13 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | **TOTAL** | | | | | | | | **25** | **9.8** | **-** | **-** | **2** | **2** | **0** | **0** | **4** | **0.55** | **13** | **33** | **12** | **0** | **0** | **6.0** | **3** | **2** | **0** | **0** | **0** | **0.59** | **4** | **5** | **1** | **0** | **10** | **1.2** | **3** | **0** | **1.6** |
| Elk River | ER-GN-01 | 631833 | 5446730 | 45.72 | 23-Aug-16 | 23-Aug-16 | 10:55 | 11:25 | 0.50 | 0.23 | 5.0 | 6.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 4.4 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 4.4 | - | - | - |
| | | | | 45.72 | 23-Aug-16 | 23-Aug-16 | 11:35 | 12:20 | 0.75 | 0.34 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 2.9 | - | 1 | 0 | 0 | 0 | 2.9 | - | 0 | 0 | 1 | 1 | 2.9 | - | - | - |
| | | | | 45.72 | 23-Aug-16 | 23-Aug-16 | 12:30 | 13:20 | 0.83 | 0.38 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 3 | 0 | 0 | 0 | 7.9 | - | 0 | 0 | 2 | 2 | 5.2 | - | - | - |
| | | | | 45.72 | 23-Aug-16 | 23-Aug-16 | 13:35 | 14:05 | 0.50 | 0.23 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | ER-GN-02 | 631684 | 5447068 | 45.72 | 23-Aug-16 | 23-Aug-16 | 11:05 | 11:40 | 0.58 | 0.27 | 4.0 | 6.0 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 1 | 0 | 0 | 7.5 | - | 1 | 0 | 0 | 0 | 3.7 | - | 1 | 0 | 1 | 2 | 7.5 | - | - | - |
| | | | | 45.72 | 23-Aug-16 | 23-Aug-16 | 11:55 | 12:10 | 0.25 | 0.11 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | ER-GN-03 | 631854 | 5446715 | 45.72 | 23-Aug-16 | 23-Aug-16 | 12:15 | 12:55 | 0.67 | 0.30 | 4.0 | 5.5 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 3 | 0 | 0 | 9.8 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | ER-GN-04 | 631915 | 5447052 | 45.72 | 23-Aug-16 | 23-Aug-16 | 13:00 | 13:45 | 0.75 | 0.34 | 5.0 | 6.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0.0 | - | 1 | 0 | 0 | 0 | 2.9 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | ER-GN-05 | 631942 | 5446804 | 22.86 | 23-Aug-16 | 23-Aug-16 | 11:10 | 12:00 | 0.83 | 0.19 | 6.0 | 5.0 | 1 | - | - | - | 1 | 5.2 | 3 | - | - | - | 0 | 16 | 1 | - | - | - | 0 | 5.2 | 1 | - | - | - | 1 | 5.2 | 0 | 0 | 0 |
| | | | | 22.86 | 23-Aug-16 | 23-Aug-16 | 12:10 | 12:40 | 0.50 | 0.11 | | | 1 | - | - | - | 1 | 8.7 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | - | 0 | 0 | - | - | - | - | 0 | 0 | 0 | 0 |
| | ER-GN-06 | 632019 | 5446804 | 22.86 | 23-Aug-16 | 23-Aug-16 | 12:50 | 13:40 | 0.83 | 0.19 | 6.0 | 5.5 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | ER-GN-07 | 631959 | 5446964 | 22.86 | 23-Aug-16 | 23-Aug-16 | 13:45 | 14:35 | 0.83 | 0.19 | 3.7 | 4.0 | 0 | - | - | - | 0 | 0 | 13 | - | - | - | 0 | 68 | 0 | - | - | - | 0 | 0 | 0 | - | - | - | 0 | 0 | 0 | 0 | 0 |
| | ER-GN-08 | 631592 | 5447131 | 45.72 | 28-Aug-16 | 28-Aug-16 | 16:30 | 17:05 | 0.58 | 0.27 | 5.0 | 6.5 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 3.7 | - | 1 | 0 | 0 | 0 | 3.7 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | ER-GN-09 | 631660 | 5447099 | 45.72 | 28-Aug-16 | 28-Aug-16 | 16:30 | 17:15 | 0.75 | 0.34 | 3.5 | 4.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.9 | - | 0 | 1 | 0 | 1 | 2.9 | - | - | - |
| | ER-GN-10 | 631732 | 5447102 | 45.72 | 28-Aug-16 | 28-Aug-16 | 16:35 | 17:35 | 1.0 | 0.46 | 4.0 | 5.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | 4.4 | - | 1 | 0 | 0 | 0 | 2.2 | - | 0 | 0 | 1 | 1 | 2.2 | - | - | - |
| | ER-GN-11 | 631696 | 5447094 | 22.86 | 28-Aug-16 | 28-Aug-16 | 16:35 | 17:25 | 0.83 | 0.19 | 5.5 | 6.5 | 8 | - | - | - | 8 | 42 | 0 | - | - | - | 0 | 0 | 1 | - | - | - | 0 | 5.2 | 1 | - | - | - | 1 | 5.2 | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | | **11** | **4.2** | **-** | **-** | **10** | **0** | **0** | **0** | **10** | **3.5** | **16** | **2** | **8** | **0** | **0** | **7.3** | **2** | **9** | **0** | **0** | **0** | **2.3** | **2** | **2** | **1** | **5** | **10** | **2.2** | **0** | **0** | **0** |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

**Table F.11:** **Gill Net Catch Records from Koocanusa Reservoir, August 2016**

| Area | Station | Location (11U, NAD83) | | Net Length | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (m*hrs/ 100 m) | Depth Range (m) | | Kokanee | | | | | | Largescale Sucker | | | | | | Mountain Whitefish | | | | | | Northern Pikeminnow | | | | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | | | | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| | | Easting | Northing | | | | | | | | | | 2.5" | 3" | 4" | 5" | | | 2.5" | 3" | 4" | 5" | | | 2.5" | 3" | 4" | 5" | | | 2.5" | 3" | 4" | 5" | | | 2.5" | | |
| Gold Creek | GC-GN-01 | 629257 | 5437156 | 45.72 | 23-Aug-16 | 23-Aug-16 | 15:50 | 16:25 | 0.58 | 0.27 | 4.5 | 8.3 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 3.7 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | GC-GN-02 | 628979 | 5437054 | 45.72 | 23-Aug-16 | 23-Aug-16 | 16:00 | 16:40 | 0.67 | 0.30 | 6.0 | 7.5 | - | 0 | 0 | 0 | 0 | 0 | - | 2 | 0 | 0 | 0 | 6.6 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 3.3 | - | - | - |
| | GC-GN-03 | 628742 | 5437043 | 45.72 | 28-Aug-16 | 28-Aug-16 | 8:25 | 9:00 | 0.58 | 0.27 | 3.5 | 4.0 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 3.7 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 3.7 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 9:05 | 9:55 | 0.83 | 0.38 | | | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.6 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 2.6 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 10:00 | 10:40 | 0.67 | 0.30 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 10:45 | 11:25 | 0.67 | 0.30 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 3.3 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | GC-GN-04 | 628826 | 5436907 | 45.72 | 28-Aug-16 | 28-Aug-16 | 8:30 | 9:25 | 0.92 | 0.42 | 6.3 | 5.2 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 2.4 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | GC-GN-05 | 628603 | 5437015 | 45.72 | 28-Aug-16 | 28-Aug-16 | 9:30 | 10:15 | 0.75 | 0.34 | 3.0 | 4.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 2.9 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | GC-GN-06 | 628565 | 5436733 | 45.72 | 28-Aug-16 | 28-Aug-16 | 10:20 | 11:00 | 0.67 | 0.30 | 3.0 | 4.0 | - | 0 | 0 | 0 | 0 | 0 | - | 2 | 0 | 0 | 0 | 6.6 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 11:05 | 11:45 | 0.67 | 0.30 | | | - | 0 | 0 | 0 | 0 | 0 | - | 8 | 0 | 0 | 0 | 26 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 1 | 0 | 2 | 6.6 | - | - | - |
| | GC-GN-07 | 628604 | 5436745 | 22.86 | 28-Aug-16 | 28-Aug-16 | 8:35 | 9:35 | 1.0 | 0.23 | 3.0 | 4.0 | 0 | - | - | - | 0 | 0 | 17 | - | - | - | 0 | 74 | 0 | - | - | - | 0 | 0 | 3 | - | - | - | 3 | 13 | 0 | 0 | 0 |
| | | | | 22.86 | 28-Aug-16 | 28-Aug-16 | 11:05 | 12:00 | 0.92 | 0.21 | | | 0 | - | - | - | 0 | 0 | 8 | - | - | - | 0 | 38 | 0 | - | - | - | 0 | 0 | 2 | - | - | - | 2 | 9.5 | 0 | 0 | 0 |
| | GC-GN-08 | 628711 | 5436693 | 45.72 | 28-Aug-16 | 28-Aug-16 | 8:50 | 9:45 | 0.92 | 0.42 | 4.0 | 5.0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | GC-GN-09 | 628604 | 5436745 | 45.72 | 28-Aug-16 | 28-Aug-16 | 9:50 | 10:30 | 0.67 | 0.30 | 3.5 | 4.5 | - | 0 | 0 | 0 | 0 | 0 | - | 3 | 0 | 1 | 0 | 13.1 | - | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 0 | 1 | 3.3 | - | - | - |
| | | | | 45.72 | 28-Aug-16 | 28-Aug-16 | 10:40 | 11:15 | 0.58 | 0.27 | | | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 3.7 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | - |
| | **TOTAL** | | | | | | | | **11.1** | **4.6** | **-** | **-** | **0** | **0** | **0** | **0** | **0** | **0** | **25** | **19** | **3** | **1** | **0** | **12** | **0** | **0** | **0** | **0** | **0** | **0** | **5** | **5** | **1** | **0** | **11** | **2.8** | **0** | **0** | **0** |

[a] CPUE = # of fish caught / effort used, expressed as # of fish per 100m hr.

**Table F.12:** **Gill Net Catch Records from Koocanusa Reservoir, April and August 2016**

| Area | Date | Fishing Hours (hrs) | Effort (m*hrs /100 m) | All Species | | | Bull Trout | | | Kokanee [b] | | | Largescale Sucker [b] | | | Longnose Sucker | | | Mountain Whitefish | | | Northern Pikeminnow [b] | | | Peamouth Chub [b] | | | Rainbow Trout [b] | | | Redside Shiner [b] | | | Westslope Cutthroat Trout | | | Yellow Perch [b] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Caught | Mortalities[c] | Percent Mortalities (%) | Total Caught | Mortalities[c] | CPUE [a] | Total Caught | Sacrificed | CPUE [a] | Total Caught | Sacrificed | CPUE [a] | Total Caught | Mortalities[c] | CPUE [a] | Total Caught | Mortalities[c] | CPUE [a] | Total Caught | Sacrificed | CPUE [a] | Total Caught | Sacrificed | CPUE [a] | Total Caught | Sacrificed | CPUE [a] | Total Caught | Sacrificed | CPUE* | Total Caught | Mortalities[c] | CPUE [a] | Total Caught | Sacrificed | CPUE [a] |
| Sand Creek | Apr-16 | 60 | 23 | 814 | 1 | 0.12 | 8 | 0 | 0.38 | 1 | 0 | 0.045 | 55 | 5 | 2.4 | 1 | 0 | 0.088 | 0 | 0 | 0 | 84 | 27 | 4.3 | 567 | 68 | 46 | 4 | 3 | 0.15 | 89 | 88 | 9.5 | 1 | 1 | 0.015 | 4 | 4 | 0.088 |
| | Aug-16 | 25 | 9.8 | 80 | 0 | 0 | - | - | - | 4 | 4 | 0.55 | 58 | 0 | 6.0 | - | - | - | 5 | 0 | 0.59 | 10 | 10 | 1.2 | - | - | - | - | - | - | - | - | - | - | - | - | 3 | 0 | 1.6 |
| Elk River | Apr-16 | 71 | 27 | 449 | 5 | 1.1 | 13 | 4 | 1.1 | 4 | 4 | 0.28 | 38 | 11 | 2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 137 | 55 | 10 | 177 | 73 | 19 | 2 | 0 | 0.057 | 73 | 45 | 34 | 2 | 1 | 0.11 | 3 | 3 | 0.16 |
| | Aug-16 | 11 | 4.2 | 57 | 0 | 0 | - | - | - | 10 | 10 | 3.5 | 26 | 0 | 7.3 | - | - | - | 11 | 0 | 2.3 | 10 | 10 | 2.2 | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 0 | 0 |
| Gold Creek | Apr-16 | 144 | 51 | 612 | 8 | 1.3 | 8 | 7 | 0.15 | 0 | 0 | 0 | 152 | 40 | 3.4 | 0 | 0 | 0 | 2 | 1 | 0.052 | 105 | 41 | 2.6 | 242 | 106 | 6.2 | 4 | 4 | 0.12 | 62 | 62 | 9.9 | 3 | 0 | 0.056 | 34 | 22 | 0.87 |
| | Aug-16 | 11 | 4.6 | 59 | 0 | 0 | - | - | - | 0 | 0 | 0 | 48 | 0 | 12 | - | - | - | 0 | 0 | 0 | 11 | 11 | 2.8 | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 0 | 0 |
| **Total** | | **323** | **120** | **2,071** | **14** | **0.68** | **29** | **11** | **0.56** | **19** | **18** | **0.73** | **377** | **56** | **5.6** | **1** | **0** | **0.029** | **18** | **1** | **0.49** | **357** | **154** | **3.9** | **986** | **247** | **24** | **10** | **7** | **0.11** | **224** | **195** | **18** | **6** | **2** | **0.062** | **44** | **29** | **0.45** |

[a] Total catch-per-unit-effort (CPUE) is the number of fish caught / effort used, expressed as number of fish per 100 m hr.

[b] Sacrificed for lethal sampling program.

[c] Mortalities are only the fish that died by accident (incidental mortalities

# Hoop Net

## Table F.13: Hoop Net Records for Fish Caught in Koocanusa Reservoir, February 2014

| Area | Station | Size | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Bull Trout | | | Burbot | | | Northern Pikeminnow | | | Peamouth Chub | | | Pumpkinseed | | | Redside Shiner | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Sand Creek | SC-HN1 | medium | 625534 | 5460432 | 17-Feb-14 | 18-Feb-14 | 9:00 | 16:30 | 31.50 | 6.8 | - | 1.31 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.76 | 2 | 0 | 1.52 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 16:30 | 15:00 | 46.50 | | | 1.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN2 | medium | 625510 | 5460337 | 17-Feb-14 | 18-Feb-14 | 9:20 | 16:45 | 31.42 | 10.3 | - | 1.31 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 2 | 2.29 | 8 | 0 | 6.11 | 1 | 0 | 0.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 16:45 | 14:45 | 46.00 | | | 1.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN3 | medium | 625520 | 5460194 | 17-Feb-14 | 18-Feb-14 | 9:30 | 17:00 | 31.50 | 8.3 | - | 1.31 | 0 | 0 | 0.00 | 1 | 0 | 0.76 | 0 | 0 | 0.00 | 1 | 0 | 0.76 | 0 | 0 | 0.00 | 1 | 0 | 0.76 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 17:00 | 14:30 | 45.50 | | | 1.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **232.42** | **-** | **-** | **9.68** | **0** | **0** | **0.00** | **1** | **0** | **0.10** | **4** | **2** | **0.41** | **11** | **0** | **1.14** | **1** | **0** | **0.10** | **1** | **0** | **0.10** | **0** | **0** | **0.00** |
| Oestriech Road | OR-HN1 | small | 628537 | 5451617 | 15-Feb-14 | 17-Feb-14 | 10:15 | 10:00 | 47.75 | 10.7 | 10.8 | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 10:00 | 14:20 | 28.33 | | | 1.18 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | OR-HN2 | small | 628593 | 5451638 | 15-Feb-14 | 17-Feb-14 | 22:30 | 10:10 | 35.67 | 8.1 | - | 1.49 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 10:10 | 14:25 | 28.25 | | | 1.18 | 1 | 0 | 0.85 | 1 | 0 | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | OR-HN3 | small | 628610 | 5451540 | 15-Feb-14 | 17-Feb-14 | 11:00 | 10:20 | 47.33 | 11.5 | - | 1.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 10:20 | 14:45 | 28.42 | | | 1.18 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **215.75** | **-** | **-** | **8.99** | **1** | **0** | **0.11** | **1** | **0** | **0.11** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** |
| Elk River | EC-HN1 | small | 626905 | 5446409 | 16-Feb-14 | 17-Feb-14 | 11:00 | 16:45 | 29.75 | 13.2 | - | 1.24 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 16:45 | 13:45 | 21.00 | | | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 13:45 | 12:00 | 46.25 | | | 1.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 1.56 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | EC-HN2 | small | 626935 | 5446527 | 16-Feb-14 | 17-Feb-14 | 11:25 | 16:55 | 29.50 | 12.0 | - | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 16:55 | 13:30 | 20.58 | | | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 13:30 | 12:20 | 46.83 | | | 1.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | EC-HN3 | small | 626905 | 5446409 | 16-Feb-14 | 17-Feb-14 | 11:45 | 17:00 | 29.25 | 16.3 | - | 1.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 17:00 | 13:25 | 20.42 | | | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 13:25 | 12:35 | 47.17 | | | 1.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.51 | 1 | 0 | 0.51 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN1 | small | 627953 | 5447921 | 15-Feb-14 | 17-Feb-14 | 9:05 | 16:15 | 55.17 | 12.7 | - | 2.30 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 16:15 | 12:30 | 20.25 | | | 0.84 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN2 | small | 628001 | 5447898 | 15-Feb-14 | 17-Feb-14 | 9:35 | 16:10 | 54.58 | 8.1 | - | 2.27 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 16:10 | 12:30 | 20.33 | | | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN3 | small | 628080 | 5447857 | 15-Feb-14 | 17-Feb-14 | 9:50 | 16:30 | 54.67 | 12.6 | 12.7 | 2.28 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.44 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Feb-14 | 18-Feb-14 | 16:30 | 12:40 | 20.17 | | | 0.84 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 23-Feb-14 | 24-Feb-14 | 9:00 | 17:15 | 32.25 | | | 1.34 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.74 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **548.17** | **-** | **-** | **22.84** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **8** | **2** | **0.35** | **1** | **0** | **0.04** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** |
| Gold Creek | GC-HN1 | medium | 629332 | 5436966 | 17-Feb-14 | 18-Feb-14 | 12:00 | 10:00 | 22.00 | 3.8 | 4.0 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.09 | 1 | 0 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 10:00 | 11:00 | 49.00 | | | 2.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN2 | medium | 629452 | 5436997 | 17-Feb-14 | 18-Feb-14 | 12:30 | 9:30 | 21.00 | 5.5 | 5.8 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 9:30 | 11:10 | 49.67 | | | 2.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 13 | 0 | 6.28 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN3 | medium | 629461 | 5436861 | 17-Feb-14 | 18-Feb-14 | 1:00 | 9:45 | 32.75 | 4.5 | 4.7 | 1.36 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Feb-14 | 20-Feb-14 | 9:45 | 11:15 | 49.50 | | | 2.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 1.45 | 9 | 0 | 4.36 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.48 |
| | | | | | 23-Feb-14 | 24-Feb-14 | 10:30 | 15:20 | 28.83 | | | 1.20 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.83 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **252.75** | **-** | **-** | **10.53** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **5** | **0** | **0.47** | **23** | **0** | **2.18** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **1** | **0** | **0.09** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## **Table F.14:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2014

| Area | Station | Size | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Bull Trout | | | Burbot | | | Juvenile Trout | | | Largescale Sucker | | | Mountain Whitefish | | | Northern Pikeminnow | | | Peamouth Chub | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Sand Creek | SC-SH1 | small | 625363 | 5461138 | 10-Apr-14 | 11-Apr-14 | 14:00 | 12:10 | 22.17 | 1.5 | - | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.08 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 12:10 | 10:30 | 22.33 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.07 |
| | SC-SH2 | small | 625147 | 5461056 | 10-Apr-14 | 11-Apr-14 | 14:05 | 12:05 | 22.00 | 1.5 | - | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.09 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 12:05 | 10:45 | 22.67 | | | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.06 |
| | SC-SH3 | small | 625183 | 5461486 | 10-Apr-14 | 11-Apr-14 | 14:15 | 10:55 | 20.67 | 1.5 | - | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.16 | 2 | 2 | 2.32 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 10:55 | 10:35 | 23.67 | | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.01 |
| | SC-SH4 | small | 624918 | 5461748 | 10-Apr-14 | 11-Apr-14 | 14:20 | 11:00 | 20.67 | 1.0 | - | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH5 | small | 624979 | 5461292 | 10-Apr-14 | 11-Apr-14 | 14:35 | 11:40 | 21.08 | 0.8 | - | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.28 |
| | SC-SH6 | small | 625306 | 5460936 | 11-Apr-14 | 12-Apr-14 | 12:30 | 11:00 | 22.50 | 1.0 | - | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.07 |
| | SC-SH7 | small | 625160 | 5461020 | 11-Apr-14 | 12-Apr-14 | 12:35 | 10:50 | 22.25 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH8 | small | 625529 | 5460486 | 12-Apr-14 | 14-Apr-14 | 13:25 | 11:30 | 46.08 | 1.0 | - | 1.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.52 |
| | SC-SH9 | small | 625544 | 546055 | 12-Apr-14 | 13-Apr-14 | 13:30 | 12:28 | 22.97 | 1.5 | - | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:28 | 11:15 | 22.78 | | | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH10 | small | 625523 | 5460626 | 12-Apr-14 | 13-Apr-14 | 13:35 | 12:25 | 22.83 | 1.0 | - | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.05 | 1 | 1 | 1.05 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:25 | 10:42 | 22.28 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH11 | small | 625516 | 5460704 | 12-Apr-14 | 13-Apr-14 | 13:50 | 12:22 | 22.53 | 1.0 | - | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:22 | 10:40 | 22.30 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH12 | small | 625492 | 5460750 | 12-Apr-14 | 13-Apr-14 | 13:55 | 12:20 | 22.42 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.07 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:20 | 10:35 | 22.25 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH13 | small | 625472 | 5459686 | 14-Apr-14 | 15-Apr-14 | 10:55 | 10:20 | 23.42 | 1.0 | - | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.05 |
| | SC-SH14 | small | 625395 | 5459525 | 14-Apr-14 | 15-Apr-14 | 11:00 | 10:18 | 23.30 | 1.8 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.03 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:18 | 10:25 | 24.12 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH15 | small | 625251 | 5459247 | 14-Apr-14 | 15-Apr-14 | 11:05 | 10:15 | 23.17 | 1.0 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:15 | 10:20 | 24.08 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH16 | small | 625432 | 5459386 | 14-Apr-14 | 15-Apr-14 | 11:45 | 10:10 | 22.42 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.07 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:10 | 10:17 | 24.12 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH17 | small | 625341 | 5459269 | 14-Apr-14 | 15-Apr-14 | 11:50 | 10:13 | 22.38 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.07 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:13 | 10:15 | 24.03 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH18 | small | 624984 | 5459134 | 16-Apr-14 | 17-Apr-14 | 12:20 | 10:05 | 21.75 | 1.0 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.10 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 10:05 | 10:00 | 23.92 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH19 | small | 624943 | 5459179 | 16-Apr-14 | 17-Apr-14 | 12:25 | 10:05 | 21.67 | 1.0 | - | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.11 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 10:05 | 10:05 | 24.00 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH20 | small | 625261 | 5459240 | 16-Apr-14 | 17-Apr-14 | 12:35 | 9:30 | 20.92 | 1.0 | - | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.15 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 9:30 | 9:50 | 24.33 | | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH21 | small | 625120 | 5459166 | 16-Apr-14 | 17-Apr-14 | 12:45 | 9:55 | 21.17 | 1.0 | - | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH22 | small | 625201 | 5459180 | 17-Apr-14 | 18-Apr-14 | 9:50 | 9:35 | 23.75 | 1.0 | - | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH23 | small | 624980 | 5459058 | 17-Apr-14 | 18-Apr-14 | 10:00 | 9:45 | 23.75 | 1.0 | - | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH1 | large | 624869 | 5461458 | 10-Apr-14 | 11-Apr-14 | 12:35 | 11:45 | 23.17 | 1.0 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.04 | 0 | 0 | 0.00 | 1 | 1 | 1.04 | 1 | 1 | 1.04 |
| | SC-LH2 | large | 624781 | 5461605 | 10-Apr-14 | 11-Apr-14 | 12:45 | 11:10 | 22.42 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 5 | 5.35 |
| | SC-LH3 | large | 624925 | 5461123 | 11-Apr-14 | 12-Apr-14 | 11:30 | 11:10 | 23.67 | 1.0 | - | 0.99 | 1 | 0 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.04 | 2 | 0 | 2.03 | 0 | 0 | 0.00 | 2 | 2 | 2.03 |
| | SC-LH4 | large | 625180 | 5461115 | 11-Apr-14 | 12-Apr-14 | 12:00 | 12:00 | 24.00 | 1.0 | - | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.00 | 0 | 0 | 0.00 | 1 | 0 | 1.00 | 2 | 0 | 2.00 |
| | SC-LH5 | large | 623376 | 5461418 | 12-Apr-14 | 13-Apr-14 | 12:45 | 10:45 | 22.00 | 1.0 | - | 0.92 | 1 | 0 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 21 | 0 | 22.91 | 2 | 0 | 2.18 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH6 | large | 623398 | 5461375 | 12-Apr-14 | 13-Apr-14 | 13:00 | 12:00 | 23.00 | 1.0 | - | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.04 | 1 | 1 | 1.04 | 2 | 2 | 2.09 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:00 | 12:05 | 24.08 | | | 1.00 | 1 | 0 | 1.00 | 1 | 0 | 1.00 | 0 | 0 | 0.00 | 10 | 0 | 9.97 | 6 | 0 | 5.98 | 1 | 0 | 1.00 | 13 | 0 | 12.96 |
| | SC-LH7 | large | 623369 | 5461325 | 13-Apr-14 | 14-Apr-14 | 11:50 | 12:50 | 25.00 | 2.5 | - | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.96 | 1 | 0 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH8 | large | 623391 | 5461316 | 14-Apr-14 | 15-Apr-14 | 12:45 | 10:35 | 21.83 | 2.5 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 4.40 | 1 | 0 | 1.10 | 0 | 0 | 0.00 | 1 | 1 | 1.10 |
| | SC-LH9 | large | 623367 | 5461287 | 14-Apr-14 | 15-Apr-14 | 13:05 | 10:50 | 21.75 | 2.5 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:50 | 10:05 | 23.25 | | | 0.97 | 1 | 0 | 1.03 | 2 | 0 | 2.06 | 0 | 0 | 0.00 | 19 | 0 | 19.61 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 3.10 |
| | SC-LH10 | large | 623511 | 5461235 | 15-Apr-14 | 16-Apr-14 | 11:05 | 11:05 | 24.00 | 2.5 | - | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.00 | 1 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH11 | large | 625271 | 5459077 | 16-Apr-14 | 17-Apr-14 | 11:50 | 9:20 | 21.50 | 2.5 | - | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 7 | 0 | 7.81 | 0 | 0 | 0.00 | 2 | 2 | 2.23 | 0 | 0 | 0.00 |
| | SC-LH12 | large | 625218 | 5459123 | 16-Apr-14 | 17-Apr-14 | 12:00 | 9:25 | 21.42 | 1.0 | - | 0.89 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.12 | 5 | 5 | 5.60 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 9:25 | 10:00 | 24.58 | | | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH13 | large | 625230 | 5458960 | 17-Apr-14 | 18-Apr-14 | 10:20 | 9:40 | 23.33 | 1.5 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 9 | 0 | 9.26 | 0 | 0 | 0.00 | 1 | 0 | 1.03 | 1 | 1 | 1.03 |
| | **TOTAL** | | | | | | | | **1,231.73** | **-** | **-** | **51.32** | **4** | **0** | **0.08** | **3** | **0** | **0.06** | **1** | **0** | **0.02** | **84** | **1** | **1.64** | **14** | **1** | **0.27** | **11** | **8** | **0.21** | **54** | **37** | **1.05** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## Table F.14: Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2014

| Area | Station | Size | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Bull Trout | | | Burbot | | | Juvenile Trout | | | Largescale Sucker | | | Mountain Whitefish | | | Northern Pikeminnow | | | Peamouth Chub | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Elk River | ER-SH1 | small | 629277 | 5447686 | 10-Apr-14 | 11-Apr-14 | 15:00 | 10:15 | 19.25 | 1.5 | 2.0 | 0.80 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 0 | 7.48 | 0 | 0 | 0.00 | 1 | 1 | 1.25 | 1 | 1 | 1.25 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 10:15 | 12:35 | 26.33 | | | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 0 | 4.56 | 0 | 0 | 0.00 | 1 | 1 | 0.91 | 3 | 3 | 2.73 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 12:35 | 9:25 | 20.83 | | | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 0 | 7.65 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.27 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:25 | 13:15 | 27.83 | | | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.15 |
| | ER-SH2 | small | 629267 | 5447798 | 10-Apr-14 | 11-Apr-14 | 15:30 | 10:20 | 18.83 | 1.0 | 1.2 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.27 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 10:20 | 12:50 | 26.50 | | | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH3 | small | 629098 | 5447797 | 11-Apr-14 | 12-Apr-14 | 9:45 | 12:20 | 26.58 | 2.5 | 3.0 | 1.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 3.61 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 12:20 | 9:15 | 20.92 | | | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 0 | 6.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:15 | 12:15 | 27.00 | | | 1.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 7 | 0 | 6.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 14-Apr-14 | 15-Apr-14 | 12:15 | 9:15 | 21.00 | | | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.29 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH4 | small | 629222 | 5447837 | 12-Apr-14 | 13-Apr-14 | 12:45 | 9:30 | 20.75 | 0.5 | 1.0 | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:30 | 13:10 | 27.67 | | | 1.15 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH5 | small | 629009 | 5447756 | 14-Apr-14 | 15-Apr-14 | 13:10 | 9:30 | 20.33 | 1.3 | 1.5 | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.54 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.36 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 9:30 | 14:45 | 29.25 | | | 1.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 9 | 0 | 7.38 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH6 | small | 629129 | 5447736 | 14-Apr-14 | 15-Apr-14 | 13:25 | 9:30 | 20.08 | 1.6 | 2.0 | 0.84 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.39 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 6 | 6 | 7.17 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 9:30 | 15:00 | 29.50 | | | 1.23 | 1 | 0 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH7 | small | 629014 | 5447587 | 15-Apr-14 | 16-Apr-14 | 10:30 | 14:20 | 27.83 | 2.2 | 2.5 | 1.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH8 | small | 628829 | 5447887 | 16-Apr-14 | 17-Apr-14 | 14:30 | 12:50 | 22.33 | 1.3 | 1.5 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 0 | 5.37 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH9 | small | 628892 | 5447832 | 16-Apr-14 | 18-Apr-14 | 15:00 | 15:15 | 48.25 | 1.5 | 1.6 | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 1.99 | 0 | 0 | 0.00 | 1 | 0 | 0.50 | 1 | 0 | 0.50 |
| | ER-SH10 | small | 628671 | 5447901 | 16-Apr-14 | 17-Apr-14 | 15:10 | 15:30 | 24.33 | 1.6 | 1.7 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 3.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 15:30 | 14:35 | 23.08 | | | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 14:35 | 8:55 | 18.33 | | | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.04 |
| | ER-SH11 | small | 628311 | 5448090 | 17-Apr-14 | 18-Apr-14 | 12:55 | 14:15 | 25.33 | 3.2 | 3.4 | 0.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.31 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH12 | small | 626954 | 5446764 | 17-Apr-14 | 18-Apr-14 | 14:00 | 13:00 | 23.00 | 1.8 | 1.6 | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 1.89 | 0 | 0 | 0.00 |
| | ER-SH13 | small | 627582 | 5447191 | 17-Apr-14 | 18-Apr-14 | 16:30 | 13:40 | 21.17 | 1.8 | 2.1 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 3.40 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 13:40 | 10:30 | 20.83 | | | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 3.46 |
| | ER-SH15 | small | 628097 | 5448156 | 18-Apr-14 | 19-Apr-14 | 14:30 | 10:00 | 19.50 | 2.0 | 2.2 | 0.81 | 0 | 0 | 0.00 | 2 | 0 | 2.46 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH16 | small | 628511 | 5447210 | 18-Apr-14 | 19-Apr-14 | 14:50 | 9:50 | 19.00 | 1.5 | 2.0 | 0.79 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.26 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.53 |
| | ER-LH1 | medium | 629285 | 5447787 | 10-Apr-14 | 11-Apr-14 | 15:45 | 10:45 | 19.00 | 2.0 | 2.5 | 0.79 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 21 | 0 | 26.53 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH2 | medium | 629160 | 5447834 | 10-Apr-14 | 11-Apr-14 | 16:00 | 11:15 | 19.25 | 2.5 | 3.0 | 0.80 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 79 | 0 | 98.49 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 5 | 6.23 |
| | ER-LH3 | medium | 629226 | 5447858 | 11-Apr-14 | 12-Apr-14 | 11:00 | 11:45 | 24.75 | 2.0 | 2.5 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH4 | medium | 629152 | 5447857 | 12-Apr-14 | 13-Apr-14 | 12:00 | 9:35 | 21.58 | 1.8 | 2.5 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:35 | 12:30 | 26.92 | | | 1.12 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.89 |
| | ER-LH5 | medium | 629018 | 5447850 | 12-Apr-14 | 13-Apr-14 | 12:15 | 9:50 | 21.58 | 1.5 | 1.0 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.11 | 0 | 0 | 0.00 |
| | ER-LH6 | medium | 629089 | 5447606 | 13-Apr-14 | 14-Apr-14 | 10:15 | 13:30 | 27.25 | 1.6 | 1.9 | 1.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH7 | medium | 628902 | 5447916 | 14-Apr-14 | 15-Apr-14 | 12:45 | 9:45 | 21.00 | 2.8 | 3.2 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 8 | 0 | 9.14 | 0 | 0 | 0.00 | 3 | 3 | 3.43 | 6 | 6 | 6.86 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 9:45 | 15:15 | 29.50 | | | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH8 | medium | 628802 | 5447795 | 14-Apr-14 | 15-Apr-14 | 13:45 | 9:50 | 20.08 | 2.0 | 2.5 | 0.84 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 9 | 0 | 10.76 | 0 | 0 | 0.00 | 1 | 1 | 1.20 | 0 | 0 | 0.00 |
| | ER-LH9 | medium | 628756 | 5447918 | 15-Apr-14 | 16-Apr-14 | 10:05 | 15:30 | 29.42 | 2.0 | 2.5 | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH10 | medium | 628776 | 5448056 | 16-Apr-14 | 17-Apr-14 | 15:25 | 15:20 | 23.92 | 1.8 | 1.9 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH11 | medium | 628574 | 5448003 | 16-Apr-14 | 17-Apr-14 | 15:40 | 13:30 | 21.83 | 2.1 | 2.2 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH12 | medium | 628561 | 5447327 | 17-Apr-14 | 18-Apr-14 | 12:30 | 14:45 | 26.25 | 1.6 | 1.8 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 17 | 0 | 15.54 | 2 | 0 | 1.83 | 1 | 0 | 0.91 | 2 | 2 | 1.83 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 14:45 | 9:45 | 19.00 | | | 0.79 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 2.53 | 15 | 15 | 18.95 |
| | ER-LH13 | medium | 628979 | 5448091 | 17-Apr-14 | 18-Apr-14 | 13:35 | 14:25 | 24.83 | 1.1 | 1.3 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.93 | 0 | 0 | 0.00 | 5 | 5 | 4.83 | 4 | 3 | 3.87 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 14:25 | 8:45 | 18.33 | | | 0.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 10 | 0 | 13.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH14 | medium | 626842 | 5446575 | 17-Apr-14 | 18-Apr-14 | 14:15 | 13:10 | 22.92 | 2.4 | 2.8 | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 13:10 | 10:45 | 21.58 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.11 | 0 | 0 | 0.00 | 1 | 0 | 1.11 | 1 | 1 | 1.11 |
| | ER-LH15 | medium | 627479 | 5447170 | 17-Apr-14 | 18-Apr-14 | 14:47 | 10:30 | 19.72 | 1.5 | 2.0 | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.22 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 10:30 | 13:40 | 27.17 | | | 1.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.77 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 3.53 |
| | **TOTAL** | | | | | | | | **1,162** | **-** | **-** | **48.34** | **1** | **0** | **0.02** | **2** | **0** | **0.04** | **0** | **0** | **0.00** | **217** | **0** | **4.49** | **2** | **0** | **0.04** | **23** | **16** | **0.48** | **64** | **59** | **1.32** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## **Table F.14:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2014

| Area | Station | Size | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Bull Trout | | | Burbot | | | Juvenile Trout | | | Largescale Sucker | | | Mountain Whitefish | | | Northern Pikeminnow | | | Peamouth Chub | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Gold Creek | GC-SH1 | small | 629513 | 5436991 | 10-Apr-14 | 11-Apr-14 | 12:00 | 14:30 | 26.50 | 1.2 | 1.5 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.91 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 14:30 | 10:05 | 19.58 | | | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.23 | 1 | 1 | 1.23 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 10:05 | 11:45 | 25.67 | | | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.94 | 0 | 0 | 0.00 |
| | GC-SH2 | small | 629508 | 5437016 | 10-Apr-14 | 11-Apr-14 | 12:15 | 14:40 | 26.42 | 1.0 | 1.3 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 14:40 | 10:15 | 19.58 | | | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH3 | small | 629687 | 5436889 | 12-Apr-14 | 13-Apr-14 | 10:30 | 11:50 | 25.33 | 1.5 | 2.2 | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.95 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 11:50 | 9:20 | 21.50 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH4 | small | 629715 | 5437265 | 13-Apr-14 | 14-Apr-14 | 12:30 | 9:30 | 21.00 | 2.2 | 2.3 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.29 | 1 | 1 | 1.14 |
| | | | | | 14-Apr-14 | 15-Apr-14 | 9:30 | 12:15 | 26.75 | | | 1.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 1.79 | 1 | 1 | 0.90 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 12:15 | 9:45 | 21.50 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.12 | 0 | 0 | 0.00 |
| | GC-SH5 | small | 629784 | 5437319 | 14-Apr-14 | 15-Apr-14 | 9:30 | 11:45 | 26.25 | 2.0 | 2.5 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.91 | 0 | 0 | 0.00 |
| | GC-SH6 | small | 629751 | 5437113 | 15-Apr-14 | 16-Apr-14 | 12:20 | 10:30 | 22.17 | 2.3 | 2.5 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH7 | small | 630094 | 5437441 | 16-Apr-14 | 17-Apr-14 | 9:50 | 10:15 | 24.42 | 2.2 | 2.5 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 1 | 2.95 | 0 | 0 | 0.00 |
| | GC-SH8 | small | 630214 | 5436886 | 16-Apr-14 | 17-Apr-14 | 10:00 | 10:45 | 24.75 | 5.7 | 6.0 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.94 | 0 | 0 | 0.00 |
| | GC-LH1 | medium | 629607 | 5437033 | 10-Apr-14 | 11-Apr-14 | 12:30 | 2:15 | 13.75 | 1.8 | 2.0 | 0.57 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-LH2 | medium | 629670 | 5437071 | 10-Apr-14 | 11-Apr-14 | 12:45 | 13:45 | 25.00 | 3.5 | 4.2 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 1.92 |
| | GC-LH3 | medium | 629646 | 5436958 | 11-Apr-14 | 12-Apr-14 | 14:00 | 10:00 | 20.00 | 2.0 | 2.8 | 0.83 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.40 | 12 | 12 | 14.40 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 10:00 | 12:00 | 26.00 | | | 1.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.92 | 1 | 1 | 0.92 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:00 | 9:45 | 21.75 | | | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.10 | 9 | 9 | 9.93 |
| | | | | | 14-Apr-14 | 15-Apr-14 | 9:45 | 12:00 | 26.25 | | | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.91 | 0 | 0 | 0.00 | 2 | 2 | 1.83 | 3 | 3 | 2.74 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 12:00 | 9:30 | 21.50 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-LH4 | medium | 629637 | 5436976 | 12-Apr-14 | 13-Apr-14 | 9:45 | 12:15 | 26.50 | 2.0 | 2.5 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.91 | 0 | 0 | 0.00 | 2 | 0 | 1.81 | 2 | 2 | 1.81 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:15 | 10:00 | 21.75 | | | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.21 | 3 | 2 | 3.31 |
| | GC-LH5 | medium | 629691 | 5436982 | 14-Apr-14 | 15-Apr-14 | 10:15 | 11:50 | 25.58 | 2.0 | 2.5 | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.94 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 11:50 | 10:00 | 22.17 | | | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.08 | 0 | 0 | 0.00 |
| | GC-LH6 | medium | 629903 | 5437095 | 16-Apr-14 | 17-Apr-14 | 9:38 | 10:00 | 24.37 | 2.5 | 2.9 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.98 | 0 | 0 | 0.00 |
| | GC-LH7 | medium | 630568 | 5437240 | 16-Apr-14 | 17-Apr-14 | 11:00 | 10:00 | 23.00 | 4.5 | 6.0 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **629.03** | **-** | **-** | **26.21** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **3** | **0** | **0.11** | **0** | **0** | **0.00** | **25** | **13** | **0.95** | **38** | **37** | **1.45** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## **Table F.14:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2014

| Area | Station | Size | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Pumpkinseed | | | Rainbow Trout | | | Redside Shiner | | | Slimy Sculpin | | | Westslope Cutthroat Trout | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Sand Creek | SC-SH1 | small | 625363 | 5461138 | 10-Apr-14 | 11-Apr-14 | 14:00 | 12:10 | 22.17 | 1.5 | - | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 12:10 | 10:30 | 22.33 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH2 | small | 625147 | 5461056 | 10-Apr-14 | 11-Apr-14 | 14:05 | 12:05 | 22.00 | 1.5 | - | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 12:05 | 10:45 | 22.67 | | | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH3 | small | 625183 | 5461486 | 10-Apr-14 | 11-Apr-14 | 14:15 | 10:55 | 20.67 | 1.5 | - | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.16 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 10:55 | 10:35 | 23.67 | | | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH4 | small | 624918 | 5461748 | 10-Apr-14 | 11-Apr-14 | 14:20 | 11:00 | 20.67 | 1.0 | - | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH5 | small | 624979 | 5461292 | 10-Apr-14 | 11-Apr-14 | 14:35 | 11:40 | 21.08 | 0.8 | - | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH6 | small | 625306 | 5460936 | 11-Apr-14 | 12-Apr-14 | 12:30 | 11:00 | 22.50 | 1.0 | - | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH7 | small | 625160 | 5461020 | 11-Apr-14 | 12-Apr-14 | 12:35 | 10:50 | 22.25 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH8 | small | 625529 | 5460486 | 12-Apr-14 | 14-Apr-14 | 13:25 | 11:30 | 46.08 | 1.0 | - | 1.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH9 | small | 625544 | 546055 | 12-Apr-14 | 13-Apr-14 | 13:30 | 12:28 | 22.97 | 1.5 | - | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:28 | 11:15 | 22.78 | | | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH10 | small | 625523 | 5460626 | 12-Apr-14 | 13-Apr-14 | 13:35 | 12:25 | 22.83 | 1.0 | - | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:25 | 10:42 | 22.28 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH11 | small | 625516 | 5460704 | 12-Apr-14 | 13-Apr-14 | 13:50 | 12:22 | 22.53 | 1.0 | - | 0.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:22 | 10:40 | 22.30 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH12 | small | 625492 | 5460750 | 12-Apr-14 | 13-Apr-14 | 13:55 | 12:20 | 22.42 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:20 | 10:35 | 22.25 | | | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH13 | small | 625472 | 5459686 | 14-Apr-14 | 15-Apr-14 | 10:55 | 10:20 | 23.42 | 1.0 | - | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH14 | small | 625395 | 5459525 | 14-Apr-14 | 15-Apr-14 | 11:00 | 10:18 | 23.30 | 1.8 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:18 | 10:25 | 24.12 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH15 | small | 625251 | 5459247 | 14-Apr-14 | 15-Apr-14 | 11:05 | 10:15 | 23.17 | 1.0 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:15 | 10:20 | 24.08 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH16 | small | 625432 | 5459386 | 14-Apr-14 | 15-Apr-14 | 11:45 | 10:10 | 22.42 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:10 | 10:17 | 24.12 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH17 | small | 625341 | 5459269 | 14-Apr-14 | 15-Apr-14 | 11:50 | 10:13 | 22.38 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:13 | 10:15 | 24.03 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH18 | small | 624984 | 5459134 | 16-Apr-14 | 17-Apr-14 | 12:20 | 10:05 | 21.75 | 1.0 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 10:05 | 10:00 | 23.92 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH19 | small | 624943 | 5459179 | 16-Apr-14 | 17-Apr-14 | 12:25 | 10:05 | 21.67 | 1.0 | - | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 10:05 | 10:05 | 24.00 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH20 | small | 625261 | 5459240 | 16-Apr-14 | 17-Apr-14 | 12:35 | 9:30 | 20.92 | 1.0 | - | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 9:30 | 9:50 | 24.33 | | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH21 | small | 625120 | 5459166 | 16-Apr-14 | 17-Apr-14 | 12:45 | 9:55 | 21.17 | 1.0 | - | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH22 | small | 625201 | 5459180 | 17-Apr-14 | 18-Apr-14 | 9:50 | 9:35 | 23.75 | 1.0 | - | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-SH23 | small | 624980 | 5459058 | 17-Apr-14 | 18-Apr-14 | 10:00 | 9:45 | 23.75 | 1.0 | - | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH1 | large | 624869 | 5461458 | 10-Apr-14 | 11-Apr-14 | 12:35 | 11:45 | 23.17 | 1.0 | - | 0.97 | 1 | 0 | 1.04 | 0 | 0 | 0.00 | 2 | 0 | 2.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH2 | large | 624781 | 5461605 | 10-Apr-14 | 11-Apr-14 | 12:45 | 11:10 | 22.42 | 1.0 | - | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH3 | large | 624925 | 5461123 | 11-Apr-14 | 12-Apr-14 | 11:30 | 11:10 | 23.67 | 1.0 | - | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.03 |
| | SC-LH4 | large | 625180 | 5461115 | 11-Apr-14 | 12-Apr-14 | 12:00 | 12:00 | 24.00 | 1.0 | - | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 7 | 0 | 7.00 |
| | SC-LH5 | large | 623376 | 5461418 | 12-Apr-14 | 13-Apr-14 | 12:45 | 10:45 | 22.00 | 1.0 | - | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH6 | large | 623398 | 5461375 | 12-Apr-14 | 13-Apr-14 | 13:00 | 12:00 | 23.00 | 1.0 | - | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:00 | 12:05 | 24.08 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 0 | 4.98 | 0 | 0 | 0.00 | 1 | 0 | 1.00 | 0 | 0 | 0.00 |
| | SC-LH7 | large | 623369 | 5461325 | 13-Apr-14 | 14-Apr-14 | 11:50 | 12:50 | 25.00 | 2.5 | - | 1.04 | 0 | 0 | 0.00 | 1 | 0 | 0.96 | 1 | 0 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH8 | large | 623391 | 5461316 | 14-Apr-14 | 15-Apr-14 | 12:45 | 10:35 | 21.83 | 2.5 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH9 | large | 623367 | 5461287 | 14-Apr-14 | 15-Apr-14 | 13:05 | 10:50 | 21.75 | 2.5 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 10:50 | 10:05 | 23.25 | | | 0.97 | 0 | 0 | 0.00 | 2 | 2 | 2.06 | 1 | 0 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH10 | large | 623511 | 5461235 | 15-Apr-14 | 16-Apr-14 | 11:05 | 11:05 | 24.00 | 2.5 | - | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH11 | large | 625271 | 5459077 | 16-Apr-14 | 17-Apr-14 | 11:50 | 9:20 | 21.50 | 2.5 | - | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH12 | large | 625218 | 5459123 | 16-Apr-14 | 17-Apr-14 | 12:00 | 9:25 | 21.42 | 1.0 | - | 0.89 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 9:25 | 10:00 | 24.58 | | | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-LH13 | large | 625230 | 5458960 | 17-Apr-14 | 18-Apr-14 | 10:20 | 9:40 | 23.33 | 1.5 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **1,231.73** | **-** | **-** | **51.32** | **1** | **0** | **0.02** | **3** | **2** | **0.06** | **13** | **1** | **0.25** | **1** | **0** | **0.02** | **1** | **0** | **0.02** | **10** | **0** | **0.19** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## **Table F.14:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2014

| Area | Station | Size | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Pumpkinseed | | | Rainbow Trout | | | Redside Shiner | | | Slimy Sculpin | | | Westslope Cutthroat Trout | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Elk River | ER-SH1 | small | 629277 | 5447686 | 10-Apr-14 | 11-Apr-14 | 15:00 | 10:15 | 19.25 | 1.5 | 2.0 | 0.80 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 10:15 | 12:35 | 26.33 | | | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 12:35 | 9:25 | 20.83 | | | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:25 | 13:15 | 27.83 | | | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH2 | small | 629267 | 5447798 | 10-Apr-14 | 11-Apr-14 | 15:30 | 10:20 | 18.83 | 1.0 | 1.2 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 10:20 | 12:50 | 26.50 | | | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH3 | small | 629098 | 5447797 | 11-Apr-14 | 12-Apr-14 | 9:45 | 12:20 | 26.58 | 2.5 | 3.0 | 1.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 12:20 | 9:15 | 20.92 | | | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:15 | 12:15 | 27.00 | | | 1.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 14-Apr-14 | 15-Apr-14 | 12:15 | 9:15 | 21.00 | | | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH4 | small | 629222 | 5447837 | 12-Apr-14 | 13-Apr-14 | 12:45 | 9:30 | 20.75 | 0.5 | 1.0 | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:30 | 13:10 | 27.67 | | | 1.15 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH5 | small | 629009 | 5447756 | 14-Apr-14 | 15-Apr-14 | 13:10 | 9:30 | 20.33 | 1.3 | 1.5 | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 9:30 | 14:45 | 29.25 | | | 1.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH6 | small | 629129 | 5447736 | 14-Apr-14 | 15-Apr-14 | 13:25 | 9:30 | 20.08 | 1.6 | 2.0 | 0.84 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 9:30 | 15:00 | 29.50 | | | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH7 | small | 629014 | 5447587 | 15-Apr-14 | 16-Apr-14 | 10:30 | 14:20 | 27.83 | 2.2 | 2.5 | 1.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH8 | small | 628829 | 5447887 | 16-Apr-14 | 17-Apr-14 | 14:30 | 12:50 | 22.33 | 1.3 | 1.5 | 0.93 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH9 | small | 628892 | 5447832 | 16-Apr-14 | 18-Apr-14 | 15:00 | 15:15 | 48.25 | 1.5 | 1.6 | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH10 | small | 628671 | 5447901 | 16-Apr-14 | 17-Apr-14 | 15:10 | 15:30 | 24.33 | 1.6 | 1.7 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 17-Apr-14 | 18-Apr-14 | 15:30 | 14:35 | 23.08 | | | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 14:35 | 8:55 | 18.33 | | | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH11 | small | 628311 | 5448090 | 17-Apr-14 | 18-Apr-14 | 12:55 | 14:15 | 25.33 | 3.2 | 3.4 | 0.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH12 | small | 626954 | 5446764 | 17-Apr-14 | 18-Apr-14 | 14:00 | 13:00 | 23.00 | 1.8 | 1.6 | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.95 |
| | ER-SH13 | small | 627582 | 5447191 | 17-Apr-14 | 18-Apr-14 | 16:30 | 13:40 | 21.17 | 1.8 | 2.1 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.13 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 13:40 | 10:30 | 20.83 | | | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH15 | small | 628097 | 5448156 | 18-Apr-14 | 19-Apr-14 | 14:30 | 10:00 | 19.50 | 2.0 | 2.2 | 0.81 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-SH16 | small | 628511 | 5447210 | 18-Apr-14 | 19-Apr-14 | 14:50 | 9:50 | 19.00 | 1.5 | 2.0 | 0.79 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH1 | medium | 629285 | 5447787 | 10-Apr-14 | 11-Apr-14 | 15:45 | 10:45 | 19.00 | 2.0 | 2.5 | 0.79 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH2 | medium | 629160 | 5447834 | 10-Apr-14 | 11-Apr-14 | 16:00 | 11:15 | 19.25 | 2.5 | 3.0 | 0.80 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH3 | medium | 629226 | 5447858 | 11-Apr-14 | 12-Apr-14 | 11:00 | 11:45 | 24.75 | 2.0 | 2.5 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH4 | medium | 629152 | 5447857 | 12-Apr-14 | 13-Apr-14 | 12:00 | 9:35 | 21.58 | 1.8 | 2.5 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 9:35 | 12:30 | 26.92 | | | 1.12 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH5 | medium | 629018 | 5447850 | 12-Apr-14 | 13-Apr-14 | 12:15 | 9:50 | 21.58 | 1.5 | 1.0 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH6 | medium | 629089 | 5447606 | 13-Apr-14 | 14-Apr-14 | 10:15 | 13:30 | 27.25 | 1.6 | 1.9 | 1.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH7 | medium | 628902 | 5447916 | 14-Apr-14 | 15-Apr-14 | 12:45 | 9:45 | 21.00 | 2.8 | 3.2 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 9:45 | 15:15 | 29.50 | | | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH8 | medium | 628802 | 5447795 | 14-Apr-14 | 15-Apr-14 | 13:45 | 9:50 | 20.08 | 2.0 | 2.5 | 0.84 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH9 | medium | 628756 | 5447918 | 15-Apr-14 | 16-Apr-14 | 10:05 | 15:30 | 29.42 | 2.0 | 2.5 | 1.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH10 | medium | 628776 | 5448056 | 16-Apr-14 | 17-Apr-14 | 15:25 | 15:20 | 23.92 | 1.8 | 1.9 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH11 | medium | 628574 | 5448003 | 16-Apr-14 | 17-Apr-14 | 15:40 | 13:30 | 21.83 | 2.1 | 2.2 | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH12 | medium | 628561 | 5447327 | 17-Apr-14 | 18-Apr-14 | 12:30 | 14:45 | 26.25 | 1.6 | 1.8 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 14:45 | 9:45 | 19.00 | | | 0.79 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH13 | medium | 628979 | 5448091 | 17-Apr-14 | 18-Apr-14 | 13:35 | 14:25 | 24.83 | 1.1 | 1.3 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 14:25 | 8:45 | 18.33 | | | 0.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH14 | medium | 626842 | 5446575 | 17-Apr-14 | 18-Apr-14 | 14:15 | 13:10 | 22.92 | 2.4 | 2.8 | 0.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 13:10 | 10:45 | 21.58 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-LH15 | medium | 627479 | 5447170 | 17-Apr-14 | 18-Apr-14 | 14:47 | 10:30 | 19.72 | 1.5 | 2.0 | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 18-Apr-14 | 19-Apr-14 | 10:30 | 13:40 | 27.17 | | | 1.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.88 |
| | **TOTAL** | | | | | | | | **1,162** | **-** | **-** | **48.34** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **3** | **0** | **0.06** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

**Table F.14:** **Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2014**

| Area | Station | Size | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Pumpkinseed | | | Rainbow Trout | | | Redside Shiner | | | Slimy Sculpin | | | Westslope Cutthroat Trout | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Gold Creek | GC-SH1 | small | 629513 | 5436991 | 10-Apr-14 | 11-Apr-14 | 12:00 | 14:30 | 26.50 | 1.2 | 1.5 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 14:30 | 10:05 | 19.58 | | | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 10:05 | 11:45 | 25.67 | | | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH2 | small | 629508 | 5437016 | 10-Apr-14 | 11-Apr-14 | 12:15 | 14:40 | 26.42 | 1.0 | 1.3 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 11-Apr-14 | 12-Apr-14 | 14:40 | 10:15 | 19.58 | | | 0.82 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH3 | small | 629687 | 5436889 | 12-Apr-14 | 13-Apr-14 | 10:30 | 11:50 | 25.33 | 1.5 | 2.2 | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 11:50 | 9:20 | 21.50 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH4 | small | 629715 | 5437265 | 13-Apr-14 | 14-Apr-14 | 12:30 | 9:30 | 21.00 | 2.2 | 2.3 | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 14-Apr-14 | 15-Apr-14 | 9:30 | 12:15 | 26.75 | | | 1.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 12:15 | 9:45 | 21.50 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH5 | small | 629784 | 5437319 | 14-Apr-14 | 15-Apr-14 | 9:30 | 11:45 | 26.25 | 2.0 | 2.5 | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH6 | small | 629751 | 5437113 | 15-Apr-14 | 16-Apr-14 | 12:20 | 10:30 | 22.17 | 2.3 | 2.5 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH7 | small | 630094 | 5437441 | 16-Apr-14 | 17-Apr-14 | 9:50 | 10:15 | 24.42 | 2.2 | 2.5 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-SH8 | small | 630214 | 5436886 | 16-Apr-14 | 17-Apr-14 | 10:00 | 10:45 | 24.75 | 5.7 | 6.0 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.97 |
| | GC-LH1 | medium | 629607 | 5437033 | 10-Apr-14 | 11-Apr-14 | 12:30 | 2:15 | 13.75 | 1.8 | 2.0 | 0.57 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-LH2 | medium | 629670 | 5437071 | 10-Apr-14 | 11-Apr-14 | 12:45 | 13:45 | 25.00 | 3.5 | 4.2 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-LH3 | medium | 629646 | 5436958 | 11-Apr-14 | 12-Apr-14 | 14:00 | 10:00 | 20.00 | 2.0 | 2.8 | 0.83 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 12-Apr-14 | 13-Apr-14 | 10:00 | 12:00 | 26.00 | | | 1.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:00 | 9:45 | 21.75 | | | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 14-Apr-14 | 15-Apr-14 | 9:45 | 12:00 | 26.25 | | | 1.09 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 12:00 | 9:30 | 21.50 | | | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-LH4 | medium | 629637 | 5436976 | 12-Apr-14 | 13-Apr-14 | 9:45 | 12:15 | 26.50 | 2.0 | 2.5 | 1.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 13-Apr-14 | 14-Apr-14 | 12:15 | 10:00 | 21.75 | | | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.10 |
| | GC-LH5 | medium | 629691 | 5436982 | 14-Apr-14 | 15-Apr-14 | 10:15 | 11:50 | 25.58 | 2.0 | 2.5 | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 15-Apr-14 | 16-Apr-14 | 11:50 | 10:00 | 22.17 | | | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-LH6 | medium | 629903 | 5437095 | 16-Apr-14 | 17-Apr-14 | 9:38 | 10:00 | 24.37 | 2.5 | 2.9 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.97 |
| | GC-LH7 | medium | 630568 | 5437240 | 16-Apr-14 | 17-Apr-14 | 11:00 | 10:00 | 23.00 | 4.5 | 6.0 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **629.03** | **-** | **-** | **26.21** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **1** | **0** | **0.04** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **4** | **1** | **0.15** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## **Table F.15:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, August 2014

| Area | Station | Size | Location (NAD 83, Zone 11U) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Bull Trout | | | Burbot | | | Kokanee | | | Largescale Sucker | | | Longnose Sucker | | | Mountain Whitefish | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Sand Creek | SC-HN1 | small | 623366 | 5462663 | 18-Aug-14 | 19-Aug-14 | 16:30 | 14:20 | 21.83 | 3.2 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 21-Aug-14 | 14:20 | 10:40 | 44.33 | | | 1.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN2 | medium | 623480 | 5462896 | 18-Aug-14 | 19-Aug-14 | 16:45 | 14:30 | 21.75 | 3.0 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 21-Aug-14 | 14:30 | 11:00 | 44.50 | | | 1.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN3 | small | 623558 | 5462945 | 18-Aug-14 | 19-Aug-14 | 17:00 | 15:00 | 22.00 | 2.7 | 2.8 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 21-Aug-14 | 15:00 | 11:50 | 44.83 | | | 1.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN4 | medium | 623573 | 5463141 | 19-Aug-14 | 21-Aug-14 | 15:20 | 12:30 | 45.17 | 1.8 | - | 1.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.53 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 21-Aug-14 | 23-Aug-14 | 12:30 | 12:30 | 48.00 | | | 2.00 | 1 | 0 | 0.50 | 0 | 0 | 0.00 | 13 | 8 | 6.50 | 3 | 0 | 1.50 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 23-Aug-14 | 25-Aug-14 | 12:30 | 10:00 | 45.50 | | | 1.90 | 0 | 0 | 0.00 | 1 | 0 | 0.53 | 13 | 7 | 6.86 | 22 | 1 | 11.60 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN5 | small | 623383 | 5462284 | 21-Aug-14 | 23-Aug-14 | 10:45 | 11:45 | 49.00 | 8.2 | - | 1.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN6 | medium | 623775 | 5462302 | 21-Aug-14 | 23-Aug-14 | 11:30 | 12:00 | 48.50 | 7.7 | - | 2.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN7 | small | 623610 | 5462630 | 21-Aug-14 | 23-Aug-14 | 12:00 | 12:00 | 48.00 | 6.6 | - | 2.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN8 | medium | 623461 | 5463290 | 23-Aug-14 | 25-Aug-14 | 14:30 | 10:45 | 44.25 | 0.7 | 1.4 | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 1.00 | 24 | 0 | 12.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **527.67** | **-** | **-** | **22.04** | **1** | **0** | **0.05** | **1** | **0** | **0.05** | **28** | **16** | **1.27** | **50** | **1** | **2.27** | **0** | **0** | **0.00** | **0** | **0** | **0.00** |
| Elk River | ER-HN1 | medium | 632410 | 5447264 | 18-Aug-14 | 19-Aug-14 | 15:30 | 12:25 | 20.92 | 3.8 | 4.2 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 12:25 | 12:45 | 24.33 | | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 12:45 | 15:15 | 50.50 | | | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN2 | small | 632342 | 5447380 | 18-Aug-14 | 19-Aug-14 | 15:45 | 12:45 | 21.00 | 3.6 | - | 2.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN3 | medium | 632208 | 5447533 | 18-Aug-14 | 19-Aug-14 | 16:00 | 13:00 | 21.00 | 2.7 | - | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN4 | small | 632413 | 5447714 | 19-Aug-14 | 20-Aug-14 | 11:15 | 13:50 | 26.58 | 2.0 | - | 1.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 21-Aug-14 | 13:50 | 13:00 | 23.17 | | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN5 | medium | 632137 | 5447900 | 19-Aug-14 | 20-Aug-14 | 13:00 | 14:15 | 25.25 | 2.0 | 2.5 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN6 | small | 632426 | 5448062 | 19-Aug-14 | 20-Aug-14 | 13:30 | 13:45 | 24.25 | 3.2 | - | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 13:45 | 13:15 | 47.50 | | | 1.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN7 | medium | 632171 | 5447985 | 20-Aug-14 | 22-Aug-14 | 14:20 | 13:00 | 46.67 | 1.7 | - | 1.94 | 1 | 0 | 0.51 | 0 | 0 | 0.00 | 2 | 2 | 1.03 | 10 | 0 | 5.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 22-Aug-14 | 24-Aug-14 | 13:00 | 14:00 | 49.00 | | | 2.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.49 | 4 | 0 | 1.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN8 | small | 631489 | 5447050 | 22-Aug-14 | 24-Aug-14 | 13:30 | 13:40 | 48.17 | 6.5 | - | 2.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN9 | small | 631232 | 5446891 | 22-Aug-14 | 24-Aug-14 | 13:30 | 13:45 | 48.25 | 10.8 | - | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN10 | medium | 632872 | 5448101 | 22-Aug-14 | 24-Aug-14 | 15:30 | 2:55 | 35.42 | 0.7 | 1.2 | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 17 | 0 | 8.46 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN11 | medium | 632800 | 5448283 | 24-Aug-14 | 25-Aug-14 | 15:00 | 12:05 | 21.08 | 1.2 | 1.5 | 1.48 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 2.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN12 | medium | 632888 | 5447862 | 24-Aug-14 | 25-Aug-14 | 15:20 | 12:50 | 21.50 | 1.4 | 0.8 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 8 | 3 | 8.93 | 2 | 0 | 2.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 25-Aug-14 | 26-Aug-14 | 12:50 | 12:00 | 23.17 | | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 3 | 4.14 | 12 | 0 | 12.43 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN13 | medium | 632801 | 5447746 | 25-Aug-14 | 26-Aug-14 | 13:00 | 12:15 | 23.25 | 1.7 | 1.5 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 8 | 0 | 8.29 | 7 | 0 | 7.25 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN14 | medium | 632150 | 5447920 | 25-Aug-14 | 26-Aug-14 | 13:30 | 12:50 | 23.33 | 1.9 | 2.7 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.03 | 4 | 0 | 4.13 | 2 | 0 | 2.06 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **624.33** | **-** | **-** | **27.22** | **1** | **0** | **0.04** | **0** | **0** | **0.00** | **24** | **10** | **0.88** | **60** | **0** | **2.20** | **2** | **0** | **0.07** | **0** | **0** | **0.00** |
| Gold Creek | GC-HN1 | small | 628534 | 5436696 | 18-Aug-14 | 19-Aug-14 | 13:45 | 10:30 | 20.75 | 3.7 | - | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 10:30 | 10:00 | 23.50 | | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 10:00 | 10:00 | 48.00 | | | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN2 | small | 628392 | 5436772 | 18-Aug-14 | 19-Aug-14 | 14:00 | 10:45 | 20.75 | 2.5 | - | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 10:45 | 10:45 | 24.00 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 10:45 | 10:15 | 47.50 | | | 1.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN3 | medium | 628414 | 5436887 | 18-Aug-14 | 19-Aug-14 | 14:30 | 11:00 | 20.50 | 2.8 | - | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 11:00 | 11:00 | 24.00 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 11:00 | 11:30 | 48.50 | | | 2.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 19 | 0 | 9.40 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 22-Aug-14 | 24-Aug-14 | 11:30 | 11:30 | 48.00 | | | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 11 | 0 | 5.50 | 0 | 0 | 0.00 | 1 | 0 | 0.50 |
| | | | | | 24-Aug-14 | 26-Aug-14 | 11:30 | 15:15 | 51.75 | | | 2.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 8 | 0 | 3.71 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN4 | medium | 628531 | 5436964 | 19-Aug-14 | 20-Aug-14 | 11:15 | 10:30 | 23.25 | 3.3 | - | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 10:30 | 10:40 | 48.17 | | | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN5 | small | 628914 | 5436830 | 22-Aug-14 | 24-Aug-14 | 10:00 | 9:45 | 47.75 | 7.7 | - | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN6 | small | 628874 | 5436705 | 22-Aug-14 | 24-Aug-14 | 10:30 | 10:00 | 47.50 | 6.4 | - | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN7 | medium | 629101 | 5436792 | 22-Aug-14 | 24-Aug-14 | 10:45 | 10:15 | 47.50 | 9.0 | 10.0 | 1.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN8 | medium | 628233 | 5437172 | 24-Aug-14 | 25-Aug-14 | 11:00 | 14:15 | 27.25 | 1.2 | 1.5 | 1.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 25-Aug-14 | 26-Aug-14 | 14:15 | 14:45 | 24.50 | | | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN9 | medium | 628316 | 5437057 | 25-Aug-14 | 26-Aug-14 | 14:00 | 15:30 | 25.50 | 1.4 | 2.2 | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 3.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **668.67** | **-** | **-** | **27.89** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **45** | **0** | **1.61** | **0** | **0** | **0.00** | **1** | **0** | **0.04** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## **Table F.15:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, August 2014

| Area | Station | Size | Location (NAD 83, Zone 11U) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Depth Range (m) | | Effort (Fishing days) | Northern Pikeminnow | | | Peamouth Chub | | | Pumpkinseed | | | Redside Shiner | | | Westslope Cutthroat Trout | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* | Catch | Mortalities/ Sacrificed | CPUE* |
| Sand Creek | SC-HN1 | small | 623366 | 5462663 | 18-Aug-14 | 19-Aug-14 | 16:30 | 14:20 | 21.83 | 3.2 | - | 0.91 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 21-Aug-14 | 14:20 | 10:40 | 44.33 | | | 1.85 | 2 | 2 | 1.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN2 | medium | 623480 | 5462896 | 18-Aug-14 | 19-Aug-14 | 16:45 | 14:30 | 21.75 | 3.0 | - | 0.91 | 6 | 6 | 6.62 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 21-Aug-14 | 14:30 | 11:00 | 44.50 | | | 1.85 | 14 | 5 | 7.55 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.54 |
| | SC-HN3 | small | 623558 | 5462945 | 18-Aug-14 | 19-Aug-14 | 17:00 | 15:00 | 22.00 | 2.7 | 2.8 | 0.92 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 21-Aug-14 | 15:00 | 11:50 | 44.83 | | | 1.87 | 1 | 0 | 0.54 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN4 | medium | 623573 | 5463141 | 19-Aug-14 | 21-Aug-14 | 15:20 | 12:30 | 45.17 | 1.8 | - | 1.88 | 5 | 0 | 2.66 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 21-Aug-14 | 23-Aug-14 | 12:30 | 12:30 | 48.00 | | | 2.00 | 2 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.50 |
| | | | | | 23-Aug-14 | 25-Aug-14 | 12:30 | 10:00 | 45.50 | | | 1.90 | 4 | 0 | 2.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN5 | small | 623383 | 5462284 | 21-Aug-14 | 23-Aug-14 | 10:45 | 11:45 | 49.00 | 8.2 | - | 1.90 | 1 | 0 | 0.53 | 2 | 2 | 1.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN6 | medium | 623775 | 5462302 | 21-Aug-14 | 23-Aug-14 | 11:30 | 12:00 | 48.50 | 7.7 | - | 2.04 | 1 | 0 | 0.49 | 1 | 1 | 0.49 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN7 | small | 623610 | 5462630 | 21-Aug-14 | 23-Aug-14 | 12:00 | 12:00 | 48.00 | 6.6 | - | 2.02 | 1 | 0 | 0.49 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN8 | medium | 623461 | 5463290 | 23-Aug-14 | 25-Aug-14 | 14:30 | 10:45 | 44.25 | 0.7 | 1.4 | 2.00 | 6 | 1 | 3.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **527.67** | **-** | **-** | **22.04** | **43** | **14** | **1.95** | **3** | **3** | **0.14** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **0** | **0** | **0.00** | **2** | **1** | **0.09** |
| Elk River | ER-HN1 | medium | 632410 | 5447264 | 18-Aug-14 | 19-Aug-14 | 15:30 | 12:25 | 20.92 | 3.8 | 4.2 | 0.87 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 12:25 | 12:45 | 24.33 | | | 1.01 | 4 | 4 | 3.95 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 12:45 | 15:15 | 50.50 | | | 1.01 | 1 | 0 | 0.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN2 | small | 632342 | 5447380 | 18-Aug-14 | 19-Aug-14 | 15:45 | 12:45 | 21.00 | 3.6 | - | 2.10 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN3 | medium | 632208 | 5447533 | 18-Aug-14 | 19-Aug-14 | 16:00 | 13:00 | 21.00 | 2.7 | - | 0.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN4 | small | 632413 | 5447714 | 19-Aug-14 | 20-Aug-14 | 11:15 | 13:50 | 26.58 | 2.0 | - | 1.11 | 1 | 0 | 0.90 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 21-Aug-14 | 13:50 | 13:00 | 23.17 | | | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN5 | medium | 632137 | 5447900 | 19-Aug-14 | 20-Aug-14 | 13:00 | 14:15 | 25.25 | 2.0 | 2.5 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN6 | small | 632426 | 5448062 | 19-Aug-14 | 20-Aug-14 | 13:30 | 13:45 | 24.25 | 3.2 | - | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 13:45 | 13:15 | 47.50 | | | 1.98 | 1 | 1 | 0.51 | 1 | 1 | 0.51 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN7 | medium | 632171 | 5447985 | 20-Aug-14 | 22-Aug-14 | 14:20 | 13:00 | 46.67 | 1.7 | - | 1.94 | 33 | 5 | 16.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 22-Aug-14 | 24-Aug-14 | 13:00 | 14:00 | 49.00 | | | 2.04 | 6 | 0 | 2.94 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 1.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN8 | small | 631489 | 5447050 | 22-Aug-14 | 24-Aug-14 | 13:30 | 13:40 | 48.17 | 6.5 | - | 2.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN9 | small | 631232 | 5446891 | 22-Aug-14 | 24-Aug-14 | 13:30 | 13:45 | 48.25 | 10.8 | - | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN10 | medium | 632872 | 5448101 | 22-Aug-14 | 24-Aug-14 | 15:30 | 2:55 | 35.42 | 0.7 | 1.2 | 2.01 | 14 | 1 | 6.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN11 | medium | 632800 | 5448283 | 24-Aug-14 | 25-Aug-14 | 15:00 | 12:05 | 21.08 | 1.2 | 1.5 | 1.48 | 7 | 0 | 4.74 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 2.71 | 1 | 0 | 0.68 | 0 | 0 | 0.00 |
| | ER-HN12 | medium | 632888 | 5447862 | 24-Aug-14 | 25-Aug-14 | 15:20 | 12:50 | 21.50 | 1.4 | 0.8 | 0.90 | 2 | 0 | 2.23 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 25-Aug-14 | 26-Aug-14 | 12:50 | 12:00 | 23.17 | | | 0.97 | 2 | 0 | 2.07 | 3 | 1 | 3.11 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN13 | medium | 632801 | 5447746 | 25-Aug-14 | 26-Aug-14 | 13:00 | 12:15 | 23.25 | 1.7 | 1.5 | 0.97 | 2 | 0 | 2.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN14 | medium | 632150 | 5447920 | 25-Aug-14 | 26-Aug-14 | 13:30 | 12:50 | 23.33 | 1.9 | 2.7 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **624.33** | **-** | **-** | **27.22** | **73** | **11** | **2.68** | **4** | **2** | **0.15** | **0** | **0** | **0.00** | **10** | **4** | **0.37** | **1** | **0** | **0.04** | **0** | **0** | **0.00** |
| Gold Creek | GC-HN1 | small | 628534 | 5436696 | 18-Aug-14 | 19-Aug-14 | 13:45 | 10:30 | 20.75 | 3.7 | - | 0.86 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 10:30 | 10:00 | 23.50 | | | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 10:00 | 10:00 | 48.00 | | | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN2 | small | 628392 | 5436772 | 18-Aug-14 | 19-Aug-14 | 14:00 | 10:45 | 20.75 | 2.5 | - | 0.86 | 2 | 2 | 2.31 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 10:45 | 10:45 | 24.00 | | | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 10:45 | 10:15 | 47.50 | | | 1.98 | 1 | 0 | 0.51 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN3 | medium | 628414 | 5436887 | 18-Aug-14 | 19-Aug-14 | 14:30 | 11:00 | 20.50 | 2.8 | - | 0.85 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.34 |
| | | | | | 19-Aug-14 | 20-Aug-14 | 11:00 | 11:00 | 24.00 | | | 1.00 | 2 | 0 | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 11:00 | 11:30 | 48.50 | | | 2.02 | 11 | 0 | 5.44 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 23 | 7 | 11.38 |
| | | | | | 22-Aug-14 | 24-Aug-14 | 11:30 | 11:30 | 48.00 | | | 2.00 | 5 | 0 | 2.50 | 1 | 0 | 0.50 | 1 | 1 | 0.50 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 0 | 2.50 |
| | | | | | 24-Aug-14 | 26-Aug-14 | 11:30 | 15:15 | 51.75 | | | 2.16 | 18 | 0 | 8.35 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.46 | 17 | 0 | 7.88 |
| | GC-HN4 | medium | 628531 | 5436964 | 19-Aug-14 | 20-Aug-14 | 11:15 | 10:30 | 23.25 | 3.3 | - | 0.97 | 9 | 8 | 9.29 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | | 20-Aug-14 | 22-Aug-14 | 10:30 | 10:40 | 48.17 | | | 2.01 | 3 | 0 | 1.49 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN5 | small | 628914 | 5436830 | 22-Aug-14 | 24-Aug-14 | 10:00 | 9:45 | 47.75 | 7.7 | - | 2.01 | 5 | 2 | 2.49 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 1 | 1.49 |
| | GC-HN6 | small | 628874 | 5436705 | 22-Aug-14 | 24-Aug-14 | 10:30 | 10:00 | 47.50 | 6.4 | - | 1.99 | 2 | 0 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN7 | medium | 629101 | 5436792 | 22-Aug-14 | 24-Aug-14 | 10:45 | 10:15 | 47.50 | 9.0 | 10.0 | 1.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.51 |
| | GC-HN8 | medium | 628233 | 5437172 | 24-Aug-14 | 25-Aug-14 | 11:00 | 14:15 | 27.25 | 1.2 | 1.5 | 1.14 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.88 | 1 | 0 | 0.88 | 0 | 0 | 0.00 |
| | | | | | 25-Aug-14 | 26-Aug-14 | 14:15 | 14:45 | 24.50 | | | 1.02 | 6 | 0 | 5.88 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.98 | 0 | 0 | 0.00 |
| | GC-HN9 | medium | 628316 | 5437057 | 25-Aug-14 | 26-Aug-14 | 14:00 | 15:30 | 25.50 | 1.4 | 2.2 | 1.06 | 4 | 0 | 3.76 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | | **668.67** | **-** | **-** | **27.89** | **68** | **12** | **2.44** | **1** | **0** | **0.04** | **1** | **1** | **0.04** | **1** | **0** | **0.04** | **3** | **0** | **0.11** | **53** | **12** | **1.90** |

* Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## Table F.16: Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (fishing days) | Depth Range (m) | | Bull Trout | | | Burbot | | | Largescale Sucker | | | Longnose Sucker | | | Mountain Whitefish | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Sand Creek | SC-HN-01 | 624847 | 5460861 | 21-Apr-15 | 22-Apr-15 | 12:23 | 10:30 | 22.12 | 0.92 | 3.0 | 3.2 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 3.26 | 2 | 0 | 2.17 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.17 | 0 | 0 | 0.00 |
| | SC-HN-02 | 625519 | 5460391 | 21-Apr-15 | 22-Apr-15 | 13:00 | 9:28 | 20.47 | 0.85 | 5.3 | 8.5 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-03 | 623200 | 5461954 | 22-Apr-15 | 23-Apr-15 | 10:10 | 9:50 | 23.67 | 0.99 | 0.9 | 1.3 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.01 | 1 | 0 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.01 | 0 | 0 | 0.00 | 1 | 1 | 1.01 |
| | SC-HN-04 | 623344 | 5461788 | 22-Apr-15 | 23-Apr-15 | 10:50 | 9:25 | 22.58 | 0.94 | 1.9 | 2.0 | 1 | 0 | 1.06 | 0 | 0 | 0.00 | 1 | 0 | 1.06 | 1 | 0 | 1.06 | 0 | 0 | 0.00 | 1 | 1 | 1.06 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-05 | 623178 | 5461858 | 23-Apr-15 | 24-Apr-15 | 9:40 | 8:53 | 23.22 | 0.97 | 0.9 | 1.1 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.03 | 1 | 1 | 1.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.03 | 1 | 1 | 1.03 | 0 | 0 | 0.00 |
| | SC-HN-06 | 623380 | 5461954 | 23-Apr-15 | 24-Apr-15 | 10:15 | 9:15 | 23.00 | 0.96 | 0.9 | 1.7 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-07 | 623144 | 5461817 | 24-Apr-15 | 25-Apr-15 | 9:05 | 10:00 | 24.92 | 1.04 | 1.4 | 1.5 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-08 | 623387 | 5461895 | 24-Apr-15 | 25-Apr-15 | 9:28 | 10:15 | 24.78 | 1.03 | 2.0 | 2.1 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.97 | 1 | 1 | 0.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-09 | 625500 | 5460013 | 25-Apr-15 | 27-Apr-15 | 11:35 | 9:20 | 45.75 | 1.91 | 3.9 | 4.3 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.52 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 1.05 | 0 | 0 | 0.00 | 1 | 1 | 0.52 | 4 | 4 | 2.10 |
| | SC-HN-10 | 625421 | 5459714 | 25-Apr-15 | 27-Apr-15 | 11:50 | 9:49 | 45.98 | 1.92 | 3.9 | 4.3 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-11 | 626117 | 5458112 | 26-Apr-15 | 27-Apr-15 | 11:55 | 10:15 | 22.33 | 0.93 | 3.9 | 4.1 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 9 | 4 | 9.67 | 8 | 8 | 8.60 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-12 | 625502 | 5460026 | 27-Apr-15 | 28-Apr-15 | 9:44 | 9:50 | 24.10 | 1.00 | 4.2 | - | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.00 |
| | SC-HN-13 | 626181 | 5458221 | 27-Apr-15 | 28-Apr-15 | 10:10 | 10:15 | 24.08 | 1.00 | 2.9 | 3.2 | 0 | 0 | 0.00 | 1 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.00 | 2 | 2 | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-14 | 626140 | 5458120 | 27-Apr-15 | 28-Apr-15 | 10:30 | 10:47 | 24.28 | 1.01 | 2.9 | 3.7 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 11 | 5 | 10.87 | 2 | 2 | 1.98 | 0 | 0 | 0.00 | 6 | 6 | 5.93 |
| | SC-HN-15 | 625509 | 5459989 | 28-Apr-15 | 29-Apr-15 | 9:30 | 9:09 | 23.65 | 0.99 | 3.7 | 3.8 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-16 | 626161 | 5458231 | 28-Apr-15 | 29-Apr-15 | 10:37 | 10:30 | 23.88 | 1.00 | 2.4 | 3.0 | 1 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.00 | 0 | 0 | 0.00 | 1 | 1 | 1.00 |
| | SC-HN-17 | 626161 | 5458130 | 28-Apr-15 | 29-Apr-15 | 11:00 | 10:43 | 23.72 | 0.99 | 2.7 | 3.1 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 4.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.01 |
| | SC-HN-18 | 625517 | 5459978 | 29-Apr-15 | 30-Apr-15 | 9:15 | 9:00 | 23.75 | 0.99 | 3.8 | 4.1 | 0 | 0 | 0.00 | 2 | 0 | 2.02 | 0 | 0 | 0.00 | 1 | 0 | 1.01 | 0 | 0 | 0.00 | 6 | 0 | 6.06 | 1 | 1 | 1.01 | 1 | 1 | 1.01 | 2 | 2 | 2.02 |
| | SC-HN-19 | 626247 | 5458220 | 29-Apr-15 | 30-Apr-15 | 10:35 | 10:00 | 23.42 | 0.98 | 2.2 | 2.9 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-20 | 626146 | 5458120 | 29-Apr-15 | 30-Apr-15 | 10:48 | 10:03 | 23.25 | 0.97 | 1.9 | 3.0 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-21 | 625476 | 5460007 | 30-Apr-15 | 1-May-15 | 9:00 | 9:25 | 24.42 | 1.02 | 3.8 | - | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.98 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 0.98 | 0 | 0 | 0.00 | 1 | 1 | 0.98 | 1 | 1 | 0.98 |
| | SC-HN-22 | 626164 | 5458276 | 30-Apr-15 | 1-May-15 | 10:20 | 9:56 | 23.60 | 0.98 | 2.9 | 4.1 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.03 | 0 | 0 | 0.00 | 1 | 1 | 1.02 | 3 | 3 | 3.05 |
| | SC-HN-23 | 626090 | 5458091 | 30-Apr-15 | 1-May-15 | 10:38 | 10:00 | 23.37 | 0.97 | 4.1 | 5.2 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 4.11 | 1 | 0 | 1.03 | 0 | 0 | 0.00 | 10 | 10 | 10.27 |
| | **TOTAL** | | | | | | | **584.33** | **24.35** | **-** | **-** | **2** | **0** | **0.08** | **3** | **0** | **0.12** | **9** | **7** | **0.37** | **6** | **1** | **0.25** | **0** | **0** | **0.00** | **44** | **13** | **1.81** | **18** | **17** | **0.74** | **7** | **7** | **0.29** | **30** | **30** | **1.23** |
| Elk River | ER-HN-01 | 630161 | 5447179 | 21-Apr-15 | 22-Apr-15 | 14:50 | 10:40 | 19.83 | 0.83 | 2.7 | 2.8 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN-02 | 630086 | 5447284 | 21-Apr-15 | 22-Apr-15 | 16:10 | 11:10 | 19.00 | 0.79 | 3.3 | 3.4 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 5 | 6.32 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 11:10 | 10:15 | 23.08 | 0.96 | | | 0 | 0 | 0.00 | 1 | 0 | 1.04 | 1 | 1 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.08 | 1 | 1 | 1.04 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN-03 | 629673 | 5447033 | 22-Apr-15 | 23-Apr-15 | 11:00 | 9:55 | 22.92 | 0.95 | 2.3 | 3.6 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 7 | 7 | 7.33 | 2 | 2 | 2.09 | 3 | 3 | 3.14 | 3 | 3 | 3.14 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:55 | 9:45 | 23.83 | 0.99 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN-04 | 628886 | 5447522 | 23-Apr-15 | 24-Apr-15 | 10:45 | 9:15 | 22.50 | 0.94 | 2.4 | 3.7 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.07 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.07 | 0 | 0 | 0.00 | 1 | 1 | 1.07 | 0 | 0 | 0.00 |
| | ER-HN-05 | 629436 | 5447496 | 24-Apr-15 | 26-Apr-15 | 9:35 | 9:39 | 48.07 | 2.00 | 3.4 | 5.2 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.50 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.50 |
| | ER-HN-06 | 630134 | 5447622 | 24-Apr-15 | 26-Apr-15 | 10:10 | 10:10 | 48.00 | 2.00 | 2.9 | 3.8 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 2 | 2.50 | 1 | 1 | 0.50 | 1 | 1 | 0.50 | 0 | 0 | 0.00 |
| | | | | 26-Apr-15 | 27-Apr-15 | 10:10 | 9:50 | 23.67 | 0.99 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 4.06 | 0 | 0 | 0.00 | 2 | 2 | 2.03 |
| | | | | 27-Apr-15 | 28-Apr-15 | 9:50 | 10:00 | 24.17 | 1.01 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 1.99 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 1.99 | 3 | 3 | 2.98 | 0 | 0 | 0.00 |
| | | | | 28-Apr-15 | 29-Apr-15 | 10:00 | 9:50 | 23.83 | 0.99 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 2.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.01 | 4 | 2 | 4.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN-07 | 629296 | 5447502 | 26-Apr-15 | 27-Apr-15 | 9:55 | 10:10 | 24.25 | 1.01 | 5.8 | 5.9 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | ER-HN-08 | 628633 | 5447383 | 27-Apr-15 | 28-Apr-15 | 10:25 | 9:30 | 23.08 | 0.96 | 2.5 | 4.3 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 7 | 2 | 7.28 | 1 | 1 | 1.04 | 0 | 0 | 0.00 | 15 | 2 | 15.60 | 5 | 3 | 5.20 | 0 | 0 | 0.00 | 1 | 1 | 1.04 |
| | | | | 28-Apr-15 | 29-Apr-15 | 9:30 | 9:30 | 24.00 | 1.00 | | | 0 | 0 | 0.00 | 1 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 10 | 10 | 10.00 |
| | | | | 29-Apr-15 | 30-Apr-15 | 9:30 | 9:05 | 23.58 | 0.98 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 0 | 4.07 | 2 | 0 | 2.04 | 0 | 0 | 0.00 | 4 | 0 | 4.07 | 2 | 0 | 2.04 | 1 | 0 | 1.02 | 16 | 16 | 16.28 |
| | | | | 30-Apr-15 | 1-May-15 | 9:05 | 9:02 | 23.95 | 1.00 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 2.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 9 | 5 | 9.02 |
| | ER-HN-09 | 630006 | 5447930 | 29-Apr-15 | 30-Apr-15 | 9:55 | 9:30 | 23.58 | 0.98 | 3.2 | 3.2 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 14 | 10 | 14.25 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 0 | 1.02 | 2 | 0 | 2.04 | 2 | 2 | 2.04 | 0 | 0 | 0.00 |
| | | | | 30-Apr-15 | 1-May-15 | 9:30 | 9:15 | 23.75 | 0.99 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **465.10** | **19.38** | **-** | **-** | **0** | **0** | **0.00** | **2** | **0** | **0.10** | **43** | **27** | **2.22** | **3** | **1** | **0.15** | **0** | **0** | **0.00** | **45** | **20** | **2.32** | **23** | **14** | **1.19** | **11** | **10** | **0.57** | **42** | **38** | **2.17** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

## Table F.16: Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (fishing days) | Depth Range (m) | | Bull Trout | | | Burbot | | | Largescale Sucker | | | Longnose Sucker | | | Mountain Whitefish | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Gold Creek | GC-HN-01 | 629265 | 5436908 | 21-Apr-15 | 22-Apr-15 | 12:00 | 8:45 | 20.75 | 0.86 | 1.3 | 1.5 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 3 | 5.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.16 | 2 | 2 | 2.31 | 0 | 0 | 0.00 | 2 | 2 | 2.31 |
| | | | | 22-Apr-15 | 23-Apr-15 | 9:00 | 9:30 | 24.50 | 1.02 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 2.94 | 0 | 0 | 0.00 | 1 | 1 | 0.98 | 0 | 0 | 0.00 | 6 | 6 | 5.88 | 1 | 1 | 0.98 | 3 | 3 | 2.94 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:40 | 9:20 | 23.67 | 0.99 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN-02 | 629207 | 5437023 | 21-Apr-15 | 22-Apr-15 | 12:25 | 9:05 | 20.67 | 0.86 | 0.5 | 1.0 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 2 | 2.32 | 0 | 0 | 0.00 |
| | GC-HN-03 | 629182 | 5436976 | 22-Apr-15 | 23-Apr-15 | 9:15 | 9:45 | 24.50 | 1.02 | 1.5 | 2.0 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.98 |
| | GC-HN-04 | 629257 | 5436902 | 23-Apr-15 | 24-Apr-15 | 10:10 | 9:00 | 22.83 | 0.95 | 1.5 | 1.5 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.05 | 1 | 1 | 1.05 | 1 | 1 | 1.05 |
| | | | | 24-Apr-15 | 25-Apr-15 | 9:05 | 9:15 | 24.17 | 1.01 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 3.97 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 2.98 | 3 | 3 | 2.98 | 0 | 0 | 0.00 | 2 | 2 | 1.99 |
| | GC-HN-05 | 629242 | 5436945 | 24-Apr-15 | 25-Apr-15 | 9:30 | 8:55 | 23.42 | 0.98 | 1.0 | 2.0 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 4 | 4.10 |
| | GC-HN-06 | 629264 | 5436804 | 25-Apr-15 | 26-Apr-15 | 9:10 | 10:15 | 25.08 | 1.05 | 1.0 | 1.0 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 0.96 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 5 | 4.78 | 1 | 1 | 0.96 | 4 | 4 | 3.83 |
| | | | | 26-Apr-15 | 27-Apr-15 | 10:20 | 9:10 | 22.83 | 0.95 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 1 | 2.10 | 1 | 0 | 1.05 | 4 | 4 | 4.20 | 2 | 2 | 2.10 |
| | | | | 27-Apr-15 | 29-Apr-15 | 9:15 | 9:10 | 47.92 | 2.00 | | | 1 | 0 | 0.50 | 0 | 0 | 0.00 | 3 | 3 | 1.50 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 5 | 3 | 2.50 | 2 | 0 | 1.00 | 0 | 0 | 0.00 | 6 | 6 | 3.01 |
| | | | | 29-Apr-15 | 30-Apr-15 | 9:25 | 9:30 | 24.08 | 1.00 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 2 | 0 | 1.99 | 0 | 0 | 0.00 | 2 | 2 | 1.99 |
| | | | | 30-Apr-15 | 1-May-15 | 9:35 | 8:50 | 23.25 | 0.97 | | | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 4 | 2 | 4.13 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 0 | 3.10 | 8 | 6 | 8.26 | 0 | 0 | 0.00 | 5 | 5 | 5.16 |
| | **TOTAL** | | | | | | | **327.67** | **13.65** | **-** | **-** | **1** | **0** | **0.07** | **0** | **0** | **0.00** | **23** | **19** | **1.68** | **0** | **0** | **0.00** | **1** | **1** | **0.07** | **15** | **9** | **1.10** | **30** | **23** | **2.20** | **9** | **9** | **0.66** | **32** | **32** | **2.34** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

**Table F.17:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, August 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (fishing days) | Depth Range (m) | | Kokanee | | | Largescale Sucker | | | Northern Pikeminnow | | | Peamouth Chub | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Sand Creek | SC-HN-01 | 623577 | 5462815 | 21-Aug-15 | 22-Aug-15 | 10:30 | 12:48 | 26.30 | 1.10 | 1.0 | 1.0 | 0 | 0 | 0.00 | 11 | 0 | 10.04 | 11 | 10 | 10.04 | 1 | 1 | 0.91 | 1 | 0 | 0.91 |
| | SC-HN-02 | 623587 | 5462851 | 22-Aug-15 | 24-Aug-15 | 12:30 | 10:37 | 46.12 | 1.92 | 0.8 | 1.0 | 9 | 9 | 4.68 | 8 | 0 | 4.16 | 20 | 1 | 10.41 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | SC-HN-03 | 623577 | 5462817 | 22-Aug-15 | 24-Aug-15 | 12:50 | 10:55 | 46.08 | 1.92 | 1.0 | 1.1 | 1 | 1 | 0.52 | 13 | 0 | 6.77 | 9 | 0 | 4.69 | 4 | 0 | 2.08 | 1 | 0 | 0.52 |
| | **TOTAL** | | | | | | | **118.50** | **4.94** | **-** | **-** | **10** | **10** | **2.03** | **32** | **0** | **6.48** | **40** | **11** | **8.10** | **5** | **1** | **1.01** | **2** | **0** | **0.41** |
| Elk River | ER-HN-01 | 632240 | 5447389 | 23-Aug-15 | 24-Aug-15 | 11:15 | 9:56 | 22.68 | 0.95 | 1.6 | 2.0 | 11 | 10 | 11.64 | 11 | 0 | 11.64 | 5 | 0 | 5.29 | 1 | 0 | 1.06 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **22.68** | **0.95** | **-** | **-** | **11** | **10** | **11.64** | **11** | **0** | **11.64** | **5** | **0** | **5.29** | **1** | **0** | **1.06** | **0** | **0** | **0.00** |
| Gold Creek | GC-HN-01 | 628634 | 5437018 | 23-Aug-15 | 24-Aug-15 | 9:35 | 14:40 | 29.08 | 1.21 | 1.0 | 1.5 | 0 | 0 | 0.00 | 1 | 0 | 0.83 | 3 | 2 | 2.48 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | GC-HN-02 | 628634 | 5437018 | 24-Aug-15 | 25-Aug-15 | 14:45 | 15:30 | 24.75 | 1.03 | 1.0 | 1.5 | 0 | 0 | 0.00 | 1 | 0 | 0.97 | 0 | 0 | 0.00 | 1 | 0 | 0.97 | 0 | 0 | 0.00 |
| | GC-HN-03 | 628780 | 5436677 | 25-Aug-15 | 26-Aug-15 | 15:45 | 8:45 | 17.00 | 0.71 | 3.0 | 3.2 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 1 | 1 | 1.41 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **70.83** | **2.95** | **-** | **-** | **0** | **0** | **0.00** | **2** | **0** | **0.68** | **4** | **3** | **1.36** | **1** | **0** | **0.34** | **0** | **0** | **0.00** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total angling effort in one area.

## **Table F.18:** Hoop Net Records for Fish Caught in Koocanusa Reservoir, April 2016

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (fishing days) | Depth Range (m) | | Bull Trout | | | Burbot | | | Westslope Cutthroat | | | Largescale Sucker | | | Longnose Sucker | | | Mountain Whitefish | | | Northern Pikeminnow | | | Peamouth Chub | | | Redside Shiner | | | Yellow Perch | | | Slimy Sculpin | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Sand Creek | SC-HN-01 | 625372 | 5457031 | 19-Apr-16 | 20-Apr-16 | 17:30 | 9:05 | 16 | 0.65 | 1.0 | 1.2 | 1 | 0 | 1.5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 4.6 | 3 | 0 | 4.6 | 0 | 0 | 0 | 2 | 0 | 3.1 | 7 | 1 | 11 | 1 | 1 | 1.5 | 2 | 2 | 3.1 | 1 | 0 | 1.5 |
| | | | | 20-Apr-16 | 21-Apr-16 | 10:45 | 9:05 | 22 | 0.93 | | | 0 | 0 | 0 | 2 | 0 | 2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.1 | 0 | 0 | 0 | 2 | 1 | 2.1 | 1 | 1 | 1.1 | 0 | 0 | 0 | 1 | 1 | 1.1 | 0 | 0 | 0 |
| | SC-HN-02 | 625780 | 5458144 | 19-Apr-16 | 20-Apr-16 | 16:05 | 11:10 | 19 | 0.80 | 1.0 | 1.5 | 2 | 0 | 2.5 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 37 | 47 | 0 | 0 | 0 | 1 | 1 | 1.3 | 2 | 2 | 2.5 | 2 | 1 | 2.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 20-Apr-16 | 21-Apr-16 | 11:30 | 10:10 | 23 | 0.94 | | | 4 | 0 | 4.2 | 0 | 0 | 0 | 2 | 0 | 2.1 | 19 | 13 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 6 | 9.5 | 5 | 5 | 5.3 | 0 | 0 | 0 | 1 | 1 | 1.1 | 0 | 0 | 0 |
| | SC-HN-03 | 625378 | 5457114 | 21-Apr-16 | 22-Apr-16 | 9:35 | 9:46 | 24 | 1.01 | 1.0 | 1.5 | 0 | 0 | 0 | 2 | 0 | 2.0 | 0 | 0 | 0 | 9 | 7 | 8.9 | 1 | 0 | 0.99 | 0 | 0 | 0 | 7 | 6 | 6.9 | 2 | 1 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SC-HN-04 | 625652 | 5457316 | 21-Apr-16 | 22-Apr-16 | 12:19 | 8:49 | 20 | 0.85 | 1.0 | 2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1.2 | 0 | 0 | 0 |
| | SC-HN-05 | 625759 | 5458154 | 22-Apr-16 | 23-Apr-16 | 9:25 | 10:10 | 25 | 1.03 | 1.1 | 2.0 | 2 | 0 | 1.9 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3.9 | 1 | 0 | 0.97 | 0 | 0 | 0 | 6 | 4 | 5.8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.97 | 0 | 0 | 0 |
| | SC-HN-06 | 625290 | 5457248 | 22-Apr-16 | 23-Apr-16 | 13:13 | 9:35 | 20 | 0.85 | 1.0 | 2.0 | 0 | 0 | 0 | 1 | 0 | 1.2 | 0 | 0 | 0 | 30 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SC-HN-07 [b] | 625773 | 5458160 | 23-Apr-16 | 24-Apr-16 | 10:35 | - | - | - | 1.5 | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | SC-HN-08 | 625642 | 5457345 | 23-Apr-16 | 24-Apr-16 | 15:04 | 11:35 | 21 | 0.85 | 1.0 | 2.5 | 0 | 0 | 0 | 2 | 0 | 2.3 | 0 | 0 | 0 | 1 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.2 | 7 | 6 | 8.2 | 0 | 0 | 0 | 3 | 3 | 3.5 | 0 | 0 | 0 |
| | SC-HN-09 | 625776 | 5458492 | 24-Apr-16 | 25-Apr-16 | 10:45 | 10:25 | 24 | 0.99 | 1.5 | 2.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 18 | 1 | 0 | 1.0 | 0 | 0 | 0 | 15 | 15 | 15 | 2 | 0 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SC-HN-10 | 625104 | 5457733 | 24-Apr-16 | 25-Apr-16 | 14:33 | 11:25 | 21 | 0.87 | 1.0 | 1.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3.5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1.2 | 0 | 0 | 0 |
| | SC-HN-11 | 625770 | 5458490 | 25-Apr-16 | 26-Apr-16 | 9:58 | 8:44 | 23 | 0.95 | 1.0 | 2.2 | 1 | 0 | 1.1 | 1 | 0 | 1.1 | 0 | 0 | 0 | 12 | 0 | 13 | 2 | 0 | 2.1 | 0 | 0 | 0 | 5 | 1 | 5.3 | 4 | 0 | 4.2 | 0 | 0 | 0 | 1 | 1 | 1.1 | 0 | 0 | 0 |
| | SC-HN-12 | 625849 | 5458439 | 25-Apr-16 | 26-Apr-16 | 13:40 | 9:28 | 20 | 0.82 | 1.1 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SC-HN-13 | 625775 | 5458149 | 26-Apr-16 | 27-Apr-16 | 9:19 | 9:50 | 25 | 1.02 | 1.6 | 2.8 | 3 | 0 | 2.9 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 4.9 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3.9 | 2 | 0 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SC-HN-14 | 625771 | 5458495 | 26-Apr-16 | 27-Apr-16 | 9:36 | 9:15 | 24 | 0.99 | 1.9 | 2.2 | 1 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 12 | 2 | 0 | 2.0 | 0 | 0 | 0 | 3 | 0 | 3.0 | 1 | 0 | 1.0 | 0 | 0 | 0 | 9 | 9 | 9.1 | 0 | 0 | 0 |
| | SC-HN-15 | 625802 | 5458426 | 26-Apr-16 | 27-Apr-16 | 12:34 | 9:30 | 21 | 0.87 | 2.0 | 2.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.1 | 1 | 0 | 1.1 | 0 | 0 | 0 | 3 | 3 | 3.4 | 0 | 0 | 0 |
| | SC-HN-16 | 625172 | 5457807 | 26-Apr-16 | 27-Apr-16 | 12:05 | 8:45 | 21 | 0.86 | 1.7 | 2.5 | 0 | 0 | 0 | 2 | 0 | 2.3 | 0 | 0 | 0 | 9 | 0 | 10 | 1 | 0 | 1.2 | 0 | 0 | 0 | 10 | 0 | 12 | 3 | 0 | 3.5 | 0 | 0 | 0 | 11 | 11 | 13 | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | **367** | **15.29** | **-** | **-** | **14** | **0** | **0.92** | **10** | **0** | **0.65** | **2** | **0** | **0.13** | **179** | **60** | **12** | **12** | **0** | **0.79** | **1** | **1** | **0.065** | **70** | **38** | **4.6** | **37** | **15** | **2.4** | **1** | **1** | **0.065** | **34** | **34** | **2.2** | **1** | **0** | **0.065** |
| Elk River | ER-HN-01 | 628483 | 5448148 | 19-Apr-16 | 20-Apr-16 | 13:20 | 10:00 | 21 | 0.86 | 2.1 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ER-HN-02 | 628208 | 5447661 | 19-Apr-16 | 20-Apr-16 | 13:30 | 10:10 | 21 | 0.86 | 1.3 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ER-HN-03 | 628439 | 5447128 | 20-Apr-16 | 21-Apr-16 | 10:30 | 11:00 | 25 | 1.02 | 1.4 | 1.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.98 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.98 | 1 | 0 | 0.98 | 0 | 0 | 0 | 4 | 4 | 3.9 | 0 | 0 | 0 |
| | | | | 21-Apr-16 | 22-Apr-16 | 11:00 | 10:30 | 23 | 0.98 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3.1 | 0 | 0 | 0 |
| | ER-HN-04 | 628143 | 5447259 | 20-Apr-16 | 21-Apr-16 | 11:20 | 10:20 | 23 | 0.96 | 0.7 | 4.1 | 0 | 0 | 0 | 6 | 0 | 6.3 | 0 | 0 | 0 | 12 | 8 | 13 | 1 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3.1 | 0 | 0 | 0 |
| | | | | 21-Apr-16 | 22-Apr-16 | 10:20 | 10:05 | 24 | 0.99 | | | 0 | 0 | 0 | 1 | 0 | 1.0 | 0 | 0 | 0 | 17 | 7 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 3.0 | 1 | 0 | 1.0 | 0 | 0 | 0 | 1 | 1 | 1.0 | 0 | 0 | 0 |
| | | | | 22-Apr-16 | 23-Apr-16 | 10:05 | 9:30 | 23 | 0.98 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 53 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ER-HN-05 | 628117 | 5446590 | 22-Apr-16 | 23-Apr-16 | 10:45 | 10:00 | 23 | 0.97 | 1.4 | 1.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3.1 | 0 | 0 | 0 | 1 | 1 | 1.0 | 1 | 1 | 1.0 | 0 | 0 | 0 | 3 | 3 | 3.1 | 0 | 0 | 0 |
| | ER-HN-06 | 628581 | 5447362 | 23-Apr-16 | 24-Apr-16 | 10:00 | 10:00 | 24 | 1.00 | 1.8 | 1.1 | 0 | 0 | 0 | 1 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 6.0 | 0 | 0 | 0 |
| | | | | 24-Apr-16 | 25-Apr-16 | 10:00 | 12:45 | 27 | 1.11 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 1 | 15 | 1 | 1 | 0.90 | 1 | 0 | 0.90 | 3 | 0 | 2.7 | 6 | 0 | 5.4 | 0 | 0 | 0 | 3 | 3 | 2.7 | 0 | 0 | 0 |
| | | | | 25-Apr-16 | 26-Apr-16 | 12:45 | 10:45 | 22 | 0.92 | | | 0 | 0 | 0 | 1 | 0 | 1.1 | 0 | 0 | 0 | 13 | 1 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2.2 | 7 | 0 | 7.6 | 0 | 0 | 0 | 2 | 2 | 2.2 | 0 | 0 | 0 |
| | ER-HN-07 | 628037 | 5446473 | 23-Apr-16 | 24-Apr-16 | 10:20 | 10:05 | 24 | 0.99 | 0.8 | 3.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ER-HN-08 | 628608 | 5447450 | 24-Apr-16 | 25-Apr-16 | 10:15 | 2:30 | 16 | 0.68 | 0.9 | 1.1 | 1 | 0 | 1.5 | 1 | 0 | 1.5 | 0 | 0 | 0 | 15 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 7.4 | 5 | 0 | 7.4 | 3 | 0 | 4.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ER-HN-09 | 628369 | 5446805 | 25-Apr-16 | 26-Apr-16 | 15:00 | 9:30 | 19 | 0.77 | 0.8 | 3.3 | 0 | 0 | 0 | 1 | 0 | 1.3 | 0 | 0 | 0 | 4 | 0 | 5.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 6.5 | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | **314** | **13.08** | **-** | **-** | **1** | **0** | **0.076** | **11** | **0** | **0.84** | **0** | **0** | **0** | **136** | **73** | **10** | **5** | **2** | **0.38** | **1** | **0** | **0.076** | **18** | **5** | **1.4** | **21** | **1** | **1.6** | **3** | **0** | **0.23** | **30** | **30** | **2.3** | **0** | **0** | **0** |
| Gold Creek | GC-HN-01 | 629858 | 5437042 | 19-Apr-16 | 20-Apr-16 | 12:15 | 10:15 | 22 | 0.92 | 2.0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1.1 | 0 | 0 | 0 |
| | GC-HN-02 | 629926 | 5436941 | 20-Apr-16 | 21-Apr-16 | 10:45 | 9:45 | 23 | 0.96 | 2.0 | 2.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5.2 | 0 | 0 | 0 |
| | GC-HN-03 | 630000 | 5437027 | 21-Apr-16 | 21-Apr-16 | 9:55 | 12:35 | 2.7 | 0.11 | 2.5 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GC-HN-04 | 630141 | 5436892 | 21-Apr-16 | 22-Apr-16 | 13:05 | 9:45 | 21 | 0.86 | 3.0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 8.1 | 0 | 0 | 0 |
| | GC-HN-05 | 630394 | 5437328 | 22-Apr-16 | 23-Apr-16 | 10:15 | 10:00 | 24 | 0.99 | 6.2 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 6 | 17 | 0 | 0 | 0 |
| | | | | 23-Apr-16 | 24-Apr-16 | 10:15 | 9:45 | 23 | 0.98 | 6.3 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 5.1 | 0 | 0 | 0 |
| | GC-HN-06 | 630017 | 5436857 | 24-Apr-16 | 25-Apr-16 | 10:15 | 10:00 | 24 | 0.99 | 2.5 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 6 | 30 | 1 | 0 | 1.0 | 0 | 0 | 0 | 1 | 1 | 1.0 | 1 | 1 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 25-Apr-16 | 26-Apr-16 | 10:15 | 10:10 | 24 | 1.00 | 3.5 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | GC-HN-07 | 629841 | 5436970 | 26-Apr-16 | 27-Apr-16 | 10:30 | 9:45 | 23 | 0.97 | 3.0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2.1 | 0 | 0 | 0 |
| | **TOTAL** | | | | | | | **186** | **7.77** | **-** | **-** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **43** | **10** | **5.5** | **1** | **0** | **0.13** | **0** | **0** | **0** | **2** | **1** | **0.26** | **1** | **1** | **0.13** | **0** | **0** | **0** | **37** | **21** | **4.8** | **0** | **0** | **0** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

[b] Net was found on April 24, 2016 on shoreline and spoke with a conservation officer.

# Minnow Trap

## Table F.19: Minnow Trap Catch Records from Koocanusa Reservoir, April 2015

| Area | Station | Location (11U, NAD83) | | Set Date | Removal Date | Set Time | Removal Time | Fishing Hours (hrs) | Effort (fishing days) | Depth (m) | Redside Shiner | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Easting | Northing | | | | | | | | Catch | Mortalities/ Sacrificed | CPUE [a] |
| Sand Creek | SC-MT-01 | 625558 | 5459677 | 22-Apr-15 | 23-Apr-15 | 12:00 | 11:15 | 23.25 | 0.97 | 1.3 | 0 | 0 | 0.00 |
| | SC-MT-02 | 625558 | 5459677 | 22-Apr-15 | 23-Apr-15 | 12:00 | 11:15 | 23.25 | 0.97 | 2.2 | 0 | 0 | 0.00 |
| | SC-MT-03 | 625648 | 5459984 | 22-Apr-15 | 23-Apr-15 | 13:41 | 11:50 | 22.15 | 0.92 | 3.5 | 0 | 0 | 0.00 |
| | SC-MT-04 | 625648 | 5459984 | 22-Apr-15 | 23-Apr-15 | 13:41 | 11:50 | 22.15 | 0.92 | 3.3 | 0 | 0 | 0.00 |
| | SC-MT-05 | 625648 | 5459984 | 22-Apr-15 | 23-Apr-15 | 13:41 | 11:50 | 22.15 | 0.92 | 2.6 | 0 | 0 | 0.00 |
| | SC-MT-06 | 625558 | 5459677 | 23-Apr-15 | 24-Apr-15 | 11:15 | 14:56 | 27.68 | 1.15 | 1.3 | 0 | 0 | 0.00 |
| | SC-MT-07 | 625558 | 5459677 | 23-Apr-15 | 24-Apr-15 | 11:15 | 14:56 | 27.68 | 1.15 | 2.2 | 0 | 0 | 0.00 |
| | SC-MT-08 | 625648 | 5459984 | 23-Apr-15 | 24-Apr-15 | 11:50 | 15:02 | 27.20 | 1.13 | 3.5 | 0 | 0 | 0.00 |
| | SC-MT-09 | 625648 | 5459984 | 23-Apr-15 | 24-Apr-15 | 11:50 | 15:02 | 27.20 | 1.13 | 3.3 | 0 | 0 | 0.00 |
| | SC-MT-10 | 625648 | 5459984 | 23-Apr-15 | 24-Apr-15 | 11:50 | 15:05 | 27.25 | 1.14 | 2.6 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **249.97** | **10.42** | **-** | **0** | **0** | **0.00** |
| Elk River | ER-MT-01 | 627418 | 5447234 | 21-Apr-15 | 22-Apr-15 | 13:45 | 9:45 | 20.00 | 0.83 | 1.9 | 1 | 1 | 1.20 |
| | | | | 22-Apr-15 | 23-Apr-15 | 9:45 | 11:45 | 26.00 | 1.08 | | 0 | 0 | 0.00 |
| | ER-MT-02 | 627892 | 5448032 | 21-Apr-15 | 22-Apr-15 | 13:55 | 9:15 | 19.33 | 0.81 | 0.9 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 9:15 | 8:45 | 23.50 | 0.98 | | 1 | 1 | 1.02 |
| | | | | 23-Apr-15 | 24-Apr-15 | 8:45 | 8:45 | 24.00 | 1.00 | | 1 | 1 | 1.00 |
| | ER-MT-03 | 628663 | 5447421 | 21-Apr-15 | 22-Apr-15 | 14:00 | 10:10 | 20.17 | 0.84 | 2.0 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 10:10 | 9:35 | 23.42 | 0.98 | | 1 | 0 | 1.02 |
| | ER-MT-04 | 630080 | 5447112 | 21-Apr-15 | 22-Apr-15 | 14:10 | 10:20 | 20.17 | 0.84 | 2.1 | 0 | 0 | 0.00 |
| | | | | 22-Apr-15 | 23-Apr-15 | 10:20 | 10:10 | 23.83 | 0.99 | | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 24-Apr-15 | 10:10 | 12:20 | 26.17 | 1.09 | | 0 | 0 | 0.00 |
| | ER-MT-05 | 630575 | 5447086 | 21-Apr-15 | 22-Apr-15 | 14:30 | 10:25 | 19.92 | 0.83 | 1.5 | 0 | 0 | 0.00 |
| | ER-MT-06 | 627943 | 5448011 | 22-Apr-15 | 23-Apr-15 | 12:00 | 9:10 | 21.17 | 0.88 | 2.3 | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 24-Apr-15 | 9:10 | 9:45 | 24.58 | 1.02 | | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **292.25** | **12.18** | **-** | **4** | **3** | **0.33** |
| Gold Creek | GC-MT-01 | 628304 | 5436757 | 21-Apr-15 | 23-Apr-15 | 14:45 | 15:15 | 48.50 | 2.02 | 2.6 | 0 | 0 | 0.00 |
| | | | | 23-Apr-15 | 25-Apr-15 | 15:15 | 9:20 | 42.08 | 1.75 | 2.2 | 0 | 0 | 0.00 |
| | GC-MT-02 | 629095 | 5436430 | 22-Apr-15 | 24-Apr-15 | 10:35 | 14:15 | 51.67 | 2.15 | 3.8 | 0 | 0 | 0.00 |
| | GC-MT-03 | 628820 | 5436565 | 22-Apr-15 | 25-Apr-15 | 10:45 | 15:05 | 76.33 | 3.18 | 1.5 | 0 | 0 | 0.00 |
| | **TOTAL** | | | | | | | **218.58** | **9.11** | **-** | **0** | **0** | **0.00** |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total minnow trap effort in one area.

# Seine Net

**Table F.20:** Seine Catch Records for Fish Caught in Koocanusa Reservoir, August 2014

| Area | Seining Station | Date | Time | Location (NAD 83, Zone 11U) | | Length (m) | Distance (m) | # of Hauls | Area Seined ($m^2$) | Largescale Sucker | | | Northern Pikeminnow | | | Peamouth Chub | | | Pumpkinseed | | | Redside Shiner (adult) | | | Redside Shiner | | | Yellow Perch | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Easting | Northing | | | | | Catch | Mortalities/ Sacrificed | CPUE [b] | Catch | Mortalities/ Sacrificed | CPUE | Catch | Mortalities/ Sacrificed | CPUE | Catch | Mortalities/ Sacrificed | CPUE | Catch | Mortalities/ Sacrificed | CPUE | Catch | Mortalities/ Sacrificed | CPUE | Catch | Mortalities/ Sacrificed | CPUE |
| Sand Creek | SC-SN-1 | 21-Aug-14 | 13:30 | 623571 | 5463284 | 15.24 | 7.62 | 1 | 116 | 200 | 5 | 1.72 | 40 | 5 | 0.34 | 0 | 0 | 0.00 | 1 | 0 | 0.01 | 75 | 15 | 0.65 | 62 | 15 | 0.53 | 15 | 5 | 0.13 |
| Elk River | ER-SN-1 | 20-Aug-14 | 15:15 | 632866 | 5448122 | 15.24 | 1.52 | 1 | 23 | 5 | 5 | 0.22 | 5 | 5 | 0.22 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 50 | 10 | 2.16 | 250 | 20 | 10.79 | 0 | 0 | 0.00 |
| Gold Creek | GC-SN-1 | 20-Aug-14 | 11:45 | 628534 | 5436696 | 15.24 | 3.05 | 1 | 46 | 29 | 5 | 0.62 | 3 | 3 | 0.06 | 13 | 5 | 0.28 | 0 | 0 | 0.00 | 200 | 10 | 4.30 | 500 | 20 | 10.76 | 22 | 5 | 0.47 |

[a] Fish were juveniles unless otherwise specified in the table as adults.

[b] Total catch-per-unit-effort (CPUE; number of fish / $m^2$) calculated as the number of fish caught over the area seined.

**Table F.21: Summary Statistics for Bull Trout Meristic Data Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structures Collected[a] | Age | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 17-Feb-14 | OR-BT-01-Feb-14 [b] | 64.5 | 67.5 | - | - | - | - | - | - |
| | | 12-Apr-14 | SC-BT-01-Apr-14 | 38.5 | 36.2 | 500 | - | - | - | - | - |
| | | 13-Apr-14 | SC-BT-02-Apr-14 | 49.8 | 48.0 | 1,100 | - | - | - | - | - |
| | | 14-Apr-14 | SC-BT-03-Apr-14 | 55.2 | 53.3 | 1,450 | - | - | - | - | - |
| | | 16-Apr-14 | SC-BT-04-Apr-14 | 56.5 | 55.0 | 1,550 | - | - | - | - | - |
| | | 23-Aug-14 | SC-BT-01-Aug-14 | 58.0 | 55.5 | 1,600 | sc, pf | 8 | - | - | muscle plug |
| | 2015 | 28-Feb-15 | SC-BT-01-Feb-15 | 42.8 | 41.8 | 740 | - | - | | - | muscle plug |
| | | 30-Apr-15 | SC-BT-01-Apr-15 | 56.7 | 53.4 | 1,725 | - | - | - | - | muscle plug |
| | 2016 | 19-Apr-16 | SC-BT-01-Apr-16 | 24.5 | 23.2 | 110 | - | - | - | - | muscle plug |
| | | 19-Apr-16 | SC-BT-02-Apr-16 | 44.2 | 42.7 | 650 | sc | 4 | - | - | muscle plug |
| | | 20-Apr-16 | SC-BT-03-Apr-16 | 78.5 | 75.5 | 4,700 | - | - | - | - | muscle plug |
| | | 20-Apr-16 | SC-BT-04-Apr-16 | 36.0 | 34.1 | 400 | sc | 4 | - | - | muscle plug |
| | | 20-Apr-16 | SC-BT-05-Apr-16 | 45.7 | 43.2 | 840 | sc | 4 | - | - | muscle plug |
| | | 21-Apr-16 | SC-BT-06-Apr-16 | 55.6 | 52.9 | 1,800 | sc | 4 | - | - | muscle plug |
| | | 21-Apr-16 | SC-BT-07-Apr-16 | 41.4 | 38.6 | 605 | sc | 4 | - | - | muscle plug |
| | | 21-Apr-16 | SC-BT-08-Apr-16 | 37.0 | 34.4 | 385 | sc | 3 | - | - | muscle plug |
| | | 21-Apr-16 | SC-BT-09-Apr-16 | 30.1 | 28.9 | 215 | sc | 2 | - | - | muscle plug |
| | | 21-Apr-16 | SC-BT-10-Apr-16 | 36.7 | 34.7 | 375 | sc | 3 | - | - | muscle plug |
| | | 23-Apr-16 | SC-BT-11-Apr-16 | 33.7 | 31.9 | 300 | - | - | - | - | - |
| | | 23-Apr-16 | SC-BT-12-Apr-16 | 34.5 | 32.6 | 350 | - | - | - | - | - |
| **total sample size** | | | | **20** | **20** | **19** | **-** | **9** | **-** | **-** | **-** |
| **average** | | | | **46** | **44** | **1,021** | **-** | **4** | **-** | **-** | **-** |
| **median** | | | | **44** | **42** | **650** | **-** | **4** | **-** | **-** | **-** |
| **standard deviation** | | | | **13** | **13** | **1,049** | **-** | **1.7** | **-** | **-** | **-** |
| **standard error** | | | | **3.0** | **3.0** | **241** | **-** | **0.55** | **-** | **-** | **-** |
| **minimum** | | | | **25** | **23** | **110** | **-** | **2** | **-** | **-** | **-** |
| **maximum** | | | | **79** | **76** | **4,700** | **-** | **8** | **-** | **-** | **-** |
| Elk River | 2014 | 13-Feb-14 | ER-BT-01-Feb-14 | 63.3 | 60.1 | 2,500 | - | - | - | - | - |
| | | 16-Feb-14 | ER-BT-02-Feb-14 | 77.2 | 73.9 | 4,100 | - | - | - | - | - |
| | | 16-Apr-14 | ER-BT-01-Apr-14 | 24.2 | 22.5 | 113 | - | - | - | - | - |
| | | 22-Aug-14 | ER-BT-01-Aug-14 | 22.6 | 21.5 | 100 | sc, oto | 3 | - | - | muscle |
| | 2015 | 23-Apr-15 | ER-BT-01-Apr-15 | 17.4 | 16.4 | 34 | - | - | - | shortened operculum | - |
| | | 28-Apr-15 | ER-BT-02-Apr-15 | 32.0 | 30.2 | 165 | - | - | - | - | muscle plug |
| | 2016 | 19-Apr-16 | ER-BT-01-Apr-16 | 34.7 | 32.5 | 355 | sc | 4 | - | - | muscle plug |
| | | 19-Apr-16 | ER-BT-02-Apr-16 | 29.7 | 27.6 | 195 | sc | 4 | - | - | muscle plug |
| | | 19-Apr-16 | ER-BT-03-Apr-16 | 36.5 | 34.1 | 355 | sc | 4 | - | - | muscle plug |
| | | 19-Apr-16 | ER-BT-04-Apr-16 | 70.9 | 67.9 | 3,700 | - | - | - | - | muscle |
| | | 21-Apr-16 | ER-BT-05-Apr-16 | 62.7 | 59.6 | 2,540 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | ER-BT-06-Apr-16 | 58.8 | 56.7 | 2,004 | oto | 4 | F | - | muscle, ovaries |
| | | 22-Apr-16 | ER-BT-07-Apr-16 | 62.5 | 60.2 | 2,600 | - | - | - | - | muscle plug |
| | | 22-Apr-16 | ER-BT-08-Apr-16 | 35.2 | 34.0 | 355 | - | - | - | previous muscle plug | muscle plug |
| | | 24-Apr-16 | ER-BT-09-Apr-16 | 63.2 | 60.0 | 2,490 | sc | 5 | - | - | muscle plug |
| | | 24-Apr-16 | ER-BT-10-Apr-16 | 64.8 | 62.4 | 2,850 | sc | 6 | - | - | muscle plug |
| | | 25-Apr-16 | ER-BT-11-Apr-16 | 69.5 | 65.0 | 3,000 | - | - | - | - | muscle plug |
| | | 25-Apr-16 | ER-BT-12-Apr-16 | 68.7 | 66.0 | 3,100 | - | - | - | - | muscle plug |
| | | 22-Apr-16 | ER-BT-13-Apr-16 | 28.2 | 26.6 | 140 | - | - | - | - | none (juvenile) |
| **total sample size** | | | | **19** | **19** | **19** | **-** | **7** | **-** | **-** | **-** |
| **average** | | | | **49** | **46** | **1,616** | **-** | **4** | **-** | **-** | **-** |
| **median** | | | | **59** | **57** | **2,004** | **-** | **4** | **-** | **-** | **-** |
| **standard deviation** | | | | **20** | **19** | **1,449** | **-** | **0.95** | **-** | **-** | **-** |
| **standard error** | | | | **4.6** | **4.4** | **332** | **-** | **0.36** | **-** | **-** | **-** |
| **minimum** | | | | **17** | **16** | **34** | **-** | **3** | **-** | **-** | **-** |
| **maximum** | | | | **77** | **74** | **4,100** | **-** | **6** | **-** | **-** | **-** |
| Gold Creek | 2014 | 12-Feb-14 | GC-BT-01-Feb-14 | 78.7 | 75.6 | 4,000[c] | - | - | - | - | - |
| | 2015 | 26-Apr-15 | GC-BT-01-Apr-15 | 33.5 | 31.5 | 310 | sc | 4 | - | - | muscle plug |
| | 2016 | 20-Apr-16 | GC-BT-01-Apr-16 | 76.3 | 74.0 | 4,100 | - | - | - | tumour on head | muscle plug |
| | | 20-Apr-16 | GC-BT-02-Apr-16 | 43.5 | 41.0 | 810 | sc, oto | 5 | - | - | muscle |
| | | 20-Apr-16 | GC-BT-03-Apr-16 | 32.0 | 30.5 | 285 | sc, oto | 4 | - | - | muscle |
| | | 24-Apr-16 | GC-BT-04-Apr-16 | 38.7 | 36.5 | 510 | sc, oto | 5 | - | - | muscle |
| | | 24-Apr-16 | GC-BT-05-Apr-16 | 38.9 | 36.4 | 460 | sc, oto | 5 | - | - | muscle |
| | | 24-Apr-16 | GC-BT-06-Apr-16 | 27.9 | 26.2 | 164 | oto | 5 | - | - | muscle |
| | | 27-Apr-16 | GC-BT-07-Apr-16 | 62.4 | 59.2 | 2,490 | sc, oto | 5 | F | - | muscle, ovaries |
| **total sample size** | | | | **9** | **9** | **8** | **-** | **7** | **-** | **-** | **-** |
| **average** | | | | **48** | **46** | **1,141** | **-** | **5** | **-** | **-** | **-** |
| **median** | | | | **39** | **37** | **485** | **-** | **5** | **-** | **-** | **-** |
| **standard deviation** | | | | **19** | **19** | **1,410** | **-** | **0.49** | **-** | **-** | **-** |
| **standard error** | | | | **6.5** | **6.3** | **499** | **-** | **0.18** | **-** | **-** | **-** |
| **minimum** | | | | **28** | **26** | **164** | **-** | **4** | **-** | **-** | **-** |
| **maximum** | | | | **79** | **76** | **4,100** | **-** | **5** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths pf - pectoral fin-ray.

[b] Fish Collected at Oestreich Road and grouped with the Sand Creek summary statistics.

[c] Body weight is a field approximation as it was slightly larger than the maximum pesola (3,500 g).

## Table F.22: Summary Statistics for Burbot Meristic Data Collected near Sand Creek, Elk River, Gold Creek, and Big Springs in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 17-Feb-14 | OR-BB-01-Feb-14[b] | 61.5 | 1,399 | - | - | - | - | muscle plug |
| | | 15-Feb-14 | SC-BB-01-Feb-14 | 69.4 | 2,120 | - | - | - | - | muscle plug |
| | | 18-Feb-14 | SC-BB-02-Feb-14 | 70.5 | 1,850 | - | - | - | - | muscle plug |
| | | 18-Feb-14 | SC-BB-03-Feb-14 | 63.0 | 1,510 | - | - | - | - | muscle plug |
| | | 18-Feb-14 | SC-BB-04-Feb-14 | 66.4 | 2,050 | - | - | - | - | muscle plug |
| | | 18-Feb-14 | SC-BB-05-Feb-14 | 70.1 | 2,150 | - | - | - | - | muscle plug |
| | | 18-Feb-14 | SC-BB-06-Feb-14 | 62.6 | 1,500 | oto | 6 | F | - | muscle plug, muscle, ovaries |
| | | 14-Apr-14 | SC-BB-01-Apr-14 | 82.0 | 3,150 | - | - | - | - | muscle plug |
| | | 16-Apr-14 | SC-BB-02-Apr-14 | 75.5 | 2,700 | - | - | - | - | muscle plug |
| | | 16-Apr-14 | SC-BB-03-Apr-14 | 55.5 | 1,200 | - | - | - | - | muscle plug |
| | | 25-Aug-14 | SC-BB-01-Aug-14 | 34.5 | 183 | sc | - | - | - | muscle plug |
| | 2015 | 27-Apr-15 | SC-BB-01-Apr-15 | 63.0 | 1,780 | - | - | - | - | muscle plug |
| | | 28-Apr-15 | SC-BB-02-Apr-15 | 79.7 | 3,100 | - | - | - | - | muscle plug |
| | | 29-Apr-15 | SC-BB-03-Apr-15 | 69.5 | 2,480 | - | - | - | - | muscle plug |
| | | 30-Apr-15 | SC-BB-04-Apr-15 | 76.5 | 3,000 | - | - | - | - | muscle plug |
| | | 30-Apr-15 | SC-BB-05-Apr-15 | 33.5 | 280 | - | - | - | - | none, too small |
| | 2016 | 20-Apr-16 | SC-BB-01-Apr-16 | 47.8 | 690 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | SC-BB-02-Apr-16 | 39.1 | 285 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | SC-BB-03-Apr-16 | 47.2 | 715 | - | - | - | - | muscle plug |
| | | 22-Apr-16 | SC-BB-04-Apr-16 | 48.9 | 755 | - | - | - | - | muscle plug |
| | | 22-Apr-16 | SC-BB-05-Apr-16 | 50.7 | 895 | - | - | - | - | muscle plug |
| | | 23-Apr-16 | SC-BB-06-Apr-16 | 40.8 | 435 | - | - | - | - | muscle plug |
| | | 24-Apr-16 | SC-BB-07-Apr-16 | 59.2 | 1,160 | - | - | - | - | muscle plug |
| | | 24-Apr-16 | SC-BB-08-Apr-16 | 43.8 | 580 | - | - | - | - | muscle plug |
| | | 26-Apr-16 | SC-BB-09-Apr-16 | 49.9 | 810 | - | - | - | - | muscle plug |
| | | 27-Apr-16 | SC-BB-10-Apr-16 | 40.6 | 465 | - | - | - | Fish had been plugged before (although area had healed over) | muscle plug |
| | | 27-Apr-16 | SC-BB-11-Apr-16 | 34.7 | 218 | - | - | - | - | none (juvenile) |
| **total sample size** | | | | **27** | **27** | **-** | **-** | **-** | **-** | **-** |
| **average** | | | | **57** | **1,387** | **-** | **-** | **-** | **-** | **-** |
| **median** | | | | **59** | **1,200** | **-** | **-** | **-** | **-** | **-** |
| **standard deviation** | | | | **15** | **944** | **-** | **-** | **-** | **-** | **-** |
| **standard error** | | | | **2.8** | **182** | **-** | **-** | **-** | **-** | **-** |
| **minimum** | | | | **34** | **183** | **-** | **-** | **-** | **-** | **-** |
| **maximum** | | | | **82** | **3,150** | **-** | **-** | **-** | **-** | **-** |
| Elk River | 2014 | 19-Apr-14 | ER-BB-01-Apr-14 | 61.4 | 1,400 | - | - | - | - | muscle plug |
| | | 19-Apr-14 | ER-BB-02-Apr-14 | 66.5 | 1,560 | - | - | - | - | muscle plug |
| | 2015 | 27-Feb-15 | ER-BB-01-Feb-15 | 62.6 | 1,340 | - | - | - | - | muscle plug |
| | | 23-Apr-15 | ER-BB-01-Apr-15 | 24.4 | 86 | - | - | - | - | none, too small |
| | | 29-Apr-15 | ER-BB-02-Apr-15 | 42.9 | 410 | - | - | - | - | muscle plug |
| | 2016 | 21-Apr-16 | ER-BB-01-Apr-16 | 42.7 | 490 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | ER-BB-02-Apr-16 | 47.3 | 660 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | ER-BB-03-Apr-16 | 42.3 | 460 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | ER-BB-04-Apr-16 | 44.7 | 590 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | ER-BB-05-Apr-16 | 47.1 | 670 | - | - | - | - | muscle plug |
| | | 21-Apr-16 | ER-BB-06-Apr-16 | 42.2 | 510 | - | - | - | - | muscle plug |
| | | 22-Apr-16 | ER-BB-07-Apr-16 | 50.7 | 690 | - | - | - | - | muscle plug |
| | | 24-Apr-16 | ER-BB-08-Apr-16 | 51.5 | 1,040 | - | - | - | - | muscle plug |
| | | 25-Apr-16 | ER-BB-09-Apr-16 | 42.0 | 515 | - | - | - | - | muscle plug |
| | | 25-Apr-16 | ER-BB-10-Apr-16 | 44.3 | 605 | - | - | - | - | muscle plug |
| | | 26-Apr-16 | ER-BB-11-Apr-16 | 36.2 | 195 | - | - | - | - | none (juvenile) |
| **total sample size** | | | | **16** | **16** | **-** | **-** | **-** | **-** | **-** |
| **average** | | | | **47** | **701** | **-** | **-** | **-** | **-** | **-** |
| **median** | | | | **45** | **598** | **-** | **-** | **-** | **-** | **-** |
| **standard deviation** | | | | **10** | **422** | **-** | **-** | **-** | **-** | **-** |
| **standard error** | | | | **2.6** | **105** | **-** | **-** | **-** | **-** | **-** |
| **minimum** | | | | **24** | **86** | **-** | **-** | **-** | **-** | **-** |
| **maximum** | | | | **67** | **1,560** | **-** | **-** | **-** | **-** | **-** |
| Gold Creek | 2015 | 04-Mar-15 | GC-BB-01-Mar-15[c] | 64.0 | 1,530 | oto | - | M | - | muscle |
| | | 27-Apr-15 | GC-BB-01-Apr-15 | 38.3 | 285 | - | - | - | - | muscle plug |
| Big Springs | 2016 | 24-Jan-16 | BS-BB-01-Jan-16[c] | 63.3 | 2,600 | oto | 6 | - | - | muscle |
| **total sample size** | | | | **3** | **3** | **-** | **-** | **-** | **-** | **-** |
| **average** | | | | **55** | **1,472** | **-** | **-** | **-** | **-** | **-** |
| **median** | | | | **63** | **1,530** | **-** | **-** | **-** | **-** | **-** |
| **standard deviation** | | | | **15** | **1,159** | **-** | **-** | **-** | **-** | **-** |
| **standard error** | | | | **8.5** | **669** | **-** | **-** | **-** | **-** | **-** |
| **minimum** | | | | **38** | **285** | **-** | **-** | **-** | **-** | **-** |
| **maximum** | | | | **64** | **2,600** | **-** | **-** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Fish Collected at Oestreich Road and grouped with the Sand Creek summary statistics.

[c] Burbot captured by a member of the Tobacco Plains Indian Band.

## Table F.23: Summary Statistics for Largescale Sucker Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 22-Apr-15 | SC-CSU-02-Apr-15 | F | 44.0 | 41.2 | 665 | sc, pf | 12 | 5.893 | 6.536 | 653 | - | - | muscle, ovaries | spent female |
| | | 22-Apr-15 | SC-CSU-03-Apr-15 | F | 45.0 | 42.4 | 800 | sc, pf | 10 | 7.758 | 16.445 | 776 | - | - | muscle, ovaries | spent female |
| | | 24-Apr-15 | SC-CSU-04-Apr-15 | F | 46.3 | 43.2 | 790 | sc, pf | 15 | 6.921 | 8.592 | 774 | regenerated scales | - | muscle, ovaries | - |
| | | 27-Apr-15 | SC-CSU-05-Apr-15 | F | 42.0 | 39.2 | 673 | sc, pf | 11 | 28.882 | 9.436 | 635 | - | - | muscle, ovaries | - |
| | | 1-May-15 | SC-CSU-06-Apr-15 | F | 44.5 | 41.8 | 725 | sc, pf | 16 | 9.022 | 7.871 | 708 | - | - | muscle, ovaries | spent female |
| | | 1-May-15 | SC-CSU-07-Apr-15 | F | 45.6 | 42.4 | 825 | sc, pf | 15 | 6.701 | 9.081 | 809 | - | - | muscle, ovaries | spent female |
| | | **total sample size** | | **-** | **6** | **6** | **6** | **-** | **6** | **6** | **6** | **6** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **45** | **42** | **746** | **-** | **13** | **11** | **9.7** | **726** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **45** | **42** | **758** | **-** | **14** | **7.3** | **8.8** | **741** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **1.5** | **1.4** | **68** | **-** | **2.5** | **8.9** | **3.5** | **72** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.61** | **0.57** | **28** | **-** | **1.0** | **3.6** | **1.4** | **29** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **42** | **39** | **665** | **-** | **10** | **5.9** | **6.5** | **635** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **46** | **43** | **825** | **-** | **16** | **29** | **16** | **809** | **-** | **-** | **-** | **-** |
| | 2016 | 19-Apr-16 | SC-CSU-04-Apr-16 | F | 44.6 | 41.5 | 740 | sc, pf | 13 | 5.126 | 7.376 | 727 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-05-Apr-16 | F | 45.2 | 42.7 | 745 | sc, pf | 13 | 9.732 | 11.336 | 724 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-08-Apr-16 | F | 45.2 | 42.5 | 790 | sc, pf | 12 | 48.020 | 9.848 | 732 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-10-Apr-16 | F | 42.1 | 39.5 | 615 | sc, pf | 12 | 4.874 | 15.798 | 594 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-12-Apr-16 | F | 48.8 | 44.9 | 710 | sc, pf | 16 | 6.710 | 7.851 | 695 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-13-Apr-16 | F | 41.0 | 38.1 | 540 | sc, pf | 13 | 6.012 | 8.170 | 526 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-14-Apr-16 | F | 48.1 | 45.4 | 820 | sc, pf | 13 | 7.141 | 10.193 | 803 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-16-Apr-16 | F | 40.9 | 38.4 | 560 | sc, pf | 11 | 4.799 | 7.551 | 548 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-17-Apr-16 | F | 43.0 | 40.2 | 660 | sc, pf | 11 | 5.920 | 8.536 | 646 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-18-Apr-16 | F | 44.6 | 41.9 | 715 | sc, pf | 14 | 7.755 | 8.635 | 699 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-20-Apr-16 | F | 44.6 | 42.4 | 720 | sc, pf | 12 | 10.599 | 9.084 | 700 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-21-Apr-16 | F | 35.2 | 42.1 | 730 | sc, pf | 11 | 4.854 | 8.098 | 717 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-23-Apr-16 | F | 45.3 | 42.7 | 835 | sc, pf | 14 | 6.460 | 8.484 | 820 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-25-Apr-16 | F | 44.2 | 41.2 | 720 | sc, pf | 13 | 5.941 | 9.228 | 705 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-27-Apr-16 | F | 43.4 | 41.0 | 690 | sc, pf | 15 | 5.857 | 7.900 | 676 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-28-Apr-16 | F | 47.5 | 45.0 | 840 | sc, pf | 14 | 8.439 | 8.625 | 823 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-34-Apr-16 | F | 41.2 | 38.5 | 615 | sc, pf | 12 | 3.889 | 9.215 | 602 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-36-Apr-16 | F | 43.0 | 40.3 | 695 | sc, pf | 11 | 21.582 | 4.896 | 669 | half of caudal fin missing | - | muscle, ovaries | - |
| | | 20-Apr-16 | SC-CSU-37-Apr-16 | F | 47.5 | 44.5 | 830 | sc, pf | 15 | 9.717 | 9.002 | 811 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-39-Apr-16 | F | 39.0 | 36.8 | 520 | sc, pf | 10 | 3.417 | 3.203 | 513 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-40-Apr-16 | F | 40.6 | 37.7 | 530 | sc, pf | 12 | 3.982 | 8.610 | 517 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-42-Apr-16 | F | 38.7 | 36.3 | 470 | sc, pf | 11 | 3.109 | 7.330 | 460 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-43-Apr-16 | F | 39.4 | 37.0 | 530 | - | - | - | - | - | - | - | - | - |
| | | 21-Apr-16 | SC-CSU-44-Apr-16 | F | 46.6 | 43.5 | 820 | - | - | - | - | - | - | - | - | - |
| | | **total sample size** | | **-** | **24** | **24** | **24** | **-** | **22** | **22** | **22** | **22** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **43** | **41** | **685** | **-** | **13** | **8.8** | **8.6** | **669** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **44** | **41** | **713** | **-** | **13** | **6.0** | **8.6** | **697** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **3.4** | **2.7** | **114** | **-** | **1.6** | **9.6** | **2.3** | **106** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.69** | **0.56** | **23** | **-** | **0.33** | **2.0** | **0.49** | **23** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **35** | **36** | **470** | **-** | **10** | **3.1** | **3.2** | **460** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **49** | **45** | **840** | **-** | **16** | **48** | **16** | **823** | **-** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

[c] Confidence around provided ages was low (i.e., at or below 50% confidence).

**Table F.23: Summary Statistics for Largescale Sucker Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 22-Apr-15 | SC-CSU-01-Apr-15 | M | 41.6 | 38.8 | 650 | sc, pf | 13 | 3.131 | 7.199 | 640 | - | - | muscle | spent male |
| | 2016 | 19-Apr-16 | SC-CSU-02-Apr-16 | M | 37.9 | 34.8 | 520 | sc, pf | 10 | 9.854 | 5.561 | 505 | - | - | muscle | - |
| | | 19-Apr-16 | SC-CSU-03-Apr-16 | M | 42.9 | 40.1 | 805 | sc, pf | 11 | 28.380 | 16.748 | 760 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-15-Apr-16 | M | 41.8 | 38.2 | 590 | sc, pf | 13 | 0.681 | 7.707 | 582 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-19-Apr-16 | M | 43.7 | 40.9 | 630 | sc, pf | 13 | 0.951 | 6.160 | 623 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-22-Apr-16 | M | 41.8 | 39.5 | 585 | sc, pf | 12 | 9.616 | 8.467 | 567 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-24-Apr-16 | M | 45.5 | 42.2 | 650 | sc, pf | 12 | 1.633 | 5.893 | 642 | - | - | muscle | - |
| | | 20-Apr-16 | SC-CSU-31-Apr-16 | M | 41.6 | 39.0 | 550 | sc, pf | 14 | 1.499 | 5.894 | 543 | inconsistent scale pattern | - | - | - |
| | | 20-Apr-16 | SC-CSU-32-Apr-16 | M | 42.5 | 39.6 | 600 | sc, pf | 13 | 1.133 | 7.530 | 591 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-33-Apr-16 | M | 44.2 | 41.1 | 640 | sc, pf | 13 | 2.179 | 9.112 | 629 | worms | 0.606 | - | - |
| | | 20-Apr-16 | SC-CSU-35-Apr-16 | M | 41.5 | 38.5 | 535 | sc, pf | 11 | 1.742 | 5.208 | 528 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-38-Apr-16 | M | 40.1 | 37.7 | 540 | sc, pf | 12 | 15.555 | 6.768 | 518 | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-41-Apr-16 | M | 40.5 | 38.2 | 545 | sc, pf | 14 | 0.787 | 10.352 | 534 | - | - | - | - |
| | | 21-Apr-16 | SC-CSU-45-Apr-16 | M | 43.9 | 40.5 | 720 | sc, pf | 14 | 4.991 | 8.917 | 706 | - | - | - | - |
| | | 21-Apr-16 | SC-CSU-46-Apr-16 | M | 42.0 | 38.9 | 610 | sc, pf | 12 | 1.507 | 8.769 | 600 | worms | 0.026 | - | - |
| | | 21-Apr-16 | SC-CSU-47-Apr-16 | M | 42.4 | 39.6 | 660 | sc, pf | 13 | 19.744 | 10.744 | 630 | - | - | - | - |
| | | 21-Apr-16 | SC-CSU-48-Apr-16 | M | 41.1 | 38.3 | 620 | sc, pf | 10 | 19.578 | 5.685 | 595 | - | - | - | - |
| | | 22-Apr-16 | SC-CSU-49-Apr-16 | M | 44.6 | 42.0 | 710 | sc, pf | 13 | 2.232 | 10.318 | 697 | - | - | - | - |
| | | 22-Apr-16 | SC-CSU-50-Apr-16 | M | 39.9 | 36.9 | 510 | sc, pf | 10 | 12.809 | 5.902 | 491 | - | - | - | - |
| | | 22-Apr-16 | SC-CSU-51-Apr-16 | M | 43.0 | 40.2 | 540 | sc, pf | 13 | 3.724 | 7.738 | 529 | regenerated scale pattern | - | - | - |
| | | 22-Apr-16 | SC-CSU-52-Apr-16 | M | 38.3 | 35.9 | 510 | sc, pf | 12 | 1.157 | 11.844 | 497 | - | - | - | - |
| | | **total sample size** | | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **2** | **-** | **-** |
| | | **average** | | **-** | **42** | **39** | **604** | **-** | **12** | **7.0** | **8.3** | **588** | **-** | **0.32** | **-** | **-** |
| | | **median** | | **-** | **42** | **39** | **595** | **-** | **13** | **2.2** | **7.7** | **586** | **-** | **0.32** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.0** | **1.9** | **79** | **-** | **1.3** | **8.1** | **2.8** | **74** | **-** | **0.41** | **-** | **-** |
| | | **standard error** | | **-** | **0.44** | **0.42** | **18** | **-** | **0.29** | **1.8** | **0.63** | **17** | **-** | **0.29** | **-** | **-** |
| | | **minimum** | | **-** | **38** | **35** | **510** | **-** | **10** | **0.68** | **5.2** | **491** | **-** | **0.026** | **-** | **-** |
| | | **maximum** | | **-** | **46** | **42** | **805** | **-** | **14** | **28** | **17** | **760** | **-** | **0.61** | **-** | **-** |
| Elk River | 2015 | 22-Apr-15 | ER-CSU-01-Apr-15 | F | 41.9 | 39.0 | 600 | sc, pf | 13 | 6.095 | 7.764 | 586 | - | - | muscle, ovaries | - |
| | | 22-Apr-15 | ER-CSU-02-Apr-15 | F | 40.6 | 37.6 | 550 | sc, pf | 11 | 5.345 | 5.909 | 539 | - | - | muscle, ovaries | - |
| | | 22-Apr-15 | ER-CSU-04-Apr-15 | F | 47.2 | 44.2 | 718 | sc, pf | 17 | 9.507 | 5.033 | 703 | - | - | muscle, ovaries | spent female |
| | | 22-Apr-15 | ER-CSU-05-Apr-15 | F | 38.3 | 35.6 | 480 | sc, pf | 11 | 3.066 | 5.303 | 472 | - | - | muscle, ovaries | spent female |
| | | 26-Apr-15 | ER-CSU-08-Apr-15 | F | 46.0 | 42.7 | 755 | sc, pf | 13 | 9.078 | 6.909 | 739 | - | - | muscle, ovaries | spent female |
| | | 26-Apr-15 | ER-CSU-09-Apr-15 | F | 41.8 | 39.2 | 618 | sc, pf | 13 | 3.721 | 5.947 | 608 | - | - | muscle, ovaries | spent female |
| | | 26-Apr-15 | ER-CSU-10-Apr-15 | F | 39.8 | 37.2 | 605 | sc, pf | 10 | 0.569 | 6.908 | 598 | - | - | muscle, ovaries | spent female |
| | | 26-Apr-15 | ER-CSU-11-Apr-15 | F | 39.6 | 37.0 | 478 | sc, pf | 11 | 0.719 | 6.334 | 471 | - | - | muscle, ovaries | spent female |
| | | 28-Apr-15 | ER-CSU-12-Apr-15 | F | 42.8 | 39.6 | 670 | sc, pf | 13 | 4.704 | 8.840 | 656 | - | - | muscle, ovaries | spent female |
| | | 30-Apr-15 | ER-CSU-17-Apr-15 | F | 48.3 | 45.0 | 895 | sc, pf | 13 | 13.144 | 9.605 | 872 | - | - | muscle, ovaries | spent female |
| | | **total sample size** | | **-** | **10** | **10** | **10** | **-** | **10** | **10** | **10** | **10** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **43** | **40** | **637** | **-** | **13** | **5.6** | **6.9** | **624** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **42** | **39** | **612** | **-** | **13** | **5.0** | **6.6** | **603** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **3.4** | **3.2** | **128** | **-** | **2.0** | **4.0** | **1.5** | **124** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **1.1** | **1.0** | **41** | **-** | **0.62** | **1.3** | **0.47** | **39** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **38** | **36** | **478** | **-** | **10** | **0.57** | **5.0** | **471** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **48** | **45** | **895** | **-** | **17** | **13** | **9.6** | **872** | **-** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

[c] Confidence around provided ages was low (i.e., at or below 50% confidence).

### Table F.23: Summary Statistics for Largescale Sucker Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2016 | 19-Apr-16 | ER-CSU-02-Apr-16 | F | 42.8 | 39.7 | 635 | sc, pf | 14 | 7.292 | 7.333 | 620 | - | - | muscle | - |
| | | 19-Apr-16 | ER-CSU-03-Apr-16 | F | 42.4 | 40.1 | 830 | sc, pf | 14 | 45.237 | 17.422 | 767 | - | - | muscle, ovaries | - |
| | | 19-Apr-16 | ER-CSU-04-Apr-16 | F | 44.0 | 40.9 | 860 | sc, pf | 12 | 69.616 | 13.278 | 777 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | ER-CSU-05-Apr-16 | F | 43.6 | 41.0 | 675 | sc, pf | 13 | 2.445 | 6.686 | 666 | - | - | - | - |
| | | 21-Apr-16 | ER-CSU-07-Apr-16[c] | F | 45.3 | 42.5 | 765 | sc, pf | 10 | 9.126 | 10.477 | 745 | - | - | muscle, ovaries | - |
| | | 21-Apr-16 | ER-CSU-08-Apr-16 | F | 43.3 | 40.4 | 695 | sc, pf | 11 | 3.144 | 10.252 | 682 | - | - | muscle, ovaries | - |
| | | 21-Apr-16 | ER-CSU-11-Apr-16 | F | 40.9 | 38.6 | 555 | sc, pf | 13 | 5.513 | 8.611 | 541 | - | - | muscle, ovaries | - |
| | | 21-Apr-16 | ER-CSU-13-Apr-16 | F | 42.8 | 38.6 | 640 | sc, pf | 10 | 5.984 | 9.811 | 624 | - | - | muscle, ovaries | - |
| | | 21-Apr-16 | ER-CSU-15-Apr-16 | F | 37.2 | 34.8 | 430 | sc, pf | 8 | 1.910 | 5.608 | 422 | - | - | muscle | - |
| | | 22-Apr-16 | ER-CSU-16-Apr-16 | F | 46.9 | 43.0 | 930 | sc, pf | 15 | 10.688 | 17.321 | 902 | - | - | muscle, ovaries | - |
| | | 22-Apr-16 | ER-CSU-17-Apr-16 | F | 42.8 | 39.7 | 650 | sc, pf | 11 | 4.393 | 9.150 | 636 | - | - | - | - |
| | | 22-Apr-16 | ER-CSU-19-Apr-16 | F | 47.4 | 44.6 | 940 | sc, pf | 15 | 6.422 | 20.723 | 913 | - | - | - | - |
| | | 22-Apr-16 | ER-CSU-20-Apr-16 | F | 45.2 | 42.5 | 780 | sc, pf | 14 | 7.387 | 16.184 | 756 | - | - | muscle, ovaries | - |
| | | 22-Apr-16 | ER-CSU-21-Apr-16 | F | 45.2 | 42.5 | 790 | sc, pf | 13 | 7.661 | 13.467 | 769 | - | - | - | - |
| | | 22-Apr-16 | ER-CSU-22-Apr-16 | F | 39.6 | 36.7 | 555 | sc, pf | 10 | 3.121 | 10.601 | 541 | - | - | - | - |
| | | 22-Apr-16 | ER-CSU-23-Apr-16 | F | 46.4 | 43.7 | 825 | sc, pf | 13 | 5.375 | 10.774 | 809 | - | - | - | - |
| | | 22-Apr-16 | ER-CSU-24-Apr-16 | F | 39.0 | 36.5 | 490 | sc, pf | 9 | 4.940 | 6.380 | 479 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-26-Apr-16 | F | 41.8 | 39.2 | 550 | sc, pf | 12 | 4.815 | 7.824 | 537 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-27-Apr-16 | F | 45.7 | 42.7 | 770 | sc, pf | 15 | 5.034 | 7.867 | 757 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-29-Apr-16 | F | 45.0 | 41.8 | 705 | sc, pf | 16 | 5.665 | 8.720 | 691 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-34-Apr-16 | F | 45.7 | 42.7 | 875 | sc, pf | 11 | 37.258 | 3.597 | 834 | - | - | muscle, ovaries | - |
| | | 23-Apr-16 | ER-CSU-45-Apr-16 | F | 46.0 | 43.1 | 880 | sc, pf | 9 | 34.402 | 11.847 | 834 | - | - | muscle, ovaries | - |
| | | **total sample size** | | **-** | **22** | **22** | **22** | **-** | **22** | **22** | **22** | **22** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **44** | **41** | **719** | **-** | **12** | **13** | **11** | **696** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **44** | **41** | **735** | **-** | **13** | **5.8** | **10** | **718** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.7** | **2.5** | **145** | **-** | **2.3** | **17** | **4.3** | **134** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.57** | **0.54** | **31** | **-** | **0.48** | **3.7** | **0.91** | **29** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **37** | **35** | **430** | **-** | **8** | **1.9** | **3.6** | **422** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **47** | **45** | **940** | **-** | **16** | **70** | **21** | **913** | **-** | **-** | **-** | **-** |
| | 2015 | 23-Apr-15 | ER-CSU-06-Apr-15 | M | 36.6 | 34.0 | 420 | - | 8 | - | 4.408 | - | - | - | muscle | spent male |
| | | 28-Apr-15 | ER-CSU-13-Apr-15 | M | 41.8 | 39.1 | 620 | sc, pf | 13 | 14.614 | 6.697 | 599 | - | - | - | - |
| | | 29-Apr-15 | ER-CSU-16-Apr-15 | M | 38.2 | 35.4 | 490 | sc, pf | 9 | 0.783 | 6.025 | 483 | - | - | - | spent male |
| | | 30-Apr-15 | ER-CSU-18-Apr-15 | M | 38.3 | 35.8 | 525 | sc, pf | 14 | 12.867 | 4.975 | 507 | - | - | - | - |
| | | 30-Apr-15 | ER-CSU-19-Apr-15 | M | 40.5 | 37.8 | 575 | sc, pf | 10 | 17.591 | 6.085 | 551 | - | - | - | - |
| | | **total sample size** | | **-** | **5** | **5** | **5** | **-** | **5** | **4** | **5** | **4** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **39** | **36** | **526** | **-** | **11** | **11** | **5.6** | **535** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **38** | **36** | **525** | **-** | **10** | **14** | **6.0** | **529** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.1** | **2.0** | **77** | **-** | **2.6** | **7.4** | **0.93** | **51** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.92** | **0.90** | **34** | **-** | **1.2** | **3.7** | **0.41** | **25** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **37** | **34** | **420** | **-** | **8** | **0.78** | **4.4** | **483** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **42** | **39** | **620** | **-** | **14** | **18** | **6.7** | **599** | **-** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

[c] Confidence around provided ages was low (i.e., at or below 50% confidence).

## Table F.23: Summary Statistics for Largescale Sucker Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2016 | 20-Apr-16 | ER-CSU-06-Apr-16 | M | 39.7 | 36.9 | 565 | sc, pf | 9 | 1.225 | 7.098 | 557 | - | - | - | - |
| | | 21-Apr-16 | ER-CSU-09-Apr-16 | M | 36.8 | 34.7 | 450 | sc, pf | 10 | 26.550 | 7.481 | 416 | - | - | - | - |
| | | 21-Apr-16 | ER-CSU-10-Apr-16 | M | 38.0 | 35.5 | 500 | sc, pf | 9 | 0.984 | 8.420 | 491 | - | - | - | - |
| | | 22-Apr-16 | ER-CSU-25-Apr-16 | M | 39.2 | 36.6 | 530 | sc, pf | 11 | 1.932 | 6.413 | 522 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-28-Apr-16 | M | 43.4 | 40.5 | 660 | sc, pf | 12 | 1.773 | 4.551 | 654 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-30-Apr-16 | M | 40.0 | 37.0 | 565 | sc, pf | 11 | 1.790 | 5.907 | 557 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-31-Apr-16 | M | 42.4 | 39.5 | 610 | sc, pf | 13 | 1.123 | 8.451 | 600 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-32-Apr-16 | M | 39.1 | 36.5 | 570 | sc, pf | 12 | 14.375 | 7.037 | 549 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-33-Apr-16 | M | 42.7 | 39.9 | 645 | sc, pf | 10 | 1.921 | 7.995 | 635 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-35-Apr-16 | M | 38.7 | 36.3 | 490 | sc, pf | 10 | 16.067 | 5.224 | 469 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-36-Apr-16 | M | 37.8 | 34.9 | 475 | sc, pf | 12 | 1.143 | 6.074 | 468 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-37-Apr-16 | M | 40.5 | 37.6 | 610 | sc, pf | 14 | 13.172 | 8.262 | 589 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-38-Apr-16 | M | 43.0 | 40.1 | 690 | sc, pf | 14 | 2.921 | 7.935 | 679 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-39-Apr-16 | M | 39.1 | 36.7 | 560 | sc, pf | 11 | 12.739 | 7.731 | 540 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-40-Apr-16 | M | 37.6 | 34.9 | 465 | sc, pf | 9 | 10.821 | 6.102 | 448 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-41-Apr-16 | M | 38.8 | 36.1 | 420 | sc, pf | 9 | 1.111 | 4.553 | 414 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-42-Apr-16 | M | 43.2 | 40.1 | 715 | - | - | - | - | - | - | - | - | unable to process accurately (overly decomposed) |
| | | 23-Apr-16 | ER-CSU-43-Apr-16 | M | 44.1 | 41.5 | 675 | sc, pf | 17 | 2.095 | 10.203 | 663 | - | - | - | - |
| | | 23-Apr-16 | ER-CSU-44-Apr-16 | M | 41.3 | 38.0 | 550 | sc, pf | 9 | 1.529 | 7.046 | 541 | - | - | - | - |
| | | 25-Apr-16 | ER-CSU-46-Apr-16 | M | 43.7 | 41.1 | 730 | sc, pf | 13 | 2.239 | 18.231 | 710 | - | - | - | - |
| | | 26-Apr-16 | ER-CSU-47-Apr-16 | M | 40.6 | 38.3 | 655 | sc, pf | 13 | 16.992 | 9.989 | 628 | - | - | - | - |
| | | **total sample size** | | **-** | **21** | **21** | **21** | **-** | **20** | **20** | **20** | **20** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **40** | **38** | **578** | **-** | **11** | **6.6** | **7.7** | **556** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **40** | **37** | **565** | **-** | **11** | **2.0** | **7.3** | **553** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.3** | **2.2** | **91** | **-** | **2.2** | **7.5** | **2.9** | **88** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.49** | **0.47** | **20** | **-** | **0.48** | **1.7** | **0.65** | **20** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **37** | **35** | **420** | **-** | **9** | **0.98** | **4.6** | **414** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **44** | **42** | **730** | **-** | **17** | **27** | **18** | **710** | **-** | **-** | **-** | **-** |
| Gold Creek | 2015 | 22-Apr-15 | GC-CSU-02-Apr-15 | F | 41.7 | 38.7 | 590 | sc, pf | 12 | 4.679 | 5.812 | 580 | - | - | muscle, ovaries | - |
| | | 25-Apr-15 | GC-CSU-08-Apr-15 | F | 44.3 | 41.5 | 630 | sc, pf | 11 | 4.424 | 6.842 | 619 | - | - | muscle, ovaries | spent female |
| | | 25-Apr-15 | GC-CSU-09-Apr-15 | F | 46.7 | 43.2 | 755 | sc, pf | 16 | 6.609 | 4.486 | 744 | - | - | muscle, ovaries | spent female |
| | | 25-Apr-15 | GC-CSU-10-Apr-15 | F | 48.0 | 44.5 | 980 | sc, pf | 15 | 42.843 | 12.110 | 925 | recently attacked by osprey | - | muscle, ovaries | - |
| | | 25-Apr-15 | GC-CSU-11-Apr-15 | F | 42.0 | 39.0 | 620 | sc, pf | 13 | 3.637 | 6.577 | 610 | - | - | muscle, ovaries | spent female |
| | | 27-Apr-15 | GC-CSU-13-Apr-15 | F | 41.4 | 38.2 | 523 | sc, pf | 12 | 1.404 | 5.845 | 516 | - | - | muscle, ovaries | spent female |
| | | 29-Apr-15 | GC-CSU-14-Apr-15 | F | 41.4 | 38.4 | 565 | sc, pf | 12 | 4.935 | 5.626 | 554 | - | - | muscle, ovaries | spent female |
| | | 29-Apr-15 | GC-CSU-15-Apr-15 | F | 44.8 | 41.5 | 700 | sc, pf | 14 | 5.827 | 6.709 | 687 | - | - | muscle, ovaries | spent female |
| | | 30-Apr-15 | GC-CSU-17-Apr-15 | F | 41.0 | 37.9 | 508 | sc, pf | 11 | 4.891 | 4.910 | 498 | - | - | muscle, ovaries | - |
| | | 1-May-15 | GC-CSU-18-Apr-15 | F | 42.0 | 39.1 | 605 | sc, pf | 8 | 2.505 | 4.952 | 598 | - | - | muscle | spent female |
| | | **total sample size** | | **-** | **10** | **10** | **10** | **-** | **10** | **10** | **10** | **10** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **43** | **40** | **648** | **-** | **12** | **8.2** | **6.4** | **633** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **42** | **39** | **613** | **-** | **12** | **4.8** | **5.8** | **604** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.5** | **2.3** | **139** | **-** | **2.3** | **12** | **2.2** | **126** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.78** | **0.73** | **44** | **-** | **0.72** | **3.9** | **0.68** | **40** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **41** | **38** | **508** | **-** | **8** | **1.4** | **4.5** | **498** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **48** | **45** | **980** | **-** | **16** | **43** | **12** | **925** | **-** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

[c] Confidence around provided ages was low (i.e., at or below 50% confidence).

**Table F.23: Summary Statistics for Largescale Sucker Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2016 | 20-Apr-16 | GC-CSU-02-Apr-16 | F | 44.2 | 41.0 | 890 | sc, pf | 13 | 7.693 | 21.845 | 860 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | GC-CSU-03-Apr-16 | F | 43.2 | 40.0 | 708 | sc, pf | 10 | 6.302 | 9.032 | 693 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | GC-CSU-04-Apr-16 | F | 46.5 | 43.5 | 1,070 | sc, pf | 11 | 102.620 | 18.351 | 949 | - | - | muscle, ovaries | - |
| | | 20-Apr-16 | GC-CSU-05-Apr-16 | F | 44.5 | 41.7 | 915 | sc, pf | 13 | 69.584 | 18.466 | 827 | worms | - | muscle, ovaries | - |
| | | 20-Apr-16 | GC-CSU-06-Apr-16 | F | 41.0 | 37.9 | 580 | sc, pf | 10 | 3.954 | 9.000 | 567 | undeveloped | - | - | - |
| | | 20-Apr-16 | GC-CSU-07-Apr-16 | F | 44.4 | 41.3 | 800 | sc, pf | 12 | 4.581 | 15.978 | 779 | undeveloped | - | - | - |
| | | 20-Apr-16 | GC-CSU-08-Apr-16 | F | 41.1 | 38.3 | 540 | sc, pf | 10 | 5.028 | 9.689 | 525 | undeveloped | - | - | - |
| | | 20-Apr-16 | GC-CSU-09-Apr-16 | F | 48.5 | 46.1 | 1,260 | sc, pf | 13 | 143.923 | 22.329 | 1,094 | - | - | muscle, ovaries | - |
| | | 21-Apr-16 | GC-CSU-11-Apr-16 | F | 44.5 | 41.6 | 755 | sc, pf | 13 | 5.358 | 9.573 | 740 | - | - | - | - |
| | | 22-Apr-16 | GC-CSU-16-Apr-16 | F | 46.0 | 42.8 | 950 | sc, pf | 13 | 4.698 | 17.727 | 928 | - | - | - | - |
| | | 22-Apr-16 | GC-CSU-17-Apr-16 | F | 42.0 | 39.8 | 610 | sc, pf | 12 | 3.999 | 15.224 | 591 | undeveloped | - | - | - |
| | | 22-Apr-16 | GC-CSU-19-Apr-16 | F | 38.9 | 36.7 | 490 | sc, pf | 11 | 3.820 | 6.470 | 480 | - | - | - | - |
| | | 23-Apr-16 | GC-CSU-20-Apr-16 | F | 43.2 | 40.7 | 760 | sc, pf | 11 | 7.489 | 26.231 | 726 | worms | - | muscle, ovaries | - |
| | | 23-Apr-16 | GC-CSU-23-Apr-16 | F | 44.4 | 41.3 | 715 | sc, pf | 11 | 6.383 | 6.726 | 702 | - | - | - | - |
| | | 23-Apr-16 | GC-CSU-26-Apr-16[c] | F | 46.6 | 43.7 | 1,045 | sc, pf | 10 | 137.690 | 22.543 | 885 | - | - | muscle, ovaries | - |
| | | 23-Apr-16 | GC-CSU-27-Apr-16 | F | 44.8 | 42.4 | 980 | sc, pf | 13 | 133.029 | 21.199 | 826 | - | - | muscle, ovaries | - |
| | | 24-Apr-16 | GC-CSU-29-Apr-16 | F | 40.6 | 37.8 | 650 | sc, pf | 11 | 4.499 | 9.038 | 636 | - | - | - | - |
| | | 24-Apr-16 | GC-CSU-30-Apr-16 | F | 44.7 | 41.8 | 760 | sc, pf | 13 | 4.361 | 14.427 | 741 | worms | 2.072 | - | - |
| | | 24-Apr-16 | GC-CSU-31-Apr-16 | F | 39.5 | 36.8 | 670 | sc, pf | 10 | 32.161 | 14.749 | 623 | worms | 0.453 | muscle, ovaries | - |
| | | 24-Apr-16 | GC-CSU-32-Apr-16 | F | 42.1 | 39.2 | 690 | sc, pf | 12 | 5.917 | 8.581 | 676 | - | - | - | - |
| | | 24-Apr-16 | GC-CSU-33-Apr-16 | F | 41.1 | 38.2 | 615 | - | - | - | - | - | - | - | - | - |
| | | 25-Apr-16 | GC-CSU-34-Apr-16 | F | 49.2 | 46.5 | 1,028 | sc, pf | 16 | 124.980 | 24.771 | 878 | - | - | muscle, ovaries | - |
| | | 25-Apr-16 | GC-CSU-37-Apr-16 | F | 44.1 | 41.8 | 695 | sc, pf | 12 | 39.278 | 10.855 | 645 | - | - | muscle, ovaries | - |
| | | 27-Apr-16 | GC-CSU-43-Apr-16 | F | 55.4 | 51.9 | 2,120 | sc, pf | 17 | 260.711 | 47.601 | 1,812 | - | - | muscle, ovaries | - |
| | | **total sample size** | | **-** | **24** | **24** | **24** | **-** | **23** | **23** | **23** | **23** | **-** | **2** | **-** | **-** |
| | | **average** | | **-** | **44** | **41** | **846** | **-** | **12** | **49** | **17** | **791** | **-** | **1.3** | **-** | **-** |
| | | **median** | | **-** | **44** | **41** | **758** | **-** | **12** | **6.4** | **15** | **740** | **-** | **1.3** | **-** | **-** |
| | | **standard deviation** | | **-** | **3.5** | **3.4** | **332** | **-** | **1.8** | **69** | **9.1** | **267** | **-** | **1.1** | **-** | **-** |
| | | **standard error** | | **-** | **0.72** | **0.70** | **68** | **-** | **0.38** | **14** | **1.9** | **56** | **-** | **0.81** | **-** | **-** |
| | | **minimum** | | **-** | **39** | **37** | **490** | **-** | **10** | **3.8** | **6.5** | **480** | **-** | **0.45** | **-** | **-** |
| | | **maximum** | | **-** | **55** | **52** | **2,120** | **-** | **17** | **261** | **48** | **1,812** | **-** | **2.1** | **-** | **-** |
| | 2015 | 22-Apr-15 | GC-CSU-03-Apr-15 | M | 41.1 | 38.2 | 560 | sc, pf | 10 | 1.634 | 6.041 | 552 | - | - | muscle | - |
| | | 23-Apr-15 | GC-CSU-04-Apr-15 | M | 39.0 | 36.3 | 520 | sc, pf | 10 | 15.912 | 4.527 | 500 | - | - | - | - |
| | | 23-Apr-15 | GC-CSU-05-Apr-15 | M | 39.5 | 36.8 | 540 | sc, pf | 12 | 14.970 | 4.900 | 520 | - | - | - | - |
| | | 24-Apr-15 | GC-CSU-07-Apr-15 | M | 38.6 | 35.8 | 490 | sc, pf | 10 | 9.316 | 5.675 | 475 | - | - | - | - |
| | | 29-Apr-15 | GC-CSU-16-Apr-15 | M | 40.2 | 37.5 | 540 | sc, pf | 11 | 10.056 | 6.370 | 524 | - | - | - | - |
| | | **total sample size** | | **-** | **5** | **5** | **5** | **-** | **5** | **5** | **5** | **5** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **40** | **37** | **530** | **-** | **11** | **10** | **5.5** | **514** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **40** | **37** | **540** | **-** | **10** | **10** | **5.7** | **520** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **0.99** | **0.95** | **26** | **-** | **0.89** | **5.7** | **0.77** | **29** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.44** | **0.43** | **12** | **-** | **0.40** | **2.5** | **0.35** | **13** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **39** | **36** | **490** | **-** | **10** | **1.6** | **4.5** | **475** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **41** | **38** | **560** | **-** | **12** | **16** | **6.4** | **552** | **-** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

[c] Confidence around provided ages was low (i.e., at or below 50% confidence).

## Table F.23: Summary Statistics for Largescale Sucker Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2016 | 21-Apr-16 | GC-CSU-10-Apr-16 | M | 43.6 | 40.7 | 860 | sc, pf | 13 | 38.801 | 18.578 | 803 | - | - | - | - |
| | | 22-Apr-16 | GC-CSU-14-Apr-16 | M | 38.6 | 36.2 | 510 | sc, pf | 12 | 13.066 | 6.445 | 490 | - | - | - | - |
| | | 23-Apr-16 | GC-CSU-21-Apr-16 | M | 45.7 | 42.9 | 960 | sc, pf | 12 | 46.645 | 27.423 | 886 | - | - | - | - |
| | | 23-Apr-16 | GC-CSU-22-Apr-16 | M | 45.9 | 43.2 | 975 | sc, pf | 16 | 48.089 | 13.850 | 913 | - | - | - | - |
| | | 23-Apr-16 | GC-CSU-24-Apr-16 | M | 47.2 | 44.5 | 1,125 | sc, pf | 14 | 58.927 | 32.669 | 1,033 | worms (in operculum) | - | - | - |
| | | 23-Apr-16 | GC-CSU-25-Apr-16 | M | 48.0 | 44.8 | 1,110 | sc, pf | 18 | 56.575 | 19.993 | 1,033 | - | - | - | - |
| | | 24-Apr-16 | GC-CSU-28-Apr-16 | M | 47.4 | 43.9 | 930 | sc, pf | 16 | 25.603 | 19.307 | 885 | worms | - | - | - |
| | | 25-Apr-16 | GC-CSU-35-Apr-16 | M | 44.1 | 41.9 | 890 | sc, pf | 12 | 35.268 | 14.973 | 840 | - | - | - | - |
| | | 25-Apr-16 | GC-CSU-36-Apr-16 | M | 43.2 | 40.0 | 700 | sc, pf | 12 | 1.215 | 9.211 | 690 | - | - | - | - |
| | | 25-Apr-16 | GC-CSU-38-Apr-16 | M | 40.4 | 37.6 | 575 | sc, pf | 10 | 17.270 | 6.214 | 552 | - | - | - | - |
| | | 26-Apr-16 | GC-CSU-39-Apr-16 | M | 44.9 | 42.2 | 935 | sc, pf | 13 | 21.032 | 14.250 | 900 | - | - | - | - |
| | | 26-Apr-16 | GC-CSU-40-Apr-16 | M | 44.4 | 37.7 | 605 | sc, pf | 11 | 12.303 | 6.677 | 586 | - | - | - | - |
| | | 26-Apr-16 | GC-CSU-41-Apr-16 | M | 36.5 | 33.8 | 450 | sc, pf | 8 | 0.678 | 7.360 | 442 | - | - | - | - |
| | | 26-Apr-16 | GC-CSU-42-Apr-16 | M | 37.4 | 34.8 | 510 | sc, pf | 9 | 13.423 | 5.979 | 491 | - | - | - | - |
| | | **total sample size** | | **-** | **14** | **14** | **14** | **-** | **14** | **14** | **14** | **14** | **-** | **-** | **-** | **-** |
| | | **average** | | **-** | **43** | **40** | **795** | **-** | **13** | **28** | **14** | **753** | **-** | **-** | **-** | **-** |
| | | **median** | | **-** | **44** | **41** | **875** | **-** | **12** | **23** | **14** | **821** | **-** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **3.7** | **3.7** | **231** | **-** | **2.8** | **20** | **8.4** | **207** | **-** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **1.0** | **0.98** | **62** | **-** | **0.74** | **5.2** | **2.2** | **55** | **-** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **37** | **34** | **450** | **-** | **8** | **0.68** | **6.0** | **442** | **-** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **48** | **45** | **1,125** | **-** | **18** | **59** | **33** | **1,033** | **-** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

[c] Confidence around provided ages was low (i.e., at or below 50% confidence).

### Table F.24: Summary Statistics for Largescale Sucker Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 12-Apr-14 | SC-CSU-01-Apr-14 | 29.0 | 27.2 | 210 | sc | - | - | - | muscle plug |
| | | 12-Apr-14 | SC-CSU-02-Apr-14 | 20.7 | 19.5 | 90 | sc | - | - | - | muscle plug |
| | | 12-Apr-14 | SC-CSU-03-Apr-14 | 28.0 | 26.0 | 160 | sc | - | - | - | muscle plug |
| | | 12-Apr-14 | SC-CSU-04-Apr-14 | 47.2 | 43.5 | 700 | sc | - | - | - | muscle plug |
| | | 12-Apr-14 | SC-CSU-05-Apr-14 | 17.5 | 16.0 | 50 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-CSU-06-Apr-14 | 14.0 | 13.1 | 24 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-07-Apr-14 | 45.2 | 43.0 | 510 | sc | - | - | - | muscle plug |
| | | 13-Apr-14 | SC-CSU-08-Apr-14 | 45.1 | 42.3 | 515 | sc | - | - | - | muscle plug |
| | | 13-Apr-14 | SC-CSU-09-Apr-14 | 47.5 | 44.3 | 520 | sc | - | - | - | muscle plug |
| | | 13-Apr-14 | SC-CSU-10-Apr-14 | 47.8 | 44.6 | 710 | sc | - | - | - | muscle plug |
| | | 13-Apr-14 | SC-CSU-11-Apr-14 | 47.3 | 44.0 | 435 | sc | - | - | - | muscle plug |
| | | 13-Apr-14 | SC-CSU-12-Apr-14 | 40.7 | 37.9 | 590 | sc | - | - | - | muscle plug |
| | | 13-Apr-14 | SC-CSU-13-Apr-14 | 43.3 | 40.0 | 720 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-14-Apr-14 | 46.7 | 42.6 | 750 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-15-Apr-14 | 46.0 | 43.5 | 800 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-16-Apr-14 | 48.7 | 46.1 | 820 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-17-Apr-14 | 41.0 | 38.3 | 520 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-18-Apr-14 | 44.8 | 41.5 | 720 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-19-Apr-14 | 52.0 | 48.2 | 950 | sc | - | - | - | - |
| | | 13-Apr-14 | SC-CSU-20-Apr-14 | 44.0 | 41.1 | 690 | sc | - | - | - | - |
| | | 21-Aug-14 | SC-CSU-01-Aug-14 | 41.0 | 38.1 | 550 | sc | 8 | - | - | muscle plug |
| | | 23-Aug-14 | SC-CSU-02-Aug-14 | 47.9 | 44.9 | 850 | sc | 9 | - | - | muscle plug |
| | | 23-Aug-14 | SC-CSU-03-Aug-14 | 49.2 | 46.2 | 1,000 | sc | 12 | - | - | muscle plug |
| | | 23-Aug-14 | SC-CSU-04-Aug-14 | 43.0 | 40.1 | 600 | sc | 8 | - | - | muscle plug |
| | | 21-Aug-14 | SC-CSUj-01-Aug-14 | 8.8 | 8.0 | 6 | - | - | - | - | whole body |
| | | 21-Aug-14 | SC-CSUj-02-Aug-14 | 9.6 | 8.9 | 8 | - | - | - | - | whole body |
| | | 21-Aug-14 | SC-CSUj-03-Aug-14 | 8.8 | 7.9 | 6 | - | - | - | - | whole body |
| | | 21-Aug-14 | SC-CSUj-04-Aug-14 | 9.1 | 8.2 | 7 | - | - | - | - | whole body |
| | | 21-Aug-14 | SC-CSUj-05-Aug-14 | 10.0 | 9.2 | 9 | - | - | - | - | whole body |
| | 2016 | 19-Apr-16 | SC-CSU-01-Apr-16 | 39.2 | 36.0 | 510 | - | - | - | - | - |
| | | 20-Apr-16 | SC-CSU-06-Apr-16 | 42.7 | 40.4 | 640 | - | - | I | - | - |
| | | 20-Apr-16 | SC-CSU-07-Apr-16 | 44.9 | 42.1 | 650 | - | - | I | - | - |
| | | 20-Apr-16 | SC-CSU-09-Apr-16 | 42.4 | 39.2 | 585 | - | - | I | - | - |
| | | 20-Apr-16 | SC-CSU-11-Apr-16 | 41.3 | 38.6 | 575 | - | - | I | - | - |
| | | 20-Apr-16 | SC-CSU-26-Apr-16 | 40.2 | 37.8 | 570 | - | - | I | - | - |
| | | 20-Apr-16 | SC-CSU-29-Apr-16 | 38.5 | 36.2 | 490 | - | - | I | - | - |
| | | 20-Apr-16 | SC-CSU-30-Apr-16 | 42.7 | 39.6 | 600 | - | - | I | - | - |
| **total sample size** | | | | **37** | **37** | **37** | **-** | **4** | **-** | **-** | **-** |
| **average** | | | | **37** | **34** | **490** | **-** | **9** | **-** | **-** | **-** |
| **median** | | | | **43** | **40** | **570** | **-** | **9** | **-** | **-** | **-** |
| **standard deviation** | | | | **14** | **13** | **296** | **-** | **2** | **-** | **-** | **-** |
| **standard error** | | | | **2.3** | **2.1** | **49** | **-** | **0.95** | **-** | **-** | **-** |
| **minimum** | | | | **8.8** | **7.9** | **5.8** | **-** | **8.0** | **-** | **-** | **-** |
| **maximum** | | | | **52** | **48** | **1,000** | **-** | **12** | **-** | **-** | **-** |
| Elk River | 2014 | 11-Apr-14 | ER-CSU-01-Apr-14 | 45.7 | 42.9 | 720 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-02-Apr-14 | 40.4 | 38.2 | 520 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-03-Apr-14 | 39.2 | 36.8 | 590 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-04-Apr-14 | 45.7 | 42.8 | 660 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-05-Apr-14 | 39.9 | 37.3 | 540 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-06-Apr-14 | 41.3 | 38.5 | 600 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-07-Apr-14 | 40.8 | 38.1 | 600 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-08-Apr-14 | 46.2 | 43.0 | 820 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-09-Apr-14 | 43.4 | 40.5 | 660 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-10-Apr-14 | 46.3 | 43.2 | 720 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-11-Apr-14 | 50.9 | 47.8 | 1,010 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-12-Apr-14 | 49.1 | 46.2 | 980 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-13-Apr-14 | 41.5 | 38.4 | 580 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-14-Apr-14 | 43.6 | 40.9 | 600 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-15-Apr-14 | 41.8 | 38.8 | 620 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-16-Apr-14 | 43.4 | 40.8 | 740 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-17-Apr-14 | 46.0 | 43.3 | 810 | - | - | - | - | muscle plug |
| | | 11-Apr-14 | ER-CSU-18-Apr-14 | 42.1 | 39.3 | 420 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-19-Apr-14 | 44.5 | 41.5 | 740 | - | - | - | - | - |
| | | 11-Apr-14 | ER-CSU-20-Apr-14 | 42.0 | 39.7 | 610 | - | - | - | - | - |
| | | 20-Aug-14 | ER-CSU-01-Aug-14 | 40.5 | 38.0 | 450 | sc | 8 | - | - | muscle plug |
| | | 22-Aug-14 | ER-CSU-02-Aug-14 | 40.8 | 38.5 | 560 | sc | 9 | - | - | muscle plug |
| | | 22-Aug-14 | ER-CSU-03-Aug-14 | 41.5 | 38.8 | 595 | sc | 9 | - | - | muscle plug |
| | | 22-Aug-14 | ER-CSU-04-Aug-14 | 48.6 | 45.2 | 870 | sc | 12 | - | - | muscle plug |
| | | 22-Aug-14 | ER-CSU-05-Aug-14 | 47.0 | 44.8 | 815 | sc | 12 | - | - | muscle plug |
| | | 22-Aug-14 | ER-CSU-06-Aug-14 | 44.0 | 42.7 | 770 | sc | 8 | - | - | muscle plug |
| | | 22-Aug-14 | ER-CSU-07-Aug-14 | 43.1 | 40.1 | 550 | sc | 8 | - | missing eye | muscle plug |
| | | 22-Aug-14 | ER-CSU-08-Aug-14 | 45.8 | 43.0 | 665 | sc | 7 | - | - | muscle plug |
| | | 22-Aug-14 | ER-CSU-09-Aug-14 | 48.0 | 44.8 | 825 | sc | 8 | - | - | muscle plug |
| | | 24-Aug-14 | ER-CSU-10-Aug-14 | 47.5 | 44.4 | 820 | sc | 10 | - | - | muscle plug |
| | | 20-Aug-14 | ER-CSUj-01-Aug-14 | 9.6 | 9.0 | 10 | - | - | - | - | whole body |
| | | 20-Aug-14 | ER-CSUj-02-Aug-14 | 8.5 | 7.8 | 6 | - | - | - | - | whole body |
| | | 20-Aug-14 | ER-CSUj-03-Aug-14 | 7.1 | 6.5 | 3 | - | - | - | - | whole body |
| | 2015 | 22-Apr-15 | ER-CSU-03-Apr-15 | 39.9 | 36.9 | 500 | - | - | - | - | - |
| | | 24-Apr-15 | ER-CSU-07-Apr-15 | 34.5 | 32.1 | 350 | - | - | - | - | - |
| | | 28-Apr-15 | ER-CSU-14-Apr-15 | 37.9 | 35.1 | 490 | sc, pf | 8 | - | - | muscle |
| | | 28-Apr-15 | ER-CSU-15-Apr-15 | 39.2 | 36.5 | 550 | sc, pf | 9 | - | - | muscle |
| | 2016 | 19-Apr-16 | ER-CSU-01-Apr-16 | 33.5 | 30.9 | 365 | - | - | - | - | - |
| | | 21-Apr-16 | ER-CSU-12-Apr-16 | 42.2 | 39.5 | 640 | - | - | - | - | - |
| | | 21-Apr-16 | ER-CSU-14-Apr-16 | 38.0 | 35.5 | 430 | - | - | - | - | - |
| | | 22-Apr-16 | ER-CSU-18-Apr-16 | 37.3 | 35.0 | 452 | - | - | - | - | - |
| **total sample size** | | | | **41** | **41** | **41** | **-** | **12** | **-** | **-** | **-** |
| **average** | | | | **40** | **38** | **592** | **-** | **9** | **-** | **-** | **-** |
| **median** | | | | **42** | **39** | **600** | **-** | **9** | **-** | **-** | **-** |
| **standard deviation** | | | | **9.8** | **9.3** | **226** | **-** | **2** | **-** | **-** | **-** |
| **standard error** | | | | **1.5** | **1.4** | **35** | **-** | **0.46** | **-** | **-** | **-** |
| **minimum** | | | | **7.1** | **6.5** | **3.2** | **-** | **7** | **-** | **-** | **-** |
| **maximum** | | | | **51** | **48** | **1,010** | **-** | **12** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

**Table F.24:** **Summary Statistics for Largescale Sucker Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2014 | 17-Feb-14 | GC-CSU-01-Feb-14 | 42.1 | 40.1 | 690 |  | - |  | - | - |
|  |  | 12-Apr-14 | GC-CSU-01-Apr-14 | 42.3 | 39.5 | 600 | - | - | - | - | muscle plug |
|  |  | 13-Apr-14 | GC-CSU-02-Apr-14 | 48.7 | 45.2 | 840 | - | - | - | - | muscle plug |
|  |  | 15-Apr-14 | GC-CSU-03-Apr-14 | 39.9 | 37.3 | 525 | - | - | - | - | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-01-Aug-14 | 46.0 | 42.4 | 720 | sc | 8 | - | - | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-02-Aug-14 | 42.4 | 39.8 | 600 | sc | 9 | - | - | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-03-Aug-14 | 48.0 | 44.6 | 910 | sc | 8 | - | lesion near anal fin | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-04-Aug-14 | 42.8 | 40.0 | 570 | sc | 8 | - | caudal fin half missing | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-05-Aug-14 | 40.7 | 37.5 | 560 | sc | 8 | - | - | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-06-Aug-14 | 37.0 | 34.5 | 430 | sc | 5 | - | - | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-07-Aug-14 | 39.7 | 37.0 | 560 | sc | 8 | - | - | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-08-Aug-14 | 43.3 | 39.7 | 570 | sc | 8 | - | - | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-09-Aug-14 | 43.9 | 41.1 | 590 | sc | 9 | - | small scar on both sides | muscle plug |
|  |  | 22-Aug-14 | GC-CSU-10-Aug-14 | 32.2 | 29.8 | 270 | sc | 5 | - | - | muscle plug |
|  |  | 20-Aug-14 | GC-CSUj-01-Aug-14 | 9.0 | 8.1 | 6 | - | - | - | - | whole body |
|  |  | 20-Aug-14 | GC-CSUj-02-Aug-14 | 11.1 | 10.1 | 12 | - | - | - | - | whole body |
|  |  | 20-Aug-14 | GC-CSUj-03-Aug-14 | 9.0 | 8.2 | 6 | - | - | - | - | whole body |
|  |  | 20-Aug-14 | GC-CSUj-04-Aug-14 | 9.8 | 9.0 | 9 | - | - | - | - | whole body |
|  |  | 20-Aug-14 | GC-CSUj-05-Aug-14 | 9.3 | 8.5 | 7 | - | - | - | - | whole body |
|  | 2015 | 22-Apr-15 | GC-CSU-01-Apr-15 | 40.3 | 37.6 | 560 | sc, pf | 12 | - | - | muscle |
|  |  | 23-Apr-15 | GC-CSU-06-Apr-15 | 38.3 | 35.8 | 470 | - | - | - | - | - |
|  |  | 26-Apr-15 | GC-CSU-12-Apr-15 | 38.0 | 35.6 | 500 | - | - | - | - | - |
|  | 2016 | 19-Apr-16 | GC-CSU-01-Apr-16 | 35.7 | 33.0 | 410 | - | - | - | - | - |
|  |  | 21-Apr-16 | GC-CSU-12-Apr-16 | 37.5 | 35.3 | 455 | sc, pf | 7 | I | - | - |
|  |  | 22-Apr-16 | GC-CSU-13-Apr-16 | 37.7 | 35.1 | 485 | sc, pf | 8 | I | undeveloped | - |
|  |  | 22-Apr-16 | GC-CSU-15-Apr-16 | 36.2 | 33.6 | 420 | - | - | - | - | - |
|  |  | 22-Apr-16 | GC-CSU-18-Apr-16 | 37.8 | 35.5 | 480 | - | - | - | - | - |
| **total sample size** |  |  |  | **27** | **27** | **27** | **-** | **13** | **-** | **-** | **-** |
| **average** |  |  |  | **35** | **32** | **454** | **-** | **8** | **-** | **-** | **-** |
| **median** |  |  |  | **38** | **36** | **500** | **-** | **8** | **-** | **-** | **-** |
| **standard deviation** |  |  |  | **13** | **12** | **252** | **-** | **1.8** | **-** | **-** | **-** |
| **standard error** |  |  |  | **2.5** | **2.3** | **48.4** | **-** | **0.49** | **-** | **-** | **-** |
| **minimum** |  |  |  | **9.0** | **8.1** | **6.2** | **-** | **5.0** | **-** | **-** | **-** |
| **maximum** |  |  |  | **49** | **45** | **910** | **-** | **12** | **-** | **-** | **-** |

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[a] Age structures collected: sc - scales, pf - pectoral fin-ray.

**Table F.25: Summary Statistics for Kokanee Meristic Data Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected$^{a}$ | Age$^{b}$ | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 23-Aug-14 | SC-KO-01-Aug-14 | 24.6 | 22.5 | 134 | sc | - | M | - | muscle plug |
| | | 23-Aug-14 | SC-KO-02-Aug-14 | 26.7 | 24.5 | 170 | sc | - | M | - | muscle plug |
| | | 23-Aug-14 | SC-KO-03-Aug-14 | 26.0 | 22.9 | 150 | sc | - | M | - | muscle plug |
| | | 23-Aug-14 | SC-KO-04-Aug-14 | 26.0 | 24.0 | 162 | sc | - | M | - | muscle plug |
| | | 23-Aug-14 | SC-KO-05-Aug-14 | 23.8 | 21.5 | 120 | sc | - | M | - | muscle plug |
| | | 23-Aug-14 | SC-KO-06-Aug-14 | 25.5 | 23.0 | 148 | sc | 2 | M | - | muscle |
| | | 23-Aug-14 | SC-KO-07-Aug-14 | 25.3 | 23.5 | 132 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 23-Aug-14 | SC-KO-08-Aug-14 | 24.8 | 23.0 | 134 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 23-Aug-14 | SC-KO-09-Aug-14 | 26.5 | 24.0 | 143 | sc, oto | 2 | M | - | muscle |
| | | 23-Aug-14 | SC-KO-10-Aug-14 | 25.0 | 22.5 | 125 | sc, oto | 2 | M | - | muscle |
| | | 23-Aug-14 | SC-KO-11-Aug-14 | 25.8 | 23.9 | 140 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 23-Aug-14 | SC-KO-12-Aug-14 | 24.8 | 22.9 | 127 | sc, oto | 2 | F | white spots on ovaries | muscle, ovaries |
| | | 23-Aug-14 | SC-KO-13-Aug-14 | 25.0 | 23.1 | 128 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 25-Aug-14 | SC-KO-14-Aug-14 | 25.0 | 23.0 | 132 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | SC-KO-15-Aug-14 | 25.5 | 23.7 | 170 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | SC-KO-16-Aug-14 | 26.1 | 23.8 | 168 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | SC-KO-17-Aug-14 | 26.0 | 23.6 | 154 | sc, oto | 2 | M | - | muscle |
| | | 25-Aug-14 | SC-KO-18-Aug-14 | 24.4 | 21.9 | 126 | sc, oto | 2 | M | - | muscle |
| | | 25-Aug-14 | SC-KO-19-Aug-14 | 25.2 | 23.5 | 150 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 25-Aug-14 | SC-KO-20-Aug-14 | 26.3 | 24.2 | 150 | sc, oto | 2 | M | - | muscle |
| | | 25-Aug-14 | SC-KO-21-Aug-14 | 28.9 | 26.7 | 185 | sc, oto | 2 | F | light orange spots in ovaries | muscle, ovaries |
| | | 25-Aug-14 | SC-KO-22-Aug-14 | 24.7 | 22.4 | 185 | sc, oto | 2 | M | - | muscle |
| | | 25-Aug-14 | SC-KO-23-Aug-14 | 28.5 | 25.8 | 201 | sc, oto | 2 | M | spots on liver | muscle |
| | | 25-Aug-14 | SC-KO-24-Aug-14 | 26.1 | 24.5 | 154 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 25-Aug-14 | SC-KO-25-Aug-14 | 25.2 | 23.1 | 136 | sc, oto | 3 | F | - | muscle, ovaries |
| | 2015 | 30-Apr-15 | SC-KO-01-Apr-15 | 22.8 | 20.0 | 78 | - | - | - | - | - |
| | | 24-Aug-15 | SC-KO-01-Aug-15 | 25.6 | 23.3 | 128 | sc | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-02-Aug-15 | 20.3 | 18.2 | 68 | oto | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-03-Aug-15 | 22.4 | 20.2 | 90 | oto | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-04-Aug-15 | 22.8 | 20.8 | 100 | oto | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-05-Aug-15 | 21.1 | 19.1 | 79 | oto | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-06-Aug-15 | 21.5 | 19.6 | 79 | oto | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-07-Aug-15 | 21.5 | 19.6 | 78 | oto | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-08-Aug-15 | 20.5 | 18.7 | 68 | oto | 2 | M | - | muscle |
| | | 24-Aug-15 | SC-KO-09-Aug-15 | 21.5 | 19.5 | 75 | oto | 2 | M | - | muscle |
| | 2016 | 24-Aug-16 | SC-KO-01A-Aug-16 | 26.8 | 24.7 | 225 | sc, oto | 3 | M | - | muscle |
| | | 24-Aug-16 | SC-KO-02A-Aug-16 | 26.4 | 24.2 | 215 | sc, oto | 2 | M | - | muscle |
| | | 24-Aug-16 | SC-KO-03A-Aug-16 | 29.7 | 26.5 | 250 | sc, oto | 2 | M | - | muscle |
| | | 28-Aug-16 | SC-KO-04A-Aug-16 | 28.0 | 25.8 | 233 | sc, oto | 2 | M | - | muscle |
| **total sample size** | | | | **39** | **39** | **39** | **-** | **30** | **-** | **-** | **-** |
| **average** | | | | **25** | **23** | **141** | **-** | **2** | **-** | **-** | **-** |
| **median** | | | | **25** | **23** | **136** | **-** | **2** | **-** | **-** | **-** |
| **standard deviation** | | | | **2.2** | **2.1** | **46** | **-** | **0.25** | **-** | **-** | **-** |
| **standard error** | | | | **0.36** | **0.34** | **7** | **-** | **0.046** | **-** | **-** | **-** |
| **minimum** | | | | **20** | **18** | **68** | **-** | **2** | **-** | **-** | **-** |
| **maximum** | | | | **30** | **27** | **250** | **-** | **3** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Aging specialist was unable to age kokanee accurately using only scales.

**Table F.25: Summary Statistics for Kokanee Meristic Data Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age[b] | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2014 | 21-Aug-14 | ER-KO-01-Aug-14 | 24.2 | 22.2 | 110 | sc, oto | 3 | F | - | muscle, ovaries |
| | | 21-Aug-14 | ER-KO-02-Aug-14 | 27.7 | 24.8 | 163 | sc, oto | 4 | M | - | muscle |
| | | 22-Aug-14 | ER-KO-03-Aug-14 | 25.1 | 22.7 | 120 | sc, oto | 3 | M | - | muscle |
| | | 22-Aug-14 | ER-KO-04-Aug-14 | 27.5 | 25.4 | 156 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 24-Aug-14 | ER-KO-05-Aug-14 | 24.0 | 22.1 | 109 | sc, oto | 3 | F | - | muscle, ovaries |
| | | 25-Aug-14 | ER-KO-06-Aug-14 | 26.3 | 23.7 | 160 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | ER-KO-07-Aug-14 | 26.0 | 24.0 | 152 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | ER-KO-08-Aug-14 | 26.5 | 24.6 | 160 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | ER-KO-09-Aug-14 | 27.1 | 24.5 | 175 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | ER-KO-10-Aug-14 | 26.1 | 24.1 | 166 | sc | - | M | - | muscle plug |
| | | 25-Aug-14 | ER-KO-11-Aug-14 | 24.8 | 23.1 | 122 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 25-Aug-14 | ER-KO-12-Aug-14 | 25.2 | 23.5 | 143 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 25-Aug-14 | ER-KO-13-Aug-14 | 25.1 | 22.8 | 153 | sc, oto | 3 | M | - | muscle |
| | | 26-Aug-14 | ER-KO-14-Aug-14 | 24.3 | 22.0 | 116 | sc, oto | 3 | M | - | muscle |
| | | 26-Aug-14 | ER-KO-15-Aug-14 | 24.6 | 22.8 | 122 | sc, oto | 3 | F | - | muscle, ovaries |
| | | 26-Aug-14 | ER-KO-16-Aug-14 | 25.2 | 23.3 | 130 | sc, oto | 2 | F | - | muscle, ovaries |
| | | 26-Aug-14 | ER-KO-17-Aug-14 | 25.3 | 23.1 | 140 | sc, oto | 2 | M | - | muscle |
| | 2015 | 25-Aug-15 | ER-KO-01-Aug-15 | 21.0 | 19.2 | 76 | oto | 2 | M | - | muscle |
| | | 25-Aug-15 | ER-KO-02-Aug-15 | 20.5 | 18.5 | 76 | oto | 2 | M | - | muscle |
| | | 25-Aug-15 | ER-KO-03-Aug-15 | 21.0 | 18.7 | 72 | oto | 2 | M | - | muscle |
| | | 25-Aug-15 | ER-KO-04-Aug-15 | 21.0 | 18.7 | 69 | oto | 2 | M | - | muscle |
| | | 25-Aug-15 | ER-KO-05-Aug-15 | 22.4 | 20.4 | 80 | oto | 2 | F | - | muscle |
| | | 25-Aug-15 | ER-KO-06-Aug-15 | 21.1 | 19.3 | 78 | oto | 2 | F | - | muscle |
| | | 25-Aug-15 | ER-KO-07-Aug-15 | 20.1 | 18.6 | 76 | oto | 2 | M | - | muscle |
| | | 25-Aug-15 | ER-KO-08-Aug-15 | 20.4 | 18.5 | 69 | oto | 2 | M | - | muscle |
| | | 25-Aug-15 | ER-KO-09-Aug-15 | 21.1 | 19.3 | 79 | - | - | M | - | muscle |
| | | 25-Aug-15 | ER-KO-10-Aug-15 | 20.8 | 18.9 | 64 | oto | 2 | F | - | muscle |
| | 2016 | 22-Apr-16 | ER-KO-01-Apr-16 | 23.6 | 22.2 | 98 | - | 3 | - | - | muscle |
| | | 22-Apr-16 | ER-KO-02-Apr-16 | 25.4 | 23.0 | 118 | - | 4 | - | - | muscle |
| | | 22-Apr-16 | ER-KO-03-Apr-16 | 25.2 | 23.0 | 120 | - | 5 | - | - | muscle |
| | | 22-Apr-16 | ER-KO-04-Apr-16 | 26.1 | 23.7 | 134 | - | 5 | - | - | muscle |
| | | 23-Aug-16 | ER-KO-01A-Aug-16 | 25.0 | 23.0 | 157 | sc, oto | 3 | M | - | muscle |
| | | 23-Aug-16 | ER-KO-02A-Aug-16 | 25.2 | 22.9 | 162 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-03A-Aug-16 | 26.9 | 24.6 | 195 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-04A-Aug-16 | 24.5 | 22.6 | 161 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-05A-Aug-16 | 25.6 | 23.4 | 173 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-06A-Aug-16 | 26.0 | 23.7 | 180 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-07A-Aug-16 | 25.0 | 22.5 | 162 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-08A-Aug-16 | 25.0 | 22.8 | 165 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-09A-Aug-16 | 24.2 | 22.2 | 158 | sc, oto | 3 | M | - | muscle |
| | | 28-Aug-16 | ER-KO-10A-Aug-16 | 25.9 | 23.5 | 185 | sc, oto | 3 | M | - | muscle |
| **total sample size** | | | | **41** | **41** | **41** | **-** | **35** | **-** | **-** | **-** |
| **average** | | | | **24** | **22** | **129** | **-** | **3** | **-** | **-** | **-** |
| **median** | | | | **25** | **23** | **134** | **-** | **3** | **-** | **-** | **-** |
| **standard deviation** | | | | **2.2** | **2.0** | **39** | **-** | **0.81** | **-** | **-** | **-** |
| **standard error** | | | | **0.34** | **0.32** | **6** | **-** | **0.14** | **-** | **-** | **-** |
| **minimum** | | | | **20** | **19** | **64** | **-** | **2** | **-** | **-** | **-** |
| **maximum** | | | | **28** | **25** | **195** | **-** | **5** | **-** | **-** | **-** |
| Gold Creek | 2014 | 25-Aug-14 | GC-KO-01-Aug-14 | 25.9 | 23.5 | 145 | sc, oto | 2 | M | - | muscle |
| | | 25-Aug-14 | GC-KO-02-Aug-14 | 17.8 | 16.0 | 46 | sc, oto | 1 | M | - | muscle |
| | | 25-Aug-14 | GC-KO-03-Aug-14 | 17.9 | 16.1 | 47 | sc, oto | 2 | M | - | muscle |
| | | 25-Aug-14 | GC-KO-04-Aug-14 | 17.7 | 16.0 | 41 | sc, oto | 1 | M | - | muscle |
| | | 25-Aug-14 | GC-KO-05-Aug-14 | 16.6 | 15.0 | 38 | sc, oto | 1 | M | - | muscle |
| | | 26-Aug-14 | GC-KO-06-Aug-14 | 18.5 | 16.5 | 48 | sc, oto | 1 | M | - | muscle |
| **total sample size** | | | | **6** | **6** | **6** | **-** | **6** | **-** | **-** | **-** |
| **average** | | | | **19** | **17** | **61** | **-** | **1** | **-** | **-** | **-** |
| **median** | | | | **18** | **16** | **47** | **-** | **1** | **-** | **-** | **-** |
| **standard deviation** | | | | **3.4** | **3.1** | **41** | **-** | **0.52** | **-** | **-** | **-** |
| **standard error** | | | | **1.4** | **1.3** | **17** | **-** | **0.21** | **-** | **-** | **-** |
| **minimum** | | | | **17** | **15** | **38** | **-** | **1** | **-** | **-** | **-** |
| **maximum** | | | | **26** | **24** | **145** | **-** | **2** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Aging specialist was unable to age kokanee accurately using only scales.

## Table F.26: Summary Statistics for Northern Pikeminnow Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 25-Apr-15 | SC-NSC-13-Apr-15 | F | 40.0 | 36.3 | 492 | sc, oto | 14 | 1.029 | 8.327 | 483 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-NSC-22-Apr-15 | F | 32.7 | 29.5 | 257 | sc, oto | 9 | 1.001 | 1.141 | 255 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-NSC-23-Apr-15 | F | 33.3 | 29.1 | 258 | sc, oto | 9 | 1.047 | 1.300 | 256 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-NSC-28-Apr-15 | F | 32.1 | 29.3 | 275 | sc, oto | 12 | 1.093 | 1.897 | 272 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-NSC-32-Apr-15 | F | 31.7 | 29.1 | 210 | sc, oto | 10 | 0.852 | 1.124 | 208 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-NSC-33-Apr-15 | F | 34.0 | 30.2 | 300 | sc, oto | 8 | 1.089 | 3.298 | 296 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-NSC-34-Apr-15 | F | 26.3 | 23.8 | 136 | sc, oto | 6 | 1.009 | 0.391 | 135 | - | - | muscle, ovaries |
| | | 26-Apr-15 | SC-NSC-35-Apr-15 | F | 30.8 | 27.6 | 226 | sc, oto | 9 | 1.075 | 1.085 | 224 | - | - | muscle, ovaries |
| | | 26-Apr-15 | SC-NSC-36-Apr-15 | F | 33.5 | 30.0 | 275 | sc, oto | 10 | 1.019 | 2.513 | 271 | - | - | muscle, ovaries |
| | | 27-Apr-15 | SC-NSC-37-Apr-15 | F | 32.6 | 29.4 | 261 | sc, oto | 9 | 1.027 | 3.218 | 257 | - | - | muscle, ovaries |
| | | 27-Apr-15 | SC-NSC-38-Apr-15 | F | 30.6 | 27.5 | 199 | sc, oto | 7 | 0.957 | 0.682 | 197 | - | - | - |
| | | 27-Apr-15 | SC-NSC-39-Apr-15 | F | 38.0 | 34.0 | 445 | sc, oto | 12 | 1.132 | 3.338 | 441 | - | - | muscle, ovaries |
| | | 27-Apr-15 | SC-NSC-40-Apr-15 | F | 29.8 | 26.2 | 187 | sc, oto | 8 | 1.040 | 1.033 | 185 | - | - | - |
| | | 27-Apr-15 | SC-NSC-41-Apr-15 | F | 30.6 | 27.3 | 239 | sc, oto | 9 | 1.175 | 1.366 | 236 | - | - | - |
| | | 27-Apr-15 | SC-NSC-42-Apr-15 | F | 28.4 | 25.3 | 166 | sc, oto | 8 | 1.025 | 0.325 | 165 | - | - | - |
| | | 27-Apr-15 | SC-NSC-43-Apr-15 | F | 29.9 | 26.5 | 190 | sc, oto | 9 | 1.021 | 0.767 | 188 | - | - | - |
| | | 27-Apr-15 | SC-NSC-44-Apr-15 | F | 35.2 | 31.7 | 370 | sc, oto | 13 | 1.162 | 5.489 | 363 | - | - | muscle, ovaries |
| | | 27-Apr-15 | SC-NSC-45-Apr-15 | F | 30.0 | 26.8 | 169 | sc, oto | 9 | 0.878 | 0.676 | 167 | - | - | - |
| | | 28-Apr-15 | SC-NSC-46-Apr-15 | F | 41.6 | 37.5 | 630 | sc, oto | 13 | 1.195 | 14.581 | 614 | - | - | muscle, ovaries |
| | | 28-Apr-15 | SC-NSC-47-Apr-15 | F | 34.4 | 30.8 | 325 | sc, oto | 13 | 1.112 | 3.661 | 320 | - | - | muscle, ovaries |
| | | **total sample size** | | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **-** | **-** |
| | | **average** | | **-** | **33** | **29** | **281** | **-** | **10** | **1.0** | **2.8** | **277** | **-** | **-** | **-** |
| | | **median** | | **-** | **32** | **29** | **258** | **-** | **9** | **1.0** | **1.3** | **255** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **3.8** | **3.5** | **123** | **-** | **2.2** | **0.088** | **3.4** | **119** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.84** | **0.77** | **27** | **-** | **0.50** | **0.020** | **0.76** | **27** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **26** | **24** | **136** | **-** | **6** | **0.85** | **0.33** | **135** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **42** | **38** | **630** | **-** | **14** | **1.2** | **15** | **614** | **-** | **-** | **-** |
| | 2016 | 19-Apr-16 | SC-NSC-03-Apr-16 | F | 41.5 | 37.5 | 760 | sc, oto | 14 | 12.743 | 9.496 | 738 | - | - | muscle, ovaries |
| | | 21-Apr-16 | SC-NSC-09-Apr-16 | F | 34.1 | 30.5 | 315 | sc, oto | 13 | 4.289 | 3.971 | 307 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-NSC-13-Apr-16 | F | 30.0 | 26.5 | 226 | sc, oto | 8 | 0.998 | 4.783 | 220 | - | - | - |
| | | 23-Apr-16 | SC-NSC-19-Apr-16 | F | 36.2 | 32.5 | 415 | sc, oto | 11 | 1.944 | 6.792 | 406 | - | - | - |
| | | 23-Apr-16 | SC-NSC-21-Apr-16 | F | 37.6 | 33.8 | 520 | sc, oto | 13 | 5.772 | 9.690 | 505 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-NSC-23-Apr-16 | F | 32.7 | 29.2 | 375 | sc, oto | 9 | 0.812 | 1.055 | 373 | - | - | - |
| | | 23-Apr-16 | SC-NSC-25-Apr-16 | F | 30.1 | 27.2 | 257 | sc, oto | 12 | 11.222 | 3.319 | 242 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-NSC-26-Apr-16 | F | 30.0 | 27.0 | 215 | sc, oto | 9 | 1.139 | 1.539 | 212 | - | - | - |
| | | 24-Apr-16 | SC-NSC-29-Apr-16 | F | 39.7 | 35.9 | 550 | sc, oto | 10 | 11.391 | 13.651 | 525 | - | - | muscle, ovaries |
| | | 25-Apr-16 | SC-NSC-32-Apr-16 | F | 45.5 | 41.2 | 996 | sc, oto | 15 | 28.832 | 20.282 | 947 | - | - | muscle, ovaries |
| | | 25-Apr-16 | SC-NSC-33-Apr-16 | F | 62.6 | 57.4 | 2,530 | sc, oto | 21 | 97.351 | 48.716 | 2,384 | - | - | muscle, ovaries |
| | | 25-Apr-16 | SC-NSC-34-Apr-16 | F | 52.5 | 47.8 | 1,420 | sc, oto | 15 | 36.771 | 19.819 | 1,363 | - | - | muscle, ovaries |
| | | 25-Apr-16 | SC-NSC-35-Apr-16 | F | 44.4 | 39.8 | 935 | sc, oto | 14 | 26.759 | 20.354 | 888 | - | - | muscle, ovaries |
| | | 25-Apr-16 | SC-NSC-36-Apr-16 | F | 44.7 | 40.4 | 875 | sc, oto | 14 | 21.707 | 21.843 | 831 | - | - | muscle, ovaries |
| | | 25-Apr-16 | SC-NSC-37-Apr-16 | F | 39.4 | 35.6 | 500 | sc, oto | 11 | 4.218 | 10.053 | 486 | - | - | - |
| | | 25-Apr-16 | SC-NSC-38-Apr-16 | F | 42.5 | 38.6 | 640 | sc, oto | 13 | 3.139 | 11.200 | 626 | - | - | - |
| | | 25-Apr-16 | SC-NSC-40-Apr-16 | F | 33.7 | 30.2 | 297 | sc, oto | 10 | 2.041 | 3.772 | 291 | - | - | - |
| | | 25-Apr-16 | SC-NSC-41-Apr-16 | F | 44.2 | 40.4 | 800 | sc, oto | 13 | 22.375 | 21.652 | 756 | - | - | - |
| | | 25-Apr-16 | SC-NSC-42-Apr-16 | F | 36.9 | 33.7 | 445 | sc, oto | 14 | 3.838 | 10.197 | 431 | - | - | - |
| | | **total sample size** | | **-** | **19** | **19** | **19** | **-** | **19** | **19** | **19** | **19** | **-** | **-** | **-** |
| | | **average** | | **-** | **40** | **36** | **688** | **-** | **13** | **16** | **13** | **660** | **-** | **-** | **-** |
| | | **median** | | **-** | **39** | **36** | **520** | **-** | **13** | **5.8** | **10** | **505** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **8.2** | **7.7** | **546** | **-** | **2.9** | **23** | **11** | **514** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **1.9** | **1.8** | **125** | **-** | **0.68** | **5.2** | **2.6** | **118** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **30** | **27** | **215** | **-** | **8** | **0.81** | **1.1** | **212** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **63** | **57** | **2,530** | **-** | **21** | **97** | **49** | **2,384** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

**Table F.26:** **Summary Statistics for Northern Pikeminnow Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 22-Apr-15 | SC-NSC-01-Apr-15 | M | 27.7 | 24.7 | 147 | sc, oto | 7 | 0.98 | 0.980 | 145 | - | - | muscle |
| | | 23-Apr-15 | SC-NSC-03-Apr-15 | M | 31.0 | 27.9 | 230 | sc, oto | 11 | 1.06 | 1.274 | 228 | - | - | muscle |
| | | 23-Apr-15 | SC-NSC-04-Apr-15 | M | 31.0 | 28.0 | 222 | sc, oto | 11 | 1.01 | 1.021 | 220 | - | - | muscle |
| | | 24-Apr-15 | SC-NSC-06-Apr-15 | M | 31.5 | 28.3 | 240 | sc, oto | 10 | 1.06 | 0.488 | 238 | - | - | muscle |
| | | 24-Apr-15 | SC-NSC-07-Apr-15 | M | 28.5 | 25.5 | 164 | sc, oto | 8 | 0.99 | 0.640 | 162 | - | - | muscle |
| | | 25-Apr-15 | SC-NSC-09-Apr-15 | M | 34.9 | 31.5 | 335 | sc, oto | 13 | 1.07 | 3.055 | 331 | - | - | muscle |
| | | 25-Apr-15 | SC-NSC-10-Apr-15 | M | 32.8 | 29.4 | 262 | sc, oto | 14 | 1.03 | 1.560 | 259 | - | - | muscle |
| | | 25-Apr-15 | SC-NSC-11-Apr-15 | M | 35.0 | 31.6 | 315 | sc, oto | 13 | 1.00 | 1.518 | 312 | - | - | muscle |
| | | 25-Apr-15 | SC-NSC-12-Apr-15 | M | 36.5 | 32.8 | 393 | sc, oto | 11 | 1.11 | 1.475 | 390 | - | - | muscle |
| | | 25-Apr-15 | SC-NSC-15-Apr-15 | M | 32.3 | 29.1 | 274 | sc, oto | 13 | 1.11 | 1.602 | 271 | - | - | muscle |
| | | 25-Apr-15 | SC-NSC-16-Apr-15 | M | 32.2 | 29.5 | 271 | sc, oto | 10 | 1.06 | 3.141 | 267 | - | - | - |
| | | 25-Apr-15 | SC-NSC-17-Apr-15 | M | 31.6 | 28.4 | 239 | sc, oto | 10 | 1.04 | 1.452 | 237 | - | - | - |
| | | 25-Apr-15 | SC-NSC-18-Apr-15 | M | 30.0 | 27.1 | 226 | sc, oto | 9 | 1.14 | 1.815 | 223 | - | - | - |
| | | 25-Apr-15 | SC-NSC-19-Apr-15 | M | 34.1 | 30.5 | 267 | sc, oto | 11 | 0.94 | 2.052 | 264 | - | - | - |
| | | 25-Apr-15 | SC-NSC-21-Apr-15 | M | 30.6 | 27.4 | 219 | sc, oto | 10 | 1.06 | 0.857 | 217 | - | - | - |
| | | 25-Apr-15 | SC-NSC-25-Apr-15 | M | 34.4 | 31.0 | 317 | sc, oto | 10 | 1.06 | 2.218 | 314 | - | - | - |
| | | 25-Apr-15 | SC-NSC-26-Apr-15 | M | 29.5 | 26.5 | 242 | sc, oto | 10 | 1.30 | 3.463 | 237 | - | - | - |
| | | 25-Apr-15 | SC-NSC-27-Apr-15 | M | 31.8 | 28.4 | 251 | sc, oto | 12 | 1.10 | 1.714 | 248 | - | - | - |
| | | 25-Apr-15 | SC-NSC-29-Apr-15 | M | 30.5 | 27.3 | 217 | sc, oto | 9 | 1.07 | 1.020 | 215 | - | - | - |
| | | 25-Apr-15 | SC-NSC-30-Apr-15 | M | 29.0 | 25.8 | 187 | sc, oto | 9 | 1.09 | 1.895 | 184 | - | - | - |
| | | 25-Apr-15 | SC-NSC-31-Apr-15 | M | 29.6 | 26.7 | 206 | sc, oto | 9 | 1.08 | 1.922 | 203 | - | - | - |
| | | **total sample size** | | **-** | **21** | **21** | **21** | **-** | **21** | **21** | **21** | **21** | **-** | **-** | **-** |
| | | **average** | | **-** | **32** | **28** | **249** | **-** | **10** | **1.1** | **1.7** | **246** | **-** | **-** | **-** |
| | | **median** | | **-** | **32** | **28** | **240** | **-** | **10** | **1.1** | **1.6** | **237** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.3** | **2.2** | **57** | **-** | **1.8** | **0.072** | **0.79** | **57** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.51** | **0.47** | **13** | **-** | **0.39** | **0.016** | **0.17** | **12** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **28** | **25** | **147** | **-** | **7** | **0.94** | **0.49** | **145** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **37** | **33** | **393** | **-** | **14** | **1.3** | **3.5** | **390** | **-** | **-** | **-** |
| | 2016 | 19-Apr-16 | SC-NSC-01-Apr-16 | M | 51.2 | 47.0 | 1,200 | sc, oto | 26 | 20.357 | 13.928 | 1,166 | constricted pupil | - | muscle |
| | | 20-Apr-16 | SC-NSC-04-Apr-16 | M | 31.5 | 28.9 | 250 | sc, oto | 15 | 2.747 | 2.853 | 244 | - | - | - |
| | | 20-Apr-16 | SC-NSC-05-Apr-16 | M | 32.7 | 29.5 | 280 | sc, oto | 10 | 1.910 | 2.833 | 275 | - | - | - |
| | | 21-Apr-16 | SC-NSC-06-Apr-16 | M | 32.9 | 29.5 | 300 | sc, oto | 13 | 3.310 | 3.253 | 293 | worms | 0.015 | - |
| | | 21-Apr-16 | SC-NSC-07-Apr-16 | M | 30.2 | 27.5 | 224 | sc | 7 | 1.214 | 2.464 | 220 | - | - | - |
| | | 21-Apr-16 | SC-NSC-08-Apr-16 | M | 31.9 | 29.2 | 240 | sc, oto | 13 | 1.280 | 2.900 | 236 | - | - | - |
| | | 21-Apr-16 | SC-NSC-10-Apr-16 | M | 34.2 | 31.2 | 325 | sc, oto | 11 | 4.507 | 4.392 | 316 | - | - | - |
| | | 21-Apr-16 | SC-NSC-11-Apr-16 | M | 37.5 | 32.9 | 455 | sc, oto | 14 | 2.858 | 4.429 | 448 | - | - | - |
| | | 22-Apr-16 | SC-NSC-15-Apr-16 | M | 38.2 | 34.8 | 540 | sc, oto | 16 | 6.678 | 7.694 | 526 | - | - | - |
| | | 22-Apr-16 | SC-NSC-16-Apr-16 | M | 32.3 | 29.2 | 290 | sc, oto | 11 | 1.631 | 3.160 | 285 | - | - | - |
| | | 22-Apr-16 | SC-NSC-17-Apr-16 | M | 32.4 | 29.0 | 262 | sc, oto | 10 | 2.002 | 3.901 | 256 | - | - | - |
| | | 22-Apr-16 | SC-NSC-18-Apr-16 | M | 32.5 | 28.2 | 300 | sc, oto | 10 | 2.795 | 2.284 | 295 | - | - | - |
| | | 23-Apr-16 | SC-NSC-20-Apr-16 | M | 36.6 | 32.9 | 445 | sc, oto | 14 | 3.920 | 4.661 | 436 | - | - | - |
| | | 23-Apr-16 | SC-NSC-22-Apr-16 | M | 36.1 | 32.6 | 410 | sc | 6 | 4.285 | 4.940 | 401 | worms | - | - |
| | | 23-Apr-16 | SC-NSC-24-Apr-16 | M | 31.7 | 28.7 | 234 | sc, oto | 10 | 0.913 | 2.358 | 231 | - | - | - |
| | | 23-Apr-16 | SC-NSC-27-Apr-16 | M | 29.7 | 26.5 | 224 | sc, oto | 11 | 2.522 | 2.792 | 219 | - | - | - |
| | | 23-Apr-16 | SC-NSC-28-Apr-16 | M | 30.0 | 26.8 | 215 | sc, oto | 9 | 0.996 | 2.950 | 211 | - | - | - |
| | | 25-Apr-16 | SC-NSC-30-Apr-16 | M | 29.9 | 27.1 | 222 | sc, oto | 10 | 1.409 | 2.346 | 218 | - | - | - |
| | | 25-Apr-16 | SC-NSC-31-Apr-16 | M | 35.7 | 32.7 | 410 | sc, oto | 14 | 2.252 | 6.557 | 401 | worms | 1.379 | - |
| | | 25-Apr-16 | SC-NSC-39-Apr-16 | M | 36.6 | 32.3 | 460 | sc, oto | 15 | 5.662 | 8.183 | 446 | - | - | - |
| | | **total sample size** | | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **2** | **-** |
| | | **average** | | **-** | **34** | **31** | **364** | **-** | **12** | **3.7** | **4.4** | **356** | **-** | **0.70** | **-** |
| | | **median** | | **-** | **33** | **29** | **295** | **-** | **11** | **2.6** | **3.2** | **289** | **-** | **0.70** | **-** |
| | | **standard deviation** | | **-** | **4.8** | **4.5** | **220** | **-** | **4.2** | **4.2** | **2.8** | **213** | **-** | **0.96** | **-** |
| | | **standard error** | | **-** | **1.1** | **1.0** | **49** | **-** | **0.94** | **0.95** | **0.63** | **48** | **-** | **0.68** | **-** |
| | | **minimum** | | **-** | **30** | **27** | **215** | **-** | **6** | **0.91** | **2.3** | **211** | **-** | **0.015** | **-** |
| | | **maximum** | | **-** | **51** | **47** | **1,200** | **-** | **26** | **20** | **14** | **1,166** | **-** | **1.4** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

### Table F.26: Summary Statistics for Northern Pikeminnow Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2015 | 23-Apr-15 | ER-NSC-05-Apr-15 | F | 35.8 | 32.3 | 380 | sc, oto | 10 | 1.128 | 3.599 | 375 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-06-Apr-15 | F | 33.9 | 30.6 | 260 | sc, oto | 11 | 0.907 | 1.204 | 258 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-08-Apr-15 | F | 32.0 | 28.6 | 232 | sc, oto | 8 | 0.992 | 1.263 | 230 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-10-Apr-15 | F | 26.6 | 23.4 | 134 | sc, oto | 8 | 1.046 | 0.223 | 133 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-13-Apr-15 | F | 46.7 | 42.7 | 885 | sc, oto | 13 | 1.137 | 12.965 | 871 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-14-Apr-15 | F | 31.6 | 28.7 | 240 | sc, oto | 13 | 1.015 | 1.466 | 238 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-15-Apr-15 | F | 28.8 | 25.5 | 171 | sc, oto | 8 | 1.031 | 0.733 | 169 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-17-Apr-15 | F | 28.5 | 25.4 | 153 | sc, oto | 9 | 0.934 | 0.801 | 151 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-NSC-19-Apr-15 | F | 32.0 | 28.5 | 265 | sc, oto | 11 | 1.145 | 1.344 | 263 | - | - | muscle, ovaries |
| | | 24-Apr-15 | ER-NSC-25-Apr-15 | F | 40.4 | 36.5 | 560 | sc, oto | 13 | 1.152 | 7.807 | 551 | - | - | muscle, ovaries |
| | | 26-Apr-15 | ER-NSC-28-Apr-15 | F | 31.0 | 27.6 | 198 | sc, oto | 9 | 0.942 | 1.008 | 196 | - | - | - |
| | | 26-Apr-15 | ER-NSC-29-Apr-15 | F | 32.5 | 29.4 | 286 | sc, oto | 9 | 1.125 | 1.527 | 283 | - | - | muscle, ovaries |
| | | 26-Apr-15 | ER-NSC-31-Apr-15 | F | 28.6 | 25.7 | 161 | sc, oto | 10 | 0.948 | 0.467 | 160 | - | - | - |
| | | 26-Apr-15 | ER-NSC-33-Apr-15 | F | 29.5 | 26.3 | 185 | sc, oto | 12 | 1.017 | 1.140 | 183 | - | - | - |
| | | 26-Apr-15 | ER-NSC-34-Apr-15 | F | 28.6 | 25.4 | 161 | sc, oto | 9 | 0.982 | 0.258 | 160 | - | - | - |
| | | 27-Apr-15 | ER-NSC-35-Apr-15 | F | 28.3 | 25.3 | 165 | sc, oto | 9 | 1.019 | 0.778 | 163 | - | - | - |
| | | 27-Apr-15 | ER-NSC-36-Apr-15 | F | 26.1 | 23.4 | 131 | sc, oto | 6 | 1.022 | 0.323 | 130 | small ovaries, hard to distinguish | - | - |
| | | 27-Apr-15 | ER-NSC-37-Apr-15 | F | 25.8 | 22.5 | 116 | sc, oto | 8 | 1.018 | 0.466 | 115 | tail deformed | - | - |
| | | 27-Apr-15 | ER-NSC-38-Apr-15 | F | 27.2 | 24.7 | 156 | sc, oto | 9 | 1.035 | 0.759 | 154 | - | - | - |
| | | 27-Apr-15 | ER-NSC-40-Apr-15 | F | 32.4 | 29.2 | 241 | sc, oto | 13 | 0.968 | 1.789 | 238 | - | - | - |
| | | 28-Apr-15 | ER-NSC-43-Apr-15 | F | 34.2 | 30.8 | 320 | sc, oto | 13 | 1.095 | 4.013 | 315 | - | - | muscle, ovaries |
| | | **total sample size** | | - | **21** | **21** | **21** | - | **21** | **21** | **21** | **21** | - | - | - |
| | | **average** | | - | **31** | **28** | **257** | - | **10** | **1.0** | **2.1** | **254** | - | - | - |
| | | **median** | | - | **31** | **28** | **198** | - | **9** | **1.0** | **1.1** | **196** | - | - | - |
| | | **standard deviation** | | - | **5.0** | **4.7** | **176** | - | **2.1** | **0.074** | **3.0** | **173** | - | - | - |
| | | **standard error** | | - | **1.1** | **1.0** | **38** | - | **0.46** | **0.016** | **0.66** | **38** | - | - | - |
| | | **minimum** | | - | **26** | **23** | **116** | - | **6** | **0.91** | **0.22** | **115** | - | - | - |
| | | **maximum** | | - | **47** | **43** | **885** | - | **13** | **1.2** | **13** | **871** | - | - | - |
| | 2016 | 19-Apr-16 | ER-NSC-02-Apr-16 | F | 34.8 | 31.5 | 340 | sc, oto | 9 | 1.786 | 2.843 | 335 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-NSC-03-Apr-16 | F | 32.3 | 29.4 | 240 | sc, oto | 9 | 0.696 | 1.667 | 238 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-NSC-04-Apr-16 | F | 31.6 | 28.1 | 240 | sc, oto | 8 | 1.401 | 3.240 | 235 | - | - | muscle |
| | | 19-Apr-16 | ER-NSC-05-Apr-16 | F | 31.5 | 28.1 | 243 | sc, oto | 12 | 0.986 | 3.727 | 238 | - | - | muscle |
| | | 19-Apr-16 | ER-NSC-06-Apr-16 | F | 33.0 | 29.9 | 262 | sc, oto | 10 | 2.442 | 4.460 | 255 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-NSC-08-Apr-16 | F | 34.6 | 31.2 | 310 | sc, oto | 9 | 0.633 | 3.147 | 306 | worms | 8.438 | muscle |
| | | 19-Apr-16 | ER-NSC-09-Apr-16[b] | F | 54.1 | 49.5 | 1,500 | sc, oto | 15 | 47.722 | 27.351 | 1,425 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-NSC-10-Apr-16 | F | 41.3 | 37.5 | 645 | sc, oto | 15 | 3.073 | 11.045 | 631 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-NSC-11-Apr-16 | F | 35.5 | 31.7 | 345 | sc, oto | 10 | 1.323 | 2.515 | 341 | - | - | muscle |
| | | 19-Apr-16 | ER-NSC-14-Apr-16 | F | 34.1 | 30.5 | 330 | sc, oto | 10 | 1.289 | 7.107 | 322 | - | - | muscle |
| | | 20-Apr-16 | ER-NSC-15-Apr-16 | F | 60.8 | 55.9 | 2,600 | sc, oto | 20 | 124.333 | 46.894 | 2,429 | - | - | muscle, ovaries |
| | | 20-Apr-16 | ER-NSC-16-Apr-16 | F | 53.4 | 48.0 | 1,540 | sc, oto | 14 | 35.537 | 17.351 | 1,487 | - | - | muscle, ovaries |
| | | 20-Apr-16 | ER-NSC-17-Apr-16 | F | 40.2 | 36.2 | 615 | sc, oto | 14 | 10.160 | 9.284 | 596 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-NSC-19-Apr-16 | F | 38.6 | 35.2 | 555 | sc, oto | 14 | 7.386 | 25.115 | 522 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-NSC-20-Apr-16 | F | 34.8 | 32.2 | 370 | sc, oto | 11 | 2.882 | 4.983 | 362 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-NSC-21-Apr-16 | F | 36.1 | 32.9 | 455 | sc, oto | 16 | 16.376 | 4.996 | 434 | - | - | muscle, ovaries |
| | | 22-Apr-16 | ER-NSC-27-Apr-16 | F | 49.1 | 45.0 | 1,200 | sc, oto | 15 | 17.618 | 24.420 | 1,158 | - | - | muscle, ovaries |
| | | 22-Apr-16 | ER-NSC-28-Apr-16 | F | 56.3 | 50.8 | 1,900 | sc, oto | 22 | 104.773 | 31.825 | 1,763 | - | - | muscle, ovaries |
| | | 22-Apr-16 | ER-NSC-29-Apr-16 | F | 61.5 | 56.7 | 2,640 | sc, oto | 21 | 131.999 | 55.866 | 2,452 | - | - | muscle, ovaries |
| | | 22-Apr-16 | ER-NSC-30-Apr-16 | F | 33.3 | 30.0 | 305 | sc, oto | 10 | 1.537 | 5.314 | 298 | - | - | |
| | | 22-Apr-16 | ER-NSC-38-Apr-16 | F | 51.1 | 47.0 | 1,400 | sc, oto | 15 | 36.948 | 24.668 | 1,338 | - | - | muscle, ovaries |
| | | **total sample size** | | - | **21** | **21** | **21** | - | **21** | **21** | **21** | **21** | - | - | - |
| | | **average** | | - | **42** | **38** | **859** | - | **13** | **26** | **15** | **817** | - | - | - |
| | | **median** | | - | **36** | **33** | **455** | - | **14** | **3.1** | **7.1** | **434** | - | - | - |
| | | **standard deviation** | | - | **10** | **9.6** | **778** | - | **4.1** | **42** | **16** | **723** | - | - | - |
| | | **standard error** | | - | **2.3** | **2.1** | **170** | - | **0.89** | **9.1** | **3.4** | **158** | - | - | - |
| | | **minimum** | | - | **32** | **28** | **240** | - | **8** | **0.63** | **1.7** | **235** | - | - | - |
| | | **maximum** | | - | **62** | **57** | **2,640** | - | **22** | **132** | **56** | **2,452** | - | - | - |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## **Table F.26:** Summary Statistics for Northern Pikeminnow Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2015 | 22-Apr-15 | ER-NSC-01-Apr-15 | M | 34.4 | 31.4 | 291 | sc | - | 0.94 | 1.873 | 288 | - | - | muscle |
| | | 22-Apr-15 | ER-NSC-02-Apr-15 | M | 36.5 | 32.9 | 420 | sc, oto | 13 | 1.18 | 5.094 | 414 | - | - | muscle |
| | | 22-Apr-15 | ER-NSC-03-Apr-15 | M | 32.2 | 28.7 | 234 | sc, oto | 10 | 0.99 | 1.435 | 232 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-04-Apr-15 | M | 36.2 | 32.5 | 380 | sc, oto | 14 | 1.11 | 3.392 | 376 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-07-Apr-15 | M | 33.4 | 29.8 | 264 | sc, oto | 10 | 1.00 | 0.631 | 262 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-09-Apr-15 | M | 33.8 | 30.3 | 255 | sc, oto | 11 | 0.92 | 0.705 | 253 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-11-Apr-15 | M | 29.4 | 26.1 | 193 | sc, oto | 9 | 1.09 | 0.518 | 191 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-12-Apr-15 | M | 44.7 | 40.5 | 990 | sc, oto | 15 | 1.49 | 20.113 | 968 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-16-Apr-15 | M | 29.0 | 26.0 | 182 | sc, oto | 11 | 1.04 | 0.736 | 180 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-21-Apr-15 | M | 30.1 | 26.9 | 226 | sc, oto | 9 | 1.16 | 0.427 | 224 | - | - | muscle |
| | | 23-Apr-15 | ER-NSC-23-Apr-15 | M | 38.2 | 34.5 | 505 | sc, oto | 13 | 1.23 | 5.314 | 498 | - | - | - |
| | | 24-Apr-15 | ER-NSC-24-Apr-15 | M | 30.3 | 27.2 | 194 | sc, oto | 9 | 0.96 | 1.079 | 192 | - | - | - |
| | | 26-Apr-15 | ER-NSC-27-Apr-15 | M | 38.5 | 34.7 | 475 | sc, oto | 13 | 1.14 | 6.375 | 467 | - | - | - |
| | | 26-Apr-15 | ER-NSC-30-Apr-15 | M | 31.3 | 28.2 | 256 | sc, oto | 10 | 1.14 | 2.169 | 253 | - | - | - |
| | | 26-Apr-15 | ER-NSC-32-Apr-15 | M | 29.8 | 26.7 | 196 | sc, oto | 9 | 1.03 | 0.804 | 194 | - | - | - |
| | | 27-Apr-15 | ER-NSC-39-Apr-15 | M | 31.1 | 27.5 | 205 | sc, oto | 9 | 0.99 | 0.638 | 203 | - | - | - |
| | | 28-Apr-15 | ER-NSC-41-Apr-15[b] | M | 39.3 | 35.3 | 560 | sc, oto | >15 | 1.27 | 4.095 | 555 | - | - | - |
| | | 28-Apr-15 | ER-NSC-42-Apr-15 | M | 29.7 | 26.5 | 206 | sc, oto | 14 | 1.11 | 2.139 | 203 | - | - | - |
| | | 29-Apr-15 | ER-NSC-44-Apr-15 | M | 34.2 | 31.0 | 390 | sc, oto | 10 | 1.31 | 4.192 | 384 | - | - | - |
| | | 29-Apr-15 | ER-NSC-45-Apr-15 | M | 27.5 | 24.6 | 172 | sc, oto | 7 | 1.16 | 1.025 | 170 | - | - | - |
| | | **total sample size** | | - | **20** | **20** | **20** | - | **19** | **20** | **20** | **20** | - | - | - |
| | | **average** | | - | **33** | **30** | **330** | - | **11** | **1.1** | **3.1** | **325** | - | - | - |
| | | **median** | | - | **33** | **29** | **256** | - | **10** | **1.1** | **1.7** | **253** | - | - | - |
| | | **standard deviation** | | - | **4.3** | **4.0** | **195** | - | **2.4** | **0.14** | **4.4** | **191** | - | - | - |
| | | **standard error** | | - | **0.97** | **0.90** | **44** | - | **0.55** | **0.032** | **0.98** | **43** | - | - | - |
| | | **minimum** | | - | **28** | **25** | **172** | - | **7** | **0.92** | **0.43** | **170** | - | - | - |
| | | **maximum** | | - | **45** | **41** | **990** | - | **15** | **1.5** | **20** | **968** | - | - | - |
| | 2016 | 19-Apr-16 | ER-NSC-01-Apr-16 | M | 33.5 | 30.4 | 345 | sc, oto | 15 | 1.448 | 4.554 | 339 | - | - | muscle |
| | | 19-Apr-16 | ER-NSC-07-Apr-16 | M | 35.4 | 32.1 | 405 | sc, oto | 13 | 2.906 | 5.250 | 397 | - | - | muscle |
| | | 19-Apr-16 | ER-NSC-12-Apr-16 | M | 33.0 | 29.5 | 310 | sc, oto | 10 | 2.742 | 4.169 | 303 | - | - | muscle |
| | | 19-Apr-16 | ER-NSC-13-Apr-16 | M | 36.0 | 32.5 | 420 | sc, oto | 10 | 4.260 | 4.743 | 411 | - | - | muscle |
| | | 20-Apr-16 | ER-NSC-18-Apr-16 | M | 32.8 | 29.3 | 315 | sc, oto | 14 | 1.165 | 3.631 | 310 | - | - | - |
| | | 21-Apr-16 | ER-NSC-22-Apr-16 | M | 35.2 | 32.3 | 370 | sc, oto | 11 | 1.922 | 6.287 | 362 | - | - | muscle |
| | | 21-Apr-16 | ER-NSC-23-Apr-16 | M | 31.0 | 28.2 | 275 | sc, oto | 11 | 2.728 | 3.837 | 268 | - | - | - |
| | | 21-Apr-16 | ER-NSC-25-Apr-16 | M | 34.5 | 31.2 | 335 | sc, oto | 11 | 4.543 | 7.160 | 323 | - | - | - |
| | | 21-Apr-16 | ER-NSC-26-Apr-16 | M | 29.4 | 26.4 | 205 | sc, oto | 9 | 1.111 | 3.139 | 201 | - | - | - |
| | | 22-Apr-16 | ER-NSC-31-Apr-16 | M | 32.9 | 29.8 | 282 | sc, oto | 15 | 2.682 | 4.114 | 275 | - | - | - |
| | | 22-Apr-16 | ER-NSC-33-Apr-16 | M | 30.1 | 26.8 | 262 | sc, oto | 9 | 2.029 | 3.746 | 256 | - | - | - |
| | | 22-Apr-16 | ER-NSC-34-Apr-16 | M | 33.5 | 29.8 | 300 | sc, oto | 10 | 2.165 | 5.604 | 292 | - | - | - |
| | | 22-Apr-16 | ER-NSC-35-Apr-16 | M | 31.1 | 27.8 | 240 | sc, oto | 11 | 1.333 | 2.527 | 236 | - | - | - |
| | | 22-Apr-16 | ER-NSC-36-Apr-16 | M | 32.5 | 29.7 | 300 | sc, oto | 10 | 2.562 | 4.491 | 293 | - | - | - |
| | | 22-Apr-16 | ER-NSC-37-Apr-16 | M | 32.5 | 29.8 | 365 | sc, oto | 11 | 7.151 | 3.787 | 354 | - | - | - |
| | | 22-Apr-16 | ER-NSC-39-Apr-16 | M | 34.0 | 30.3 | 380 | sc, oto | 10 | 4.245 | 7.477 | 368 | - | - | - |
| | | 22-Apr-16 | ER-NSC-40-Apr-16 | M | 30.5 | 26.8 | 246 | sc, oto | 11 | 4.705 | 2.916 | 238 | - | - | - |
| | | 23-Apr-16 | ER-NSC-41-Apr-16 | M | 34.1 | 30.6 | 400 | sc, oto | 11 | 4.632 | 1.508 | 394 | - | - | - |
| | | 23-Apr-16 | ER-NSC-42-Apr-16 | M | 33.5 | 30.0 | 330 | sc, oto | 10 | 1.383 | 2.675 | 326 | - | - | - |
| | | 23-Apr-16 | ER-NSC-43-Apr-16 | M | 30.0 | 26.8 | 228 | sc, oto | 9 | 1.062 | 1.656 | 225 | - | - | - |
| | | **total sample size** | | - | **20** | **20** | **20** | - | **20** | **20** | **20** | **20** | - | - | - |
| | | **average** | | - | **33** | **30** | **316** | - | **11** | **2.8** | **4.2** | **309** | - | - | - |
| | | **median** | | - | **33** | **30** | **313** | - | **11** | **2.6** | **4.0** | **307** | - | - | - |
| | | **standard deviation** | | - | **1.9** | **1.9** | **62** | - | **1.8** | **1.6** | **1.6** | **61** | - | - | - |
| | | **standard error** | | - | **0.42** | **0.42** | **14** | - | **0.41** | **0.36** | **0.36** | **14** | - | - | - |
| | | **minimum** | | - | **29** | **26** | **205** | - | **9** | **1.1** | **1.5** | **201** | - | - | - |
| | | **maximum** | | - | **36** | **33** | **420** | - | **15** | **7.2** | **7.5** | **411** | - | - | - |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.26: Summary Statistics for Northern Pikeminnow Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2015 | 22-Apr-15 | GC-NSC-02-Apr-15 | F | 31.0 | 28.1 | 207 | sc, oto | 7 | 0.933 | 1.443 | 205 | - | - | muscle, ovaries |
| | | 22-Apr-15 | GC-NSC-04-Apr-15 | F | 28.8 | 25.9 | 188 | sc, oto | 8 | 1.082 | 1.472 | 185 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-NSC-10-Apr-15 | F | 28.1 | 25.0 | 151 | sc, oto | 9 | 0.966 | 0.809 | 149 | - | - | muscle, ovaries |
| | | 24-Apr-15 | GC-NSC-13-Apr-15 | F | 32.1 | 28.9 | 252 | sc, oto | 9 | 1.044 | 5.499 | 245 | - | - | muscle, ovaries |
| | | 24-Apr-15 | GC-NSC-20-Apr-15 | F | 29.7 | 26.4 | 175 | sc, oto | 8 | 0.951 | 1.244 | 173 | - | - | muscle, ovaries |
| | | 24-Apr-15 | GC-NSC-22-Apr-15 | F | 30.2 | 26.9 | 188 | sc, oto | 9 | 0.966 | 0.742 | 186 | - | - | muscle, ovaries |
| | | 25-Apr-15 | GC-NSC-31-Apr-15 | F | 33.0 | 30.2 | 261 | sc, oto | 12 | 0.948 | 2.304 | 258 | - | - | muscle, ovaries |
| | | 26-Apr-15 | GC-NSC-33-Apr-15 | F | 37.4 | 34.0 | 390 | sc, oto | 10 | 0.992 | 2.407 | 387 | - | - | muscle, ovaries |
| | | 26-Apr-15 | GC-NSC-34-Apr-15 | F | 37.5 | 34.0 | 390 | sc, oto | 9 | 0.992 | 2.099 | 387 | - | - | muscle, ovaries |
| | | 26-Apr-15 | GC-NSC-36-Apr-15 | F | 29.4 | 26.0 | 183 | sc, oto | 8 | 1.041 | 0.703 | 181 | - | - | - |
| | | 26-Apr-15 | GC-NSC-37-Apr-15 | F | 30.3 | 27.0 | 203 | sc, oto | 8 | 1.031 | 1.635 | 200 | - | - | muscle, ovaries |
| | | 27-Apr-15 | GC-NSC-38-Apr-15 | F | 30.7 | 27.8 | 212 | sc, oto | 8 | 0.987 | 1.068 | 210 | - | - | - |
| | | 27-Apr-15 | GC-NSC-40-Apr-15 | F | 30.6 | 27.3 | 139 | sc, oto | 8 | 0.683 | 0.899 | 137 | - | - | - |
| | | 27-Apr-15 | GC-NSC-42-Apr-15 | F | 31.3 | 27.7 | 231 | sc, oto | 9 | 1.087 | 1.655 | 228 | - | - | - |
| | | 27-Apr-15 | GC-NSC-43-Apr-15[b] | F | 32.2 | 28.9 | 229 | sc | 5 | 0.949 | 0.478 | 228 | - | - | - |
| | | 29-Apr-15 | GC-NSC-44-Apr-15 | F | 32.7 | 29.1 | 251 | sc, oto | 9 | 1.019 | 1.279 | 249 | yellow grub | - | - |
| | | 29-Apr-15 | GC-NSC-45-Apr-15 | F | 33.2 | 30.0 | 248 | sc, oto | 8 | 0.919 | 1.445 | 246 | - | - | - |
| | | 29-Apr-15 | GC-NSC-46-Apr-15 | F | 31.8 | 28.3 | 249 | sc, oto | 9 | 1.099 | 1.781 | 246 | - | - | - |
| | | 29-Apr-15 | GC-NSC-47-Apr-15 | F | 27.5 | 24.5 | 142 | sc, oto | 7 | 0.966 | 0.721 | 140 | - | - | - |
| | | 29-Apr-15 | GC-NSC-48-Apr-15 | F | 30.8 | 27.5 | 187 | sc, oto | 8 | 0.899 | 0.805 | 185 | - | - | - |
| | | 30-Apr-15 | GC-NSC-49-Apr-15 | F | 44.8 | 40.1 | 880 | sc, oto | 12 | 1.365 | 17.220 | 861 | - | - | muscle, ovaries |
| | | **total sample size** | | - | **21** | **21** | **21** | - | **21** | **21** | **21** | **21** | - | - | - |
| | | **average** | | - | **32** | **29** | **255** | - | **9** | **1.0** | **2.3** | **252** | - | - | - |
| | | **median** | | - | **31** | **28** | **212** | - | **8** | **0.99** | **1.4** | **210** | - | - | - |
| | | **standard deviation** | | - | **3.9** | **3.6** | **158** | - | **1.5** | **0.12** | **3.6** | **154** | - | - | - |
| | | **standard error** | | - | **0.84** | **0.78** | **34** | - | **0.34** | **0.026** | **0.78** | **34** | - | - | - |
| | | **minimum** | | - | **28** | **25** | **139** | - | **5** | **0.68** | **0.48** | **137** | - | - | - |
| | | **maximum** | | - | **45** | **40** | **880** | - | **12** | **1.4** | **17** | **861** | - | - | - |
| | 2016 | 19-Apr-16 | GC-NSC-01-Apr-16 | F | 38.2 | 34.9 | 450 | sc, oto | 13 | 4.851 | 8.314 | 437 | - | - | muscle, ovaries |
| | | 20-Apr-16 | GC-NSC-05-Apr-16[b] | F | 62.2 | 57.0 | 2,500 | sc, oto | 15 | 117.790 | 58.547 | 2,324 | - | - | muscle, ovaries |
| | | 20-Apr-16 | GC-NSC-06-Apr-16 | F | 54.5 | 48.8 | 1,400 | sc, oto | 15 | 35.725 | 22.150 | 1,342 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-NSC-08-Apr-16 | F | 55.8 | 50.6 | 1,870 | sc, oto | 17 | 65.069 | 30.611 | 1,774 | - | - | muscle, ovaries |
| | | 22-Apr-16 | GC-NSC-12-Apr-16 | F | 45.5 | 41.6 | 940 | sc, oto | 14 | 35.102 | 15.207 | 890 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-NSC-13-Apr-16 | F | 60.8 | 55.6 | 2,360 | sc, oto | 17 | 124.236 | 62.559 | 2,173 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-NSC-14-Apr-16 | F | 40.9 | 36.9 | 585 | sc, oto | 13 | 14.056 | 5.363 | 566 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-NSC-15-Apr-16 | F | 36.7 | 33.2 | 405 | sc, oto | 11 | 2.913 | 5.822 | 396 | - | - | - |
| | | 23-Apr-16 | GC-NSC-16-Apr-16 | F | 42.0 | 38.3 | 610 | sc, oto | 12 | 4.990 | 6.279 | 599 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-NSC-17-Apr-16 | F | 37.6 | 33.9 | 435 | sc, oto | 12 | 3.960 | 7.856 | 423 | - | - | muscle, ovaries |
| | | 24-Apr-16 | GC-NSC-18-Apr-16 | F | 38.6 | 34.8 | 460 | sc, oto | 10 | 1.972 | 7.797 | 450 | deep fork length | - | - |
| | | 24-Apr-16 | GC-NSC-20-Apr-16 | F | 31.4 | 28.1 | 254 | sc, oto | 8 | 1.238 | 2.889 | 250 | - | - | - |
| | | 24-Apr-16 | GC-NSC-21-Apr-16 | F | 32.7 | 29.3 | 254 | sc, oto | 10 | 1.576 | 1.791 | 251 | - | - | - |
| | | 24-Apr-16 | GC-NSC-22-Apr-16 | F | 29.9 | 26.8 | 198 | sc, oto | 9 | 1.896 | 2.562 | 194 | - | - | - |
| | | 25-Apr-16 | GC-NSC-24-Apr-16 | F | 52.8 | 48.2 | 1,640 | sc, oto | 14 | 80.260 | 25.921 | 1,534 | - | - | muscle, ovaries |
| | | 25-Apr-16 | GC-NSC-25-Apr-16 | F | 45.6 | 41.1 | 930 | sc, oto | 11 | 19.358 | 19.448 | 891 | - | - | - |
| | | 25-Apr-16 | GC-NSC-26-Apr-16 | F | 53.5 | 48.0 | 1,600 | sc, oto | 15 | 96.212 | 42.725 | 1,461 | worms | - | muscle, ovaries |
| | | 25-Apr-16 | GC-NSC-28-Apr-16 | F | 34.8 | 31.3 | 350 | sc, oto | 10 | 1.764 | 5.854 | 342 | - | - | - |
| | | 25-Apr-16 | GC-NSC-30-Apr-16 | F | 33.5 | 30.4 | 298 | sc, oto | 16 | 2.655 | 5.118 | 290 | - | - | - |
| | | 25-Apr-16 | GC-NSC-31-Apr-16 | F | 38.2 | 34.8 | 390 | sc, oto | 12 | 2.507 | 3.506 | 384 | - | - | - |
| | | 25-Apr-16 | GC-NSC-32-Apr-16 | F | 31.9 | 28.6 | 230 | sc, oto | 10 | 1.053 | 3.628 | 225 | - | - | - |
| | | **total sample size** | | - | **21** | **21** | **21** | - | **21** | **21** | **21** | **21** | - | - | - |
| | | **average** | | - | **43** | **39** | **865** | - | **13** | **29** | **16** | **819** | - | - | - |
| | | **median** | | - | **39** | **35** | **460** | - | **12** | **4.9** | **7.8** | **450** | - | - | - |
| | | **standard deviation** | | - | **10** | **9.3** | **729** | - | **2.6** | **41** | **18** | **672** | - | - | - |
| | | **standard error** | | - | **2.2** | **2.0** | **159** | - | **0.58** | **9.0** | **4.0** | **147** | - | - | - |
| | | **minimum** | | - | **30** | **27** | **198** | - | **8** | **1.1** | **1.8** | **194** | - | - | - |
| | | **maximum** | | - | **62** | **57** | **2,500** | - | **17** | **124** | **63** | **2,324** | - | - | - |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.26: Summary Statistics for Northern Pikeminnow Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2015 | 22-Apr-15 | GC-NSC-01-Apr-15[b] | M | 46.1 | 41.8 | 800 | sc, oto | 25 | 1.10 | 8.010 | 791 | - | - | muscle |
| | | 22-Apr-15 | GC-NSC-03-Apr-15 | M | 32.2 | 31.0 | 202 | sc, oto | 10 | 0.68 | 0.553 | 201 | - | - | muscle |
| | | 22-Apr-15 | GC-NSC-05-Apr-15 | M | 29.3 | 26.2 | 172 | sc, oto | 9 | 0.96 | 0.534 | 171 | - | - | muscle |
| | | 22-Apr-15 | GC-NSC-06-Apr-15 | M | 28.3 | 25.4 | 162 | sc, oto | 8 | 0.99 | 0.586 | 160 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-14-Apr-15 | M | 33.4 | 30.1 | 295 | sc, oto | 11 | 1.08 | 1.042 | 293 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-15-Apr-15 | M | 32.8 | 29.5 | 244 | sc, oto | 9 | 0.95 | 1.220 | 242 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-16-Apr-15 | M | 35.7 | 32.1 | 345 | sc, oto | 10 | 1.04 | 1.806 | 342 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-17-Apr-15 | M | 30.0 | 26.9 | 210 | sc, oto | 10 | 1.08 | 0.961 | 208 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-18-Apr-15 | M | 31.4 | 28.0 | 247 | sc, oto | 10 | 1.13 | 1.371 | 245 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-19-Apr-15 | M | 29.1 | 26.5 | 186 | sc, oto | 9 | 1.00 | 0.318 | 185 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-21-Apr-15 | M | 31.6 | 28.2 | 216 | sc, oto | 6 | 0.96 | 0.403 | 215 | - | - | muscle |
| | | 24-Apr-15 | GC-NSC-23-Apr-15 | M | 29.3 | 26.0 | 188 | sc, oto | 9 | 1.07 | 1.009 | 186 | - | - | muscle |
| | | 25-Apr-15 | GC-NSC-26-Apr-15 | M | 29.8 | 26.7 | 195 | sc, oto | 11 | 1.02 | 1.085 | 193 | - | - | muscle |
| | | 25-Apr-15 | GC-NSC-27-Apr-15 | M | 28.0 | 24.8 | 160 | sc, oto | 9 | 1.05 | 0.786 | 158 | - | - | muscle |
| | | 25-Apr-15 | GC-NSC-28-Apr-15 | M | 31.5 | 28.3 | 237 | sc, oto | 8 | 1.05 | 1.460 | 234 | - | - | - |
| | | 25-Apr-15 | GC-NSC-30-Apr-15 | M | 35.1 | 31.4 | 310 | sc, oto | 9 | 1.00 | 0.885 | 308 | - | - | - |
| | | 25-Apr-15 | GC-NSC-32-Apr-15 | M | 38.5 | 35.4 | 515 | sc, oto | 12 | 1.16 | 5.033 | 509 | - | - | - |
| | | 26-Apr-15 | GC-NSC-35-Apr-15 | M | 29.7 | 26.5 | 185 | sc, oto | 8 | 0.99 | 1.003 | 183 | - | - | - |
| | | 27-Apr-15 | GC-NSC-39-Apr-15 | M | 30.7 | 27.3 | 233 | sc, oto | 9 | 1.15 | 2.198 | 230 | - | - | - |
| | | 27-Apr-15 | GC-NSC-41-Apr-15 | M | 37.3 | 33.4 | 440 | sc, oto | 9 | 1.18 | 2.654 | 436 | - | - | - |
| | | | **total sample size** | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **-** | **-** |
| | | | **average** | **-** | **32** | **29** | **277** | **-** | **10** | **1.0** | **1.6** | **274** | **-** | **-** | **-** |
| | | | **median** | **-** | **31** | **28** | **225** | **-** | **9** | **1.0** | **1.0** | **222** | **-** | **-** | **-** |
| | | | **standard deviation** | **-** | **4.4** | **4.1** | **154** | **-** | **3.7** | **0.11** | **1.8** | **152** | **-** | **-** | **-** |
| | | | **standard error** | **-** | **0.97** | **0.91** | **34** | **-** | **0.84** | **0.024** | **0.41** | **34** | **-** | **-** | **-** |
| | | | **minimum** | **-** | **28** | **25** | **160** | **-** | **6** | **0.68** | **0.32** | **158** | **-** | **-** | **-** |
| | | | **maximum** | **-** | **46** | **42** | **800** | **-** | **25** | **1.2** | **8.0** | **791** | **-** | **-** | **-** |
| | 2016 | 19-Apr-16 | GC-NSC-02-Apr-16 | M | 34.5 | 31.2 | 345 | sc, oto | 14 | 3.771 | 3.699 | 338 | - | - | muscle |
| | | 19-Apr-16 | GC-NSC-03-Apr-16 | M | 37.8 | 34.0 | 440 | sc, oto | 13 | 3.344 | 4.782 | 432 | - | - | muscle |
| | | 20-Apr-16 | GC-NSC-07-Apr-16 | M | 37.2 | 33.5 | 440 | sc, oto | 11 | 5.050 | 3.503 | 431 | - | - | - |
| | | 21-Apr-16 | GC-NSC-09-Apr-16 | M | 36.2 | 32.7 | 435 | sc, oto | 14 | 5.101 | 6.578 | 423 | - | - | - |
| | | 21-Apr-16 | GC-NSC-10-Apr-16 | M | 39.5 | 35.4 | 465 | sc, oto | 9 | 4.673 | 4.897 | 455 | - | - | - |
| | | 21-Apr-16 | GC-NSC-11-Apr-16 | M | 35.5 | 32.3 | 350 | sc, oto | 10 | 2.476 | 5.170 | 342 | - | - | - |
| | | 24-Apr-16 | GC-NSC-19-Apr-16 | M | 35.7 | 30.5 | 370 | sc, oto | 11 | 1.906 | 4.775 | 363 | - | - | - |
| | | 24-Apr-16 | GC-NSC-23-Apr-16 | M | 45.3 | 41.0 | 865 | sc, oto | 14 | 8.752 | 12.709 | 844 | - | - | - |
| | | 25-Apr-16 | GC-NSC-27-Apr-16 | M | 37.5 | 33.6 | 450 | sc, oto | 14 | 5.564 | 5.726 | 439 | - | - | - |
| | | 25-Apr-16 | GC-NSC-29-Apr-16 | M | 31.6 | 28.2 | 226 | sc, oto | 11 | 0.521 | 1.430 | 224 | - | - | - |
| | | 26-Apr-16 | GC-NSC-33-Apr-16 | M | 33.3 | 29.7 | 280 | sc, oto | 13 | 1.058 | 3.461 | 275 | - | - | - |
| | | | **total sample size** | **-** | **11** | **11** | **11** | **-** | **11** | **11** | **11** | **11** | **-** | **-** | **-** |
| | | | **average** | **-** | **37** | **33** | **424** | **-** | **12** | **3.8** | **5.2** | **415** | **-** | **-** | **-** |
| | | | **median** | **-** | **36** | **33** | **435** | **-** | **13** | **3.8** | **4.8** | **423** | **-** | **-** | **-** |
| | | | **standard deviation** | **-** | **3.6** | **3.4** | **165** | **-** | **1.8** | **2.4** | **2.9** | **160** | **-** | **-** | **-** |
| | | | **standard error** | **-** | **1.1** | **1.0** | **50** | **-** | **0.55** | **0.71** | **0.86** | **48** | **-** | **-** | **-** |
| | | | **minimum** | **-** | **32** | **28** | **226** | **-** | **9** | **0.52** | **1.4** | **224** | **-** | **-** | **-** |
| | | | **maximum** | **-** | **45** | **41** | **865** | **-** | **14** | **8.8** | **13** | **844** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.27: Summary Statistics for Northern Pikeminnow Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Gonad Weight (g) | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 15-Feb-14 | SC-NSC-01-Feb-14 | 30.4 | 27.3 | 235 | - | - | - | - | - | - |
| | | 15-Feb-14 | SC-NSC-02-Feb-14 | 36.7 | 32.9 | 450 | - | - | - | - | - | - |
| | | 15-Feb-14 | SC-NSC-03-Feb-14 | 51.1 | 46.5 | 1,120 | - | - | - | - | - | - |
| | | 15-Feb-14 | SC-NSC-04-Feb-14 | 55.4 | 51.0 | 1,360 | - | - | - | - | - | - |
| | | 17-Feb-14 | SC-NSC-05-Feb-14 | 35.5 | 32.1 | 320 | sc,oto | - | F | - | - | muscle, ovaries |
| | | 18-Feb-14 | SC-NSC-07-Feb-14 | 25.4 | 22.9 | 125 | - | - | - | - | - | - |
| | | 18-Feb-14 | SC-NSC-08-Feb-14 | 26.8 | 24.2 | 140 | - | - | - | - | - | - |
| | | 18-Feb-14 | SC-NSC-09-Feb-14 | 35.9 | 32.4 | 350 | - | - | M | - | - | - |
| | | 19-Feb-14 | SC-NSC-10-Feb-14 | 49.9 | 45.4 | 1,200 | sc,oto | - | F | - | - | muscle, ovaries |
| | | 19-Feb-14 | SC-NSC-11-Feb-14 | 31.5 | 28.2 | 235 | - | - | M | - | - | - |
| | | 20-Feb-14 | SC-NSC-12-Feb-14 | 26.7 | 25.1 | 180 | - | - | - | - | - | - |
| | | 20-Feb-14 | SC-NSC-13-Feb-14 | 39.6 | 35.8 | 435 | - | - | M | - | - | - |
| | | 11-Apr-14 | SC-NSC-01-Apr-14 | 36.1 | 32.8 | 355 | sc | - | F | 6.194 | - | muscle, ovaries |
| | | 11-Apr-14 | SC-NSC-02-Apr-14 | 35.0 | 31.8 | 320 | sc, oto | - | M | - | - | muscle |
| | | 12-Apr-14 | SC-NSC-03-Apr-14 | 40.8 | 37.5 | 570 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | SC-NSC-04-Apr-14 | 32.5 | 29.3 | 274 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | SC-NSC-05-Apr-14 | 50.3 | 45.4 | 900 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | SC-NSC-06-Apr-14 | 43.5 | 39.3 | 720 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | SC-NSC-07-Apr-14 | 35.3 | 31.9 | 362 | sc, oto | - | M | - | - | muscle |
| | | 17-Apr-14 | SC-NSC-08-Apr-14 | 31.4 | 28.4 | 249 | sc, oto | - | M | - | - | muscle |
| | | 17-Apr-14 | SC-NSC-09-Apr-14 | 27.2 | 24.0 | 152 | sc, oto | - | M | - | - | muscle |
| | | 17-Apr-14 | SC-NSC-10-Apr-14 | 34.4 | 31.2 | 300 | sc, oto | - | F | 1.839 | - | muscle, ovaries |
| | | 19-Aug-14 | SC-NSC-01-Aug-14 | 35.9 | 32.9 | 320 | sc, oto | 12 | - | - | - | muscle |
| | | 19-Aug-14 | SC-NSC-02-Aug-14 | 30.9 | 27.9 | 202 | sc, oto | 8 | - | - | - | muscle |
| | | 19-Aug-14 | SC-NSC-03-Aug-14 | 27.6 | 24.7 | 152 | sc, oto | 7 | - | - | - | muscle |
| | | 19-Aug-14 | SC-NSC-04-Aug-14 | 32.1 | 29.3 | 229 | sc, oto | 9 | - | - | - | muscle |
| | | 19-Aug-14 | SC-NSC-05-Aug-14 | 31.7 | 27.8 | 220 | sc, oto | 9 | - | - | - | muscle |
| | | 19-Aug-14 | SC-NSC-06-Aug-14 | 22.7 | 20.2 | 66 | sc, oto | 4 | - | - | tail split to body | muscle |
| | | 21-Aug-14 | SC-NSC-07-Aug-14 | 36.5 | 33.5 | 335 | sc, oto | 11 | - | - | - | muscle |
| | | 21-Aug-14 | SC-NSC-08-Aug-14 | 36.0 | 32.9 | 335 | sc, oto | 11 | - | - | - | muscle |
| | | 21-Aug-14 | SC-NSC-09-Aug-14 | 38.7 | 34.6 | 440 | sc, oto | 12 | F | - | - | muscle |
| | | 21-Aug-14 | SC-NSC-10-Aug-14 | 27.1 | 24.6 | 146 | sc, oto | 6 | - | - | - | muscle |
| | 2015 | 23-Apr-15 | SC-NSC-02-Apr-15 | 27.0 | 24.6 | 158 | - | - | - | 1.061 | - | - |
| | | 23-Apr-15 | SC-NSC-05-Apr-15 | 28.2 | 25.2 | 167 | - | - | - | 1.044 | - | - |
| | | 24-Apr-15 | SC-NSC-08-Apr-15 | 26.1 | 23.4 | 119 | - | - | - | 0.929 | worms | - |
| | | 25-Apr-15 | SC-NSC-14-Apr-15 | 30.0 | 26.8 | 195 | - | - | - | 1.013 | - | - |
| | | 25-Apr-15 | SC-NSC-20-Apr-15 | 28.8 | 26.0 | 187 | - | - | - | 1.064 | - | - |
| | | 25-Apr-15 | SC-NSC-24-Apr-15 | 33.7 | 30.4 | 265 | - | - | - | 0.943 | - | - |
| | | 22-Aug-15 | SC-NSC-01-Aug-15 | 39.6 | 35.9 | 485 | oto | 14 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-02-Aug-15 | 38.1 | 34.3 | 425 | oto | 13 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-03-Aug-15 | 26.3 | 22.6 | 119 | oto | 6 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-04-Aug-15 | 32.2 | 29.2 | 289 | oto | 11 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-05-Aug-15 | 28.4 | 25.7 | 148 | oto | 9 | - | - | missing eye | muscle |
| | | 22-Aug-15 | SC-NSC-06-Aug-15 | 35.6 | 31.9 | 310 | oto | 13 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-07-Aug-15 | 33.4 | 30.7 | 262 | oto | 8 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-08-Aug-15 | 31.8 | 28.9 | 218 | oto | 9 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-09-Aug-15 | 28.9 | 25.4 | 175 | oto | 8 | - | - | - | muscle |
| | | 22-Aug-15 | SC-NSC-10-Aug-15 | 37.0 | 33.2 | 350 | oto | 10 | - | - | - | muscle |
| | | 24-Aug-15 | SC-NSC-11-Aug-15 | 48.3 | 45.0 | 1,170 | oto | 13 | - | - | - | muscle |
| | 2016 | 19-Apr-16 | SC-NSC-02-Apr-16 | 23.2 | 20.4 | 89 | - | - | - | - | - | - |
| | | 21-Apr-16 | SC-NSC-12-Apr-16 | 28.5 | 26.4 | 178 | - | - | - | - | - | - |
| | | 22-Apr-16 | SC-NSC-14-Apr-16 | 30.1 | 27.2 | 210 | - | - | - | - | - | - |
| | | 24-Aug-16 | SC-NSC-01A-Aug-16 | 39.6 | 36.0 | 480 | sc, oto | 12 | - | - | - | muscle |
| | | 24-Aug-16 | SC-NSC-02A-Aug-16 | 41.4 | 37.9 | 550 | sc, oto | 11 | - | - | - | muscle |
| | | 24-Aug-16 | SC-NSC-03A-Aug-16 | 37.7 | 34.0 | 423 | sc, oto | 9 | - | - | - | muscle |
| | | 24-Aug-16 | SC-NSC-04A-Aug-16 | 39.1 | 35.1 | 580 | sc, oto | 11 | - | - | - | muscle |
| | | 24-Aug-16 | SC-NSC-05A-Aug-16 | 40.5 | 36.7 | 535 | sc, oto | 13 | - | - | - | muscle |
| | | 24-Aug-16 | SC-NSC-06A-Aug-16 | 31.9 | 28.5 | 260 | sc, oto | 9 | - | - | - | muscle |
| | | 24-Aug-16 | SC-NSC-07A-Aug-16 | 43.5 | 39.3 | 750 | sc, oto | 14 | - | - | - | muscle |
| | | 28-Aug-16 | SC-NSC-08A-Aug-16 | 39.5 | 35.8 | 450 | sc, oto | 10 | - | - | - | muscle |
| | | 28-Aug-16 | SC-NSC-09A-Aug-16 | 49.5 | 45.5 | 1,100 | sc, oto | 15 | - | - | - | muscle |
| | | 28-Aug-16 | SC-NSC-10A-Aug-16 | 38.5 | 35.0 | 450 | sc, oto | 12 | - | - | - | muscle |
| **total sample size** | | | | **62** | **62** | **62** | **-** | **31** | **-** | **8** | **-** | **-** |
| **average** | | | | **35** | **32** | **385** | **-** | **10** | **-** | **1.761** | **-** | **-** |
| **median** | | | | **35** | **32** | **305** | **-** | **11** | **-** | **1.052** | **-** | **-** |
| **standard deviation** | | | | **7.3** | **6.8** | **293** | **-** | **2.6** | **-** | **1.815** | **-** | **-** |
| **standard error** | | | | **0.92** | **0.86** | **37** | **-** | **0.47** | **-** | **0.642** | **-** | **-** |
| **minimum** | | | | **23** | **20** | **66** | **-** | **4** | **-** | **0.929** | **-** | **-** |
| **maximum** | | | | **55** | **51** | **1,360** | **-** | **15** | **-** | **6.194** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Fish collected at Englishman Creek were grouped with the Elk River summary statistics.

## Table F.27: Summary Statistics for Northern Pikeminnow Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Gonad Weight (g) | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2014 | 17-Feb-14 | EC-NSC-01-Feb-14 | 37.9 | 34.6 | 405 | sc,oto | - | F | - | - | muscle, ovaries |
| | | 17-Feb-14 | EC-NSC-02-Feb-14 | 24.4 | 22.1 | 84 | - | - | - | - | - | - |
| | | 20-Feb-14 | EC-NSC-03-Feb-14 | 29.2 | 26.5 | 180 | - | - | - | - | - | - |
| | | 20-Feb-14 | EC-NSC-04-Feb-14 | 27.8 | 24.8 | 160 | - | - | - | - | - | - |
| | | 20-Feb-14 | EC-NSC-05-Feb-14 | 26.7 | 24.2 | 146 | - | - | - | - | - | - |
| | | 20-Feb-14 | EC-NSC-06-Feb-14 | 26.0 | 23.1 | 132 | - | - | - | - | - | - |
| | | 13-Feb-14 | ER-NSC-01-Feb-14 | 39.0 | 35.9 | 440 | - | - | - | - | - | - |
| | | 14-Feb-14 | ER-NSC-02-Feb-14 | 40.0 | 36.3 | 225 | - | - | - | - | - | - |
| | | 14-Feb-14 | ER-NSC-03-Feb-14 | 37.2 | 33.8 | 380 | - | - | - | - | - | - |
| | | 14-Feb-14 | ER-NSC-04-Feb-14 | 49.3 | 44.8 | 1,140 | - | - | - | - | - | - |
| | | 14-Feb-14 | ER-NSC-05-Feb-14 | 41.8 | 38.4 | 575 | - | - | - | - | - | - |
| | | 16-Feb-14 | ER-NSC-06-Feb-14 | 41.0 | 37.2 | 505 | sc | - | F | - | - | muscle, ovaries |
| | | 17-Feb-14 | ER-NSC-07-Feb-14 | 32.1 | 28.5 | 240 | - | - | M | - | - | - |
| | | 17-Feb-14 | ER-NSC-08-Feb-14 | 35.2 | 31.0 | 320 | - | - | M | - | - | - |
| | | 18-Feb-14 | ER-NSC-09-Feb-14 | 38.2 | 34.9 | 465 | sc,oto | - | F | - | - | muscle, ovaries |
| | | 19-Feb-14 | ER-NSC-10-Feb-14 | 33.1 | 29.5 | 250 | - | - | M | - | - | - |
| | | 17-Feb-14 | ER-NSC-11-Feb-14 | 26.3 | 23.3 | 135 | - | - | M | - | - | - |
| | | 24-Feb-14 | ER-NSC-12-Feb-14 | 29.5 | 27.2 | 316 | - | - | F | - | - | muscle, ovaries |
| | | 11-Apr-14 | ER-NSC-01-Apr-14 | 31.1 | 28.1 | 232 | sc | - | M | - | - | - |
| | | 12-Apr-14 | ER-NSC-02-Apr-14 | 32.0 | 28.9 | 265 | sc | - | M | - | - | muscle |
| | | 13-Apr-14 | ER-NSC-03-Apr-14 | 43.5 | 39.2 | 650 | sc, oto | - | M | - | - | muscle |
| | | 15-Apr-14 | ER-NSC-04-Apr-14 | 28.7 | 25.5 | 182 | sc, oto | - | M | - | - | - |
| | | 15-Apr-14 | ER-NSC-05-Apr-14 | 30.1 | 27.3 | 209 | sc, oto | - | M | - | - | - |
| | | 15-Apr-14 | ER-NSC-06-Apr-14 | 27.5 | 24.5 | 168 | sc, oto | - | M | - | - | - |
| | | 15-Apr-14 | ER-NSC-07-Apr-14 | 39.3 | 35.2 | 440 | - | - | F | - | - | - |
| | | 18-Apr-14 | ER-NSC-08-Apr-14 | 42.8 | 38.7 | 748 | sc, oto | - | M | - | - | muscle |
| | | 18-Apr-14 | ER-NSC-09-Apr-14 | 43.7 | 39.8 | 670 | sc, oto | - | M | - | - | muscle |
| | | 18-Apr-14 | ER-NSC-10-Apr-14 | 42.1 | 37.9 | 594 | sc, oto | - | M | - | - | muscle |
| | | 18-Apr-14 | ER-NSC-11-Apr-14 | 37.3 | 33.5 | 438 | sc, oto | - | F | 4.512 | - | muscle, ovaries |
| | | 18-Apr-14 | ER-NSC-12-Apr-14 | 39.0 | 35.3 | 460 | sc, oto | - | M | - | - | muscle |
| | | 18-Apr-14 | ER-NSC-13-Apr-14 | 35.0 | 31.6 | 364 | sc, oto | - | M | - | - | muscle |
| | | 18-Apr-14 | ER-NSC-14-Apr-14 | 34.1 | 30.8 | 312 | sc, oto | - | F | 3.360 | - | muscle, ovaries |
| | | 20-Aug-14 | ER-NSC-01-Aug-14 | 26.5 | 23.4 | 124 | sc, oto | 5 | - | - | - | muscle |
| | | 20-Aug-14 | ER-NSC-02-Aug-14 | 30.4 | 27.2 | 218 | sc, oto | 9 | - | - | - | muscle |
| | | 20-Aug-14 | ER-NSC-03-Aug-14 | 25.2 | 22.6 | 111 | sc, oto | 5 | - | - | - | muscle |
| | | 20-Aug-14 | ER-NSC-04-Aug-14 | 29.9 | 27.4 | 172 | sc, oto | 7 | - | - | - | muscle |
| | | 20-Aug-14 | ER-NSC-05-Aug-14 | 32.8 | 29.5 | 260 | sc, oto | 10 | - | - | - | muscle |
| | | 22-Aug-14 | ER-NSC-06-Aug-14 | 58.4 | 53.7 | 1,560 | sc, oto | 25 | F | - | - | muscle |
| | | 22-Aug-14 | ER-NSC-07-Aug-14 | 32.5 | 29.2 | 242 | sc, oto | 9 | - | - | - | muscle |
| | | 22-Aug-14 | ER-NSC-08-Aug-14 | 37.5 | 33.8 | 405 | sc, oto | 12 | - | - | - | muscle |
| | | 22-Aug-14 | ER-NSC-09-Aug-14 | 39.2 | 35.4 | 442 | sc, oto | 12 | - | - | - | muscle |
| | | 22-Aug-14 | ER-NSC-10-Aug-14 | 30.7 | 27.8 | 230 | sc, oto | 11 | - | - | - | muscle |
| | 2015 | 23-Apr-15 | ER-NSC-18-Apr-15 | 29.1 | 25.6 | 166 | - | - | I | 0.989 | - | - |
| | | 23-Apr-15 | ER-NSC-20-Apr-15 | 27.1 | 24.2 | - | - | - | I | - | - | - |
| | | 23-Apr-15 | ER-NSC-22-Apr-15 | 27.0 | 24.0 | 128 | - | - | I | 0.926 | - | - |
| | | 24-Apr-15 | ER-NSC-26-Apr-15 | 25.2 | 22.7 | 107 | - | - | I | 0.915 | - | - |
| | | 23-Aug-15 | ER-NSC-01-Aug-15 | 28.9 | 26.2 | 158 | oto | 6 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-02-Aug-15 | 35.3 | 31.7 | 330 | oto | 8 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-03-Aug-15 | 30.9 | 28.2 | 244 | oto | 13 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-04-Aug-15 | 33.6 | 30.3 | 278 | oto | 12 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-05-Aug-15 | 31.4 | 29.4 | 244 | oto | 8 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-06-Aug-15 | 29.9 | 26.9 | 212 | oto | 6 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-07-Aug-15 | 27.0 | 24.2 | 144 | oto | 8 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-08-Aug-15 | 25.7 | 23.1 | 126 | oto | 9 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-09-Aug-15 | 25.3 | 22.7 | 106 | oto | 6 | - | - | - | muscle |
| | | 23-Aug-15 | ER-NSC-10-Aug-15 | 30.3 | 27.2 | 177 | oto | 9 | - | - | - | muscle |
| | 2016 | 21-Apr-16 | ER-NSC-24-Apr-16 | 34.9 | 31.4 | 365 | - | - | - | - | - | |
| | | 22-Apr-16 | ER-NSC-32-Apr-16 | 43.7 | 40.1 | 690 | - | - | - | - | - | |
| | | 23-Aug-16 | ER-NSC-01A-Aug-16 | 54.1 | 49.0 | 1,500 | sc, oto | 18 | - | - | - | muscle |
| | | 23-Aug-16 | ER-NSC-02A-Aug-16 | 59.3 | 54.3 | 2,120 | sc, oto | 15 | - | - | - | muscle |
| | | 23-Aug-16 | ER-NSC-03A-Aug-16 | 55.8 | 51.2 | 1,380 | sc, oto | 17 | - | - | - | muscle |
| | | 23-Aug-16 | ER-NSC-04A-Aug-16 | 54.7 | 49.3 | 1,775 | sc, oto | 18 | - | - | - | muscle |
| | | 23-Aug-16 | ER-NSC-05A-Aug-16 | 39.0 | 34.9 | 510 | sc, oto | 14 | - | - | - | muscle |
| | | 23-Aug-16 | ER-NSC-06A-Aug-16 | 35.0 | 31.6 | 355 | sc, oto | 10 | - | - | - | muscle |
| | | 23-Aug-16 | ER-NSC-07A-Aug-16 | 32.9 | 29.3 | 270 | sc, oto | 8 | - | - | - | muscle |
| | | 28-Aug-16 | ER-NSC-08A-Aug-16 | 57.5 | 52.3 | 1,660 | sc, oto | 17 | - | - | - | muscle |
| | | 28-Aug-16 | ER-NSC-09A-Aug-16 | 61.0 | 55.3 | 2,340 | sc, oto | 20 | - | - | - | muscle |
| | | 28-Aug-16 | ER-NSC-10A-Aug-16 | 50.0 | 45.4 | 1,080 | sc, oto | 14 | - | - | - | muscle |
| **total sample size** | | | | **68** | **68** | **67** | **-** | **30** | **-** | **5** | **-** | **-** |
| **average** | | | | **36** | **33** | **478** | **-** | **11** | **-** | **2.140** | **-** | **-** |
| **median** | | | | **33** | **30** | **278** | **-** | **10** | **-** | **0.989** | **-** | **-** |
| **standard deviation** | | | | **9.4** | **8.7** | **499** | **-** | **5** | **-** | **1.689** | **-** | **-** |
| **standard error** | | | | **1.1** | **1.1** | **61** | **-** | **1** | **-** | **0.755** | **-** | **-** |
| **minimum** | | | | **24** | **22** | **84** | **-** | **5** | **-** | **0.915** | **-** | **-** |
| **maximum** | | | | **61** | **55** | **2,340** | **-** | **25** | **-** | **4.512** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Fish collected at Englishman Creek were grouped with the Elk River summary statistics.

## Table F.27: Summary Statistics for Northern Pikeminnow Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Gonad Weight (g) | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2014 | 12-Feb-14 | GC-NSC-01-Feb-14 | 37.3 | 34.0 | 365 | - | - | - | - | - | - |
| | | 13-Feb-14 | GC-NSC-02-Feb-14 | 48.7 | 44.5 | 1,000 | - | - | - | - | - | - |
| | | 13-Feb-14 | GC-NSC-03-Feb-14 | 42.8 | 39.2 | 710 | - | - | - | - | - | - |
| | | 13-Feb-14 | GC-NSC-04-Feb-14 | 41.5 | 37.2 | 510 | - | - | - | - | - | - |
| | | 14-Feb-14 | GC-NSC-05-Feb-14 | 43.4 | 39.5 | 730 | - | - | - | - | - | - |
| | | 14-Feb-14 | GC-NSC-06-Feb-14 | 29.6 | 26.4 | 200 | - | - | - | - | - | - |
| | | 14-Feb-14 | GC-NSC-07-Feb-14 | 30.3 | 27.2 | 195 | - | - | - | - | - | - |
| | | 14-Feb-14 | GC-NSC-08-Feb-14 | 43.1 | 39.6 | 590 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-09-Feb-14 | 62.9 | 57.4 | 2,100 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-10-Feb-14 | 43.4 | 38.5 | 720 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-11-Feb-14 | 33.7 | 30.9 | 300 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-12-Feb-14 | 53.8 | 49.1 | 1,500 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-13-Feb-14 | 50.6 | 46.4 | 1,200 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-14-Feb-14 | 30.4 | 27.6 | 230 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-15-Feb-14 | 39.7 | 36.0 | 550 | - | - | - | - | - | - |
| | | 15-Feb-14 | GC-NSC-16-Feb-14 | 50.7 | 46.2 | 1,150 | - | - | - | - | - | - |
| | | 16-Feb-14 | GC-NSC-17-Feb-14 | 58.5 | 52.8 | 1,800 | - | - | - | - | - | - |
| | | 16-Feb-14 | GC-NSC-18-Feb-14 | 46.3 | 42.4 | 810 | - | - | - | - | - | - |
| | | 16-Feb-14 | GC-NSC-19-Feb-14 | 37.3 | 33.1 | 355 | - | - | - | - | - | - |
| | | 16-Feb-14 | GC-NSC-20-Feb-14 | 39.2 | 35.6 | 475 | - | - | - | - | - | - |
| | | 17-Feb-14 | GC-NSC-21-Feb-14 | 35.7 | 32.3 | 345 | - | - | M | - | - | - |
| | | 18-Feb-14 | GC-NSC-22-Feb-14 | 27.9 | 25.3 | 155 | - | - | - | - | - | - |
| | | 18-Feb-14 | GC-NSC-23-Feb-14 | 39.3 | 35.7 | 495 | sc,oto | - | F | - | - | muscle, ovaries |
| | | 19-Feb-14 | GC-NSC-24-Feb-14 | 31.5 | 28.0 | 185 | - | - | - | - | - | - |
| | | 19-Feb-14 | GC-NSC-25-Feb-14 | 33.0 | 30.1 | 295 | - | - | M | - | - | - |
| | | 20-Feb-14 | GC-NSC-26-Feb-14 | 29.8 | 26.8 | 190 | - | - | - | - | - | - |
| | | 20-Feb-14 | GC-NSC-27-Feb-14 | 20.8 | 18.7 | 50 | - | - | - | - | - | - |
| | | 20-Feb-14 | GC-NSC-28-Feb-14 | 35.5 | 32.3 | 360 | sc,oto | - | F | - | - | muscle |
| | | 20-Feb-14 | GC-NSC-29-Feb-14 | 38.6 | 34.9 | 500 | sc,oto | - | F | - | - | muscle |
| | | 18-Feb-14 | GC-NSC-30-Feb-14 | 15.2 | 13.4 | 21 | - | - | - | - | - | - |
| | | 24-Feb-14 | GC-NSC-31-Feb-14 | 38.0 | - | 580 | - | - | F | - | - | muscle, ovaries |
| | | 12-Apr-14 | GC-NSC-01-Apr-14 | 27.2 | 24.0 | 144 | sc, oto | - | I | - | - | muscle |
| | | 12-Apr-14 | GC-NSC-02-Apr-14 | 28.5 | 25.4 | 173 | sc, oto | - | M | - | - | muscle |
| | | 12-Apr-14 | GC-NSC-03-Apr-14 | 27.9 | 24.7 | 155 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | GC-NSC-04-Apr-14 | 50.4 | 46.1 | 1,090 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | GC-NSC-05-Apr-14 | 28.2 | 25.0 | 158 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | GC-NSC-06-Apr-14 | 33.5 | 30.3 | 320 | sc, oto | - | M | - | - | muscle |
| | | 13-Apr-14 | GC-NSC-07-Apr-14 | 47.0 | 42.6 | 840 | sc | - | M | - | damaged left eye | muscle |
| | | 14-Apr-14 | GC-NSC-08-Apr-14 | 31.2 | 27.8 | 156 | sc, oto | - | M | - | - | muscle |
| | | 14-Apr-14 | GC-NSC-09-Apr-14 | 30.9 | 27.6 | 215 | sc, oto | - | M | - | - | muscle |
| | | 14-Apr-14 | GC-NSC-10-Apr-14 | 40.4 | 36.5 | 522 | sc, oto | - | F | 4.343 | - | muscle, ovaries |
| | | 14-Apr-14 | GC-NSC-11-Apr-14 | 24.5 | 21.5 | 94 | sc, oto | - | I | - | - | muscle |
| | | 14-Apr-14 | GC-NSC-12-Apr-14 | 40.0 | 36.3 | 550 | sc, oto | - | M | - | - | muscle |
| | | 15-Apr-14 | GC-NSC-13-Apr-14 | 28.7 | 25.6 | 162 | sc, oto | - | M | - | - | muscle |
| | | 19-Aug-14 | GC-NSC-01-Aug-14 | 30.1 | 26.8 | 191 | sc, oto | 8 | - | - | - | muscle |
| | | 19-Aug-14 | GC-NSC-02-Aug-14 | 24.8 | 22.3 | 124 | sc, oto | 6 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-03-Aug-14 | 30.2 | 26.7 | 184 | sc, oto | 8 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-04-Aug-14 | 33.8 | 30.6 | 290 | sc, oto | 8 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-05-Aug-14 | 30.6 | 27.8 | 212 | sc, oto | 7 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-06-Aug-14 | 34.7 | 31.0 | 286 | sc, oto | 10 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-07-Aug-14 | 30.0 | 26.9 | 178 | sc, oto | 9 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-08-Aug-14 | 30.0 | 27.0 | 208 | sc, oto | 7 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-09-Aug-14 | 33.3 | 30.0 | 294 | sc, oto | 10 | - | - | - | muscle |
| | | 20-Aug-14 | GC-NSC-10-Aug-14 | 36.7 | 33.2 | 364 | sc, oto | 12 | - | - | - | muscle |
| | 2015 | 23-Apr-15 | GC-NSC-07-Apr-15 | 28.5 | 25.4 | 159 | - | - | - | 0.970 | - | - |
| | | 23-Apr-15 | GC-NSC-08-Apr-15 | 30.8 | 27.5 | 211 | - | - | - | 1.015 | - | - |
| | | 23-Apr-15 | GC-NSC-09-Apr-15 | 28.8 | 25.8 | 172 | - | - | - | 1.002 | - | - |
| | | 23-Apr-15 | GC-NSC-11-Apr-15 | 27.4 | 24.4 | 125 | - | - | - | 0.860 | - | - |
| | | 23-Apr-15 | GC-NSC-12-Apr-15 | 28.0 | 25.2 | 150 | - | - | - | 0.937 | - | - |
| | | 24-Apr-15 | GC-NSC-24-Apr-15 | 27.6 | 24.6 | 144 | - | - | - | 0.967 | - | - |
| | | 24-Apr-15 | GC-NSC-25-Apr-15 | 29.2 | 26.0 | 149 | - | - | - | 0.848 | - | - |
| | | 25-Apr-15 | GC-NSC-29-Apr-15 | 30.2 | 26.8 | 180 | - | - | - | 0.935 | - | - |
| | | 24-Aug-15 | GC-NSC-01-Aug-15 | 28.7 | 25.7 | 149 | oto | 7 | - | - | - | muscle |
| | | 24-Aug-15 | GC-NSC-02-Aug-15 | 37.3 | 34.3 | 360 | oto | 12 | - | - | - | muscle |
| | | 24-Aug-15 | GC-NSC-03-Aug-15 | 26.8 | 24.1 | 131 | oto | 6 | - | - | - | muscle |
| | | 24-Aug-15 | GC-NSC-04-Aug-15 | 26.9 | 24.0 | 122 | oto | 6 | - | - | - | muscle |
| | | 25-Aug-15 | GC-NSC-05-Aug-15 | 29.0 | 25.7 | 166 | oto | 6 | - | - | - | muscle |
| | | 25-Aug-15 | GC-NSC-06-Aug-15 | 32.2 | 29.0 | 230 | oto | 6 | - | - | - | muscle |
| | | 25-Aug-15 | GC-NSC-07-Aug-15 | 27.5 | 24.8 | 142 | oto | 6 | - | - | - | muscle |
| | | 25-Aug-15 | GC-NSC-08-Aug-15 | 26.4 | 23.5 | 120 | oto | 6 | - | - | - | muscle |
| | | 25-Aug-15 | GC-NSC-09-Aug-15 | 22.2 | 19.8 | 71 | oto | 4 | - | - | - | muscle |
| | | 26-Aug-15 | GC-NSC-10-Aug-15 | 31.7 | 28.9 | 225 | oto | 9 | - | - | - | muscle |
| | 2016 | 19-Apr-16 | GC-NSC-04-Apr-16 | 29.5 | 26.6 | 174 | - | - | - | - | - | - |
| | | 23-Aug-16 | GC-NSC-01A-Aug-16 | 37.0 | 33.3 | 440 | sc, oto | 10 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-02A-Aug-16 | 47.6 | 43.3 | 1,040 | sc, oto | 14 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-03A-Aug-16 | 34.8 | 31.5 | 365 | sc, oto | 13 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-04A-Aug-16 | 37.3 | 33.8 | 410 | sc, oto | 13 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-05A-Aug-16 | 32.0 | 28.8 | 236 | sc, oto | 10 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-06A-Aug-16 | 41.3 | 37.6 | 575 | sc, oto | 9 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-07A-Aug-16 | 37.7 | 34.5 | 505 | sc, oto | 12 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-08A-Aug-16 | 36.2 | 32.6 | 400 | sc, oto | 12 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-09A-Aug-16 | 36.0 | 32.8 | 350 | sc, oto | 11 | - | - | - | muscle |
| | | 28-Aug-16 | GC-NSC-10A-Aug-16 | 33.0 | 29.6 | 290 | sc, oto | 14 | - | - | - | muscle |
| **total sample size** | | | | **83** | **82** | **83** | **-** | **30** | **-** | **9** | **-** | **-** |
| **average** | | | | **35** | **31** | **402** | **-** | **9** | **-** | **1.320** | **-** | **-** |
| **median** | | | | **33** | **29** | **286** | **-** | **9** | **-** | **0.967** | **-** | **-** |
| **standard deviation** | | | | **8.4** | **7.9** | **381** | **-** | **2.8** | **-** | **1.135** | **-** | **-** |
| **standard error** | | | | **0.92** | **0.87** | **42** | **-** | **0.51** | **-** | **0.378** | **-** | **-** |
| **minimum** | | | | **15** | **13** | **21** | **-** | **4** | **-** | **0.848** | **-** | **-** |
| **maximum** | | | | **63** | **57** | **2,100** | **-** | **14** | **-** | **4.343** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Fish collected at Englishman Creek were grouped with the Elk River summary statistics.

## **Table F.28:** Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 11-Apr-14 | SC-PCC-02-Apr-14 | F | 27.6 | 24.4 | 140 | sc, oto | 11 | 9.772 | 1.708 | 129 | - | - | - |
| | | 11-Apr-14 | SC-PCC-03-Apr-14 | F | 30.9 | 28.0 | 204 | sc, oto | 14 | 15.667 | 4.160 | 184 | - | - | - |
| | | 11-Apr-14 | SC-PCC-04-Apr-14 | F | 26.6 | 23.7 | 139 | sc, oto | 12 | 9.041 | 1.983 | 128 | - | - | - |
| | | 11-Apr-14 | SC-PCC-06-Apr-14 | F | 27.2 | 24.2 | 152 | sc, oto | 17 | 7.929 | 2.805 | 141 | - | - | - |
| | | 11-Apr-14 | SC-PCC-07-Apr-14 | F | 23.2 | 20.3 | 90 | sc | 5 | 0.841 | 1.428 | 88 | - | - | - |
| | | 11-Apr-14 | SC-PCC-10-Apr-14 | F | 23.4 | 21.0 | 96 | sc, oto | 7 | 3.215 | 1.600 | 91 | worms | 2.940 | - |
| | | 11-Apr-14 | SC-PCC-11-Apr-14 | F | 24.0 | 21.6 | 118 | sc, oto | 6 | 3.134 | 1.827 | 113 | worms | 5.323 | - |
| | | 12-Apr-14 | SC-PCC-12-Apr-14 | F | 28.6 | 25.7 | 174 | sc, oto | 10 | 9.899 | 2.427 | 162 | - | - | - |
| | | 12-Apr-14 | SC-PCC-14-Apr-14 | F | 26.5 | 24.0 | 142 | sc, oto | 14 | 8.892 | 2.705 | 130 | - | - | - |
| | | 12-Apr-14 | SC-PCC-15-Apr-14 | F | 26.7 | 24.4 | 159 | sc, oto | 11 | 12.055 | 2.510 | 144 | - | - | - |
| | | 12-Apr-14 | SC-PCC-16-Apr-14 | F | 23.6 | 21.0 | 106 | sc, oto | 6 | 2.339 | 1.458 | 102 | - | - | - |
| | | 12-Apr-14 | SC-PCC-17-Apr-14 | F | 23.4 | 21.0 | 93 | sc, oto | 7 | 0.583 | 1.036 | 91 | worms | 5.470 | - |
| | | 12-Apr-14 | SC-PCC-18-Apr-14 | F | 24.1 | 21.7 | 116 | sc, oto | 11 | 6.580 | 1.920 | 108 | - | - | - |
| | | 12-Apr-14 | SC-PCC-20-Apr-14 | F | 29.2 | 26.9 | 182 | sc, oto | 17 | 8.999 | 3.770 | 169 | - | - | - |
| | | 13-Apr-14 | SC-PCC-21-Apr-14 | F | 28.2 | 24.7 | 154 | sc, oto | 17 | 7.197 | 2.103 | 145 | - | - | - |
| | | 14-Apr-14 | SC-PCC-23-Apr-14 | F | 22.7 | 20.2 | 106 | sc, oto | 12 | 8.057 | 2.461 | 95 | blood in liver | - | - |
| | | 14-Apr-14 | SC-PCC-24-Apr-14 | F | 24.6 | 22.0 | 110 | sc, oto | 6 | 1.099 | 1.313 | 108 | worms, very small ovaries, underdeveloped | 11.577 | - |
| | | 14-Apr-14 | SC-PCC-27-Apr-14 | F | 24.5 | 21.8 | 120 | sc, oto | 7 | 8.208 | 2.161 | 110 | - | - | - |
| | | 14-Apr-14 | SC-PCC-29-Apr-14 | F | 24.0 | 20.9 | 109 | sc, oto | 5 | 1.088 | 1.711 | 106 | worms | 10.511 | - |
| | | 14-Apr-14 | SC-PCC-31-Apr-14 | F | 23.3 | 20.5 | 105 | sc, oto | 5 | 4.924 | 2.007 | 98 | - | - | - |
| | | 14-Apr-14 | SC-PCC-32-Apr-14 | F | 30.4 | 27.1 | 209 | sc, oto | 19 | 20.982 | 3.980 | 184 | - | - | - |
| | | 14-Apr-14 | SC-PCC-36-Apr-14 | F | 26.2 | 23.4 | 133 | sc, oto | 8 | 6.859 | 2.094 | 124 | worms | 2.375 | - |
| | | 15-Apr-14 | SC-PCC-38-Apr-14 | F | 30.1 | 27.0 | 208 | sc, oto | 15 | 17.977 | 3.375 | 187 | - | - | - |
| | | | **total sample size** | **-** | **23** | **23** | **23** | **-** | **23** | **23** | **23** | **23** | **-** | **6** | **-** |
| | | | **average** | **-** | **26.0** | **23.3** | **138** | **-** | **11** | **7.623** | **2.284** | **128** | **-** | **6.366** | **-** |
| | | | **median** | **-** | **26.2** | **23.4** | **133** | **-** | **11** | **7.929** | **2.094** | **124** | **-** | **5.397** | **-** |
| | | | **standard deviation** | **-** | **2.6** | **2.5** | **37** | **-** | **4.5** | **5.408** | **0.852** | **32** | **-** | **3.844** | **-** |
| | | | **standard error** | **-** | **0.5** | **0.5** | **8** | **-** | **0.94** | **1.128** | **0.178** | **7** | **-** | **1.569** | **-** |
| | | | **minimum** | **-** | **22.7** | **20.2** | **90** | **-** | **5** | **0.583** | **1.036** | **88** | **-** | **2.375** | **-** |
| | | | **maximum** | | **30.9** | **28.0** | **209** | **-** | **19** | **20.982** | **4.160** | **187** | **-** | **11.577** | **-** |
| | 2015 | 24-Apr-15 | SC-PCC-01-Apr-15 | F | 24.5 | 22.0 | 106 | sc, oto | 7 | 7.743 | 2.485 | 96 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-PCC-02-Apr-15 | F | 25.4 | 22.9 | 134 | sc, oto | 6 | 2.383 | 1.622 | 130 | worms | 20.682 | muscle, ovaries |
| | | 25-Apr-15 | SC-PCC-04-Apr-15 | F | 26.0 | 23.4 | 110 | sc, oto | 8 | 3.355 | 1.387 | 105 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-PCC-05-Apr-15 | F | 27.7 | 24.8 | 166 | sc, oto | 11 | 12.497 | 3.924 | 150 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-PCC-06-Apr-15 | F | 27.0 | 24.5 | 134 | sc, oto | 12 | 6.259 | 1.855 | 126 | - | - | muscle, ovaries |
| | | 25-Apr-15 | SC-PCC-08-Apr-15 | F | 29.3 | 26.2 | 190 | sc, oto | 14 | 10.901 | 3.766 | 175 | - | - | muscle, ovaries |
| | | 26-Apr-15 | SC-PCC-10-Apr-15 | F | 27.6 | 24.9 | 144 | sc, oto | 13 | 8.117 | 2.065 | 134 | - | - | muscle, ovaries |
| | | 26-Apr-15 | SC-PCC-13-Apr-15 | F | 28.5 | 25.5 | 172 | sc, oto | 12 | 12.149 | 3.878 | 156 | - | - | muscle, ovaries |
| | | 26-Apr-15 | SC-PCC-14-Apr-15 | F | 29.7 | 26.8 | 187 | sc, oto | 21 | 12.451 | 3.001 | 172 | excess connective tissue around organs | - | muscle, ovaries |
| | | 26-Apr-15 | SC-PCC-15-Apr-15 | F | 27.2 | 24.4 | 150 | sc, oto | 11 | 8.195 | 2.763 | 139 | - | - | muscle, ovaries |
| | | 27-Apr-15 | SC-PCC-16-Apr-15 | F | 28.3 | 25.3 | 178 | sc, oto | 17 | 13.187 | 4.244 | 161 | - | - | - |
| | | 27-Apr-15 | SC-PCC-17-Apr-15 | F | 27.7 | 24.8 | 163 | sc, oto | 13 | 10.674 | 3.007 | 149 | - | - | - |
| | | 27-Apr-15 | SC-PCC-18-Apr-15 | F | 31.0 | 28.4 | 263 | sc, oto | 27 | 17.973 | 5.340 | 240 | - | - | - |
| | | 27-Apr-15 | SC-PCC-20-Apr-15 | F | 26.2 | 23.4 | 142 | sc, oto | 9 | 5.829 | 1.874 | 134 | worms | 11.734 | - |
| | | 27-Apr-15 | SC-PCC-21-Apr-15 | F | 26.5 | 23.8 | 149 | sc, oto | 10 | 14.169 | 4.089 | 131 | - | - | - |
| | | 27-Apr-15 | SC-PCC-22-Apr-15 | F | 24.5 | 21.8 | 116 | sc, oto | 10 | 7.862 | 2.075 | 106 | - | - | - |
| | | 27-Apr-15 | SC-PCC-24-Apr-15 | F | 27.5 | 24.6 | 150 | sc, oto | 10 | 7.763 | 2.431 | 140 | - | - | - |
| | | 27-Apr-15 | SC-PCC-25-Apr-15 | F | 27.1 | 24.6 | 155 | sc, oto | - | 8.086 | 2.811 | 144 | - | - | - |
| | | 27-Apr-15 | SC-PCC-26-Apr-15 | F | 26.2 | 23.2 | 143 | sc, oto | 13 | 10.390 | 2.488 | 130 | - | - | - |
| | | 27-Apr-15 | SC-PCC-27-Apr-15 | F | 28.1 | 25.5 | 169 | sc, oto | 15 | 13.747 | 3.800 | 151 | - | - | - |
| | | | **total sample size** | **-** | **20** | **20** | **20** | **-** | **19** | **20** | **20** | **20** | **-** | **2** | **-** |
| | | | **average** | **-** | **27.3** | **24.5** | **156** | **-** | **13** | **9.687** | **2.945** | **143** | **-** | **16.208** | **-** |
| | | | **median** | **-** | **27.4** | **24.6** | **150** | **-** | **12** | **9.293** | **2.787** | **139** | **-** | **16.208** | **-** |
| | | | **standard deviation** | **-** | **1.6** | **1.6** | **34** | **-** | **4.9** | **3.840** | **1.045** | **31** | **-** | **6.327** | **-** |
| | | | **standard error** | **-** | **0.4** | **0.4** | **8** | **-** | **1.1** | **0.859** | **0.234** | **7** | **-** | **4.474** | **-** |
| | | | **minimum** | **-** | **24.5** | **21.8** | **106** | **-** | **6** | **2.383** | **1.387** | **96** | **-** | **11.734** | **-** |
| | | | **maximum** | | **31.0** | **28.4** | **263** | **-** | **27** | **17.973** | **5.340** | **240** | **-** | **20.682** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

**Table F.28:** **Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2016 | 19-Apr-16 | SC-PCC-01-Apr-16 | F | 26.5 | 23.4 | 136 | sc, oto | 10 | 4.916 | 2.413 | 129 | worms | 9.843 | muscle, ovaries |
| | | 20-Apr-16 | SC-PCC-06-Apr-16 | F | 26.7 | 24.4 | 160 | sc, oto | 13 | 16.845 | 2.906 | 140 | - | - | muscle, ovaries |
| | | 20-Apr-16 | SC-PCC-08-Apr-16 | F | 23.7 | 21.4 | 105 | sc, oto | 5 | 2.994 | 1.875 | 100 | worms | 13.700 | muscle, ovaries |
| | | 21-Apr-16 | SC-PCC-10-Apr-16 | F | 24.2 | 21.8 | 102 | sc, oto | 7 | 1.185 | 0.962 | 100 | worms | 7.912 | - |
| | | 21-Apr-16 | SC-PCC-11-Apr-16 | F | 26.7 | 24.1 | 152 | sc, oto | 13 | 5.502 | 1.479 | 145 | worms | 9.276 | muscle, ovaries |
| | | 21-Apr-16 | SC-PCC-12-Apr-16 | F | 25.2 | 22.5 | 130 | sc, oto | 13 | 10.740 | 1.659 | 118 | - | - | muscle, ovaries |
| | | 21-Apr-16 | SC-PCC-16-Apr-16 | F | 25.0 | 22.6 | 134 | sc, oto | 11 | 8.736 | 2.403 | 123 | - | - | muscle, ovaries |
| | | 21-Apr-16 | SC-PCC-17-Apr-16 | F | 24.5 | 22.0 | 132 | sc, oto | 10 | 12.741 | 1.269 | 118 | worms | 8.223 | muscle, ovaries |
| | | 23-Apr-16 | SC-PCC-18-Apr-16 | F | 27.9 | 24.4 | 160 | sc, oto | 12 | 16.156 | 3.049 | 141 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-PCC-19-Apr-16 | F | 29.4 | 26.6 | 176 | sc, oto | 16 | 11.168 | 3.253 | 162 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-PCC-20-Apr-16 | F | 27.8 | 25.0 | 185 | sc, oto | 14 | 19.574 | 3.942 | 161 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-PCC-21-Apr-16 | F | 28.1 | 25.3 | 159 | sc, oto | 14 | 12.146 | 3.910 | 143 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-PCC-22-Apr-16 | F | 29.0 | 23.2 | 135 | sc, oto | 11 | 12.456 | 3.215 | 119 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-PCC-26-Apr-16 | F | 27.8 | 24.9 | 172 | sc, oto | 9 | 18.396 | 3.363 | 150 | - | - | - |
| | | 23-Apr-16 | SC-PCC-27-Apr-16 | F | 25.7 | 23.0 | 136 | sc, oto | 8 | 10.245 | 2.572 | 123 | - | - | - |
| | | 23-Apr-16 | SC-PCC-28-Apr-16 | F | 24.1 | 21.7 | 118 | sc, oto | 5 | 12.601 | 2.878 | 103 | - | - | - |
| | | 23-Apr-16 | SC-PCC-29-Apr-16 | F | 26.9 | 24.4 | 150 | sc, oto | 10 | 3.809 | 2.508 | 144 | worms | 15.382 | - |
| | | 23-Apr-16 | SC-PCC-30-Apr-16 | F | 23.9 | 21.4 | 115 | sc, oto | 7 | 8.728 | 1.737 | 105 | - | - | - |
| | | 23-Apr-16 | SC-PCC-31-Apr-16 | F | 29.1 | 26.5 | 194 | sc, oto | 13 | 17.874 | 3.366 | 173 | - | - | - |
| | | 23-Apr-16 | SC-PCC-32-Apr-16 | F | 24.3 | 21.9 | 129 | sc, oto | 9 | 13.620 | 3.019 | 112 | - | - | - |
| | | 23-Apr-16 | SC-PCC-33-Apr-16 | F | 24.7 | 23.2 | 112 | sc, oto | 12 | 2.236 | 1.290 | 108 | - | - | - |
| | | 23-Apr-16 | SC-PCC-34-Apr-16 | F | 25.6 | 23.2 | 132 | sc, oto | 8 | 7.981 | 1.808 | 122 | - | - | - |
| | | 23-Apr-16 | SC-PCC-35-Apr-16 | F | 26.7 | 23.7 | 144 | sc, oto | 10 | 13.412 | 2.295 | 128 | - | - | - |
| | | 23-Apr-16 | SC-PCC-36-Apr-16 | F | 28.4 | 25.5 | 176 | sc, oto | 18 | 20.830 | 3.975 | 151 | - | - | - |
| | | 23-Apr-16 | SC-PCC-37-Apr-16 | F | 24.2 | 21.8 | 108 | sc, oto | 8 | 8.578 | 2.918 | 97 | - | - | - |
| | | 23-Apr-16 | SC-PCC-40-Apr-16 | F | 23.2 | 20.8 | 100 | sc, oto | 5 | 10.023 | 1.537 | 88 | worms | - | - |
| | | 23-Apr-16 | SC-PCC-41-Apr-16 | F | 26.1 | 23.5 | 144 | sc, oto | 10 | 11.358 | 2.377 | 130 | - | - | - |
| | | 23-Apr-16 | SC-PCC-42-Apr-16 | F | 24.9 | 22.4 | 126 | sc, oto | 5 | 3.445 | 2.186 | 120 | worms | 16.480 | - |
| | | 23-Apr-16 | SC-PCC-43-Apr-16 | F | 25.9 | 23.4 | 140 | sc, oto | 7 | 6.146 | 2.794 | 131 | worms | 0.694 | - |
| | | 23-Apr-16 | SC-PCC-44-Apr-16 | F | 24.5 | 21.9 | 110 | sc, oto | 9 | 8.509 | 2.076 | 99 | - | - | - |
| | | **total sample size** | | **-** | **30** | **30** | **30** | **-** | **30** | **30** | **30** | **30** | **-** | **8** | **-** |
| | | **average** | | **-** | **26.0** | **23.3** | **139** | **-** | **10** | **10.432** | **2.501** | **126** | **-** | **10.189** | **-** |
| | | **median** | | **-** | **25.8** | **23.2** | **136** | **-** | **10** | **10.493** | **2.461** | **123** | **-** | **9.560** | **-** |
| | | **standard deviation** | | **-** | **1.8** | **1.5** | **25** | **-** | **3.3** | **5.301** | **0.826** | **22** | **-** | **5.057** | **-** |
| | | **standard error** | | **-** | **0.3** | **0.3** | **5** | **-** | **0.61** | **0.968** | **0.151** | **4** | **-** | **1.788** | **-** |
| | | **minimum** | | **-** | **23.2** | **20.8** | **100** | **-** | **5** | **1.185** | **0.962** | **88** | **-** | **0.694** | **-** |
| | | **maximum** | | | **29.4** | **26.6** | **194** | **-** | **18** | **20.830** | **3.975** | **173** | **-** | **16.480** | **-** |
| | 2014 | 11-Apr-14 | SC-PCC-01-Apr-14 | M | 23.6 | 21.5 | 104 | sc, oto | 8 | 1.731 | 1.247 | 101 | worms | 10.061 | - |
| | | 11-Apr-14 | SC-PCC-05-Apr-14 | M | 21.5 | 19.1 | 74 | sc | 4 | 1.496 | 0.990 | 72 | - | - | - |
| | | 11-Apr-14 | SC-PCC-08-Apr-14 | M | 22.4 | 19.9 | 90 | sc, oto | 5 | 1.555 | 1.080 | 87 | - | - | - |
| | | 12-Apr-14 | SC-PCC-13-Apr-14 | M | 23.3 | 20.6 | 102 | sc, oto | 8 | 1.544 | 1.366 | 99 | small worms | 0.049 | - |
| | | 13-Apr-14 | SC-PCC-22-Apr-14 | M | 21.5 | 19.2 | 78 | sc, oto | 6 | 0.699 | 0.930 | 76 | worms | 6.600 | - |
| | | 14-Apr-14 | SC-PCC-26-Apr-14 | M | 22.8 | 20.6 | 86 | sc, oto | 6 | 2.092 | 1.337 | 83 | worms | 0.082 | - |
| | | 14-Apr-14 | SC-PCC-30-Apr-14 | M | 21.2 | 19.0 | 76 | sc, oto | 4 | 0.375 | 0.984 | 75 | worms | 9.441 | - |
| | | 14-Apr-14 | SC-PCC-33-Apr-14 | M | 20.1 | 18.2 | 71 | sc, oto | 5 | 3.185 | 1.320 | 66 | - | - | - |
| | | 14-Apr-14 | SC-PCC-34-Apr-14 | M | 21.4 | 19.0 | 70 | sc, oto | 4 | 1.201 | 0.730 | 68 | - | - | - |
| | | 14-Apr-14 | SC-PCC-35-Apr-14 | M | 21.3 | 18.1 | 64 | sc, oto | 5 | 0.650 | 1.278 | 62 | - | - | - |
| | | 14-Apr-14 | SC-PCC-37-Apr-14 | M | 17.9 | 15.7 | 46 | sc, oto | 5 | 0.415 | 1.092 | 44 | - | - | - |
| | | 17-Apr-14 | SC-PCC-39-Apr-14 | M | 24.0 | 21.2 | 106 | sc, oto | 11 | 2.627 | 1.484 | 102 | - | - | - |
| | | 18-Apr-14 | SC-PCC-40-Apr-14 | M | 25.1 | 22.2 | 118 | sc, oto | 8 | 3.064 | 1.813 | 113 | worms | 4.394 | - |
| | | **total sample size** | | **-** | **13** | **13** | **13** | **-** | **13** | **13** | **13** | **13** | **-** | **6** | **-** |
| | | **average** | | **-** | **22.0** | **19.6** | **83** | **-** | **6** | **1.587** | **1.204** | **81** | **-** | **5.105** | **-** |
| | | **median** | | **-** | **21.5** | **19.2** | **78** | **-** | **5** | **1.544** | **1.247** | **76** | **-** | **5.497** | **-** |
| | | **standard deviation** | | **-** | **1.8** | **1.7** | **20** | **-** | **2.1** | **0.947** | **0.279** | **19** | **-** | **4.402** | **-** |
| | | **standard error** | | **-** | **0.5** | **0.5** | **6** | **-** | **0.58** | **0.263** | **0.077** | **5** | **-** | **1.797** | **-** |
| | | **minimum** | | **-** | **17.9** | **15.7** | **46** | **-** | **4** | **0.375** | **0.730** | **44** | **-** | **0.049** | **-** |
| | | **maximum** | | | **25.1** | **22.2** | **118** | **-** | **11** | **3.185** | **1.813** | **113** | **-** | **10.061** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## **Table F.28:** Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 25-Apr-15 | SC-PCC-03-Apr-15 | M | 24.4 | 22.0 | 111 | sc, oto | 8 | 2.047 | 1.304 | 108 | worms | 4.658 | whole body |
| | | 25-Apr-15 | SC-PCC-07-Apr-15 | M | 25.3 | 22.9 | 112 | sc, oto | 9 | 1.959 | 1.533 | 109 | - | - | whole body |
| | | 26-Apr-15 | SC-PCC-09-Apr-15 | M | 25.7 | 23.0 | 132 | sc, oto | 9 | 5.326 | 1.877 | 125 | - | - | whole body |
| | | 26-Apr-15 | SC-PCC-11-Apr-15 | M | 23.3 | 20.5 | 95 | sc, oto | 6 | 4.994 | 1.688 | 88 | - | - | whole body |
| | | 26-Apr-15 | SC-PCC-12-Apr-15 | M | 24.6 | 21.8 | 102 | sc, oto | 12 | 1.390 | 1.213 | 99 | - | - | whole body |
| | | 27-Apr-15 | SC-PCC-19-Apr-15 | M | 26.8 | 24.1 | 157 | sc, oto | 11 | 6.088 | 1.747 | 149 | one large testes | - | - |
| | | 27-Apr-15 | SC-PCC-23-Apr-15 | M | 25.9 | 23.2 | 120 | sc, oto | 13 | 1.106 | 1.266 | 118 | - | - | - |
| | | 28-Apr-15 | SC-PCC-28-Apr-15 | M | 24.1 | 21.3 | 105 | sc, oto | 4 | 2.624 | 0.988 | 101 | - | - | - |
| | | 28-Apr-15 | SC-PCC-29-Apr-15 | M | 24.9 | 22.3 | 113 | sc, oto | 12 | 4.055 | 1.670 | 107 | - | - | - |
| | | 30-Apr-15 | SC-PCC-30-Apr-15 | M | 21.0 | 18.7 | 70 | sc, oto | 4 | 3.516 | 1.516 | 65 | - | - | - |
| | | 30-Apr-15 | SC-PCC-31-Apr-15 | M | 22.3 | 20.0 | 81 | sc, oto | 5 | 3.927 | 0.905 | 76 | - | - | - |
| | | 30-Apr-15 | SC-PCC-32-Apr-15 | M | 22.1 | 19.8 | 83 | sc, oto | 6 | 0.868 | 1.140 | 80 | worms | 8.446 | - |
| | | 30-Apr-15 | SC-PCC-33-Apr-15 | M | 23.8 | 21.3 | 112 | sc, oto | 8 | 6.236 | 1.290 | 104 | - | - | - |
| | | **total sample size** | | **-** | **13** | **13** | **13** | **-** | **13** | **13** | **13** | **13** | **-** | **2** | **-** |
| | | **average** | | **-** | **24.2** | **21.6** | **107** | **-** | **8** | **3.395** | **1.395** | **102** | **-** | **6.552** | **-** |
| | | **median** | | **-** | **24.4** | **21.8** | **111** | **-** | **8** | **3.516** | **1.304** | **104** | **-** | **6.552** | **-** |
| | | **standard deviation** | | **-** | **1.7** | **1.5** | **23** | **-** | **3.1** | **1.881** | **0.302** | **22** | **-** | **2.679** | **-** |
| | | **standard error** | | **-** | **0.5** | **0.4** | **6** | **-** | **0.86** | **0.522** | **0.084** | **6** | **-** | **1.894** | **-** |
| | | **minimum** | | **-** | **21.0** | **18.7** | **70** | **-** | **4** | **0.868** | **0.905** | **65** | **-** | **4.658** | **-** |
| | | **maximum** | | | **26.8** | **24.1** | **157** | **-** | **13** | **6.236** | **1.877** | **149** | **-** | **8.446** | **-** |
| | 2016 | 20-Apr-16 | SC-PCC-07-Apr-16 | M | 25.4 | 22.6 | 120 | sc, oto | 7 | 1.366 | 0.926 | 118 | worms | 9.191 | whole body |
| | | 21-Apr-16 | SC-PCC-09-Apr-16 | M | 23.1 | 20.9 | 108 | sc, oto | 9 | 1.951 | 4.156 | 102 | worms | 8.636 | whole body |
| | | 21-Apr-16 | SC-PCC-14-Apr-16 | M | 26.0 | 23.5 | 140 | sc, oto | 7 | 1.519 | 1.278 | 137 | worms | 8.174 | whole body |
| | | 23-Apr-16 | SC-PCC-23-Apr-16 | M | 23.2 | 20.6 | 97 | sc, oto | 7 | 5.188 | 1.502 | 90 | - | - | whole body |
| | | 23-Apr-16 | SC-PCC-24-Apr-16 | M | 23.7 | 21.3 | 102 | sc, oto | 6 | 0.800 | 0.592 | 101 | worms | 8.157 | whole body |
| | | 23-Apr-16 | SC-PCC-25-Apr-16 | M | 23.0 | 20.6 | 96 | sc, oto | 7 | 0.682 | 1.656 | 94 | worms | 16.028 | - |
| | | 23-Apr-16 | SC-PCC-38-Apr-16 | M | 24.4 | 22.0 | 104 | sc, oto | 10 | 4.657 | 1.912 | 97 | - | - | - |
| | | 23-Apr-16 | SC-PCC-39-Apr-16 | M | 24.3 | 21.6 | 104 | sc, oto | 10 | 3.890 | 1.523 | 99 | - | - | - |
| | | 23-Apr-16 | SC-PCC-45-Apr-16 | M | 21.6 | 19.1 | 90 | sc, oto | 5 | 0.767 | 1.172 | 88 | worms | 11.287 | - |
| | | 23-Apr-16 | SC-PCC-46-Apr-16 | M | 22.7 | 20.0 | 88 | sc, oto | 5 | 0.773 | 1.184 | 86 | worms | 9.277 | - |
| | | 23-Apr-16 | SC-PCC-47-Apr-16 | M | 23.6 | 20.8 | 112 | sc, oto | 5 | 0.963 | 1.332 | 110 | worms | 23.631 | - |
| | | 23-Apr-16 | SC-PCC-48-Apr-16 | M | 25.5 | 23.0 | 144 | sc, oto | 10 | 5.799 | 2.267 | 136 | - | - | - |
| | | 23-Apr-16 | SC-PCC-49-Apr-16 | M | 23.1 | 20.8 | 97 | sc, oto | 8 | 3.803 | 1.365 | 92 | - | - | - |
| | | 24-Apr-16 | SC-PCC-50-Apr-16 | M | 19.5 | 17.3 | 57 | sc, oto | 6 | 2.291 | 0.937 | 54 | - | - | - |
| | | 24-Apr-16 | SC-PCC-51-Apr-16 | M | 19.2 | 17.0 | 57 | sc, oto | 4 | 0.742 | 0.877 | 55 | - | - | - |
| | | 24-Apr-16 | SC-PCC-52-Apr-16 | M | 19.8 | 17.2 | 57 | sc, oto | 5 | 1.885 | 0.998 | 54 | - | - | - |
| | | 24-Apr-16 | SC-PCC-53-Apr-16 | M | 19.2 | 17.3 | 61 | sc, oto | 4 | 1.741 | 1.615 | 58 | - | - | - |
| | | 24-Apr-16 | SC-PCC-54-Apr-16 | M | 19.0 | 17.5 | 60 | sc, oto | 4 | 2.473 | 1.022 | 57 | - | - | - |
| | | 24-Apr-16 | SC-PCC-55-Apr-16 | M | 19.1 | 17.0 | 57 | sc, oto | 4 | 0.539 | 0.815 | 56 | worms | 1.008 | - |
| | | 24-Apr-16 | SC-PCC-56-Apr-16 | M | 21.0 | 18.7 | 80 | sc, oto | 5 | 2.358 | 1.141 | 77 | worms | 0.067 | - |
| | | **total sample size** | | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **10** | **-** |
| | | **average** | | **-** | **22.3** | **19.9** | **92** | **-** | **6** | **2.209** | **1.414** | **88** | **-** | **9.546** | **-** |
| | | **median** | | **-** | **23.1** | **20.6** | **97** | **-** | **6** | **1.813** | **1.231** | **91** | **-** | **8.914** | **-** |
| | | **standard deviation** | | **-** | **2.4** | **2.2** | **27** | **-** | **2.1** | **1.618** | **0.759** | **26** | **-** | **6.758** | **-** |
| | | **standard error** | | **-** | **0.5** | **0.5** | **6** | **-** | **0.47** | **0.362** | **0.170** | **6** | **-** | **2.137** | **-** |
| | | **minimum** | | **-** | **19.0** | **17.0** | **57** | **-** | **4** | **0.539** | **0.592** | **54** | **-** | **0.067** | **-** |
| | | **maximum** | | | **26.0** | **23.5** | **144** | **-** | **10** | **5.799** | **4.156** | **137** | **-** | **23.631** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.28: Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2014 | 11-Apr-14 | ER-PCC-01-Apr-14 | F | 25.9 | 22.9 | 144 | sc, oto | 11 | 8.872 | 2.655 | 132 | - | - | - |
| | | 11-Apr-14 | ER-PCC-02-Apr-14 | F | 27.7 | 25.5 | 178 | sc, oto | 17 | 11.507 | 2.964 | 164 | - | - | - |
| | | 11-Apr-14 | ER-PCC-04-Apr-14 | F | 26.9 | 24.4 | 162 | sc, oto | 10 | 13.242 | 2.781 | 146 | - | - | - |
| | | 11-Apr-14 | ER-PCC-05-Apr-14 | F | 28.7 | 25.8 | 189 | sc, oto | 11 | 14.312 | 3.395 | 171 | - | - | - |
| | | 11-Apr-14 | ER-PCC-06-Apr-14 | F | 27.3 | 25.0 | 158 | sc, oto | 11 | 13.841 | 2.099 | 142 | - | - | - |
| | | 11-Apr-14 | ER-PCC-07-Apr-14 | F | 28.5 | 25.6 | 182 | sc, oto | 11 | 10.666 | 2.568 | 169 | - | - | - |
| | | 12-Apr-14 | ER-PCC-08-Apr-14 | F | 29.3 | 26.4 | 212 | sc, oto | 24 | 14.330 | 4.160 | 194 | - | - | - |
| | | 12-Apr-14 | ER-PCC-09-Apr-14 | F | 27.1 | 24.4 | 149 | sc, oto | 12 | 9.397 | 2.862 | 137 | - | - | - |
| | | 12-Apr-14 | ER-PCC-10-Apr-14 | F | 29.0 | 25.5 | 108 | sc, oto | 19 | 13.217 | 2.830 | 92 | - | - | - |
| | | 12-Apr-14 | ER-PCC-11-Apr-14 | F | 30.3 | 27.8 | 210 | sc, oto | 15 | 12.694 | 4.075 | 193 | - | - | - |
| | | 12-Apr-14 | ER-PCC-12-Apr-14 | F | 28.7 | 26.0 | 181 | sc, oto | 17 | 9.771 | 2.914 | 168 | - | - | - |
| | | 12-Apr-14 | ER-PCC-13-Apr-14 | F | 23.0 | 25.6 | 130 | sc, oto | 8 | 4.805 | 2.623 | 123 | blood in liver | - | - |
| | | 12-Apr-14 | ER-PCC-14-Apr-14 | F | 31.5 | 28.5 | 266 | sc, oto | 21 | 17.671 | 4.825 | 244 | - | - | - |
| | | 14-Apr-14 | ER-PCC-16-Apr-14 | F | 25.7 | 22.5 | 132 | sc, oto | 8 | 4.461 | 1.907 | 126 | worms | 12.924 | - |
| | | 14-Apr-14 | ER-PCC-17-Apr-14 | F | 26.3 | 23.7 | 149 | sc, oto | 10 | 11.308 | 2.447 | 135 | - | - | - |
| | | 15-Apr-14 | ER-PCC-18-Apr-14 | F | 28.8 | 25.9 | 223 | sc, oto | 21 | 15.019 | 3.430 | 205 | - | - | - |
| | | 15-Apr-14 | ER-PCC-19-Apr-14 | F | 28.1 | 25.5 | 178 | sc, oto | 15 | 13.387 | 3.247 | 161 | - | - | - |
| | | 15-Apr-14 | ER-PCC-20-Apr-14 | F | 25.7 | 23.5 | 156 | sc, oto | 11 | 14.003 | 3.385 | 139 | - | - | - |
| | | 15-Apr-14 | ER-PCC-21-Apr-14 | F | 30.1 | 27.2 | 229 | sc, oto | 16 | 15.257 | 4.141 | 210 | - | - | - |
| | | 15-Apr-14 | ER-PCC-22-Apr-14 | F | 25.8 | 28.5 | 180 | sc, oto | 20 | 10.528 | 3.269 | 166 | - | - | - |
| | | 18-Apr-14 | ER-PCC-25-Apr-14[b] | F | 29.2 | 26.1 | 190 | sc, oto | >15 | 15.978 | 2.763 | 171 | - | - | - |
| | | | **total sample size** | **-** | **21** | **21** | **21** | **-** | **20** | **21** | **21** | **21** | **-** | **-** | **-** |
| | | | **average** | **-** | **27.8** | **25.5** | **176** | **-** | **14** | **12.108** | **3.111** | **161** | **-** | **-** | **-** |
| | | | **median** | **-** | **28.1** | **25.6** | **178** | **-** | **14** | **13.217** | **2.914** | **164** | **-** | **-** | **-** |
| | | | **standard deviation** | **-** | **2.0** | **1.6** | **37** | **-** | **4.8** | **3.361** | **0.722** | **35** | **-** | **-** | **-** |
| | | | **standard error** | **-** | **0.4** | **0.4** | **8** | **-** | **1.1** | **0.733** | **0.157** | **8** | **-** | **-** | **-** |
| | | | **minimum** | **-** | **23.0** | **22.5** | **108** | **-** | **8** | **4.461** | **1.907** | **92** | **-** | **-** | **-** |
| | | | **maximum** | | **31.5** | **28.5** | **266** | **-** | **24** | **17.671** | **4.825** | **244** | **-** | **-** | **-** |
| | 2015 | 22-Apr-15 | ER-PCC-01-Apr-15 | F | 26.7 | 24.1 | 150 | sc | 5 | 11.736 | 1.088 | 137 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-02-Apr-15 | F | 30.0 | 27.1 | 200 | sc, oto | 22 | 8.879 | 2.226 | 189 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-03-Apr-15 | F | 30.7 | 27.6 | 198 | sc, oto | 21 | 9.947 | 3.333 | 185 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-04-Apr-15 | F | 29.2 | 25.9 | 174 | sc, oto | 11 | 10.882 | 2.767 | 160 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-05-Apr-15 | F | 27.3 | 24.5 | 178 | sc, oto | 15 | 12.307 | 3.720 | 162 | gill cysts | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-06-Apr-15 | F | 28.1 | 25.4 | 158 | sc, oto | 15 | 10.681 | 2.938 | 144 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-07-Apr-15 | F | 21.4 | 19.0 | 77 | sc, oto | 5 | 4.790 | 0.989 | 71 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-08-Apr-15 | F | 25.3 | 22.5 | 90.5 | sc, oto | 9 | 5.160 | 1.844 | 83 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-10-Apr-15 | F | 28.1 | 25.4 | 146 | sc, oto | 13 | 5.149 | 1.489 | 139 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-11-Apr-15 | F | 29.7 | 27.0 | 180 | sc, oto | 20 | 9.550 | 3.025 | 167 | - | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-12-Apr-15 | F | 30.9 | 27.4 | 212 | sc, oto | 19 | 16.073 | 4.221 | 192 | caudal deformed | - | muscle, ovaries |
| | | 22-Apr-15 | ER-PCC-13-Apr-15 | F | 28.0 | 24.9 | 160 | sc, oto | 13 | 9.203 | 2.500 | 148 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-PCC-14-Apr-15 | F | 29.2 | 26.1 | 205 | sc, oto | 20 | 13.447 | 3.606 | 188 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-PCC-15-Apr-15 | F | 29.4 | 26.3 | 183 | sc, oto | 21 | 10.653 | 3.301 | 169 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-PCC-16-Apr-15 | F | 25.7 | 23.0 | 127 | sc, oto | 9 | 9.022 | 2.605 | 115 | - | - | - |
| | | 23-Apr-15 | ER-PCC-18-Apr-15 | F | 27.6 | 24.9 | 168 | sc, oto | 15 | 10.748 | 3.153 | 154 | - | - | - |
| | | 23-Apr-15 | ER-PCC-20-Apr-15 | F | 29.4 | 26.4 | 170 | sc, oto | 15 | 9.449 | 2.430 | 158 | - | - | - |
| | | 23-Apr-15 | ER-PCC-21-Apr-15 | F | 27.5 | 24.8 | 152 | sc, oto | 9 | 8.702 | 2.538 | 141 | - | - | - |
| | | 23-Apr-15 | ER-PCC-22-Apr-15 | F | 28.7 | 25.7 | 168 | sc, oto | 17 | 6.808 | 2.637 | 159 | - | - | - |
| | | 23-Apr-15 | ER-PCC-23-Apr-15 | F | 27.0 | 24.3 | 138 | sc, oto | 13 | 8.824 | 2.123 | 127 | - | - | - |
| | | 28-Apr-15 | ER-PCC-34-Apr-15 | F | 23.6 | 21.4 | 93 | - | - | - | - | - | - | - | - |
| | | | **total sample size** | **-** | **21** | **21** | **21** | **-** | **20** | **20** | **20** | **20** | **-** | **-** | **-** |
| | | | **average** | **-** | **27.8** | **24.9** | **158** | **-** | **14** | **9.601** | **2.627** | **149** | **-** | **-** | **-** |
| | | | **median** | **-** | **28.1** | **25.4** | **168** | **-** | **15** | **9.500** | **2.621** | **156** | **-** | **-** | **-** |
| | | | **standard deviation** | **-** | **2.3** | **2.1** | **37** | **-** | **5.2** | **2.780** | **0.847** | **32** | **-** | **-** | **-** |
| | | | **standard error** | **-** | **0.5** | **0.5** | **8** | **-** | **1.2** | **0.622** | **0.189** | **7** | **-** | **-** | **-** |
| | | | **minimum** | **-** | **21.4** | **19.0** | **77** | **-** | **5** | **4.790** | **0.989** | **71** | **-** | **-** | **-** |
| | | | **maximum** | | **30.9** | **27.6** | **212** | **-** | **22** | **16.073** | **4.221** | **192** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

### Table F.28: Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2016 | 19-Apr-16 | ER-PCC-01-Apr-16 | F | 27.1 | 23.8 | 160 | sc | 4 | 13.767 | 3.102 | 143 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-02-Apr-16 | F | 22.5 | 19.5 | 75 | sc, oto | 5 | 7.473 | 2.222 | 65 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-03-Apr-16 | F | 23.5 | 20.3 | 96 | sc, oto | 7 | 4.350 | 2.049 | 90 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-04-Apr-16 | F | 23.4 | 21.3 | 84 | - | - | - | - | - | - | - | - |
| | | 19-Apr-16 | ER-PCC-05-Apr-16 | F | 22.2 | 19.6 | 87 | sc, oto | 5 | 6.665 | 1.679 | 79 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-06-Apr-16 | F | 22.5 | 20.1 | 89 | sc, oto | 5 | 7.875 | 1.328 | 80 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-07-Apr-16 | F | 25.6 | 22.9 | 140 | sc, oto | 8 | 14.949 | 3.695 | 121 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-08-Apr-16 | F | 24.5 | 22.2 | 125 | sc, oto | 9 | 9.874 | 1.769 | 113 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-09-Apr-16 | F | 20.7 | 18.5 | 66 | sc, oto | 4 | 1.933 | 1.162 | 63 | worms | 3.500 | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-10-Apr-16 | F | 25.5 | 23.2 | 144 | sc, oto | 9 | 8.747 | 3.185 | 132 | worms | 1.123 | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-11-Apr-16 | F | 24.5 | 21.6 | 100 | sc, oto | 7 | 3.487 | 1.393 | 95 | worms | 4.893 | muscle, ovaries |
| | | 19-Apr-16 | ER-PCC-14-Apr-16 | F | 22.5 | 20.3 | 90 | sc, oto | 5 | 8.152 | 2.027 | 80 | - | - | muscle, ovaries |
| | | 20-Apr-16 | ER-PCC-15-Apr-16 | F | 23.5 | 20.9 | 110 | sc, oto | 7 | 11.829 | 2.662 | 96 | - | - | muscle, ovaries |
| | | 22-Apr-16 | ER-PCC-16-Apr-16 | F | 25.5 | 22.6 | 122 | sc, oto | 13.5 | 6.591 | 1.993 | 113 | - | - | - |
| | | 22-Apr-16 | ER-PCC-17-Apr-16 | F | 30.4 | 27.5 | 232 | sc, oto | 18 | 26.184 | 6.495 | 199 | - | - | - |
| | | 22-Apr-16 | ER-PCC-18-Apr-16 | F | 26.1 | 23.4 | 152 | sc, oto | 10 | 19.077 | 3.880 | 129 | - | - | - |
| | | 22-Apr-16 | ER-PCC-19-Apr-16 | F | 25.6 | 23.2 | 156 | sc, oto | 10 | 19.472 | 4.119 | 132 | - | - | - |
| | | 22-Apr-16 | ER-PCC-20-Apr-16 | F | 25.7 | 23.1 | 138 | sc, oto | 10 | 12.278 | 2.313 | 123 | - | - | - |
| | | 22-Apr-16 | ER-PCC-22-Apr-16 | F | 26.5 | 23.6 | 160 | sc, oto | 10 | 15.665 | 4.118 | 140 | - | - | - |
| | | 22-Apr-16 | ER-PCC-23-Apr-16 | F | 24.5 | 21.5 | 118 | sc, oto | 7 | 10.972 | 3.672 | 103 | - | - | - |
| | | 22-Apr-16 | ER-PCC-25-Apr-16 | F | 23.4 | 21.1 | 114 | sc, oto | 5 | 0.828 | 1.612 | 112 | worms | 17.527 | - |
| | | 22-Apr-16 | ER-PCC-29-Apr-16[b] | F | 24.8 | 22.8 | 136 | sc, oto | 10 | 10.056 | 3.131 | 123 | - | - | - |
| | | 22-Apr-16 | ER-PCC-30-Apr-16 | F | 25.7 | 23.0 | 132 | sc, oto | 9 | 11.083 | 2.651 | 118 | - | - | - |
| | | 22-Apr-16 | ER-PCC-31-Apr-16 | F | 26.0 | 23.2 | 154 | sc, oto | 13 | 15.995 | 2.881 | 135 | - | - | - |
| | | 22-Apr-16 | ER-PCC-32-Apr-16 | F | 29.5 | 26.5 | 188 | sc, oto | 11 | 16.571 | 3.306 | 168 | - | - | - |
| | | 22-Apr-16 | ER-PCC-38-Apr-16 | F | 24.7 | 22.2 | 122 | sc, oto | 7 | 14.272 | 1.982 | 106 | - | - | - |
| | | 22-Apr-16 | ER-PCC-39-Apr-16 | F | 26.9 | 23.6 | 132 | sc, oto | 11 | 9.589 | 3.503 | 119 | - | - | - |
| | | 22-Apr-16 | ER-PCC-40-Apr-16 | F | 27.9 | 25.2 | 196 | sc, oto | 13 | 14.115 | 4.034 | 178 | worms | 22.541 | - |
| | | 22-Apr-16 | ER-PCC-41-Apr-16 | F | 26.5 | 23.6 | 164 | sc, oto | 10 | 17.972 | 3.594 | 142 | - | - | - |
| | | 22-Apr-16 | ER-PCC-42-Apr-16 | F | 23.6 | 21.1 | 104 | sc, oto | 5 | 9.394 | 2.648 | 92 | - | - | - |
| | | 22-Apr-16 | ER-PCC-43-Apr-16 | F | 23.0 | 20.5 | 99 | sc, oto | 5 | 7.762 | 1.842 | 89 | - | - | - |
| | | 22-Apr-16 | ER-PCC-44-Apr-16 | F | 23.5 | 21.2 | 116 | sc, oto | 10 | 11.071 | 2.475 | 102 | - | - | - |
| | | **total sample size** | | **-** | **32** | **32** | **32** | **-** | **31** | **31** | **31** | **31** | **-** | **5** | **-** |
| | | **average** | | **-** | **24.9** | **22.3** | **128** | **-** | **8** | **11.227** | **2.791** | **116** | **-** | **9.917** | **-** |
| | | **median** | | **-** | **24.8** | **22.4** | **124** | **-** | **9** | **10.972** | **2.651** | **113** | **-** | **4.893** | **-** |
| | | **standard deviation** | | **-** | **2.1** | **2.0** | **37** | **-** | **3.3** | **5.524** | **1.123** | **31** | **-** | **9.500** | **-** |
| | | **standard error** | | **-** | **0.4** | **0.3** | **7** | **-** | **0.59** | **0.992** | **0.202** | **6** | **-** | **4.249** | **-** |
| | | **minimum** | | **-** | **20.7** | **18.5** | **66** | **-** | **4** | **0.828** | **1.162** | **63** | **-** | **1.123** | **-** |
| | | **maximum** | | | **30.4** | **27.5** | **232** | **-** | **18** | **26.184** | **6.495** | **199** | **-** | **22.541** | **-** |
| | 2014 | 11-Apr-14 | ER-PCC-03-Apr-14 | M | 23.6 | 20.9 | 100 | sc, oto | 14 | 1.528 | 1.191 | 97 | - | - | - |
| | | 13-Apr-14 | ER-PCC-15-Apr-14 | M | 22.8 | 20.0 | 91 | sc, oto | 5 | 2.746 | 1.267 | 87 | - | - | - |
| | | 15-Apr-14 | ER-PCC-23-Apr-14 | M | 21.9 | 19.1 | 67 | sc, oto | 7 | 0.170 | 0.941 | 66 | - | - | - |
| | | 15-Apr-14 | ER-PCC-24-Apr-14 | M | 23.8 | 20.9 | 103 | sc, oto | 4 | 0.788 | 1.119 | 101 | worms | 14.144 | - |
| | | 19-Apr-14 | ER-PCC-26-Apr-14 | M | 24.3 | 22.0 | 104 | sc, oto | 4 | 1.355 | 1.254 | 101 | worms | 6.483 | - |
| | | 19-Apr-14 | ER-PCC-27-Apr-14 | M | 25.6 | 23.0 | 120 | sc, oto | 7 | 4.258 | 1.528 | 114 | - | - | - |
| | | 19-Apr-14 | ER-PCC-28-Apr-14 | M | 25.5 | 22.7 | 123 | sc, oto | 9 | 3.970 | 1.392 | 118 | - | - | - |
| | | 19-Apr-14 | ER-PCC-29-Apr-14 | M | 26.8 | 24.1 | 157 | sc, oto | 11 | 5.348 | 1.515 | 150 | - | - | - |
| | | 19-Apr-14 | ER-PCC-30-Apr-14 | M | 26.5 | 24.9 | 115 | sc, oto | 11 | 1.379 | 1.592 | 112 | damaged caudal fin | - | - |
| | | 19-Apr-14 | ER-PCC-31-Apr-14 | M | 24.5 | 22.1 | 105 | sc, oto | 7 | 3.647 | 1.312 | 100 | - | - | - |
| | | 19-Apr-14 | ER-PCC-32-Apr-14 | M | 23.3 | 20.9 | 98 | sc, oto | 8 | 2.627 | 0.933 | 94 | - | - | - |
| | | 19-Apr-14 | ER-PCC-33-Apr-14 | M | 22.8 | 25.5 | 101 | sc, oto | 11 | 1.908 | 0.826 | 98 | - | - | - |
| | | **total sample size** | | **-** | **12** | **12** | **12** | **-** | **12** | **12** | **12** | **12** | **-** | **2** | **-** |
| | | **average** | | **-** | **24.3** | **22.2** | **107** | **-** | **8** | **2.477** | **1.239** | **103** | **-** | **10.314** | **-** |
| | | **median** | | **-** | **24.1** | **22.1** | **104** | **-** | **8** | **2.268** | **1.261** | **101** | **-** | **10.314** | **-** |
| | | **standard deviation** | | **-** | **1.5** | **2.0** | **21** | **-** | **3.1** | **1.566** | **0.249** | **20** | **-** | **5.417** | **-** |
| | | **standard error** | | **-** | **0.4** | **0.6** | **6** | **-** | **0.90** | **0.452** | **0.072** | **6** | **-** | **3.831** | **-** |
| | | **minimum** | | **-** | **21.9** | **19.1** | **67** | **-** | **4** | **0.170** | **0.826** | **66** | **-** | **6.483** | **-** |
| | | **maximum** | | | **26.8** | **25.5** | **157** | **-** | **14** | **5.348** | **1.592** | **150** | **-** | **14.144** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.28: Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2015 | 26-Apr-15 | ER-PCC-24-Apr-15 | M | 18.6 | 16.4 | 50 | sc, oto | 4 | 1.866 | 0.851 | 47 | - | - | whole body |
| | | 26-Apr-15 | ER-PCC-25-Apr-15 | M | 23.5 | 20.9 | 100 | sc, oto | 9 | 4.467 | 1.512 | 94 | - | - | whole body |
| | | 27-Apr-15 | ER-PCC-26-Apr-15 | M | 24.0 | 21.4 | 99 | sc, oto | 9 | 3.019 | 1.132 | 95 | - | - | whole body |
| | | 27-Apr-15 | ER-PCC-27-Apr-15 | M | 27.1 | 24.3 | 144 | sc, oto | 12 | 6.216 | 2.023 | 136 | - | - | whole body |
| | | 28-Apr-15 | ER-PCC-28-Apr-15 | M | 23.3 | 20.8 | 86 | sc, oto | 6 | 2.742 | 1.249 | 82 | - | - | whole body |
| | | 28-Apr-15 | ER-PCC-29-Apr-15 | M | 25.2 | 21.8 | 121 | sc, oto | - | 3.731 | 1.649 | 116 | - | - | - |
| | | 28-Apr-15 | ER-PCC-30-Apr-15 | M | 23.0 | 20.3 | 83 | sc, oto | 6 | 1.412 | 0.931 | 81 | worms | 6.593 | - |
| | | 28-Apr-15 | ER-PCC-31-Apr-15 | M | 24.6 | 22.1 | 118 | sc, oto | 9 | 4.021 | 1.750 | 112 | - | - | - |
| | | 28-Apr-15 | ER-PCC-32-Apr-15 | M | 21.0 | 19.0 | 71 | sc, oto | 6 | 2.262 | 0.997 | 68 | - | - | - |
| | | 28-Apr-15 | ER-PCC-33-Apr-15 | M | 23.6 | 21.5 | 91 | sc, oto | 12 | 2.058 | 1.370 | 88 | - | - | - |
| | | 28-Apr-15 | ER-PCC-35-Apr-15 | M | 24.5 | 21.9 | 117 | sc, oto | 9 | 5.327 | 1.222 | 110 | - | - | - |
| | | 28-Apr-15 | ER-PCC-36-Apr-15 | M | 24.6 | 21.7 | 118 | sc, oto | 13 | 4.867 | 1.055 | 112 | - | - | - |
| | | 29-Apr-15 | ER-PCC-37-Apr-15 | M | 23.2 | 20.6 | 96 | sc, oto | 6 | 4.255 | 1.894 | 90 | - | - | - |
| | | 29-Apr-15 | ER-PCC-38-Apr-15 | M | 23.2 | 20.8 | 87 | sc, oto | 9 | 3.924 | 1.141 | 82 | - | - | - |
| | | 29-Apr-15 | ER-PCC-39-Apr-15 | M | 23.6 | 21.8 | 98 | sc, oto | 6 | 3.843 | 1.423 | 93 | - | - | - |
| | | 29-Apr-15 | ER-PCC-40-Apr-15 | M | 22.9 | 20.4 | 85 | sc, oto | 9 | 4.145 | 1.170 | 80 | - | - | - |
| | | 29-Apr-15 | ER-PCC-41-Apr-15 | M | 18.5 | 16.5 | 47 | sc, oto | 4 | 1.543 | 0.818 | 45 | - | - | - |
| | | 29-Apr-15 | ER-PCC-42-Apr-15 | M | 25.3 | 22.7 | 120 | sc, oto | 9 | 4.525 | 1.419 | 114 | - | - | - |
| | | 29-Apr-15 | ER-PCC-43-Apr-15 | M | 18.3 | 16.4 | 47 | sc, oto | 4 | 1.989 | 7.643 | 37 | - | - | - |
| | | **total sample size** | | **-** | **19** | **19** | **19** | **-** | **18** | **19** | **19** | **19** | **-** | **-** | **-** |
| | | **average** | | **-** | **23.1** | **20.6** | **94** | **-** | **8** | **3.485** | **1.645** | **88** | **-** | **-** | **-** |
| | | **median** | | **-** | **23.5** | **20.9** | **96** | **-** | **9** | **3.843** | **1.249** | **90** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.4** | **2.1** | **27** | **-** | **2.8** | **1.369** | **1.492** | **26** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.5** | **0.5** | **6** | **-** | **0.66** | **0.314** | **0.342** | **6** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **18.3** | **16.4** | **47** | **-** | **4** | **1.412** | **0.818** | **37** | **-** | **-** | **-** |
| | | **maximum** | | | **27.1** | **24.3** | **144** | **-** | **13** | **6.216** | **7.643** | **136** | **-** | **-** | **-** |
| | 2016 | 19-Apr-16 | ER-PCC-12-Apr-16 | M | 19.4 | 17.0 | 52 | sc, oto | 4 | 1.395 | 0.927 | 50 | - | - | whole body |
| | | 19-Apr-16 | ER-PCC-13-Apr-16 | M | 19.7 | 17.9 | 54 | sc, oto | 4 | 1.420 | 0.500 | 52 | worms | 0.107 | whole body |
| | | 22-Apr-16 | ER-PCC-21-Apr-16 | M | 23.1 | 20.5 | 108 | sc, oto | 8 | 7.103 | 1.904 | 99 | - | - | whole body |
| | | 22-Apr-16 | ER-PCC-26-Apr-16 | M | 22.2 | 20.0 | 86 | sc, oto | 5 | 4.484 | 1.356 | 80 | - | - | whole body |
| | | 22-Apr-16 | ER-PCC-27-Apr-16 | M | 27.2 | 24.3 | 148 | sc, oto | 9 | 6.943 | 1.839 | 139 | - | - | whole body |
| | | 22-Apr-16 | ER-PCC-28-Apr-16 | M | 22.6 | 20.2 | 96 | sc, oto | 5 | 5.030 | 1.275 | 90 | - | - | - |
| | | 22-Apr-16 | ER-PCC-33-Apr-16 | M | 23.1 | 20.5 | 98 | sc, oto | 5 | 6.482 | 1.944 | 90 | - | - | - |
| | | 22-Apr-16 | ER-PCC-34-Apr-16 | M | 25.6 | 23.2 | 140 | sc, oto | 13 | 6.914 | 1.010 | 132 | dorsal tumour | - | - |
| | | 22-Apr-16 | ER-PCC-36-Apr-16 | M | 23.1 | 20.6 | 104 | sc, oto | 5 | 0.617 | 1.413 | 102 | worms | 15.272 | - |
| | | 22-Apr-16 | ER-PCC-45-Apr-16 | M | 23.7 | 21.4 | 104 | sc, oto | 6 | 0.455 | 1.341 | 102 | worms | 8.731 | - |
| | | 22-Apr-16 | ER-PCC-46-Apr-16 | M | 24.1 | 21.6 | 116 | sc, oto | 10 | 1.363 | 1.837 | 113 | worms | 15.266 | - |
| | | 22-Apr-16 | ER-PCC-48-Apr-16 | M | 25.2 | 22.6 | 144 | sc, oto | 5 | 1.219 | 1.930 | 141 | worms | 26.642 | - |
| | | 22-Apr-16 | ER-PCC-49-Apr-16 | M | 25.5 | 23.4 | 130 | sc, oto | 13 | 5.208 | 2.087 | 123 | - | - | - |
| | | 22-Apr-16 | ER-PCC-50-Apr-16 | M | 21.6 | 19.4 | 85 | sc, oto | 5 | 4.060 | 1.052 | 80 | - | - | - |
| | | 22-Apr-16 | ER-PCC-51-Apr-16 | M | 26.4 | 23.7 | 142 | sc, oto | 7 | 1.084 | 1.467 | 139 | worms | 23.828 | - |
| | | 22-Apr-16 | ER-PCC-52-Apr-16 | M | 22.5 | 20.0 | 91 | sc, oto | 5 | 4.487 | 1.668 | 85 | - | - | - |
| | | 22-Apr-16 | ER-PCC-53-Apr-16 | M | 23.1 | 20.5 | 96 | sc, oto | 6 | 4.865 | 1.366 | 90 | - | - | - |
| | | 22-Apr-16 | ER-PCC-54-Apr-16 | M | 22.9 | 20.5 | 108 | sc, oto | 5 | 0.796 | 1.037 | 106 | worms | 15.512 | - |
| | | 25-Apr-16 | ER-PCC-55-Apr-16 | M | 20.9 | 18.7 | 68 | sc, oto | 5 | 3.207 | 1.201 | 64 | - | - | - |
| | | 25-Apr-16 | ER-PCC-56-Apr-16 | M | 19.5 | 17.4 | 55 | sc, oto | 5 | 2.307 | 0.957 | 52 | - | - | - |
| | | 25-Apr-16 | ER-PCC-57-Apr-16 | M | 19.2 | 17.2 | 53 | sc, oto | 5 | 1.806 | 0.819 | 50 | - | - | - |
| | | **total sample size** | | **-** | **21** | **21** | **21** | **-** | **21** | **21** | **21** | **21** | **-** | **7** | **-** |
| | | **average** | | **-** | **22.9** | **20.5** | **99** | **-** | **6** | **3.393** | **1.378** | **94** | **-** | **15.051** | **-** |
| | | **median** | | **-** | **23.1** | **20.5** | **98** | **-** | **5** | **3.207** | **1.356** | **90** | **-** | **15.272** | **-** |
| | | **standard deviation** | | **-** | **2.3** | **2.1** | **31** | **-** | **2.7** | **2.325** | **0.435** | **30** | **-** | **8.897** | **-** |
| | | **standard error** | | **-** | **0.5** | **0.5** | **7** | **-** | **0.58** | **0.507** | **0.095** | **7** | **-** | **3.363** | **-** |
| | | **minimum** | | **-** | **19.2** | **17.0** | **52** | **-** | **4** | **0.455** | **0.500** | **50** | **-** | **0.107** | **-** |
| | | **maximum** | | | **27.2** | **24.3** | **148** | **-** | **13** | **7.103** | **2.087** | **141** | **-** | **26.642** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

**Table F.28:** **Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2014 | 11-Apr-14 | GC-PCC-01-Apr-14 | F | 26.4 | 24.0 | 140 | sc, oto | 7 | 1.531 | 1.595 | 137 | worms | 7.927 | - |
| | | 11-Apr-14 | GC-PCC-02-Apr-14 | F | 24.2 | 22.7 | 116 | sc, oto | 7 | 6.506 | 1.787 | 108 | - | - | - |
| | | 12-Apr-14 | GC-PCC-05-Apr-14 | F | 24.5 | 21.8 | 109 | sc, oto | 8 | 9.606 | 2.951 | 96 | - | - | - |
| | | 12-Apr-14 | GC-PCC-06-Apr-14 | F | 29.0 | 26.4 | 90 | sc, oto | 16 | 8.65 | 2.926 | 78 | - | - | - |
| | | 12-Apr-14 | GC-PCC-07-Apr-14 | F | 23.5 | 20.8 | 94 | sc, oto | 5 | 1.079 | 1.550 | 91 | worms | 5.700 | - |
| | | 12-Apr-14 | GC-PCC-09-Apr-14 | F | 28.3 | 25.2 | 174 | sc, oto | 15 | 10.444 | 2.446 | 161 | - | - | - |
| | | 12-Apr-14 | GC-PCC-10-Apr-14 | F | 27.7 | 24.7 | 160 | sc, oto | 14 | 10.559 | 3.335 | 146 | - | - | - |
| | | 12-Apr-14 | GC-PCC-11-Apr-14 | F | 28.2 | 25.1 | 190 | sc, oto | 11 | 18.807 | 4.015 | 167 | - | - | - |
| | | 12-Apr-14 | GC-PCC-13-Apr-14 | F | 26.5 | 23.6 | 143 | sc, oto | 8 | 12.678 | 2.703 | 128 | - | - | - |
| | | 12-Apr-14 | GC-PCC-15-Apr-14 | F | 26.2 | 23.4 | 142 | sc, oto | 8 | 6.187 | 2.505 | 133 | worms | 7.100 | - |
| | | 13-Apr-14 | GC-PCC-18-Apr-14 | F | 26.7 | 24.0 | 144 | sc, oto | 8 | 5.03 | 2.776 | 136 | worms | 9.598 | - |
| | | 13-Apr-14 | GC-PCC-19-Apr-14 | F | 25.1 | 22.1 | 131 | sc, oto | 4 | 8.39 | 2.743 | 120 | - | - | - |
| | | 13-Apr-14 | GC-PCC-21-Apr-14 | F | 27.0 | 24.1 | 166 | sc, oto | 12 | 13.904 | 3.565 | 149 | - | - | - |
| | | 13-Apr-14 | GC-PCC-22-Apr-14 | F | 22.7 | 20.0 | 91 | sc, oto | 4 | 1.071 | 1.206 | 89 | worms | 8.960 | - |
| | | 14-Apr-14 | GC-PCC-23-Apr-14 | F | 26.8 | 24.0 | 155 | sc, oto | 8 | 13.555 | 3.242 | 138 | - | - | - |
| | | 14-Apr-14 | GC-PCC-26-Apr-14 | F | 22.6 | 20.2 | 79 | sc, oto | 5 | 0.624 | 1.176 | 77 | worms | 4.679 | - |
| | | 14-Apr-14 | GC-PCC-30-Apr-14 | F | 29.8 | 26.8 | 221 | sc, oto | 17 | 18.673 | 6.134 | 196 | - | - | - |
| | | 14-Apr-14 | GC-PCC-33-Apr-14 | F | 27.7 | 24.6 | 188 | sc, oto | 8 | 14.749 | 4.740 | 169 | - | - | - |
| | | 15-Apr-14 | GC-PCC-35-Apr-14 | F | 24.7 | 22.1 | 115 | sc, oto | 8 | 7.456 | 2.403 | 105 | - | - | - |
| | | 15-Apr-14 | GC-PCC-36-Apr-14 | F | 28.5 | 25.7 | 154 | sc, oto | 16 | 6.717 | 1.827 | 145 | - | - | - |
| | | | **total sample size** | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **6** | **-** |
| | | | **average** | **-** | **26.3** | **23.6** | **140** | **-** | **9** | **8.811** | **2.781** | **129** | **-** | **7.327** | **-** |
| | | | **median** | **-** | **26.6** | **24.0** | **143** | **-** | **8** | **8.520** | **2.723** | **135** | **-** | **7.514** | **-** |
| | | | **standard deviation** | **-** | **2.1** | **1.9** | **38** | **-** | **4.2** | **5.500** | **1.214** | **33** | **-** | **1.892** | **-** |
| | | | **standard error** | **-** | **0.5** | **0.4** | **8** | **-** | **0.93** | **1.230** | **0.271** | **7** | **-** | **0.772** | **-** |
| | | | **minimum** | **-** | **22.6** | **20.0** | **79** | **-** | **4** | **0.624** | **1.176** | **77** | **-** | **4.679** | **-** |
| | | | **maximum** | | **29.8** | **26.8** | **221** | **-** | **17** | **18.807** | **6.134** | **196** | **-** | **9.598** | **-** |
| | 2015 | 22-Apr-15 | GC-PCC-01-Apr-15 | F | 26.2 | 23.5 | 133 | sc, oto | 10 | 8.852 | 1.795 | 122 | - | - | muscle, ovaries |
| | | 22-Apr-15 | GC-PCC-02-Apr-15 | F | 27.0 | 24.5 | 120 | sc, oto | 11 | 5.622 | 1.457 | 113 | - | - | muscle, ovaries |
| | | 22-Apr-15 | GC-PCC-03-Apr-15 | F | 26.7 | 24.0 | 133 | sc, oto | 10 | 4.404 | 1.354 | 127 | - | - | muscle, ovaries |
| | | 22-Apr-15 | GC-PCC-04-Apr-15 | F | 27.0 | 24.4 | 138 | sc, oto | 13 | 7.686 | 2.119 | 128 | - | - | muscle, ovaries |
| | | 22-Apr-15 | GC-PCC-05-Apr-15 | F | 26.0 | 23.6 | 138 | sc, oto | 13 | 13.034 | 2.718 | 122 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-PCC-06-Apr-15 | F | 28.7 | 25.8 | 197 | sc, oto | 25 | 11.773 | 2.013 | 183 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-PCC-07-Apr-15 | F | 26.6 | 24.0 | 145 | sc, oto | 9 | 9.919 | 3.473 | 132 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-PCC-08-Apr-15 | F | 22.2 | 19.7 | 82 | sc, oto | 4 | 4.089 | 1.398 | 77 | worms | 0.553 | muscle, ovaries |
| | | 23-Apr-15 | GC-PCC-09-Apr-15 | F | 27.7 | 25.0 | 160 | sc, oto | 14 | 9.126 | 2.510 | 148 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-PCC-10-Apr-15 | F | 26.1 | 23.5 | 125 | sc, oto | 13 | 5.747 | 2.349 | 117 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-PCC-11-Apr-15 | F | 26.9 | 24.3 | 145 | sc, oto | 12 | 8.125 | 1.901 | 135 | - | - | - |
| | | 23-Apr-15 | GC-PCC-13-Apr-15 | F | 27.7 | 24.8 | 122 | sc, oto | 24 | 2.036 | 1.709 | 118 | small, abnormal ovary | - | - |
| | | 23-Apr-15 | GC-PCC-14-Apr-15 | F | 28.8 | 25.9 | 170 | sc, oto | - | 9.223 | 2.689 | 158 | - | - | - |
| | | 24-Apr-15 | GC-PCC-15-Apr-15 | F | 27.5 | 24.6 | 149 | sc, oto | 17 | 8.338 | 2.862 | 138 | - | - | - |
| | | 24-Apr-15 | GC-PCC-19-Apr-15 | F | 26.0 | 23.3 | 147 | sc, oto | 13 | 6.802 | 2.238 | 138 | - | - | - |
| | | 24-Apr-15 | GC-PCC-22-Apr-15 | F | 26.0 | 23.6 | 129 | sc, oto | 10 | 8.062 | 1.942 | 119 | - | - | - |
| | | 24-Apr-15 | GC-PCC-23-Apr-15 | F | 27.4 | 24.7 | 153 | sc, oto | 14 | 7.510 | 2.035 | 143 | - | - | - |
| | | 24-Apr-15 | GC-PCC-24-Apr-15 | F | 28.1 | 25.3 | 153 | sc, oto | 14 | 8.162 | 2.149 | 143 | - | - | - |
| | | 24-Apr-15 | GC-PCC-25-Apr-15 | F | 28.7 | 26.0 | 159 | sc, oto | 16 | 11.211 | 2.315 | 145 | - | - | - |
| | | 24-Apr-15 | GC-PCC-26-Apr-15 | F | 27.7 | 24.4 | 171 | sc, oto | 11 | 7.467 | 3.564 | 160 | - | - | - |
| | | 24-Apr-15 | GC-PCC-27-Apr-15 | F | 28.6 | 25.8 | 169 | sc, oto | 11 | 8.859 | 2.521 | 158 | - | - | - |
| | | | **total sample size** | **-** | **21** | **21** | **21** | **-** | **20** | **21** | **21** | **21** | **-** | **-** | **-** |
| | | | **average** | **-** | **27.0** | **24.3** | **145** | **-** | **13** | **7.907** | **2.243** | **135** | **-** | **-** | **-** |
| | | | **median** | **-** | **27.0** | **24.4** | **145** | **-** | **13** | **8.125** | **2.149** | **135** | **-** | **-** | **-** |
| | | | **standard deviation** | **-** | **1.5** | **1.4** | **24** | **-** | **4.8** | **2.592** | **0.599** | **22** | **-** | **-** | **-** |
| | | | **standard error** | **-** | **0.3** | **0.3** | **5** | **-** | **1.1** | **0.566** | **0.131** | **5** | **-** | **-** | **-** |
| | | | **minimum** | **-** | **22.2** | **19.7** | **82** | **-** | **4** | **2.036** | **1.354** | **77** | **-** | **-** | **-** |
| | | | **maximum** | | **28.8** | **26.0** | **197** | **-** | **25** | **13.034** | **3.564** | **183** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.28: Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2016 | 19-Apr-16 | GC-PCC-01-Apr-16 | F | 20.9 | 18.4 | 76 | sc, oto | 5 | 0.692 | 1.157 | 74 | worms | 8.200 | muscle |
| | | 19-Apr-16 | GC-PCC-05-Apr-16 | F | 19.8 | 17.7 | 53 | sc, oto | 5 | 1.699 | 1.268 | 50 | worms | 0.084 | muscle, ovaries |
| | | 19-Apr-16 | GC-PCC-18-Apr-16 | F | 20.0 | 17.6 | 55 | sc, oto | 4 | 1.868 | 1.345 | 52 | - | - | muscle, ovaries |
| | | 19-Apr-16 | GC-PCC-21-Apr-16 | F | 21.7 | 19.2 | 71 | sc, oto | 5 | 2.887 | 1.473 | 67 | worms | 0.255 | muscle, ovaries |
| | | 20-Apr-16 | GC-PCC-25-Apr-16 | F | 21.4 | 19.0 | 88 | sc, oto | 5 | 7.753 | 1.863 | 78 | - | - | muscle, ovaries |
| | | 20-Apr-16 | GC-PCC-26-Apr-16 | F | 28.1 | 25.4 | 190 | sc, oto | 14 | 17.219 | 4.813 | 168 | - | - | muscle, ovaries |
| | | 20-Apr-16 | GC-PCC-28-Apr-16 | F | 21.4 | 19.2 | 75 | - | - | - | - | - | worms | - | - |
| | | 20-Apr-16 | GC-PCC-30-Apr-16 | F | 21.6 | 19.5 | 78 | sc, oto | 5 | 4.669 | 3.002 | 70 | - | - | muscle, ovaries |
| | | 20-Apr-16 | GC-PCC-33-Apr-16 | F | 20.5 | 18.2 | 63 | sc, oto | 5 | 3.537 | 1.380 | 58 | - | - | muscle, ovaries |
| | | 20-Apr-16 | GC-PCC-34-Apr-16 | F | 20.3 | 18.2 | 66 | sc, oto | 5 | 4.084 | 1.570 | 60 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-PCC-40-Apr-16 | F | 22.0 | 19.3 | 72 | sc, oto | 5 | 4.327 | 0.892 | 67 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-PCC-42-Apr-16 | F | 19.5 | 17.1 | 58 | sc, oto | 4 | 2.246 | 1.152 | 55 | worms | 1.952 | muscle, ovaries |
| | | 21-Apr-16 | GC-PCC-43-Apr-16 | F | 21.2 | 18.9 | 72 | - | - | - | - | - | worms | - | - |
| | | 21-Apr-16 | GC-PCC-44-Apr-16 | F | 24.4 | 21.6 | 125 | sc, oto | 11 | 8.659 | 2.774 | 114 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-PCC-45-Apr-16 | F | 30.0 | 27.3 | 190 | sc, oto | 13 | 13.469 | 6.111 | 170 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-PCC-46-Apr-16 | F | 22.4 | 19.7 | 89 | sc, oto | 7 | 7.546 | 2.193 | 79 | - | - | - |
| | | 21-Apr-16 | GC-PCC-50-Apr-16 | F | 20.0 | 17.7 | 64 | sc, oto | 4 | 5.125 | 1.651 | 57 | - | - | - |
| | | 21-Apr-16 | GC-PCC-51-Apr-16 | F | 22.8 | 20.8 | 92 | sc, oto | 8 | 6.582 | 2.189 | 83 | - | - | - |
| | | 22-Apr-16 | GC-PCC-52-Apr-16 | F | 20.0 | 17.8 | 55 | sc, oto | 5 | 0.957 | 1.202 | 53 | - | - | - |
| | | 22-Apr-16 | GC-PCC-53-Apr-16 | F | 19.8 | 17.5 | 60 | sc, oto | 5 | 4.014 | 1.795 | 54 | - | - | - |
| | | 22-Apr-16 | GC-PCC-54-Apr-16 | F | 18.9 | 16.6 | 49 | sc, oto | 5 | 0.598 | 0.724 | 48 | - | - | - |
| | | 22-Apr-16 | GC-PCC-55-Apr-16 | F | 23.7 | 21.2 | 110 | sc, oto | 5 | 11.043 | 0.844 | 98 | - | - | - |
| | | 22-Apr-16 | GC-PCC-59-Apr-16 | F | 21.4 | 19.2 | 73 | sc, oto | 5 | 2.299 | 1.957 | 69 | worms | 0.132 | - |
| | | 22-Apr-16 | GC-PCC-67-Apr-16 | F | 20.0 | 18.0 | 55 | sc, oto | 4 | 0.990 | 1.029 | 53 | - | - | - |
| | | 22-Apr-16 | GC-PCC-69-Apr-16 | F | 22.5 | 20.0 | 82 | sc, oto | 5 | 6.281 | 1.832 | 74 | - | - | - |
| | | 22-Apr-16 | GC-PCC-73-Apr-16 | F | 20.1 | 17.7 | 60 | sc, oto | 4 | 1.234 | 0.923 | 58 | worms | 0.501 | - |
| | | 23-Apr-16 | GC-PCC-75-Apr-16 | F | 22.1 | 19.8 | 85 | sc, oto | 6 | 8.615 | 1.520 | 75 | - | - | - |
| | | 23-Apr-16 | GC-PCC-76-Apr-16 | F | 19.7 | 17.6 | 59 | sc, oto | 5 | 3.030 | 1.849 | 54 | worms | 0.123 | - |
| | | 23-Apr-16 | GC-PCC-77-Apr-16 | F | 23.0 | 20.9 | 102 | sc, oto | 5 | 10.645 | 2.715 | 89 | - | - | - |
| | | 23-Apr-16 | GC-PCC-78-Apr-16 | F | 18.9 | 16.9 | 49 | sc, oto | 4 | 1.195 | 1.522 | 46 | - | - | - |
| | | 23-Apr-16 | GC-PCC-79-Apr-16 | F | 18.6 | 16.4 | 46 | sc, oto | 4 | 0.692 | 0.823 | 44 | - | - | - |
| | | 23-Apr-16 | GC-PCC-80-Apr-16 | F | 21.6 | 19.3 | 75 | sc, oto | 5 | 6.211 | 2.042 | 67 | - | - | - |
| | | 25-Apr-16 | GC-PCC-81-Apr-16 | F | 27.2 | 24.4 | 185 | sc, oto | 12 | 22.169 | 5.160 | 158 | - | - | muscle, ovaries |
| | | 25-Apr-16 | GC-PCC-82-Apr-16 | F | 28.2 | 25.5 | 192 | sc, oto | 11 | 28.014 | 3.897 | 160 | - | - | muscle, ovaries |
| | | 25-Apr-16 | GC-PCC-83-Apr-16 | F | 25.8 | 23.0 | 136 | sc, oto | 7 | 16.000 | 3.943 | 116 | - | - | - |
| | | 25-Apr-16 | GC-PCC-84-Apr-16 | F | 28.0 | 25.1 | 182 | sc, oto | 12 | 20.415 | 3.707 | 158 | - | - | - |
| | | 25-Apr-16 | GC-PCC-86-Apr-16 | F | 29.5 | 26.6 | 200 | sc, oto | 13 | 21.462 | 4.438 | 174 | - | - | muscle, ovaries |
| | | 25-Apr-16 | GC-PCC-87-Apr-16[b] | F | 29.5 | 27.3 | 152 | sc, oto | 15 | 8.862 | 3.407 | 140 | - | - | - |
| | | 25-Apr-16 | GC-PCC-88-Apr-16 | F | 23.5 | 21.0 | 108 | sc, oto | 5 | 4.482 | 1.486 | 102 | worms | 6.213 | - |
| | | 25-Apr-16 | GC-PCC-89-Apr-16 | F | 24.5 | 22.0 | 116 | sc, oto | 9 | 8.805 | 2.823 | 104 | - | - | - |
| | | 25-Apr-16 | GC-PCC-90-Apr-16 | F | 26.4 | 24.0 | 156 | sc, oto | 13 | 15.133 | 4.160 | 137 | - | - | muscle, ovaries |
| | | 25-Apr-16 | GC-PCC-91-Apr-16 | F | 25.7 | 22.9 | 118 | sc, oto | 10 | 12.156 | 2.322 | 104 | - | - | - |
| | | 25-Apr-16 | GC-PCC-92-Apr-16 | F | 25.2 | 22.5 | 122 | sc, oto | 8 | 9.331 | 2.070 | 111 | - | - | muscle, ovaries |
| | | 25-Apr-16 | GC-PCC-93-Apr-16 | F | 23.1 | 20.6 | 99 | sc, oto | 5 | 9.872 | 2.804 | 86 | - | - | - |
| | | 25-Apr-16 | GC-PCC-94-Apr-16 | F | 23.0 | 20.8 | 94 | sc, oto | 5 | 5.785 | 1.792 | 86 | worms | 1.429 | - |
| | | 25-Apr-16 | GC-PCC-95-Apr-16 | F | 23.9 | 21.4 | 110 | sc, oto | 6 | 5.961 | 2.768 | 101 | worms | 0.278 | - |
| | | | **total sample size** | **-** | **46** | **46** | **46** | **-** | **44** | **44** | **44** | **44** | **-** | **10** | **-** |
| | | | **average** | **-** | **22.9** | **20.5** | **98** | **-** | **7** | **7.696** | **2.282** | **89** | **-** | **1.917** | **-** |
| | | | **median** | **-** | **22.1** | **19.6** | **84** | **-** | **5** | **6.086** | **1.856** | **77** | **-** | **0.390** | **-** |
| | | | **standard deviation** | **-** | **3.1** | **3.0** | **45** | **-** | **3.3** | **6.583** | **1.285** | **38** | **-** | **2.894** | **-** |
| | | | **standard error** | **-** | **0.5** | **0.4** | **7** | **-** | **0.49** | **0.992** | **0.194** | **6** | **-** | **0.915** | **-** |
| | | | **minimum** | **-** | **18.6** | **16.4** | **46** | **-** | **4** | **0.598** | **0.724** | **44** | **-** | **0.084** | **-** |
| | | | **maximum** | | **30.0** | **27.3** | **200** | **-** | **15** | **28.014** | **6.111** | **174** | **-** | **8.200** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.28: Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2014 | 11-Apr-14 | GC-PCC-04-Apr-14 | M | 24.5 | 21.9 | 125 | sc, oto | 6 | 0.963 | 1.950 | 122 | worms | 13.486 | - |
| | | 12-Apr-14 | GC-PCC-08-Apr-14 | M | 27.8 | 24.9 | 162 | sc, oto | 9 | 4.118 | 2.842 | 155 | - | - | - |
| | | 12-Apr-14 | GC-PCC-12-Apr-14 | M | 23.1 | 20.3 | 98 | sc, oto | 6 | 2.042 | 1.924 | 94 | - | - | - |
| | | 12-Apr-14 | GC-PCC-14-Apr-14 | M | 23.1 | 20.6 | 100 | sc, oto | 8 | 2.395 | 1.942 | 96 | - | - | - |
| | | 12-Apr-14 | GC-PCC-16-Apr-14 | M | 23.1 | 20.5 | 90 | sc, oto | 5 | 1.828 | 1.559 | 87 | worms | 7.554 | - |
| | | 12-Apr-14 | GC-PCC-17-Apr-14 | M | 21.5 | 19.1 | 75 | sc, oto | 4 | 1.202 | 1.514 | 72 | worms | 0.261 | - |
| | | 13-Apr-14 | GC-PCC-20-Apr-14 | M | 23.1 | 20.6 | 114 | sc, oto | 8 | 3.004 | 2.585 | 108 | - | - | - |
| | | 14-Apr-14 | GC-PCC-24-Apr-14 | M | 25.8 | 23.0 | 134 | sc, oto | 5 | 2.924 | 1.462 | 130 | - | - | - |
| | | 14-Apr-14 | GC-PCC-25-Apr-14 | M | 24.8 | 22.3 | 112 | sc, oto | 5 | 0.954 | 1.080 | 110 | worms | 12.440 | - |
| | | 14-Apr-14 | GC-PCC-28-Apr-14 | M | 24.5 | 21.9 | 92 | sc, oto | 8 | 2.272 | 1.117 | 89 | - | - | - |
| | | 14-Apr-14 | GC-PCC-29-Apr-14 | M | 24.2 | 21.7 | 108 | sc, oto | 5 | 1.467 | 1.426 | 105 | worms | 8.894 | - |
| | | 14-Apr-14 | GC-PCC-32-Apr-14 | M | 25.6 | 22.7 | 120 | sc, oto | 8 | 2.131 | 2.520 | 115 | worms | 18.594 | - |
| | | 15-Apr-14 | GC-PCC-34-Apr-14 | M | 25.1 | 22.9 | 112 | sc, oto | 5 | 2.346 | 0.973 | 109 | - | - | - |
| | | 15-Apr-14 | GC-PCC-37-Apr-14 | M | 24.7 | 22.3 | 112 | sc, oto | 7 | 2.987 | 1.955 | 107 | - | - | - |
| | | **total sample size** | | **-** | **14** | **14** | **14** | **-** | **14** | **14** | **14** | **14** | **-** | **6** | **-** |
| | | **average** | | **-** | **24.4** | **21.8** | **111** | **-** | **6** | **2.188** | **1.775** | **107** | **-** | **10.205** | **-** |
| | | **median** | | **-** | **24.5** | **21.9** | **112** | **-** | **6** | **2.202** | **1.742** | **108** | **-** | **10.667** | **-** |
| | | **standard deviation** | | **-** | **1.5** | **1.5** | **21** | **-** | **1.6** | **0.891** | **0.579** | **20** | **-** | **6.225** | **-** |
| | | **standard error** | | **-** | **0.4** | **0.4** | **6** | **-** | **0.43** | **0.238** | **0.155** | **5** | **-** | **2.541** | **-** |
| | | **minimum** | | **-** | **21.5** | **19.1** | **75** | **-** | **4** | **0.954** | **0.973** | **72** | **-** | **0.261** | **-** |
| | | **maximum** | | | **27.8** | **24.9** | **162** | **-** | **9** | **4.118** | **2.842** | **155** | **-** | **18.594** | **-** |
| | 2015 | 23-Apr-15 | GC-PCC-12-Apr-15 | M | 25.8 | 23.0 | 128 | sc, oto | 5 | 2.967 | 1.188 | 124 | - | - | whole body |
| | | 24-Apr-15 | GC-PCC-16-Apr-15 | M | 23.9 | 21.2 | 95 | sc, oto | 10 | 2.832 | 1.258 | 91 | - | - | whole body |
| | | 24-Apr-15 | GC-PCC-17-Apr-15 | M | 23.2 | 20.6 | 100 | sc, oto | 5 | 4.931 | 1.865 | 93 | - | - | whole body |
| | | 24-Apr-15 | GC-PCC-18-Apr-15 | M | 24.7 | 22.0 | 109 | sc, oto | 9 | 2.796 | 1.324 | 105 | - | - | whole body |
| | | 24-Apr-15 | GC-PCC-20-Apr-15 | M | 25.7 | 22.9 | 131 | sc, oto | 6 | 1.674 | 1.539 | 128 | worms | 19.149 | whole body |
| | | 24-Apr-15 | GC-PCC-21-Apr-15 | M | 24.6 | 22.1 | 118 | sc, oto | 10 | 3.695 | 1.544 | 113 | - | - | whole body |
| | | 24-Apr-15 | GC-PCC-28-Apr-15 | M | 25.7 | 23.1 | 109 | sc, oto | 12 | 2.094 | 1.335 | 106 | - | - | - |
| | | 25-Apr-15 | GC-PCC-29-Apr-15 | M | 20.9 | 18.9 | 66 | sc, oto | 5 | 2.753 | 1.024 | 62 | - | - | - |
| | | 26-Apr-15 | GC-PCC-30-Apr-15 | M | 22.1 | 19.7 | 77 | sc, oto | 5 | 2.350 | 1.236 | 73 | - | - | - |
| | | 26-Apr-15 | GC-PCC-31-Apr-15 | M | 23.6 | 21.0 | 98 | sc, oto | 12 | 3.931 | 1.223 | 93 | - | - | - |
| | | 26-Apr-15 | GC-PCC-32-Apr-15 | M | 23.2 | 20.8 | 88 | sc, oto | 9 | 3.250 | 1.077 | 84 | - | - | - |
| | | 26-Apr-15 | GC-PCC-33-Apr-15 | M | 24.2 | 21.4 | 110 | sc, oto | 6 | 2.139 | 1.145 | 107 | - | - | - |
| | | 27-Apr-15 | GC-PCC-34-Apr-15 | M | 25.1 | 22.1 | 108 | sc, oto | 7 | 1.504 | 1.038 | 105 | worms | 4.062 | - |
| | | 27-Apr-15 | GC-PCC-35-Apr-15 | M | 22.0 | 19.6 | 83 | sc, oto | 5 | 2.795 | 1.263 | 79 | - | - | - |
| | | 27-Apr-15 | GC-PCC-36-Apr-15 | M | 25.0 | 22.5 | 122 | sc, oto | 5 | 2.713 | 1.519 | 118 | - | - | - |
| | | 29-Apr-15 | GC-PCC-37-Apr-15 | M | 23.5 | 21.1 | 82 | sc, oto | 7 | 2.620 | 0.862 | 79 | - | - | - |
| | | 1-May-15 | GC-PCC-38-Apr-15 | M | 22.7 | 20.3 | 76 | sc, oto | 6 | 2.895 | 1.226 | 71 | - | - | - |
| | | 1-May-15 | GC-PCC-39-Apr-15 | M | 20.5 | 17.9 | 58 | sc, oto | 4 | 2.582 | 0.817 | 54 | - | - | - |
| | | **total sample size** | | **-** | **18** | **18** | **18** | **-** | **18** | **18** | **18** | **18** | **-** | **2** | **-** |
| | | **average** | | **-** | **23.7** | **21.1** | **98** | **-** | **7** | **2.807** | **1.249** | **94** | **-** | **11.606** | **-** |
| | | **median** | | **-** | **23.8** | **21.2** | **99** | **-** | **6** | **2.774** | **1.231** | **93** | **-** | **11.606** | **-** |
| | | **standard deviation** | | **-** | **1.6** | **1.5** | **21** | **-** | **2.6** | **0.806** | **0.256** | **21** | **-** | **10.668** | **-** |
| | | **standard error** | | **-** | **0.4** | **0.3** | **5** | **-** | **0.60** | **0.190** | **0.060** | **5** | **-** | **7.544** | **-** |
| | | **minimum** | | **-** | **20.5** | **17.9** | **58** | **-** | **4** | **1.504** | **0.817** | **54** | **-** | **4.062** | **-** |
| | | **maximum** | | | **25.8** | **23.1** | **131** | **-** | **12** | **4.931** | **1.865** | **128** | **-** | **19.149** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.28: Summary Statistics for Peamouth Chub Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[c] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2016 | 19-Apr-16 | GC-PCC-13-Apr-16 | M | 20.0 | 17.5 | 58 | sc, oto | 5 | 1.199 | 0.809 | 56 | - | - | whole body |
| | | 19-Apr-16 | GC-PCC-16-Apr-16 | M | 21.5 | 18.9 | 68 | sc, oto | 6 | 1.330 | 0.622 | 66 | - | - | whole body |
| | | 19-Apr-16 | GC-PCC-22-Apr-16 | M | 19.3 | 17.0 | 51 | sc, oto | 5 | 0.135 | 0.588 | 50 | worms | 5.134 | - |
| | | 20-Apr-16 | GC-PCC-27-Apr-16 | M | 20.6 | 18.5 | 35 | sc, oto | 5 | 2.752 | 0.873 | 31 | - | - | whole body |
| | | 20-Apr-16 | GC-PCC-31-Apr-16 | M | 21.0 | 19.2 | 74 | sc, oto | 5 | 2.914 | 1.552 | 70 | - | - | whole body |
| | | 20-Apr-16 | GC-PCC-36-Apr-16 | M | 18.5 | 16.7 | 50 | sc, oto | 4 | 2.165 | 0.983 | 47 | - | - | whole body |
| | | 20-Apr-16 | GC-PCC-37-Apr-16 | M | 20.0 | 17.9 | 66 | sc, oto | 4 | 2.371 | 0.999 | 63 | - | - | - |
| | | 20-Apr-16 | GC-PCC-38-Apr-16 | M | 18.8 | 16.8 | 51 | sc, oto | 4 | 2.077 | 1.072 | 48 | - | - | - |
| | | 21-Apr-16 | GC-PCC-39-Apr-16 | M | 20.2 | 17.8 | 68 | sc, oto | 4 | 0.790 | 0.994 | 66 | worms | 3.566 | - |
| | | 21-Apr-16 | GC-PCC-41-Apr-16 | M | 22.7 | 20.4 | 98 | sc, oto | 5 | 0.762 | 1.714 | 96 | worms | 12.597 | - |
| | | 21-Apr-16 | GC-PCC-47-Apr-16 | M | 18.7 | 16.6 | 52 | sc, oto | 4 | 2.872 | 0.288 | 49 | small liver | - | - |
| | | 21-Apr-16 | GC-PCC-48-Apr-16 | M | 19.5 | 17.6 | 60 | sc, oto | 5 | 3.099 | 0.985 | 56 | - | - | - |
| | | 22-Apr-16 | GC-PCC-56-Apr-16 | M | 21.8 | 19.3 | 73 | sc, oto | 6 | 3.818 | 2.957 | 66 | - | - | - |
| | | 22-Apr-16 | GC-PCC-58-Apr-16 | M | 18.2 | 16.1 | 40 | sc, oto | 5 | 0.199 | 0.639 | 39 | - | - | - |
| | | 22-Apr-16 | GC-PCC-61-Apr-16 | M | 22.5 | 20.1 | 91 | sc, oto | 6 | 4.734 | 1.215 | 85 | - | - | - |
| | | 22-Apr-16 | GC-PCC-63-Apr-16 | M | 20.0 | 17.5 | 57 | sc, oto | 5 | 1.548 | 1.324 | 54 | - | - | - |
| | | 22-Apr-16 | GC-PCC-64-Apr-16 | M | 21.2 | 19.0 | 72 | sc, oto | 4 | 3.195 | 1.151 | 68 | - | - | - |
| | | 22-Apr-16 | GC-PCC-65-Apr-16 | M | 18.4 | 16.3 | 50 | sc, oto | 3 | 1.997 | 0.630 | 47 | - | - | - |
| | | 22-Apr-16 | GC-PCC-66-Apr-16 | M | 18.5 | 16.3 | 47 | sc, oto | 5 | 2.626 | 0.709 | 44 | - | - | - |
| | | 22-Apr-16 | GC-PCC-68-Apr-16 | M | 18.7 | 16.6 | 49 | sc, oto | 4 | 1.529 | 0.704 | 47 | - | - | - |
| | | 22-Apr-16 | GC-PCC-70-Apr-16 | M | 20.1 | 17.8 | 57 | sc, oto | 5 | 2.790 | 1.215 | 53 | - | - | - |
| | | 22-Apr-16 | GC-PCC-74-Apr-16 | M | 19.0 | 16.6 | 49 | sc, oto | 5 | 2.249 | 0.999 | 46 | - | - | - |
| | | **total sample size** | | **-** | **22** | **22** | **22** | **-** | **22** | **22** | **22** | **22** | **-** | **3** | **-** |
| | | **average** | | **-** | **20.0** | **17.8** | **60** | **-** | **5** | **2.143** | **1.046** | **57** | **-** | **7.099** | **-** |
| | | **median** | | **-** | **20.0** | **17.6** | **57** | **-** | **5** | **2.207** | **0.990** | **54** | **-** | **5.134** | **-** |
| | | **standard deviation** | | **-** | **1.4** | **1.3** | **15** | **-** | **0.77** | **1.147** | **0.540** | **15** | **-** | **4.826** | **-** |
| | | **standard error** | | **-** | **0.3** | **0.3** | **3** | **-** | **0.16** | **0.244** | **0.115** | **3** | **-** | **2.786** | **-** |
| | | **minimum** | | **-** | **18.2** | **16.1** | **35** | **-** | **3** | **0.135** | **0.288** | **31** | **-** | **3.566** | **-** |
| | | **maximum** | | | **22.7** | **20.4** | **98** | **-** | **6** | **4.734** | **2.957** | **96** | **-** | **12.597** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

[b] Confidence around provided age was low (i.e., at or below 50% confidence).

[c] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

**Table F.29: Summary Statistics for Peamouth Chub Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, Englishman Creek, and Gold Creek in Koocanusa Reservoir, 2014 and 2015**

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 18-Feb-14 | SC-PCC-01-Feb-14 | 28.0 | 25.3 | 145 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-02-Feb-14 | 24.9 | 22.5 | 108 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-03-Feb-14 | 30.0 | 27.0 | 200 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-04-Feb-14 | 31.8 | 28.6 | 225 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-05-Feb-14 | 26.9 | 24.1 | 155 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-06-Feb-14 | 28.1 | 26.3 | 145 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-07-Feb-14 | 25.5 | 22.8 | 110 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-08-Feb-14 | 27.0 | 24.2 | 150 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-09-Feb-14 | 24.0 | 21.4 | 90 | - | - | - | - | - |
| | | 18-Feb-14 | SC-PCC-10-Feb-14 | 25.3 | 22.8 | 115 | - | - | - | - | - |
| | | 20-Feb-14 | SC-PCC-11-Feb-14 | 24.2 | 21.6 | 90 | - | - | - | - | - |
| | | 14-Apr-16 | SC-PCC-25-Apr-14 | 24.7 | 21.9 | 114 | sc, oto | 6 | - | worms | muscle, ovaries |
| | | 14-Apr-16 | SC-PCC-28-Apr-14 | 20.0 | 17.8 | 56 | sc, oto | 5 | - | - | muscle |
| | | 23-Aug-14 | SC-PCC-01-Aug-14 | 28.6 | 26.0 | 145 | sc, oto | 11 | F | - | muscle |
| | | 23-Aug-14 | SC-PCC-02-Aug-14 | 27.1 | 24.3 | 130 | sc, oto | 11 | F | - | muscle |
| | | | **total sample size** | **15** | **15** | **15** | **-** | **4** | **-** | **-** | - |
| | | | **average** | **26** | **24** | **132** | **-** | **8** | **-** | **-** | - |
| | | | **median** | **27** | **24** | **130** | **-** | **9** | **-** | **-** | - |
| | | | **standard deviation** | **2.8** | **2.7** | **43** | **-** | **3.2** | **-** | **-** | - |
| | | | **standard error** | **0.73** | **0.69** | **11** | **-** | **1.6** | **-** | **-** | - |
| | | | **minimum** | **20** | **18** | **56** | **-** | **5** | **-** | **-** | - |
| | | | **maximum** | **32** | **29** | **225** | **-** | **11** | **-** | **-** | - |
| Elk River | 2014 | 17-Feb-14 | ER-PCC-01-Feb-14 | 30.4 | 27.3 | 220 | - | - | - | - | - |
| | | 22-Aug-14 | ER-PCC-01-Aug-14 | 26.7 | 24.4 | 124 | sc, oto | 10 | - | - | muscle |
| | | 22-Aug-14 | ER-PCC-02-Aug-14 | 25.7 | 22.8 | 105 | sc, oto | 9 | - | - | muscle |
| | | 24-Aug-14 | ER-PCC-03-Aug-14 | 29.5 | 26.7 | 165 | sc, oto | 17 | - | - | muscle |
| | | 26-Aug-14 | ER-PCC-04-Aug-14 | 26.1 | 23.5 | 120 | sc, oto | 9 | F | - | muscle |
| | 2015 | 22-Apr-15 | ER-PCC-09-Apr-15 | 28.7 | 25.7 | 141 | sc, oto | 17 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-PCC-17-Apr-15 | 28.1 | 25.3 | 158 | - | - | - | - | - |
| | | 23-Apr-15 | ER-PCC-19-Apr-15 | 26.7 | 24.0 | 115 | - | - | - | - | - |
| | | | **total sample size** | **8** | **8** | **8** | **-** | **-** | **-** | **-** | - |
| | | | **average** | **28** | **25** | **144** | **-** | **-** | **-** | **-** | - |
| | | | **median** | **27** | **25** | **133** | **-** | **-** | **-** | **-** | - |
| | | | **standard deviation** | **1.7** | **1.6** | **37** | **-** | **-** | **-** | **-** | - |
| | | | **standard error** | **0.60** | **0.55** | **13** | **-** | **-** | **-** | **-** | - |
| | | | **minimum** | **26** | **23** | **105** | **-** | **-** | **-** | **-** | - |
| | | | **maximum** | **30** | **27** | **220** | **-** | **-** | **-** | **-** | - |
| Englishman Creek | 2014 | 20-Feb-14 | EC-PCC-01-Feb-14 | 25.6 | 23.4 | 115 | - | - | - | - | - |
| Gold Creek | 2014 | 18-Feb-14 | GC-PCC-01-Feb-14 | 17.1 | 15.3 | 39 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-02-Feb-14 | 25.9 | 23.3 | 120 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-03-Feb-14 | 27.0 | 24.4 | 155 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-04-Feb-14 | 26.5 | 23.7 | 135 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-05-Feb-14 | 23.4 | 21.4 | 95 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-06-Feb-14 | 19.3 | 17.3 | 50 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-07-Feb-14 | 25.9 | 24.1 | 125 | - | - | - | damaged caudal fin | - |
| | | 20-Feb-14 | GC-PCC-08-Feb-14 | 17.4 | 15.5 | 25 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-09-Feb-14 | 26.5 | 23.8 | 135 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-10-Feb-14 | 20.8 | 18.6 | 45 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-11-Feb-14 | 26.5 | 24.7 | 165 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-12-Feb-14 | 25.3 | 22.2 | 95 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-13-Feb-14 | 22.0 | 18.6 | 76 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-14-Feb-14 | 24.3 | 21.5 | 98 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-15-Feb-14 | 20.5 | 18.2 | 50 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-16-Feb-14 | 24.7 | 22.1 | 110 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-17-Feb-14 | 24.0 | 21.2 | 90 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-18-Feb-14 | 22.4 | 20.0 | 80 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-19-Feb-14 | 25.8 | 23.2 | 128 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-20-Feb-14 | 25.0 | 22.4 | 115 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-21-Feb-14 | 24.1 | 21.7 | 100 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-22-Feb-14 | 22.9 | 20.5 | 76 | - | - | - | - | - |
| | | 20-Feb-14 | GC-PCC-23-Feb-14 | 16.8 | 14.7 | 30 | - | - | - | - | - |
| | | 11-Apr-14 | GC-PCC-03-Apr-14 | 25.0 | 22.5 | 116 | sc, oto | 7 | - | worms | muscle, ovaries |
| | | 14-Apr-14 | GC-PCC-27-Apr-14 | 18.8 | 16.5 | 54 | sc, oto | 3 | - | worms | muscle |
| | | 14-Apr-14 | GC-PCC-31-Apr-14 | 20.4 | 18.0 | 58 | sc, oto | 4 | - | worms | muscle |
| | | 22-Aug-14 | GC-PCC-01-Aug-14 | 23.6 | 21.2 | 105 | sc, oto | 5 | - | worms | muscle |
| | | | **total sample size** | **27** | **27** | **27** | **-** | **4** | **-** | **-** | - |
| | | | **average** | **23** | **21** | **91** | **-** | **5** | **-** | **-** | - |
| | | | **median** | **24** | **21** | **95** | **-** | **5** | **-** | **-** | - |
| | | | **standard deviation** | **3.1** | **3.0** | **38** | **-** | **1.7** | **-** | **-** | - |
| | | | **standard error** | **0.60** | **0.57** | **7.4** | **-** | **0.85** | **-** | **-** | - |
| | | | **minimum** | **17** | **15** | **25** | **-** | **3** | **-** | **-** | - |
| | | | **maximum** | **27** | **25** | **165** | **-** | **7** | **-** | **-** | - |

[a] Age structures collected: sc - scales, oto - otoliths.

[a] Fish collected at Englishman Creek was grouped with the Elk River summary statistics.

**Table F.30: Summary Statistics for Rainbow Trout Meristic Data Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 15-Feb-14 | SC-RB-01-Feb-14 | 53.5 | 50.6 | 1,350 | sc, oto | 5 | F | - | muscle, ovaries |
| | | 14-Apr-14 | SC-RB-01-Apr-14 | 39.8 | 36.8 | 525 | sc, oto | 4 | F | - | muscle, ovaries |
| | | 15-Apr-14 | SC-RB-02-Apr-14 | 34.5 | - | 470 | sc, oto | 4 | F | - | muscle, ovaries |
| | | 15-Apr-14 | SC-RB-03-Apr-14 | 51.5 | - | 1,620 | sc, oto | 5 | F | - | muscle, ovaries |
| | 2016 | 19-Apr-16 | SC-RB-01-Apr-16 | 26.1 | 24.3 | 146 | sc,oto | 3 | - | - | muscle |
| | | 19-Apr-16 | SC-RB-02-Apr-16 | 28.8 | 26.9 | 195 | sc,oto | 4 | - | - | muscle |
| | | 24-Apr-16 | SC-RB-03-Apr-16 | 44.0 | 41.7 | 620 | - | - | - | - | muscle plug |
| | | 24-Apr-16 | SC-RB-04-Apr-16 | 48.7 | 45.2 | 1,018 | sc,oto | 4 | F | - | muscle, ovaries |
| **total sample size** | | | | **8** | **6** | **8** | **-** | **7** | **-** | **-** | **-** |
| **average** | | | | **41** | **38** | **743** | **-** | **4** | **-** | **-** | **-** |
| **median** | | | | **42** | **39** | **573** | **-** | **4** | **-** | **-** | **-** |
| **standard deviation** | | | | **10** | **10** | **535** | **-** | **0.69** | **-** | **-** | **-** |
| **standard error** | | | | **3.7** | **4.2** | **189** | **-** | **0.26** | **-** | **-** | **-** |
| **minimum** | | | | **26** | **24** | **146** | **-** | **3** | **-** | **-** | **-** |
| **maximum** | | | | **54** | **51** | **1,620** | **-** | **5** | **-** | **-** | **-** |
| Elk River | 2014 | 15-Feb-14 | ER-RB-01-Feb-14 | 46.0 | 43.2 | 855 | sc, oto | 4 | M | - | muscle |
| | 2016 | 22-Apr-16 | ER-RB-01-Apr-16 | 26.5 | 24.7 | 135 | - | - | - | - | muscle plug |
| | | 22-Apr-16 | ER-RB-02-Apr-16 | 34.8 | 32.1 | 315 | - | - | - | - | muscle plug |
| **total sample size** | | | | **3** | **3** | **3** | **-** | **-** | **-** | **-** | **-** |
| **average** | | | | **36** | **33** | **435** | **-** | **-** | **-** | **-** | **-** |
| **median** | | | | **35** | **32** | **315** | **-** | **-** | **-** | **-** | **-** |
| **standard deviation** | | | | **9.8** | **9.3** | **375** | **-** | **-** | **-** | **-** | **-** |
| **standard error** | | | | **5.6** | **5.4** | **216** | **-** | **-** | **-** | **-** | **-** |
| **minimum** | | | | **27** | **25** | **135** | **-** | **-** | **-** | **-** | **-** |
| **maximum** | | | | **46** | **43** | **855** | **-** | **-** | **-** | **-** | **-** |
| Gold Creek | 2014 | 14-Feb-14 | GC-RB-01-Feb-14 | 57.0 | 54.2 | 1,500 | sc | 5 | F | - | muscle, ovaries |
| | | 16-Feb-14 | GC-RB-02-Feb-14 | 33.5 | 31.4 | 260 | sc, oto | 3 | F | - | muscle, ovaries |
| | | 26-Aug-14 | GC-RB-01-Aug-14 | 45.9 | 42.3 | 545 | sc | 5 | - | - | muscle plug |
| | 2015 | 30-Apr-15 | GC-RB-01-Apr-15 | 33.2 | 30.5 | 337 | sc, oto | 4 | - | - | muscle |
| | 2016 | 23-Apr-16 | GC-RB-01-Apr-16 | 33.8 | 31.4 | 315 | sc, oto | 3 | F | - | muscle, ovaries |
| | | 24-Apr-16 | GC-RB-02-Apr-16 | 29.7 | 27.5 | 194 | sc, oto | 3 | - | - | muscle |
| | | 24-Apr-16 | GC-RB-03-Apr-16 | 35.2 | 32.8 | 320 | sc, oto | 3 | F | - | muscle, ovaries |
| **total sample size** | | | | **7** | **7** | **7** | **-** | **7** | **-** | **-** | **-** |
| **average** | | | | **38** | **36** | **496** | **-** | **4** | **-** | **-** | **-** |
| **median** | | | | **34** | **31** | **320** | **-** | **3** | **-** | **-** | **-** |
| **standard deviation** | | | | **9.7** | **9.4** | **456** | **-** | **1.0** | **-** | **-** | **-** |
| **standard error** | | | | **3.7** | **3.5** | **172** | **-** | **0.36** | **-** | **-** | **-** |
| **minimum** | | | | **30** | **28** | **194** | **-** | **3** | **-** | **-** | **-** |
| **maximum** | | | | **57** | **54** | **1,500** | **-** | **5** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths.

## Table F.31: Summary Statistics for Redside Shiner Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 25-Apr-15 | SC-RSC-03-Apr-15 | F | 11.0 | 9.6 | 13 | oto | 3 | 0.376 | 0.130 | 12 | worms | 1.199 | muscle, ovaries |
| | | 26-Apr-15 | SC-RSC-04-Apr-15 | F | 11.5 | 10.1 | 13 | oto | 4 | 0.594 | 0.240 | 13 | - | - | muscle, ovaries |
| | | 28-Apr-15 | SC-RSC-06-Apr-15 | F | 10.6 | 9.2 | 11 | oto | 3 | 0.501 | 0.187 | 10 | - | - | muscle, ovaries |
| | | 30-Apr-15 | SC-RSC-07-Apr-15 | F | 11.3 | 10.0 | 13 | oto | 3 | 0.594 | 0.199 | 12 | - | - | muscle, ovaries |
| | | 30-Apr-15 | SC-RSC-08-Apr-15 | F | 9.5 | 8.2 | 6 | oto | 3 | 0.165 | 0.068 | 6 | - | - | muscle, ovaries |
| | | 1-May-15 | SC-RSC-09-Apr-15 | F | 11.3 | 9.8 | 12 | oto | 3 | 0.705 | 0.181 | 11 | - | - | muscle, ovaries |
| | | **total sample size** | | - | **6** | **6** | **6** | - | **6** | **6** | **6** | **6** | - | - | - |
| | | **average** | | - | **11** | **9.5** | **11** | - | **3** | **0.49** | **0.17** | **11** | - | - | - |
| | | **median** | | - | **11** | **9.7** | **12** | - | **3** | **0.55** | **0.18** | **12** | - | - | - |
| | | **standard deviation** | | - | **0.74** | **0.71** | **2.6** | - | **0.41** | **0.19** | **0.060** | **2.4** | - | - | - |
| | | **standard error** | | - | **0.30** | **0.29** | **1.1** | - | **0.17** | **0.079** | **0.025** | **1.0** | - | - | - |
| | | **minimum** | | - | **9.5** | **8.2** | **6.2** | - | **3** | **0.17** | **0.068** | **6.0** | - | - | - |
| | | **maximum** | | - | **12** | **10** | **13** | - | **4** | **0.71** | **0.24** | **13** | - | - | - |
| | 2016 | 20-Apr-16 | SC-RSC-01-Apr-16 | F | 13.6 | 11.8 | 20 | oto | 5 | 0.826 | 0.115 | 19 | worms | 0.136 | muscle, ovaries |
| | | 22-Apr-16 | SC-RSC-06-Apr-16 | F | 11.1 | 9.6 | 13 | oto | 3 | 0.610 | 0.152 | 12 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-RSC-07-Apr-16 | F | 11.3 | 9.7 | 12 | oto | 3 | 0.542 | 0.162 | 12 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-RSC-08-Apr-16 | F | 11.2 | 10.0 | 13 | oto | 3 | 0.436 | 0.140 | 13 | worms | 0.525 | - |
| | | 22-Apr-16 | SC-RSC-09-Apr-16 | F | 11.0 | 9.5 | 13 | oto | 3 | 0.527 | 0.264 | 12 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-RSC-10-Apr-16 | F | 10.8 | 9.2 | 10 | oto | 3 | 0.344 | 0.089 | 10 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-RSC-11-Apr-16 | F | 11.1 | 9.7 | 12 | oto | 3 | 0.345 | 0.200 | 12 | worms | 0.851 | - |
| | | 22-Apr-16 | SC-RSC-12-Apr-16 | F | 12.0 | 10.5 | 17 | oto | 3 | 1.042 | 0.385 | 15 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-RSC-15-Apr-16 | F | 11.2 | 9.7 | 13 | oto | 3 | 0.530 | 0.249 | 12 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-RSC-16-Apr-16 | F | 10.8 | 9.5 | 11 | oto | 3 | 0.443 | 0.212 | 10 | - | - | - |
| | | 22-Apr-16 | SC-RSC-19-Apr-16 | F | 10.5 | 9.2 | 10 | oto | 3 | 0.151 | 0.084 | 9 | worms | 0.284 | - |
| | | 22-Apr-16 | SC-RSC-22-Apr-16 | F | 11.0 | 10.0 | 10 | oto | 3 | 0.237 | 0.103 | 9 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-RSC-23-Apr-16 | F | 12.3 | 10.7 | 15 | oto | 3 | 0.134 | 0.171 | 15 | worms | 0.407 | - |
| | | 23-Apr-16 | SC-RSC-24-Apr-16 | F | 11.4 | 10.0 | 12 | oto | 3 | 0.318 | 0.104 | 11 | worms | 0.005 | muscle, ovaries |
| | | 23-Apr-16 | SC-RSC-25-Apr-16 | F | 10.7 | 9.3 | 11 | oto | 3 | 0.444 | 0.120 | 10 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-RSC-27-Apr-16 | F | 11.4 | 10.1 | 11 | oto | 3 | 0.416 | 0.083 | 11 | worms | 0.083 | - |
| | | 23-Apr-16 | SC-RSC-31-Apr-16 | F | 10.4 | 9.2 | 9 | oto | 3 | 0.344 | 0.236 | 9 | - | - | - |
| | | 24-Apr-16 | SC-RSC-32-Apr-16 | F | 11.5 | 10.2 | 14 | oto | 3 | 0.750 | 0.235 | 13 | - | - | - |
| | | 24-Apr-16 | SC-RSC-33-Apr-16 | F | 11.7 | 10.2 | 14 | oto | 3 | 0.391 | 0.103 | 14 | worms | 0.084 | - |
| | | 24-Apr-16 | SC-RSC-35-Apr-16 | F | 10.7 | 9.3 | 11 | oto | 3 | 0.657 | 0.195 | 10 | - | - | - |
| | | **total sample size** | | - | **20** | **20** | **20** | - | **20** | **20** | **20** | **20** | - | **8** | - |
| | | **average** | | - | **11** | **9.9** | **13** | - | **3** | **0.47** | **0.17** | **12** | - | **0.30** | - |
| | | **median** | | - | **11** | **9.7** | **12** | - | **3** | **0.44** | **0.16** | **12** | - | **0.21** | - |
| | | **standard deviation** | | - | **0.72** | **0.63** | **2.7** | - | **0.45** | **0.22** | **0.078** | **2.5** | - | **0.29** | - |
| | | **standard error** | | - | **0.16** | **0.14** | **0.60** | - | **0.10** | **0.050** | **0.017** | **0.56** | - | **0.10** | - |
| | | **minimum** | | - | **10** | **9.2** | **9.2** | - | **3** | **0.13** | **0.083** | **8.6** | - | **0.0050** | - |
| | | **maximum** | | - | **14** | **12** | **20** | - | **5** | **1.0** | **0.39** | **19** | - | **0.85** | - |
| | 2015 | 22-Apr-15 | SC-RSC-01-Apr-15 | M | 10.7 | 7.9 | 10 | oto | 2 | 0.201 | 0.183 | 10 | - | - | whole body |
| | | 27-Apr-15 | SC-RSC-05-Apr-15 | M | 9.1 | 7.9 | 6 | oto | - | 0.132 | 0.126 | 6 | - | - | whole body |
| | | **total sample size** | | - | **2** | **2** | **2** | - | - | **2** | **2** | **2** | - | - | - |
| | | **average** | | - | **9.9** | **7.9** | **8.4** | - | - | **0.17** | **0.15** | **8.1** | - | - | - |
| | | **median** | | - | **9.9** | **7.9** | **8.4** | - | - | **0.17** | **0.15** | **8.1** | - | - | - |
| | | **standard deviation** | | - | **1.1** | **0** | **2.8** | - | - | **0.049** | **0.040** | **2.7** | - | - | - |
| | | **standard error** | | - | **0.80** | **0** | **2.0** | - | - | **0.035** | **0.029** | **1.9** | - | - | - |
| | | **minimum** | | - | **9.1** | **7.9** | **6.5** | - | - | **0.13** | **0.13** | **6.2** | - | - | - |
| | | **maximum** | | - | **11** | **7.9** | **10** | - | - | **0.20** | **0.18** | **10** | - | - | - |
| | 2016 | 22-Apr-16 | SC-RSC-03-Apr-16 | M | 11.2 | 9.8 | 12 | oto | 3 | 0.124 | 0.169 | 12 | - | - | - |
| | | 22-Apr-16 | SC-RSC-04-Apr-16 | M | 10.9 | 9.6 | 11 | - | - | 0.122 | 0.232 | 11 | - | - | whole body |
| | | 22-Apr-16 | SC-RSC-05-Apr-16 | M | 10.6 | 9.2 | 10 | - | - | 0.133 | 0.073 | 10 | - | - | whole body |
| | | 22-Apr-16 | SC-RSC-14-Apr-16 | M | 11.0 | 9.5 | 11 | - | - | 0.166 | 0.201 | 11 | - | - | whole body |
| | | 22-Apr-16 | SC-RSC-17-Apr-16 | M | 11.6 | 10.7 | 17 | - | - | 0.141 | 0.238 | 16 | worms | 1.360 | whole body |
| | | 22-Apr-16 | SC-RSC-18-Apr-16 | M | 11.0 | 9.6 | 13 | - | - | 0.200 | 0.214 | 12 | - | - | whole body |
| | | 22-Apr-16 | SC-RSC-20-Apr-16 | M | 11.0 | 9.1 | 11 | oto | 3 | 0.136 | 0.128 | 10 | - | - | - |
| | | 22-Apr-16 | SC-RSC-21-Apr-16 | M | 10.1 | 9.0 | 10 | oto | 3 | 0.077 | 0.125 | 9 | - | - | - |
| | | 23-Apr-16 | SC-RSC-28-Apr-16 | M | 10.6 | 9.3 | 11 | oto | 3 | 0.313 | 0.312 | 10 | - | - | - |
| | | 23-Apr-16 | SC-RSC-29-Apr-16 | M | 10.1 | 8.9 | 9 | oto | 2 | 0.095 | 0.091 | 9 | - | - | - |
| | | 23-Apr-16 | SC-RSC-30-Apr-16 | M | 10.9 | 9.4 | 12 | oto | 3 | 0.129 | 0.129 | 12 | - | - | - |
| | | 24-Apr-16 | SC-RSC-34-Apr-16 | M | 11.6 | 10.1 | 14 | oto | 3 | 0.138 | 0.182 | 13 | - | - | - |
| | | 24-Apr-16 | SC-RSC-36-Apr-16 | M | 10.0 | 8.5 | 9 | oto | 3 | 0.075 | 0.144 | 9 | - | - | - |
| | | 24-Apr-16 | SC-RSC-37-Apr-16 | M | 10.2 | 8.7 | 9 | oto | 2 | 0.122 | 0.201 | 9 | - | - | - |
| | | 24-Apr-16 | SC-RSC-38-Apr-16 | M | 11.4 | 9.8 | 13 | oto | 3 | 0.185 | 0.160 | 13 | - | - | - |
| | | 24-Apr-16 | SC-RSC-39-Apr-16 | M | 11.0 | 9.6 | 12 | oto | 3 | 0.127 | 0.232 | 12 | worms | 0.014 | - |
| | | 24-Apr-16 | SC-RSC-40-Apr-16 | M | 11.6 | 10.1 | 15 | oto | 3 | 0.090 | 0.188 | 14 | - | - | - |
| | | 24-Apr-16 | SC-RSC-41-Apr-16 | M | 10.0 | 8.7 | 9 | oto | 2 | 0.167 | 0.109 | 8 | - | - | - |
| | | 24-Apr-16 | SC-RSC-42-Apr-16 | M | 10.3 | 8.8 | 10 | oto | 3 | 0.131 | 0.155 | 9 | - | - | - |
| | | 24-Apr-16 | SC-RSC-43-Apr-16 | M | 11.3 | 9.7 | 14 | oto | 4 | 0.291 | 0.140 | 13 | - | - | - |
| | | **total sample size** | | - | **20** | **20** | **20** | - | **15** | **20** | **20** | **20** | - | **2** | - |
| | | **average** | | - | **11** | **9.4** | **11** | - | **3** | **0.15** | **0.17** | **11** | - | **0.69** | - |
| | | **median** | | - | **11** | **9.5** | **11** | - | **3** | **0.13** | **0.16** | **11** | - | **0.69** | - |
| | | **standard deviation** | | - | **0.55** | **0.56** | **2.2** | - | **0.52** | **0.062** | **0.058** | **2.1** | - | **0.95** | - |
| | | **standard error** | | - | **0.12** | **0.12** | **0.48** | - | **0.13** | **0.014** | **0.013** | **0.47** | - | **0.67** | - |
| | | **minimum** | | - | **10** | **8.5** | **8.7** | - | **2** | **0.075** | **0.073** | **8.4** | - | **0.014** | - |
| | | **maximum** | | - | **12** | **11** | **17** | - | **4** | **0.31** | **0.31** | **16** | - | **1.4** | - |
| Elk River | 2015 | 23-Apr-15 | ER-RSC-02-Apr-15 | F | 12.2 | 10.6 | 16 | oto | 4 | 0.486 | 0.100 | 15 | worms | 0.997 | muscle, ovaries |
| | | 23-Apr-15 | ER-RSC-04-Apr-15 | F | 11.1 | 9.8 | 11 | oto | 3 | 0.492 | 0.147 | 10 | - | - | muscle, ovaries |
| | | 24-Apr-15 | ER-RSC-07-Apr-15 | F | 13.0 | 11.2 | 23 | oto | 4 | 0.721 | 0.137 | 22 | worms | 3.355 | muscle, ovaries |
| | | 26-Apr-15 | ER-RSC-08-Apr-15 | F | 13.0 | 11.5 | 24 | oto | 4 | 0.602 | 0.294 | 23 | worms | 5.769 | muscle, ovaries |
| | | 26-Apr-15 | ER-RSC-09-Apr-15 | F | 14.1 | 12.3 | 26 | oto | 4 | 0.540 | 0.327 | 25 | worms | 1.661 | muscle, ovaries |
| | | 26-Apr-15 | ER-RSC-10-Apr-15 | F | 14.5 | 13.1 | 18 | oto | 5 | 0.942 | 0.293 | 17 | - | - | muscle, ovaries |
| | | 28-Apr-15 | ER-RSC-11-Apr-15 | F | 12.7 | 11.0 | 15 | oto | 4 | 0.401 | 0.173 | 15 | worms | 0.371 | muscle, ovaries |
| | | 29-Apr-15 | ER-RSC-13-Apr-15 | F | 13.6 | 12.0 | 20 | oto | 4 | 0.858 | 0.251 | 18 | - | - | muscle, ovaries |
| | | 30-Apr-15 | ER-RSC-15-Apr-15 | F | 11.5 | 10.1 | 13 | oto | 3 | 0.580 | 0.202 | 12 | - | - | muscle, ovaries |
| | | 30-Apr-15 | ER-RSC-16-Apr-15 | F | 12.0 | 10.3 | 15 | oto | - | 0.406 | 0.170 | 14 | worms | 1.48 | muscle, ovaries |
| | | **total sample size** | | - | **10** | **10** | **10** | - | **9** | **10** | **10** | **10** | - | **6** | - |
| | | **average** | | - | **13** | **11** | **18** | - | **4** | **0.60** | **0.21** | **17** | - | **2.3** | - |
| | | **median** | | - | **13** | **11** | **17** | - | **4** | **0.56** | **0.19** | **16** | - | **1.6** | - |
| | | **standard deviation** | | - | **1.1** | **1.1** | **4.8** | - | **0.60** | **0.18** | **0.077** | **4.7** | - | **2.0** | - |
| | | **standard error** | | - | **0.35** | **0.33** | **1.5** | - | **0.20** | **0.058** | **0.024** | **1.5** | - | **0.81** | - |
| | | **minimum** | | - | **11** | **9.8** | **11** | - | **3** | **0.40** | **0.10** | **10** | - | **0.37** | - |
| | | **maximum** | | - | **15** | **13** | **26** | - | **5** | **0.94** | **0.33** | **25** | - | **5.8** | - |

[a] Age structures collected: oto - otoliths.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.31: Summary Statistics for Redside Shiner Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2016 | 20-Apr-16 | ER-RSC-04-Apr-16 | F | 11.3 | 10.0 | 12 | - | - | 0.368 | 0.130 | 11 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-05-Apr-16 | F | 10.0 | 9.0 | 11 | oto | 3 | 0.785 | 0.268 | 10 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-06-Apr-16 | F | 12.1 | 10.4 | 17 | oto | 3 | 0.843 | 0.411 | 15 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-07-Apr-16 | F | 11.1 | 9.8 | 13 | oto | 3 | 0.445 | 0.123 | 13 | worms | 1.220 | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-09-Apr-16 | F | 10.7 | 9.3 | 11 | oto | 3 | 0.751 | 0.317 | 10 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-11-Apr-16 | F | 11.0 | 9.7 | 11 | oto | 3 | 0.639 | 0.205 | 10 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-13-Apr-16 | F | 10.7 | 9.5 | 11 | oto | 3 | 0.575 | 0.326 | 10 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-14-Apr-16 | F | 11.7 | 10.6 | 15 | oto | 3 | 0.447 | 0.359 | 14 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-15-Apr-16 | F | 10.6 | 9.1 | 11 | oto | 3 | 0.573 | 0.189 | 10 | worms | 0.017 | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-16-Apr-16 | F | 11.3 | 10.0 | 13 | oto | 3 | 0.625 | 0.238 | 12 | - | - | muscle, ovaries |
| | | 21-Apr-16 | ER-RSC-22-Apr-16 | F | 10.0 | 8.8 | 9 | oto | 4 | 0.471 | 0.145 | 9 | - | - | - |
| | | 21-Apr-16 | ER-RSC-23-Apr-16 | F | 11.1 | 9.7 | 12 | oto | 3 | 0.468 | 0.216 | 11 | worms | 0.025 | - |
| | | 21-Apr-16 | ER-RSC-24-Apr-16 | F | 10.0 | 9.0 | 10 | oto | 3 | 0.412 | 0.300 | 10 | worms | 0.019 | - |
| | | 21-Apr-16 | ER-RSC-28-Apr-16 | F | 10.3 | 9.0 | 10 | oto | 3 | 0.527 | 0.307 | 9 | - | - | - |
| | | 21-Apr-16 | ER-RSC-29-Apr-16 | F | 11.7 | 10.6 | 15 | oto | 3 | 0.812 | 0.265 | 14 | - | - | - |
| | | 21-Apr-16 | ER-RSC-30-Apr-16 | F | 11.8 | 10.4 | 14 | oto | 3 | 0.509 | 0.270 | 13 | - | - | - |
| | | 21-Apr-16 | ER-RSC-31-Apr-16 | F | 11.4 | 10.2 | 14 | oto | 3 | 0.810 | 0.387 | 13 | - | - | - |
| | | 21-Apr-16 | ER-RSC-32-Apr-16 | F | 10.6 | 9.4 | 12 | oto | 3 | 0.786 | 0.332 | 11 | - | - | - |
| | | 21-Apr-16 | ER-RSC-34-Apr-16 | F | 11.5 | 10.0 | 13 | oto | 4 | 0.628 | 0.260 | 12 | - | - | - |
| | | **total sample size** | | **-** | **19** | **19** | **19** | **-** | **18** | **19** | **19** | **19** | **-** | **4** | **-** |
| | | **average** | | **-** | **11** | **9.7** | **12** | **-** | **3** | **0.60** | **0.27** | **12** | **-** | **0.32** | **-** |
| | | **median** | | **-** | **11** | **9.7** | **12** | **-** | **3** | **0.58** | **0.27** | **11** | **-** | **0.022** | **-** |
| | | **standard deviation** | | **-** | **0.64** | **0.58** | **2.0** | **-** | **0.32** | **0.15** | **0.083** | **1.9** | **-** | **0.60** | **-** |
| | | **standard error** | | **-** | **0.15** | **0.13** | **0.46** | **-** | **0.076** | **0.035** | **0.019** | **0.44** | **-** | **0.30** | **-** |
| | | **minimum** | | **-** | **10** | **8.8** | **9.2** | **-** | **3** | **0.37** | **0.12** | **8.6** | **-** | **0.017** | **-** |
| | | **maximum** | | **-** | **12** | **11** | **17** | **-** | **4** | **0.84** | **0.41** | **15** | **-** | **1.2** | **-** |
| | 2015 | 23-Apr-15 | ER-RSC-05-Apr-15 | M | 10.7 | 9.4 | 10 | oto | 3 | 0.121 | 0.093 | 10 | - | - | whole body |
| | | 28-Apr-15 | ER-RSC-12-Apr-15 | M | 11.2 | 9.8 | 11 | - | - | 0.103 | 0.082 | 11 | - | - | whole body |
| | | 30-Apr-15 | ER-RSC-14-Apr-15 | M | 12.8 | 11.3 | 19 | - | - | 0.268 | 3.460 | 15 | - | - | whole body |
| | | **total sample size** | | **-** | **3** | **3** | **3** | **-** | **-** | **3** | **3** | **3** | **-** | **-** | **-** |
| | | **average** | | **-** | **12** | **10** | **13** | **-** | **-** | **0.16** | **1.2** | **12** | **-** | **-** | **-** |
| | | **median** | | **-** | **11** | **9.8** | **11** | **-** | **-** | **0.12** | **0.093** | **11** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **1.1** | **1.0** | **5.1** | **-** | **-** | **0.091** | **1.9** | **3.1** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.63** | **0.58** | **3.0** | **-** | **-** | **0.052** | **1.1** | **1.8** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **11** | **9.4** | **9.8** | **-** | **-** | **0.10** | **0.082** | **9.5** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **13** | **11** | **19** | **-** | **-** | **0.27** | **3.5** | **15** | **-** | **-** | **-** |
| | 2016 | 20-Apr-16 | ER-RSC-01-Apr-16 | M | 12.0 | 10.2 | 14 | - | - | 0.189 | 0.119 | 13 | - | - | whole body |
| | | 20-Apr-16 | ER-RSC-02-Apr-16 | M | 9.8 | 8.5 | 8 | - | - | 0.103 | 0.092 | 8 | - | - | whole body |
| | | 20-Apr-16 | ER-RSC-03-Apr-16 | M | 10.9 | 9.4 | 12 | - | - | 0.108 | 0.128 | 11 | - | - | whole body |
| | | 21-Apr-16 | ER-RSC-08-Apr-16 | M | 11.4 | 9.9 | 13 | - | - | 0.209 | 0.304 | 13 | - | - | whole body |
| | | 21-Apr-16 | ER-RSC-10-Apr-16 | M | 11.0 | 9.7 | 10 | - | - | 0.228 | 0.177 | 10 | - | - | whole body |
| | | 21-Apr-16 | ER-RSC-12-Apr-16 | M | 11.4 | 10.3 | 13 | - | - | 0.238 | 0.200 | 13 | - | - | whole body |
| | | 21-Apr-16 | ER-RSC-17-Apr-16 | M | 10.0 | 8.7 | 10 | oto | 2 | 0.074 | 0.130 | 9 | - | - | - |
| | | 21-Apr-16 | ER-RSC-18-Apr-16 | M | 10.0 | 8.8 | 9 | oto | 4 | 0.139 | 0.203 | 9 | - | - | - |
| | | 21-Apr-16 | ER-RSC-19-Apr-16 | M | 9.7 | 8.8 | 8 | oto | 3 | 0.093 | 0.149 | 8 | damaged caudal fin | - | - |
| | | 21-Apr-16 | ER-RSC-21-Apr-16 | M | 11.9 | 10.4 | 15 | oto | 3 | 0.376 | 0.383 | 14 | - | - | - |
| | | 21-Apr-16 | ER-RSC-26-Apr-16 | M | 11.8 | 10.4 | 14 | oto | 3 | 0.157 | 0.263 | 14 | worms | 0.163 | - |
| | | 21-Apr-16 | ER-RSC-27-Apr-16 | M | 11.9 | 10.2 | 14 | oto | 3 | 0.168 | 0.393 | 14 | - | - | - |
| | | 21-Apr-16 | ER-RSC-33-Apr-16 | M | 11.0 | 9.6 | 14 | oto | 3 | 0.149 | 0.403 | 13 | - | - | - |
| | | 21-Apr-16 | ER-RSC-36-Apr-16 | M | 10.7 | 9.4 | 10 | oto | 3 | 0.075 | 0.179 | 10 | - | - | - |
| | | 21-Apr-16 | ER-RSC-37-Apr-16 | M | 9.9 | 8.7 | 8 | oto | 2 | 0.148 | 0.130 | 8 | - | - | - |
| | | 21-Apr-16 | ER-RSC-38-Apr-16 | M | 10.7 | 9.5 | 12 | oto | 3 | 0.139 | 0.240 | 11 | - | - | - |
| | | 21-Apr-16 | ER-RSC-39-Apr-16 | M | 10.2 | 9.2 | 10 | oto | 2 | 0.098 | 0.184 | 9 | - | - | - |
| | | 21-Apr-16 | ER-RSC-40-Apr-16 | M | 11.8 | 10.5 | 13 | oto | 4 | 0.174 | 0.228 | 13 | - | - | - |
| | | 25-Apr-16 | ER-RSC-41-Apr-16 | M | 11.5 | 10.2 | 13 | oto | 3 | 0.191 | 0.197 | 12 | - | - | - |
| | | 25-Apr-16 | ER-RSC-42-Apr-16 | M | 10.8 | 9.4 | 10 | oto | 3 | 0.251 | 0.152 | 10 | - | - | - |
| | | 25-Apr-16 | ER-RSC-43-Apr-16 | M | 10.8 | 10.0 | 12 | oto | 3 | 0.206 | 0.116 | 11 | damaged caudal fin | - | - |
| | | **total sample size** | | **-** | **21** | **21** | **21** | **-** | **15** | **21** | **21** | **21** | **-** | **-** | **-** |
| | | **average** | | **-** | **11** | **9.6** | **11** | **-** | **3** | **0.17** | **0.21** | **11** | **-** | **-** | **-** |
| | | **median** | | **-** | **11** | **9.6** | **12** | **-** | **3** | **0.16** | **0.18** | **11** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **0.76** | **0.64** | **2.2** | **-** | **0.59** | **0.071** | **0.093** | **2.1** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.17** | **0.14** | **0.47** | **-** | **0.15** | **0.016** | **0.020** | **0.45** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **9.7** | **8.5** | **8.2** | **-** | **2** | **0.074** | **0.092** | **8.0** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **12** | **11** | **15** | **-** | **4** | **0.38** | **0.40** | **14** | **-** | **-** | **-** |
| Gold Creek | 2015 | 22-Apr-15 | GC-RSC-01-Apr-15 | F | 11.0 | 9.5 | 11 | oto | 3 | 0.579 | 0.104 | 10 | - | - | muscle, ovaries |
| | | 24-Apr-15 | GC-RSC-05-Apr-15 | F | 12.0 | 11.2 | 14 | oto | 3 | 0.406 | 0.150 | 14 | worms | 3.243 | muscle, ovaries |
| | | 27-Apr-15 | GC-RSC-07-Apr-15 | F | 14.0 | 12.2 | 26 | oto | 4 | 0.303 | 0.295 | 25 | worms | 4.555 | muscle, ovaries |
| | | 27-Apr-15 | GC-RSC-08-Apr-15 | F | 13.5 | 11.6 | 26 | oto | 4 | 1.225 | 0.332 | 24 | worms | 3.257 | muscle, ovaries |
| | | 27-Apr-15 | GC-RSC-09-Apr-15 | F | 12.0 | 10.4 | 16 | oto | 3 | 0.080 | 0.168 | 16 | worms | 2.211 | muscle, ovaries |
| | | 27-Apr-15 | GC-RSC-10-Apr-15 | F | 14.1 | 12.3 | 25 | oto | 4 | 0.680 | 0.380 | 23 | worms | 1.872 | muscle, ovaries |
| | | **total sample size** | | **-** | **6** | **6** | **6** | **-** | **6** | **6** | **6** | **6** | **-** | **5** | **-** |
| | | **average** | | **-** | **13** | **11** | **20** | **-** | **4** | **0.55** | **0.24** | **19** | **-** | **3.0** | **-** |
| | | **median** | | **-** | **13** | **11** | **20** | **-** | **4** | **0.49** | **0.23** | **20** | **-** | **3.2** | **-** |
| | | **standard deviation** | | **-** | **1.3** | **1.1** | **6.5** | **-** | **0.55** | **0.39** | **0.11** | **6.3** | **-** | **1.1** | **-** |
| | | **standard error** | | **-** | **0.52** | **0.44** | **2.7** | **-** | **0.22** | **0.16** | **0.046** | **2.6** | **-** | **0.47** | **-** |
| | | **minimum** | | **-** | **11** | **9.5** | **11** | **-** | **3** | **0.080** | **0.10** | **10** | **-** | **1.9** | **-** |
| | | **maximum** | | **-** | **14** | **12** | **26** | **-** | **4** | **1.2** | **0.38** | **25** | **-** | **4.6** | **-** |

[a] Age structures collected: oto - otoliths.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

## Table F.31: Summary Statistics for Redside Shiner Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 2016

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2016 | 21-Apr-16 | GC-RSC-03-Apr-16 | F | 10.7 | 9.4 | 10 | oto | 3 | 0.407 | 0.090 | 9 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-07-Apr-16 | F | 11.4 | 10.2 | 15 | oto | 3 | 0.489 | 0.277 | 15 | worms | 0.907 | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-08-Apr-16 | F | 11.0 | 9.9 | 12 | oto | 3 | 0.339 | 0.191 | 11 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-09-Apr-16 | F | 10.1 | 9.5 | 10 | oto | 3 | 0.218 | 0.174 | 10 | worms | 0.800 | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-10-Apr-16 | F | 12.1 | 10.7 | 16 | oto | 3 | 0.592 | 0.276 | 15 | worms | 0.475 | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-11-Apr-16 | F | 10.8 | 9.2 | 11 | oto | 3 | 0.354 | 0.086 | 11 | worms | 0.360 | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-12-Apr-16 | F | 11.0 | 10.5 | 12 | oto | 3 | 0.712 | 0.179 | 12 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-13-Apr-16 | F | 11.2 | 10.7 | 12 | oto | 3 | 0.949 | 0.321 | 11 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-14-Apr-16 | F | 10.1 | 8.9 | 10 | oto | 3 | 0.730 | 0.252 | 9 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-16-Apr-16 | F | 11.8 | 10.2 | 16 | oto | 3 | 0.510 | 0.452 | 15 | worms | 0.224 | muscle, ovaries |
| | | 23-Apr-16 | GC-RSC-20-Apr-16 | F | 11.5 | 10.2 | 15 | oto | 3 | 0.503 | 0.317 | 14 | - | - | - |
| | | 24-Apr-16 | GC-RSC-22-Apr-16 | F | 12.2 | 10.7 | 16 | oto | 3 | 1.231 | 0.404 | 14 | - | - | - |
| | | 24-Apr-16 | GC-RSC-23-Apr-16 | F | 12.1 | 10.4 | 16 | oto | 5 | 1.049 | 0.320 | 14 | - | - | - |
| | | 24-Apr-16 | GC-RSC-24-Apr-16 | F | 11.6 | 10.2 | 14 | oto | 3 | 0.270 | 0.352 | 14 | worms | 0.306 | - |
| | | 24-Apr-16 | GC-RSC-28-Apr-16 | F | 11.5 | 10.0 | 16 | oto | 4 | 0.742 | 0.568 | 15 | worms | 0.016 | - |
| | | 24-Apr-16 | GC-RSC-29-Apr-16 | F | 12.1 | 10.5 | 16 | oto | 3 | 0.638 | 0.198 | 15 | - | - | - |
| | | 24-Apr-16 | GC-RSC-30-Apr-16 | F | 10.9 | 9.5 | 14 | oto | 3 | 0.866 | 0.394 | 12 | - | - | - |
| | | 24-Apr-16 | GC-RSC-31-Apr-16 | F | 11.8 | 10.2 | 14 | oto | 3 | 0.788 | 0.256 | 13 | worms | - | - |
| | | 24-Apr-16 | GC-RSC-32-Apr-16 | F | 11.1 | 9.6 | 14 | oto | 3 | 0.418 | 0.183 | 13 | - | - | - |
| | | 24-Apr-16 | GC-RSC-34-Apr-16 | F | 11.1 | 9.5 | 15 | oto | 3 | 0.318 | 0.604 | 14 | worms | 1.515 | - |
| | | 24-Apr-16 | GC-RSC-35-Apr-16 | F | 11.1 | 10.8 | 13 | oto | 3 | 0.306 | 0.130 | 12 | - | - | - |
| | | 24-Apr-16 | GC-RSC-36-Apr-16 | F | 11.2 | 9.7 | 13 | oto | 3 | 0.603 | 0.250 | 12 | worms | 0.080 | - |
| | | **total sample size** | | **-** | **22** | **22** | **22** | **-** | **22** | **22** | **22** | **22** | **-** | **9** | **-** |
| | | **average** | | **-** | **11** | **10** | **14** | **-** | **3** | **0.59** | **0.29** | **13** | **-** | **0.52** | **-** |
| | | **median** | | **-** | **11** | **10** | **14** | **-** | **3** | **0.55** | **0.27** | **13** | **-** | **0.36** | **-** |
| | | **standard deviation** | | **-** | **0.59** | **0.54** | **2.1** | **-** | **0.47** | **0.27** | **0.14** | **2.0** | **-** | **0.48** | **-** |
| | | **standard error** | | **-** | **0.13** | **0.12** | **0.46** | **-** | **0.10** | **0.057** | **0.029** | **0.42** | **-** | **0.16** | **-** |
| | | **minimum** | | **-** | **10** | **8.9** | **9.5** | **-** | **3** | **0.22** | **0.086** | **9.0** | **-** | **0.016** | **-** |
| | | **maximum** | | **-** | **12** | **11** | **16** | **-** | **5** | **1.2** | **0.60** | **15** | **-** | **1.5** | **-** |
| | 2016 | 20-Apr-16 | GC-RSC-01-Apr-16 | M | 11.5 | 10.2 | 13 | - | - | 0.406 | 0.245 | 13 | - | - | whole body |
| | | 20-Apr-16 | GC-RSC-02-Apr-16 | M | 11.2 | 9.7 | 12 | - | - | 0.178 | 0.176 | 11 | - | - | whole body |
| | | 21-Apr-16 | GC-RSC-04-Apr-16 | M | 11.8 | 10.3 | 16 | - | - | 0.140 | 0.273 | 15 | - | - | whole body |
| | | 21-Apr-16 | GC-RSC-05-Apr-16 | M | 9.7 | 7.9 | 8 | - | - | 0.066 | 0.130 | 8 | - | - | whole body |
| | | 23-Apr-16 | GC-RSC-15-Apr-16 | M | 11.3 | 9.7 | 14 | - | - | 0.272 | 0.374 | 13 | - | - | whole body |
| | | 23-Apr-16 | GC-RSC-17-Apr-16 | M | 10.2 | 8.9 | 9 | oto | 2 | 0.255 | 0.160 | 9 | - | - | - |
| | | 23-Apr-16 | GC-RSC-18-Apr-16 | M | 10.7 | 9.5 | 11 | oto | 3 | 0.155 | 0.151 | 11 | - | - | - |
| | | 23-Apr-16 | GC-RSC-19-Apr-16 | M | 10.5 | 9.2 | 9 | oto | 2 | 0.061 | 0.175 | 9 | worms | 0.139 | - |
| | | 23-Apr-16 | GC-RSC-21-Apr-16 | M | 11.2 | 9.9 | 12 | oto | 3 | 0.087 | 0.167 | 12 | - | - | - |
| | | 24-Apr-16 | GC-RSC-25-Apr-16 | M | 11.5 | 9.9 | 13 | oto | 3 | 0.215 | 0.115 | 13 | worms | 0.102 | - |
| | | 24-Apr-16 | GC-RSC-26-Apr-16 | M | 11.1 | 9.6 | 12 | oto | 3 | 0.117 | 0.276 | 11 | - | - | - |
| | | 24-Apr-16 | GC-RSC-27-Apr-16 | M | 10.3 | 9.0 | 10 | oto | 2 | 0.263 | 0.197 | 9 | - | - | - |
| | | 24-Apr-16 | GC-RSC-33-Apr-16 | M | 11.7 | 9.9 | 14 | oto | 3 | 0.159 | 0.284 | 14 | worms | 0.196 | - |
| | | 24-Apr-16 | GC-RSC-37-Apr-16 | M | 11.3 | 10.0 | 14 | oto | 3 | 0.089 | 0.544 | 13 | worms | 0.886 | - |
| | | 24-Apr-16 | GC-RSC-38-Apr-16 | M | 11.6 | 10.3 | 14 | oto | 4 | 0.231 | 0.338 | 14 | worms | 0.040 | - |
| | | 24-Apr-16 | GC-RSC-39-Apr-16 | M | 10.1 | 8.5 | 10 | oto | 2 | 0.189 | 0.162 | 10 | - | - | - |
| | | 24-Apr-16 | GC-RSC-40-Apr-16 | M | 11.2 | 9.8 | 13 | oto | 3 | 0.161 | 0.301 | 13 | worms | 0.075 | - |
| | | 24-Apr-16 | GC-RSC-41-Apr-16 | M | 10.1 | 8.9 | 10 | oto | 2 | 0.151 | 0.188 | 10 | - | - | - |
| | | 24-Apr-16 | GC-RSC-42-Apr-16 | M | 9.2 | 8.5 | 7 | oto | 2 | 0.104 | 0.093 | 7 | - | - | - |
| | | 24-Apr-16 | GC-RSC-43-Apr-16 | M | 10.4 | 9.0 | 11 | oto | 2 | 0.164 | 0.122 | 10 | - | - | - |
| | | 24-Apr-16 | GC-RSC-44-Apr-16 | M | 11.2 | 9.8 | 15 | oto | 3 | 0.302 | 0.319 | 14 | - | - | - |
| | | **total sample size** | | **-** | **21** | **21** | **21** | **-** | **16** | **21** | **21** | **21** | **-** | **6** | **-** |
| | | **average** | | **-** | **11** | **9.5** | **12** | **-** | **3** | **0.18** | **0.23** | **11** | **-** | **0.24** | **-** |
| | | **median** | | **-** | **11** | **9.7** | **12** | **-** | **3** | **0.16** | **0.19** | **11** | **-** | **0.12** | **-** |
| | | **standard deviation** | | **-** | **0.72** | **0.66** | **2.3** | **-** | **0.62** | **0.086** | **0.11** | **2.2** | **-** | **0.32** | **-** |
| | | **standard error** | | **-** | **0.16** | **0.14** | **0.51** | **-** | **0.15** | **0.019** | **0.024** | **0.49** | **-** | **0.13** | **-** |
| | | **minimum** | | **-** | **9.2** | **7.9** | **7.2** | **-** | **2** | **0.061** | **0.093** | **7.0** | **-** | **0.040** | **-** |
| | | **maximum** | | **-** | **12** | **10** | **16** | **-** | **4** | **0.41** | **0.54** | **15** | **-** | **0.89** | **-** |

[a] Age structures collected: oto - otoliths.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

**Table F.32: Summary Statistics for Redside Shiner Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016**

| Year | Area | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 15-Feb-14 | SC-RSC-01-Feb-14 | 11.7 | 10.4 | 12 | - | - |
| | | 21-Aug-14 | SC-RSC-01-Aug-14 | 7.9 | 6.9 | 4 | - | whole body |
| | | 21-Aug-14 | SC-RSC-02-Aug-14 | 6.2 | 5.5 | 2 | - | whole body |
| | | 21-Aug-14 | SC-RSC-03-Aug-14 | 6.5 | 6.0 | 2 | - | whole body |
| | | 21-Aug-14 | SC-RSC-04-Aug-14 | 5.6 | 5.0 | 2 | - | whole body |
| | | 21-Aug-14 | SC-RSC-05-Aug-14 | 5.7 | 5.0 | 1 | - | whole body |
| | 2015 | 24-Apr-15 | SC-RSC-02-Apr-15 | 11.0 | 9.6 | 12 | - | - |
| | 2016 | 22-Apr-16 | SC-RSC-02-Apr-16 | 11.8 | 10.3 | 15 | worms | - |
| | | 22-Apr-16 | SC-RSC-13-Apr-16 | 10.8 | 9.3 | 12 | worms | - |
| | | 23-Apr-16 | SC-RSC-26-Apr-16 | 11.2 | 9.5 | 11 | worms | - |
| | | | **total sample size** | **10** | **10** | **10** | **-** | **-** |
| | | | **average** | **8.8** | **7.8** | **7.4** | **-** | **-** |
| | | | **median** | **9.4** | **8.1** | **7.5** | **-** | **-** |
| | | | **standard deviation** | **2.7** | **2.3** | **5.4** | **-** | **-** |
| | | | **standard error** | **0.85** | **0.72** | **1.7** | **-** | **-** |
| | | | **minimum** | **5.6** | **5.0** | **1.5** | **-** | **-** |
| | | | **maximum** | **12** | **10** | **15** | **-** | **-** |
| Elk River | 2014 | 20-Aug-14 | ER-RSC-01-Aug-14 | 8.3 | 7.3 | 5 | - | whole body |
| | | 20-Aug-14 | ER-RSC-02-Aug-14 | 8.7 | 7.6 | 5 | - | whole body |
| | | 20-Aug-14 | ER-RSC-03-Aug-14 | 7.0 | 6.1 | 3 | - | whole body |
| | | 20-Aug-14 | ER-RSC-04-Aug-14 | 6.6 | 5.5 | 2 | - | whole body |
| | | 20-Aug-14 | ER-RSC-05-Aug-14 | 6.1 | 5.4 | 2 | - | whole body |
| | 2015 | 22-Apr-15 | ER-RSC-01-Apr-15 | 11.2 | 9.6 | 13 | - | - |
| | | 23-Apr-15 | ER-RSC-03-Apr-15 | 11.3 | 10.0 | 13 | - | - |
| | | 24-Apr-15 | ER-RSC-06-Apr-15 | 11.6 | 10.0 | 15 | - | - |
| | 2016 | 21-Apr-16 | ER-RSC-20-Apr-16 | 11.1 | 9.8 | 11 | worms | - |
| | | 21-Apr-16 | ER-RSC-25-Apr-16 | 9.6 | 8.7 | 9 | - | - |
| | | | **total sample size** | **10** | **10** | **10** | **-** | **-** |
| | | | **average** | **9.2** | **8.0** | **7.6** | **-** | **-** |
| | | | **median** | **9.2** | **8.2** | **7.0** | **-** | **-** |
| | | | **standard deviation** | **2.1** | **1.9** | **4.9** | **-** | **-** |
| | | | **standard error** | **0.67** | **0.59** | **1.6** | **-** | **-** |
| | | | **minimum** | **6.1** | **5.4** | **1.7** | **-** | **-** |
| | | | **maximum** | **12** | **10** | **15** | **-** | **-** |
| Gold Creek | 2014 | 20-Aug-14 | GC-RSC-01-Aug-14 | 8.7 | 7.7 | 6 | - | whole body |
| | | 20-Aug-14 | GC-RSC-02-Aug-14 | 6.6 | 5.7 | 2 | - | whole body |
| | | 20-Aug-14 | GC-RSC-03-Aug-14 | 8.1 | 7.0 | 4 | - | whole body |
| | | 20-Aug-14 | GC-RSC-04-Aug-14 | 10.1 | 8.7 | 8 | - | whole body |
| | | 20-Aug-14 | GC-RSC-05-Aug-14 | 7.7 | 6.9 | 4 | - | whole body |
| | 2015 | 22-Apr-15 | GC-RSC-02-Apr-15 | 11.5 | 10.2 | 15 | - | - |
| | | 22-Apr-15 | GC-RSC-03-Apr-15 | 10.5 | 9.0 | 9 | - | - |
| | | 23-Apr-15 | GC-RSC-04-Apr-15 | 12.1 | 10.5 | 14 | - | - |
| | | 26-Apr-15 | GC-RSC-06-Apr-15 | 12.5 | 10.7 | 19 | - | - |
| | 2016 | 23-Apr-16 | GC-RSC-06-Apr-16 | 12.0 | 10.7 | 15 | - | - |
| | | | **total sample size** | **10** | **10** | **10** | **-** | **-** |
| | | | **average** | **10** | **8.7** | **10** | **-** | **-** |
| | | | **median** | **10** | **8.9** | **8.3** | **-** | **-** |
| | | | **standard deviation** | **2.1** | **1.8** | **5.8** | **-** | **-** |
| | | | **standard error** | **0.66** | **0.57** | **1.8** | **-** | **-** |
| | | | **minimum** | **6.6** | **5.7** | **2.2** | **-** | **-** |
| | | | **maximum** | **13** | **11** | **19** | **-** | **-** |

**Table F.33:** **Summary Statistics for Mountain Whitefish Meristic Data Collected near Sand Creek and Elk River in Koocanusa Reservoir, 2016**

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|
| Sand Creek | 2016 | 24-Aug-16 | SC-MW-01A-Aug-16 | 35.4 | 32.8 | 440 | muscle plug |
| | | 24-Aug-16 | SC-MW-02A-Aug-16 | 33.5 | 31.1 | 400 | muscle plug |
| | | 24-Aug-16 | SC-MW-03A-Aug-16 | 33.1 | 30.9 | 380 | muscle plug |
| | | 28-Aug-16 | SC-MW-04A-Aug-16 | 32.7 | 29.6 | 315 | muscle plug |
| | | 28-Aug-16 | SC-MW-05A-Aug-16 | 32.0 | 29.4 | 310 | muscle plug |
| | | | **total sample size** | **5** | **5** | **5** | **-** |
| | | | **average** | **33** | **31** | **369** | **-** |
| | | | **median** | **33** | **31** | **380** | **-** |
| | | | **standard deviation** | **1.3** | **1.4** | **56** | **-** |
| | | | **standard error** | **0.57** | **0.61** | **25** | **-** |
| | | | **minimum** | **32** | **29** | **310** | **-** |
| | | | **maximum** | **35** | **33** | **440** | **-** |
| Elk River | 2016 | 23-Aug-16 | ER-MW-01A-Aug-16 | 33.6 | 31.0 | 395 | muscle plug |
| | | 23-Aug-16 | ER-MW-02A-Aug-16 | 28.5 | 26.2 | 203 | muscle plug |
| | | 23-Aug-16 | ER-MW-03A-Aug-16 | 33.5 | 30.8 | 370 | muscle plug |
| | | 23-Aug-16 | ER-MW-04A-Aug-16 | 35.6 | 32.5 | 435 | muscle plug |
| | | 23-Aug-16 | ER-MW-05A-Aug-16 | 34.0 | 31.8 | 390 | muscle plug |
| | | 23-Aug-16 | ER-MW-06A-Aug-16 | 30.6 | 28.2 | 325 | muscle plug |
| | | 23-Aug-16 | ER-MW-07A-Aug-16 | 30.2 | 28.0 | 295 | muscle plug |
| | | 28-Aug-16 | ER-MW-08A-Aug-16 | 32.0 | 29.6 | 325 | muscle plug |
| | | 28-Aug-16 | ER-MW-09A-Aug-16 | 32.2 | 29.8 | 265 | muscle plug |
| | | 28-Aug-16 | ER-MW-10A-Aug-16 | 34.1 | 32.0 | 470 | muscle plug |
| | | | **total sample size** | **10** | **10** | **10** | **-** |
| | | | **average** | **32** | **30** | **347** | **-** |
| | | | **median** | **33** | **30** | **348** | **-** |
| | | | **standard deviation** | **2.2** | **2.0** | **81** | **-** |
| | | | **standard error** | **0.68** | **0.64** | **26** | **-** |
| | | | **minimum** | **34** | **31** | **395** | **-** |
| | | | **maximum** | **36** | **33** | **470** | **-** |

### Table F.34: Summary Statistics for Westslope Cutthroat Trout Meristic Data Collected near Elk River and Gold Creek in Koocanusa Reservoir, 2014

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age |
|---|---|---|---|---|---|---|---|---|
| Elk River | 2014 | 25-Aug-14 | ER-WCT-01-Aug-14 | 19.0 | 18.1 | 71 | sc | 2 |
| Gold Creek | 2014 | 25-Aug-14 | GC-WCT-01-Aug-14 | 24.0 | 22.6 | 132 | sc | 2 |
| | | 26-Aug-14 | GC-WCT-02-Aug-14 | 26.5 | 25.0 | 172 | sc | 3 |
| | | 26-Aug-14 | GC-WCT-03-Aug-14 | 22.3 | 21.3 | 102 | sc | 2 |
| **total sample size** | | **-** | **-** | **3** | **3** | **3** | **-** | **3** |
| **average** | | **-** | **-** | **24** | **23** | **135** | **-** | **2** |
| **median** | | **-** | **-** | **24** | **23** | **132** | **-** | **2** |
| **standard deviation** | | **-** | **-** | **2.1** | **1.9** | **35** | **-** | **0.58** |
| **standard error** | | **-** | **-** | **1.2** | **1.1** | **20** | **-** | **0.33** |
| **minimum** | | **-** | **-** | **22** | **21** | **102** | **-** | **2** |
| **maximum** | | **-** | **-** | **27** | **25** | **172** | **-** | **3** |

[a] Age structures collected: sc - scales.

## **Table F.35:** Summary Statistics for Yellow Perch Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 201

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 23-Apr-15 | SC-YP-01-Apr-15 | F | 14.0 | 13.2 | 31 | ds | 2 | 3.635 | 0.387 | 27 | - | - | muscle, ovaries |
| | | 28-Apr-15 | SC-YP-10-Apr-15 | F | 19.7 | 18.5 | 84 | ds | 3 | 24.432 | 1.002 | 59 | - | - | muscle, ovaries |
| | | 30-Apr-15 | SC-YP-15-Apr-15 | F | 14.3 | 13.8 | 33 | ds | 2 | 0.118 | 0.353 | 32 | - | - | muscle, ovaries |
| | | 30-Apr-15 | SC-YP-17-Apr-15 | F | 22.6 | 21.7 | 162 | ds | 3 | 43.150 | 2.148 | 117 | - | - | muscle, ovaries |
| | | 1-May-15 | SC-YP-19-Apr-15 | F | 21.0 | 20.0 | 125 | ds | 3 | 38.215 | 1.141 | 86 | - | - | muscle, ovaries |
| | | 1-May-15 | SC-YP-25-Apr-15 | F | 14.0 | 13.4 | 29 | ds | 2 | 0.157 | 0.273 | 28 | - | - | muscle |
| | | **total sample size** | | **-** | **6** | **6** | **6** | **-** | **6** | **6** | **6** | **6** | **-** | **-** | **-** |
| | | **average** | | **-** | **18** | **17** | **77** | **-** | **3** | **18** | **0.88** | **58** | **-** | **-** | **-** |
| | | **median** | | **-** | **17** | **16** | **58** | **-** | **3** | **14** | **0.69** | **45** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **3.9** | **3.8** | **57** | **-** | **0.55** | **20** | **0.72** | **37** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **1.6** | **1.5** | **23** | **-** | **0.22** | **8.0** | **0.29** | **15** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **14** | **13** | **29** | **-** | **2** | **0.12** | **0.27** | **27** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **23** | **22** | **162** | **-** | **3** | **43** | **2.1** | **117** | **-** | **-** | **-** |
| | 2016 | 20-Apr-16 | SC-YP-01-Apr-16 | F | 21.5 | 20.8 | 130 | ds | 3 | 28.454 | 1.112 | 100 | - | - | muscle, ovaries |
| | | 21-Apr-16 | SC-YP-03-Apr-16 | F | 20.6 | 19.8 | 102 | ds | 3 | 24.722 | 1.203 | 76 | - | - | muscle, ovaries |
| | | 22-Apr-16 | SC-YP-05-Apr-16 | F | 17.0 | 16.0 | 60 | ds | 3 | 13.149 | 0.118 | 47 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-YP-06-Apr-16 | F | 27.2 | 26.0 | 292 | ds | 4 | 88.003 | 3.127 | 201 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-YP-09-Apr-16 | F | 19.2 | 18.1 | 92 | ds | 3 | 31.202 | 1.020 | 60 | - | - | muscle, ovaries |
| | | 23-Apr-16 | SC-YP-10-Apr-16 | F | 20.6 | 19.4 | 107 | ds | 3 | 24.893 | 1.056 | 81 | worms | 1.219 | muscle, ovaries |
| | | 25-Apr-16 | SC-YP-14-Apr-16 | F | 21.7 | 20.7 | 130 | ds | 3 | 32.565 | 1.296 | 96 | - | - | muscle, ovaries |
| | | 27-Apr-16 | SC-YP-17-Apr-16 | F | 22.7 | 21.9 | 166 | ds | 3 | 46.599 | 1.866 | 118 | - | - | muscle, ovaries |
| | | 27-Apr-16 | SC-YP-18-Apr-16 | F | 22.3 | 21.2 | 145 | ds | 3 | 48.150 | 1.268 | 96 | - | - | muscle, ovaries |
| | | 27-Apr-16 | SC-YP-19-Apr-16 | F | 21.0 | 20.0 | 118 | ds | 3 | 28.934 | 1.386 | 88 | - | - | muscle, ovaries |
| | | 27-Apr-16 | SC-YP-20-Apr-16 | F | 21.0 | 19.8 | 126 | ds | 3 | 39.494 | 1.062 | 85 | - | - | - |
| | | 27-Apr-16 | SC-YP-21-Apr-16 | F | 22.3 | 21.1 | 154 | ds | 4 | 43.992 | 1.641 | 108 | - | - | - |
| | | 27-Apr-16 | SC-YP-22-Apr-16 | F | 20.7 | 19.5 | 101 | ds | 3 | 25.961 | 0.881 | 74 | - | - | - |
| | | 27-Apr-16 | SC-YP-24-Apr-16 | F | 20.7 | 19.6 | 115 | ds | 3 | 27.804 | 1.021 | 86 | - | - | - |
| | | **total sample size** | | **-** | **14** | **14** | **14** | **-** | **14** | **14** | **14** | **14** | **-** | **-** | **-** |
| | | **average** | | **-** | **21** | **20** | **131** | **-** | **3** | **36** | **1.3** | **94** | **-** | **-** | **-** |
| | | **median** | | **-** | **21** | **20** | **122** | **-** | **3** | **30** | **1.2** | **87** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.2** | **2.2** | **53** | **-** | **0.36** | **18** | **0.66** | **36** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.59** | **0.59** | **14** | **-** | **0.10** | **4.8** | **0.18** | **9.6** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **17** | **16** | **60** | **-** | **3** | **13** | **0.12** | **47** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **27** | **26** | **292** | **-** | **4** | **88** | **3.1** | **201** | **-** | **-** | **-** |

[a] Age structures collected: ds - dorsal spine.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight, and was used for statistical analyses.

**Table F.35:** **Summary Statistics for Yellow Perch Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 201**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2015 | 27-Apr-15 | SC-YP-03-Apr-15 | M | 15.1 | 14.4 | 37 | ds | 2 | 0.930 | 0.439 | 36 | - | - | - |
| | | 27-Apr-15 | SC-YP-04-Apr-15 | M | 12.2 | 11.6 | 18 | ds | 2 | 0.471 | 0.305 | 17 | - | - | - |
| | | 27-Apr-15 | SC-YP-05-Apr-15 | M | 10.2 | 9.7 | 11 | ds | 2 | 0.218 | 0.247 | 10 | - | - | - |
| | | 28-Apr-15 | SC-YP-06-Apr-15 | M | 17.4 | 16.6 | 66 | ds | 3 | 2.115 | 0.746 | 63 | worms | 1.312 | - |
| | | 28-Apr-15 | SC-YP-07-Apr-15 | M | 14.6 | 13.9 | 33 | ds | 2 | 1.203 | 0.433 | 31 | - | - | - |
| | | 28-Apr-15 | SC-YP-08-Apr-15 | M | 19.5 | 18.6 | 78 | ds | 3 | 3.711 | 0.950 | 73 | - | - | - |
| | | 28-Apr-15 | SC-YP-09-Apr-15 | M | 23.5 | 22.3 | 139 | ds | 4 | 6.138 | 1.617 | 131 | - | - | - |
| | | 28-Apr-15 | SC-YP-11-Apr-15 | M | 13.0 | 12.3 | 23 | ds | 2 | 0.777 | 0.294 | 22 | - | - | - |
| | | 28-Apr-15 | SC-YP-12-Apr-15 | M | 13.9 | 12.9 | 27 | ds | 2 | 0.507 | 0.266 | 27 | - | - | - |
| | | 29-Apr-15 | SC-YP-13-Apr-15 | M | 15.6 | 14.7 | 35 | ds | 2 | 0.619 | 0.455 | 34 | - | - | - |
| | | 29-Apr-15 | SC-YP-14-Apr-15 | M | 14.1 | 13.3 | 19 | ds | 2 | 0.750 | 0.333 | 17 | - | - | - |
| | | 30-Apr-15 | SC-YP-16-Apr-15 | M | 11.7 | 11.2 | 15 | ds | 2 | 0.412 | 0.229 | 15 | - | - | - |
| | | 1-May-15 | SC-YP-18-Apr-15 | M | 17.8 | 17.0 | 56 | ds | 3 | 1.651 | 0.620 | 53 | - | - | - |
| | | 1-May-15 | SC-YP-20-Apr-15 | M | 20.7 | 19.7 | 83 | ds | 4 | 1.914 | 0.560 | 81 | - | - | - |
| | | 1-May-15 | SC-YP-21-Apr-15 | M | 15.9 | 15.1 | 42 | ds | 3 | 1.215 | 0.382 | 40 | - | - | - |
| | | 1-May-15 | SC-YP-22-Apr-15 | M | 12.3 | 11.5 | 19 | ds | 2 | 0.928 | 0.241 | 18 | - | - | - |
| | | 1-May-15 | SC-YP-23-Apr-15 | M | 14.7 | 14.0 | 27 | ds | 3 | 0.674 | 0.183 | 26 | - | - | - |
| | | 1-May-15 | SC-YP-24-Apr-15 | M | 16.6 | 15.8 | 39 | ds | 2 | 2.076 | 0.315 | 37 | - | - | - |
| | | 1-May-15 | SC-YP-26-Apr-15 | M | 11.5 | 11.0 | 16 | ds | 2 | 0.288 | 0.044 | 15 | - | - | - |
| | | 1-May-15 | SC-YP-27-Apr-15 | M | 15.7 | 14.9 | 35 | ds | 2 | 0.672 | 0.318 | 34 | - | - | - |
| | | **total sample size** | | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **-** | **-** |
| | | **average** | | **-** | **15** | **15** | **41** | **-** | **2** | **1.4** | **0.45** | **39** | **-** | **-** | **-** |
| | | **median** | | **-** | **15** | **14** | **34** | **-** | **2** | **0.85** | **0.33** | **32** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **3.3** | **3.2** | **31** | **-** | **0.69** | **1.4** | **0.34** | **29** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.74** | **0.71** | **6.9** | **-** | **0.15** | **0.31** | **0.077** | **6.6** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **10** | **9.7** | **11** | **-** | **2** | **0.22** | **0.044** | **10** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **24** | **22** | **139** | **-** | **4** | **6.1** | **1.6** | **131** | **-** | **-** | **-** |
| | 2016 | 20-Apr-16 | SC-YP-02-Apr-16 | M | 19.0 | 18.4 | 70 | ds | 3 | 1.686 | 0.886 | 67 | - | - | - |
| | | 21-Apr-16 | SC-YP-04-Apr-16 | M | 17.6 | 17.0 | 59 | ds | 3 | 2.460 | 0.973 | 56 | - | - | - |
| | | 23-Apr-16 | SC-YP-07-Apr-16 | M | 18.7 | 17.6 | 60 | ds | 3 | 1.600 | 0.705 | 58 | - | - | - |
| | | 23-Apr-16 | SC-YP-08-Apr-16 | M | 19.1 | 18.0 | 72 | ds | 3 | 1.746 | 0.502 | 70 | - | - | - |
| | | 23-Apr-16 | SC-YP-11-Apr-16 | M | 18.0 | 17.1 | 50 | ds | 3 | 2.057 | 0.753 | 47 | - | - | - |
| | | 24-Apr-16 | SC-YP-12-Apr-16 | M | 18.9 | 18.0 | 71 | ds | 3 | 2.027 | 0.933 | 68 | - | - | - |
| | | 24-Apr-16 | SC-YP-13-Apr-16 | M | 19.7 | 18.2 | 77 | ds | 3 | 1.939 | 0.753 | 74 | - | - | - |
| | | 26-Apr-16 | SC-YP-15-Apr-16 | M | 19.0 | 18.1 | 65 | ds | 3 | 2.009 | 0.612 | 62 | - | - | - |
| | | 27-Apr-16 | SC-YP-16-Apr-16 | M | 19.1 | 18.0 | 73 | ds | 3 | 0.843 | 0.481 | 72 | - | - | - |
| | | 27-Apr-16 | SC-YP-23-Apr-16 | M | 19.0 | 18.5 | 64 | ds | 3 | 2.427 | 0.747 | 61 | - | - | - |
| | | 27-Apr-16 | SC-YP-25-Apr-16 | M | 17.3 | 16.2 | 59 | ds | 3 | 2.575 | 1.049 | 55 | - | - | - |
| | | 27-Apr-16 | SC-YP-26-Apr-16 | M | 21.7 | 20.7 | 108 | ds | 4 | 3.024 | 1.294 | 104 | - | - | - |
| | | 27-Apr-16 | SC-YP-27-Apr-16 | M | 23.3 | 22.2 | 153 | ds | 4 | 4.567 | 1.877 | 147 | - | - | - |
| | | 27-Apr-16 | SC-YP-28-Apr-16 | M | 19.2 | 18.2 | 68 | ds | 3 | 0.974 | 0.595 | 66 | - | - | - |
| | | 27-Apr-16 | SC-YP-29-Apr-16 | M | 18.3 | 17.3 | 66 | ds | 3 | 2.477 | 0.653 | 63 | - | - | - |
| | | 27-Apr-16 | SC-YP-30-Apr-16 | M | 18.6 | 17.4 | 69 | ds | 3 | 2.064 | 0.969 | 66 | - | - | - |
| | | 27-Apr-16 | SC-YP-31-Apr-16 | M | 19.6 | 18.7 | 88 | ds | 3 | 3.781 | 0.672 | 84 | - | - | - |
| | | 27-Apr-16 | SC-YP-32-Apr-16 | M | 18.1 | 17.2 | 64 | ds | 3 | 1.867 | 1.012 | 61 | - | - | - |
| | | 27-Apr-16 | SC-YP-33-Apr-16 | M | 19.2 | 18.1 | 71 | ds | 3 | 0.660 | 0.579 | 70 | - | - | - |
| | | 27-Apr-16 | SC-YP-34-Apr-16 | M | 17.5 | 16.4 | 57 | ds | 3 | 1.244 | 0.669 | 55 | - | - | - |
| | | **total sample size** | | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **-** | **-** |
| | | **average** | | **-** | **19** | **18** | **73** | **-** | **3** | **2.1** | **0.84** | **70** | **-** | **-** | **-** |
| | | **median** | | **-** | **19** | **18** | **69** | **-** | **3** | **2.0** | **0.75** | **66** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **1.4** | **1.4** | **22** | **-** | **0.31** | **0.94** | **0.32** | **22** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.31** | **0.30** | **5.0** | **-** | **0.07** | **0.21** | **0.072** | **4.8** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **17** | **16** | **50** | **-** | **3** | **0.66** | **0.48** | **47** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **23** | **22** | **153** | **-** | **4** | **4.6** | **1.9** | **147** | **-** | **-** | **-** |

[a] Age structures collected: ds - dorsal spine.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight, and was used for statistical analyses.

**Table F.35:** **Summary Statistics for Yellow Perch Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 201**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2015 | 23-Apr-15 | ER-YP-01-Apr-15 | F | 19.9 | 18.9 | 91 | ds | 3 | 20.385 | 1.003 | 70 | - | - | muscle, ovaries |
| | | 23-Apr-15 | ER-YP-02-Apr-15 | F | 20.5 | 19.6 | 90 | ds | 3 | 22.615 | 1.122 | 66 | - | - | muscle, ovaries |
| | | 26-Apr-15 | ER-YP-04-Apr-15 | F | 23.8 | 22.7 | 161 | ds | 4 | 39.529 | 1.803 | 120 | - | - | muscle, ovaries |
| | | 27-Apr-15 | ER-YP-05-Apr-15 | F | 20.7 | 20.0 | 120 | ds | 3 | 33.906 | 1.353 | 85 | - | - | muscle, ovaries |
| | | 27-Apr-15 | ER-YP-06-Apr-15 | F | 20.4 | 19.4 | 102 | ds | 3 | 1.401 | 1.105 | 99 | - | - | muscle, ovaries |
| | | 28-Apr-15 | ER-YP-07-Apr-15 | F | 27.4 | 26.3 | 275 | ds | 6 | 70.664 | 3.098 | 201 | - | - | muscle, ovaries |
| | | 29-Apr-15 | ER-YP-08-Apr-15 | F | 31.7 | 30.2 | 310 | ds | 8 | 10.843 | 1.766 | 297 | - | - | muscle, ovaries |
| | | 29-Apr-15 | ER-YP-09-Apr-15 | F | 19.7 | 18.8 | 92 | ds | 3 | 20.535 | 1.392 | 70 | - | - | muscle, ovaries |
| | | 29-Apr-15 | ER-YP-10-Apr-15 | F | 25.7 | 24.6 | 242 | ds | 4 | 77.645 | 2.151 | 162 | - | - | muscle, ovaries |
| | | 29-Apr-15 | ER-YP-11-Apr-15 | F | 18.1 | 17.1 | 72 | ds | 2 | 14.750 | 1.267 | 56 | - | - | muscle, ovaries |
| | | 29-Apr-15 | ER-YP-12-Apr-15 | F | 24.6 | 23.5 | 178 | ds | 5 | 42.309 | 2.019 | 134 | - | - | muscle, ovaries |
| | | 29-Apr-15 | ER-YP-13-Apr-15 | F | 16.7 | 15.5 | 42 | ds | 2 | 0.188 | 0.445 | 41 | - | - | - |
| | | 29-Apr-15 | ER-YP-14-Apr-15 | F | 17.8 | 16.8 | 73 | ds | 3 | 18.115 | 1.097 | 54 | - | - | - |
| | | 29-Apr-15 | ER-YP-15-Apr-15 | F | 22.4 | 21.4 | 138 | ds | 3 | 30.426 | 1.261 | 106 | - | - | - |
| | | 30-Apr-15 | ER-YP-21-Apr-15 | F | 15.8 | 15.1 | 44 | ds | 2 | 0.157 | 0.465 | 43 | - | - | - |
| | | 30-Apr-15 | ER-YP-22-Apr-15 | F | 15.2 | 14.5 | 36 | ds | 2 | 0.174 | 0.353 | 36 | - | - | - |
| | | 30-Apr-15 | ER-YP-25-Apr-15 | F | 20.5 | 19.5 | 103 | ds | 4 | 25.417 | 1.322 | 76 | - | - | - |
| | | 30-Apr-15 | ER-YP-27-Apr-15 | F | 20.3 | 19.3 | 105 | ds | 3 | 24.679 | 1.256 | 79 | - | - | - |
| | | 30-Apr-15 | ER-YP-28-Apr-15 | F | 21.7 | 20.7 | 121 | ds | 3 | 31.649 | 1.581 | 88 | - | - | - |
| | | 30-Apr-15 | ER-YP-32-Apr-15 | F | 14.6 | 13.9 | 29 | - | - | - | - | - | - | - | - |
| | | 30-Apr-15 | ER-YP-33-Apr-15 | F | 14.2 | 13.4 | 29 | - | - | - | - | - | - | - | - |
| | | 1-May-15 | ER-YP-37-Apr-15 | F | 14.2 | 13.5 | 29 | ds | - | - | - | - | - | - | - |
| | | 1-May-15 | ER-YP-38-Apr-15 | F | 15.4 | 14.7 | 36 | ds | - | - | - | - | - | - | - |
| | | **total sample size** | | **-** | **23** | **23** | **23** | **-** | **19** | **19** | **19** | **19** | **-** | **-** | **-** |
| | | **average** | | **-** | **20** | **19** | **110** | **-** | **3** | **26** | **1.4** | **99** | **-** | **-** | **-** |
| | | **median** | | **-** | **20** | **19** | **92** | **-** | **3** | **23** | **1.3** | **79** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **4.5** | **4.4** | **79** | **-** | **1.5** | **22** | **0.65** | **64** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.94** | **0.91** | **16** | **-** | **0.35** | **4.9** | **0.15** | **15** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **14** | **13** | **29** | **-** | **2** | **0.16** | **0.35** | **36** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **32** | **30** | **310** | **-** | **8** | **78** | **3.1** | **297** | **-** | **-** | **-** |
| | 2016 | 19-Apr-16 | ER-YP-01-Apr-16 | F | 20.1 | 18.9 | 120 | ds | 3 | 29.420 | 1.357 | 89 | worms | 2.484 | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-02-Apr-16 | F | 24.2 | 23.6 | 165 | ds | 5 | 42.111 | 1.967 | 121 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-03-Apr-16 | F | 18.1 | 17.5 | 76 | ds | 3 | 16.548 | 0.397 | 59 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-04-Apr-16 | F | 19.3 | 18.5 | 93 | ds | 3 | 19.390 | 1.275 | 72 | worms | 1.822 | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-05-Apr-16 | F | 20.3 | 19.7 | 101 | ds | 3 | 29.170 | 1.219 | 71 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-06-Apr-16 | F | 19.4 | 18.7 | 89 | ds | 3 | 21.115 | 0.787 | 67 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-07-Apr-16 | F | 21.1 | 20.3 | 115 | ds | 3 | 25.706 | 1.503 | 88 | worms | 1.470 | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-09-Apr-16 | F | 22.2 | 21.5 | 130 | ds | 3 | 36.004 | 0.974 | 93 | - | - | muscle, ovaries |
| | | 19-Apr-16 | ER-YP-10-Apr-16 | F | 19.2 | 18.4 | 90 | ds | 4 | 28.850 | 0.882 | 60 | - | - | muscle, ovaries |
| | | 22-Apr-16 | ER-YP-11-Apr-16 | F | 20.7 | 19.6 | 112 | ds | 3 | 30.573 | 0.904 | 81 | - | - | muscle, ovaries |
| | | 22-Apr-16 | ER-YP-12-Apr-16 | F | 15.6 | 15.0 | 45 | ds | 3 | 9.941 | 0.457 | 35 | - | - | - |
| | | 23-Apr-16 | ER-YP-16-Apr-16 | F | 28.2 | 26.5 | 345 | ds | 5 | 107.203 | 3.556 | 234 | - | - | muscle, ovaries |
| | | 23-Apr-16 | ER-YP-17-Apr-16 | F | 17.1 | 16.2 | 55 | ds | 3 | 15.154 | 0.619 | 39 | - | - | - |
| | | 24-Apr-16 | ER-YP-22-Apr-16 | F | 17.7 | 16.9 | 61 | ds | 3 | 16.463 | 1.074 | 43 | - | - | - |
| | | 24-Apr-16 | ER-YP-24-Apr-16 | F | 31.7 | 30.0 | 390 | ds | 6 | 116.654 | 4.311 | 269 | - | - | - |
| | | 25-Apr-16 | ER-YP-25-Apr-16 | F | 17.2 | 16.1 | 61 | ds | 3 | 12.740 | 0.742 | 48 | worms | 1.596 | - |
| | | 26-Apr-16 | ER-YP-29-Apr-16 | F | 19.9 | 18.9 | 89 | ds | 3 | 27.468 | 0.843 | 61 | - | - | - |
| | | **total sample size** | | **-** | **17** | **17** | **17** | **-** | **17** | **17** | **17** | **17** | **-** | **4** | **-** |
| | | **average** | | **-** | **21** | **20** | **126** | **-** | **3** | **34** | **1.3** | **90** | **-** | **1.8** | **-** |
| | | **median** | | **-** | **20** | **19** | **93** | **-** | **3** | **27** | **0.97** | **71** | **-** | **1.7** | **-** |
| | | **standard deviation** | | **-** | **4.1** | **3.8** | **96** | **-** | **0.94** | **30** | **1.1** | **65** | **-** | **0.45** | **-** |
| | | **standard error** | | **-** | **0.99** | **0.93** | **23** | **-** | **0.23** | **7.4** | **0.26** | **16** | **-** | **0.23** | **-** |
| | | **minimum** | | **-** | **16** | **15** | **45** | **-** | **3** | **9.9** | **0.40** | **35** | **-** | **1.5** | **-** |
| | | **maximum** | | **-** | **32** | **30** | **390** | **-** | **6** | **117** | **4.3** | **269** | **-** | **2.5** | **-** |

[a] Age structures collected: ds - dorsal spine.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight, and was used for statistical analyses.

## Table F.35: Summary Statistics for Yellow Perch Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 201

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elk River | 2015 | 23-Apr-15 | ER-YP-03-Apr-15 | M | 12.5 | 11.8 | 23 | ds | 2 | 0.991 | 0.354 | 21 | - | - | muscle |
| | | 29-Apr-15 | ER-YP-16-Apr-15 | M | 13.3 | 12.6 | 24 | ds | 2 | 0.459 | 0.209 | 23 | - | - | - |
| | | 29-Apr-15 | ER-YP-17-Apr-15 | M | 11.7 | 11.0 | 18 | ds | 2 | 0.085 | 0.155 | 18 | worms | 0.525 | - |
| | | 30-Apr-15 | ER-YP-19-Apr-15 | M | 12.3 | 11.6 | 18 | ds | 2 | 0.314 | 0.155 | 17 | - | - | - |
| | | 30-Apr-15 | ER-YP-20-Apr-15 | M | 13.5 | 12.9 | 25 | ds | 2 | 0.878 | 0.289 | 24 | - | - | - |
| | | 30-Apr-15 | ER-YP-23-Apr-15 | M | 11.0 | 10.5 | 14 | ds | 2 | 0.561 | 0.223 | 13 | - | - | - |
| | | 30-Apr-15 | ER-YP-24-Apr-15 | M | 12.7 | 12.0 | 18 | ds | 2 | 0.507 | 0.218 | 17 | - | - | - |
| | | 30-Apr-15 | ER-YP-26-Apr-15 | M | 12.5 | 11.0 | 17 | ds | 2 | 0.498 | 0.210 | 16 | - | - | - |
| | | 30-Apr-15 | ER-YP-29-Apr-15 | M | 13.1 | 12.5 | 22 | ds | 2 | 0.873 | 0.278 | 21 | - | - | - |
| | | 30-Apr-15 | ER-YP-30-Apr-15 | M | 12.3 | 11.7 | 17 | ds | 2 | 0.435 | 0.201 | 17 | - | - | - |
| | | 30-Apr-15 | ER-YP-31-Apr-15 | M | 12.9 | 12.3 | 21 | ds | 2 | 0.546 | 0.237 | 20 | - | - | - |
| | | 1-May-15 | ER-YP-34-Apr-15 | M | 13.7 | 13.0 | 27 | ds | 2 | 1.018 | 0.416 | 25 | - | - | - |
| | | 1-May-15 | ER-YP-35-Apr-15 | M | 12.0 | 11.3 | 17 | ds | 2 | 0.075 | 0.255 | 17 | - | - | - |
| | | 1-May-15 | ER-YP-36-Apr-15 | M | 12.6 | 12.0 | 20 | ds | 2 | 0.866 | 0.248 | 18 | - | - | - |
| | | **total sample size** | | **-** | **14** | **14** | **14** | **-** | **14** | **14** | **14** | **14** | **-** | **-** | **-** |
| | | **average** | | **-** | **13** | **12** | **20** | **-** | **2** | **0.58** | **0.25** | **19** | **-** | **-** | **-** |
| | | **median** | | **-** | **13** | **12** | **19** | **-** | **2** | **0.53** | **0.23** | **18** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **0.72** | **0.75** | **3.7** | **-** | **0** | **0.31** | **0.071** | **3.4** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.19** | **0.20** | **0.98** | **-** | **0** | **0.082** | **0.019** | **0.91** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **11** | **11** | **14** | **-** | **2** | **0.075** | **0.16** | **13** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **14** | **13** | **27** | **-** | **2** | **1.0** | **0.42** | **25** | **-** | **-** | **-** |
| | 2016 | 19-Apr-16 | ER-YP-08-Apr-16 | M | 12.3 | 11.7 | 22 | ds | 2 | 0.385 | 0.258 | 21 | worms | 0.947 | - |
| | | 22-Apr-16 | ER-YP-13-Apr-16 | M | 12.2 | 11.7 | 21 | ds | 2 | 0.344 | 0.164 | 20 | - | - | - |
| | | 22-Apr-16 | ER-YP-14-Apr-16 | M | 13.0 | 12.3 | 21 | ds | 2 | 0.165 | 0.262 | 21 | - | - | - |
| | | 22-Apr-16 | ER-YP-15-Apr-16 | M | 14.4 | 13.8 | 31 | ds | 3 | 0.573 | 0.309 | 30 | - | - | - |
| | | 23-Apr-16 | ER-YP-18-Apr-16 | M | 14.7 | 13.7 | 30 | ds | 3 | 1.411 | 0.561 | 28 | - | - | - |
| | | 24-Apr-16 | ER-YP-19-Apr-16 | M | 17.9 | 17.0 | 54 | ds | 3 | 1.282 | 0.510 | 52 | - | - | - |
| | | 24-Apr-16 | ER-YP-20-Apr-16 | M | 15.5 | 14.6 | 40 | ds | 3 | 0.680 | 0.559 | 39 | - | - | - |
| | | 24-Apr-16 | ER-YP-21-Apr-16 | M | 17.3 | 16.2 | 49 | ds | 3 | 1.051 | 0.588 | 47 | - | - | - |
| | | 24-Apr-16 | ER-YP-23-Apr-16 | M | 17.2 | 16.3 | 57 | ds | 5 | 2.214 | 0.841 | 54 | - | - | - |
| | | 25-Apr-16 | ER-YP-26-Apr-16 | M | 16.1 | 15.3 | 42 | ds | 3 | 0.959 | 0.420 | 41 | - | - | - |
| | | 25-Apr-16 | ER-YP-27-Apr-16 | M | 13.2 | 12.8 | 23 | ds | 3 | 1.102 | 0.236 | 22 | - | - | - |
| | | 26-Apr-16 | ER-YP-28-Apr-16 | M | 15.0 | 15.2 | 47 | ds | 4 | 0.922 | 0.646 | 45 | - | - | - |
| | | 26-Apr-16 | ER-YP-30-Apr-16 | M | 14.7 | 14.0 | 38 | ds | 3 | 1.063 | 0.597 | 36 | worms | 0.545 | - |
| | | 26-Apr-16 | ER-YP-33-Apr-16 | M | 15.4 | 14.8 | 36 | ds | 3 | 0.714 | 0.765 | 35 | - | - | - |
| | | 26-Apr-16 | ER-YP-34-Apr-16 | M | 15.8 | 14.9 | 45 | ds | 3 | 1.243 | 0.678 | 43 | - | - | - |
| | | 26-Apr-16 | ER-YP-35-Apr-16 | M | 11.2 | 10.5 | 15 | ds | 2 | 0.601 | 0.123 | 14 | - | - | - |
| | | **total sample size** | | **-** | **16** | **16** | **16** | **-** | **16** | **16** | **16** | **16** | **-** | **2** | **-** |
| | | **average** | | **-** | **15** | **14** | **36** | **-** | **3** | **0.92** | **0.47** | **34** | **-** | **0.75** | **-** |
| | | **median** | | **-** | **15** | **14** | **37** | **-** | **3** | **0.94** | **0.53** | **35** | **-** | **0.75** | **-** |
| | | **standard deviation** | | **-** | **2.0** | **1.8** | **13** | **-** | **0.77** | **0.50** | **0.22** | **12** | **-** | **0.28** | **-** |
| | | **standard error** | | **-** | **0.49** | **0.46** | **3.2** | **-** | **0.19** | **0.12** | **0.055** | **3.1** | **-** | **0.20** | **-** |
| | | **minimum** | | **-** | **11** | **11** | **15** | **-** | **2** | **0.17** | **0.12** | **14** | **-** | **0.55** | **-** |
| | | **maximum** | | **-** | **18** | **17** | **57** | **-** | **5** | **2.2** | **0.84** | **54** | **-** | **0.95** | **-** |

[a] Age structures collected: ds - dorsal spine.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

**Table F.35:** **Summary Statistics for Yellow Perch Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 201**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2015 | 22-Apr-15 | GC-YP-01-Apr-15 | F | 23.1 | 21.9 | 152 | ds | 4 | 32.744 | 1.962 | 117 | - | - | muscle, ovaries |
| | | 22-Apr-15 | GC-YP-02-Apr-15 | F | 20.0 | 19.0 | 96 | ds | 3 | 20.077 | 1.371 | 75 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-YP-03-Apr-15 | F | 18.6 | 17.7 | 77 | ds | 3 | 18.806 | 0.968 | 57 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-YP-04-Apr-15 | F | 26.1 | 24.9 | 217 | ds | 4 | 65.083 | 3.131 | 149 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-YP-05-Apr-15 | F | 20.5 | 19.6 | 103 | ds | 3 | 23.730 | 1.297 | 78 | - | - | muscle, ovaries |
| | | 23-Apr-15 | GC-YP-06-Apr-15 | F | 23.1 | 21.9 | 157 | ds | 6 | 41.461 | 1.967 | 114 | - | - | muscle, ovaries |
| | | 24-Apr-15 | GC-YP-07-Apr-15 | F | 27.3 | 26.0 | 279 | ds | 4 | 82.471 | 3.399 | 193 | - | - | muscle, ovaries |
| | | 25-Apr-15 | GC-YP-08-Apr-15 | F | 28.1 | 26.9 | 295 | ds | 4 | 81.350 | 4.170 | 209 | - | - | muscle, ovaries |
| | | 25-Apr-15 | GC-YP-09-Apr-15 | F | 32.0 | 30.5 | 490 | ds | 6 | 118.545 | 7.216 | 364 | - | - | muscle, ovaries |
| | | 25-Apr-15 | GC-YP-10-Apr-15 | F | 23.5 | 22.7 | 170 | ds | 4 | 44.819 | 2.227 | 123 | - | - | muscle, ovaries |
| | | 25-Apr-15 | GC-YP-11-Apr-15 | F | 29.4 | 27.9 | 340 | ds | 8 | 65.761 | 3.880 | 270 | - | - | - |
| | | 25-Apr-15 | GC-YP-12-Apr-15 | F | 19.2 | 18.4 | 87 | ds | 4 | 19.834 | 1.140 | 66 | - | - | - |
| | | 26-Apr-15 | GC-YP-18-Apr-15 | F | 17.5 | 16.7 | 60 | ds | 3 | 16.142 | 0.850 | 43 | - | - | - |
| | | 29-Apr-15 | GC-YP-22-Apr-15 | F | 13.6 | 12.6 | 23 | ds | 2 | 0.108 | 0.322 | 23 | - | - | - |
| | | 1-May-15 | GC-YP-36-Apr-15 | F | 13.8 | 13.0 | 27 | ds | 2 | 5.007 | 0.236 | 22 | worms | 0.897 | - |
| | | **total sample size** | | **-** | **15** | **15** | **15** | **-** | **15** | **15** | **15** | **15** | **-** | **-** | **-** |
| | | **average** | | **-** | **22** | **21** | **172** | **-** | **4** | **42** | **2.3** | **127** | **-** | **-** | **-** |
| | | **median** | | **-** | **23** | **22** | **152** | **-** | **4** | **33** | **2.0** | **114** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **5.5** | **5.3** | **131** | **-** | **1.6** | **34** | **1.8** | **97** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **1.4** | **1.4** | **34** | **-** | **0.41** | **8.7** | **0.48** | **25** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **14** | **13** | **23** | **-** | **2** | **0.11** | **0.24** | **22** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **32** | **31** | **490** | **-** | **8** | **119** | **7.2** | **364** | **-** | **-** | **-** |
| | 2016 | 20-Apr-16 | GC-YP-01-Apr-16 | F | 15.8 | 15.1 | 42 | ds | 3 | 0.277 | 0.426 | 41 | undeveloped | - | - |
| | | 21-Apr-16 | GC-YP-06-Apr-16 | F | 23.6 | 22.2 | 180 | ds | 4 | 56.784 | 2.457 | 121 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-YP-07-Apr-16 | F | 16.3 | 15.2 | 49 | ds | 3 | 9.454 | 0.584 | 39 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-YP-09-Apr-16 | F | 16.0 | 15.2 | 49 | ds | 3 | 11.639 | 0.614 | 37 | - | - | muscle, ovaries |
| | | 21-Apr-16 | GC-YP-21-Apr-16 | F | 17.6 | 16.9 | 64 | ds | 3 | 17.267 | 0.788 | 46 | - | - | muscle, ovaries |
| | | 22-Apr-16 | GC-YP-23-Apr-16 | F | 26.4 | 25.4 | 254 | ds | 5 | 69.116 | 3.241 | 182 | - | - | muscle, ovaries |
| | | 22-Apr-16 | GC-YP-24-Apr-16 | F | 22.5 | 21.4 | 154 | ds | 3 | 42.550 | 1.388 | 110 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-YP-31-Apr-16 | F | 30.0 | 28.5 | 345 | ds | 5 | 102.777 | 4.238 | 238 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-YP-32-Apr-16 | F | 18.4 | 17.5 | 65 | ds | 3 | 15.972 | 0.767 | 48 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-YP-33-Apr-16 | F | 17.7 | 16.8 | 64 | ds | 3 | 16.673 | 0.577 | 47 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-YP-35-Apr-16 | F | 20.7 | 19.6 | 98 | ds | 3 | 25.879 | 0.915 | 71 | - | - | muscle, ovaries |
| | | 23-Apr-16 | GC-YP-36-Apr-16 | F | 17.2 | 16.4 | 49 | ds | 4 | 9.549 | 0.602 | 39 | - | - | muscle, ovaries |
| | | 24-Apr-16 | GC-YP-37-Apr-16 | F | 24.8 | 23.3 | 200 | ds | 4 | 58.030 | 2.427 | 140 | - | - | muscle, ovaries |
| | | 25-Apr-16 | GC-YP-38-Apr-16 | F | 15.2 | 14.7 | 45 | ds | 3 | 10.845 | 0.532 | 34 | - | - | - |
| | | 25-Apr-16 | GC-YP-39-Apr-16 | F | 19.0 | 18.0 | 73 | ds | 3 | 20.440 | 1.034 | 52 | - | - | - |
| | | 25-Apr-16 | GC-YP-40-Apr-16 | F | 19.1 | 18.3 | 89 | ds | 3 | 22.781 | 0.656 | 66 | - | - | - |
| | | 25-Apr-16 | GC-YP-41-Apr-16 | F | 18.4 | 17.4 | 63 | ds | 3 | 15.365 | 0.827 | 47 | - | - | - |
| | | 27-Apr-16 | GC-YP-42-Apr-16 | F | 17.3 | 16.4 | 49 | ds | 3 | 10.837 | 0.437 | 38 | - | - | - |
| | | **total sample size** | | **-** | **18** | **18** | **18** | **-** | **18** | **18** | **18** | **18** | **-** | **-** | **-** |
| | | **average** | | **-** | **20** | **19** | **107** | **-** | **3** | **29** | **1.3** | **77** | **-** | **-** | **-** |
| | | **median** | | **-** | **18** | **17** | **65** | **-** | **3** | **17** | **0.78** | **48** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **4.1** | **3.9** | **86** | **-** | **0.70** | **27** | **1.1** | **58** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.97** | **0.92** | **20** | **-** | **0.16** | **6.3** | **0.26** | **14** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **15** | **15** | **42** | **-** | **3** | **0.28** | **0.43** | **34** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **30** | **29** | **345** | **-** | **5** | **103** | **4.2** | **238** | **-** | **-** | **-** |

[a] Age structures collected: ds - dorsal spine.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

**Table F.35:** **Summary Statistics for Yellow Perch Meristic Data Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2015 and 201**

| Area | Year | Processing Date | Fish ID | Sex | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Gonad Weight (g) | Liver Weight (g) | Adjusted Body Weight (g)[b] | Abnormalities | Worm Weight (g) | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold Creek | 2015 | 26-Apr-15 | GC-YP-14-Apr-15 | M | 11.8 | 11.2 | 16 | ds | 2 | 0.302 | 0.270 | 15 | - | - | - |
| | | 26-Apr-15 | GC-YP-15-Apr-15 | M | 12.0 | 11.3 | 16 | ds | 2 | 0.340 | 0.164 | 15 | - | - | - |
| | | 26-Apr-15 | GC-YP-16-Apr-15 | M | 11.7 | 11.1 | 16 | ds | 2 | 0.484 | 0.146 | 15 | - | - | - |
| | | 26-Apr-15 | GC-YP-17-Apr-15 | M | 12.3 | 11.7 | 19 | ds | 2 | 0.963 | 0.253 | 18 | - | - | - |
| | | 27-Apr-15 | GC-YP-19-Apr-15 | M | 12.0 | 11.3 | 18 | ds | 2 | 0.770 | 0.220 | 17 | - | - | - |
| | | 27-Apr-15 | GC-YP-20-Apr-15 | M | 12.8 | 12.0 | 18 | ds | 2 | 0.512 | 0.096 | 18 | - | - | - |
| | | 27-Apr-15 | GC-YP-21-Apr-15 | M | 11.1 | 10.5 | 13 | ds | 2 | 0.435 | 0.212 | 12 | - | - | - |
| | | 29-Apr-15 | GC-YP-23-Apr-15 | M | 12.5 | 11.5 | 20 | ds | 2 | 0.756 | 0.292 | 19 | - | - | - |
| | | 29-Apr-15 | GC-YP-24-Apr-15 | M | 11.6 | 10.9 | 15 | ds | 2 | 0.497 | 0.254 | 14 | - | - | - |
| | | 29-Apr-15 | GC-YP-25-Apr-15 | M | 11.0 | 10.3 | 13 | ds | 2 | 0.418 | 0.164 | 13 | - | - | - |
| | | 29-Apr-15 | GC-YP-26-Apr-15 | M | 12.3 | 11.7 | 19 | ds | 2 | 0.557 | 0.265 | 18 | - | - | - |
| | | 29-Apr-15 | GC-YP-27-Apr-15 | M | 11.4 | 10.8 | 13 | ds | 2 | 0.211 | 0.182 | 13 | - | - | - |
| | | 30-Apr-15 | GC-YP-28-Apr-15 | M | 12.7 | 11.0 | 19 | ds | 2 | 0.803 | 0.261 | 18 | - | - | - |
| | | 30-Apr-15 | GC-YP-29-Apr-15 | M | 12.6 | 11.9 | 18 | ds | 2 | 0.730 | 0.259 | 17 | - | - | - |
| | | 1-May-15 | GC-YP-30-Apr-15 | M | 15.5 | 14.8 | 38 | ds | 3 | 0.854 | 0.221 | 36 | - | - | - |
| | | 1-May-15 | GC-YP-31-Apr-15 | M | 23.1 | 22.1 | 102 | ds | 8 | 0.886 | 0.584 | 101 | - | - | - |
| | | 1-May-15 | GC-YP-32-Apr-15 | M | 12.5 | 11.9 | 20 | ds | 2 | 0.689 | 0.298 | 19 | - | - | - |
| | | 1-May-15 | GC-YP-33-Apr-15 | M | 15.8 | 15.0 | 41 | ds | 3 | 1.727 | 0.613 | 39 | - | - | - |
| | | 1-May-15 | GC-YP-34-Apr-15 | M | 12.3 | 11.7 | 19 | ds | 2 | 0.744 | 0.251 | 18 | - | - | - |
| | | 1-May-15 | GC-YP-35-Apr-15 | M | 12.7 | 12.0 | 18 | ds | 2 | 0.576 | 0.147 | 17 | - | - | - |
| | | **total sample size** | | **-** | **20** | **20** | **20** | **-** | **20** | **20** | **20** | **20** | **-** | **-** | **-** |
| | | **average** | | **-** | **13** | **12** | **24** | **-** | **2** | **0.66** | **0.26** | **23** | **-** | **-** | **-** |
| | | **median** | | **-** | **12** | **12** | **18** | **-** | **2** | **0.63** | **0.25** | **17** | **-** | **-** | **-** |
| | | **standard deviation** | | **-** | **2.7** | **2.6** | **20** | **-** | **1.4** | **0.33** | **0.13** | **20** | **-** | **-** | **-** |
| | | **standard error** | | **-** | **0.60** | **0.58** | **4.4** | **-** | **0.30** | **0.073** | **0.029** | **4.4** | **-** | **-** | **-** |
| | | **minimum** | | **-** | **11** | **10** | **13** | **-** | **2** | **0.21** | **0.096** | **12** | **-** | **-** | **-** |
| | | **maximum** | | **-** | **23** | **22** | **102** | **-** | **8** | **1.7** | **0.61** | **101** | **-** | **-** | **-** |
| | 2016 | 20-Apr-16 | GC-YP-02-Apr-16 | M | 15.8 | 15.0 | 41 | ds | 3 | 0.760 | 0.463 | 40 | - | - | - |
| | | 20-Apr-16 | GC-YP-03-Apr-16 | M | 15.5 | 14.7 | 35 | ds | 3 | 1.075 | 0.635 | 33 | worms | 0.780 | - |
| | | 20-Apr-16 | GC-YP-04-Apr-16 | M | 14.5 | 13.6 | 30 | ds | 3 | 1.180 | 0.448 | 28 | - | - | - |
| | | 20-Apr-16 | GC-YP-05-Apr-16 | M | 15.4 | 14.6 | 35 | ds | 3 | 0.967 | 0.451 | 34 | - | - | - |
| | | 21-Apr-16 | GC-YP-10-Apr-16 | M | 15.1 | 14.5 | 35 | ds | 3 | 0.459 | 0.609 | 34 | - | - | - |
| | | 21-Apr-16 | GC-YP-11-Apr-16 | M | 15.4 | 14.5 | 34 | ds | 3 | 1.096 | 0.848 | 32 | - | - | - |
| | | 21-Apr-16 | GC-YP-12-Apr-16 | M | 15.4 | 14.7 | 41 | ds | 3 | 0.686 | 0.384 | 40 | worms | 0.805 | - |
| | | 21-Apr-16 | GC-YP-13-Apr-16 | M | 15.3 | 14.4 | 39 | ds | 3 | 1.032 | 0.724 | 37 | - | - | - |
| | | 21-Apr-16 | GC-YP-14-Apr-16 | M | 14.6 | 13.8 | 34 | ds | 3 | 0.731 | 0.892 | 32 | - | - | - |
| | | 21-Apr-16 | GC-YP-15-Apr-16 | M | 12.1 | 11.5 | 18 | ds | 2 | 0.489 | 0.202 | 17 | - | - | - |
| | | 21-Apr-16 | GC-YP-16-Apr-16 | M | 14.3 | 13.5 | 36 | ds | 3 | 1.182 | 0.555 | 34 | worms | 0.369 | - |
| | | 21-Apr-16 | GC-YP-18-Apr-16 | M | 13.9 | 13.0 | 30 | ds | 3 | 0.750 | 1.140 | 28 | - | - | - |
| | | 21-Apr-16 | GC-YP-19-Apr-16 | M | 15.2 | 14.5 | 35 | ds | 3 | 0.818 | 0.709 | 33 | - | - | - |
| | | 21-Apr-16 | GC-YP-20-Apr-16 | M | 14.1 | 13.5 | 31 | ds | 3 | 0.675 | 0.523 | 30 | - | - | - |
| | | 21-Apr-16 | GC-YP-22-Apr-16 | M | 14.8 | 14.0 | 32 | ds | 3 | 0.666 | 0.440 | 31 | - | - | - |
| | | 22-Apr-16 | GC-YP-25-Apr-16 | M | 14.2 | 13.4 | 31 | ds | 3 | 1.069 | 0.441 | 29 | - | - | - |
| | | 22-Apr-16 | GC-YP-26-Apr-16 | M | 16.5 | 15.6 | 44 | ds | 3 | 1.216 | 0.387 | 42 | - | - | - |
| | | 22-Apr-16 | GC-YP-27-Apr-16 | M | 16.0 | 15.4 | 41 | ds | 3 | 0.910 | 0.375 | 40 | - | - | - |
| | | 22-Apr-16 | GC-YP-28-Apr-16 | M | 14.0 | 13.2 | 28 | ds | 3 | 1.360 | 0.509 | 26 | - | - | - |
| | | 22-Apr-16 | GC-YP-29-Apr-16 | M | 13.9 | 13.1 | 28 | ds | 3 | 0.761 | 0.458 | 27 | - | - | - |
| | | 22-Apr-16 | GC-YP-30-Apr-16 | M | 17.2 | 16.4 | 46 | ds | 3 | 0.861 | 0.721 | 44 | - | - | - |
| | | **total sample size** | | **-** | **21** | **21** | **21** | **-** | **21** | **21** | **21** | **21** | **-** | **3** | **-** |
| | | **average** | | **-** | **15** | **14** | **34** | **-** | **3** | **0.89** | **0.57** | **33** | **-** | **0.65** | **-** |
| | | **median** | | **-** | **15** | **14** | **35** | **-** | **3** | **0.86** | **0.51** | **33** | **-** | **0.78** | **-** |
| | | **standard deviation** | | **-** | **1.1** | **1.1** | **6.3** | **-** | **0.22** | **0.25** | **0.21** | **6.3** | **-** | **0.24** | **-** |
| | | **standard error** | | **-** | **0.24** | **0.23** | **1.4** | **-** | **0.048** | **0.053** | **0.047** | **1.4** | **-** | **0.14** | **-** |
| | | **minimum** | | **-** | **12** | **12** | **18** | **-** | **2** | **0.46** | **0.20** | **17** | **-** | **0.37** | **-** |
| | | **maximum** | | **-** | **17** | **16** | **46** | **-** | **3** | **1.4** | **1.1** | **44** | **-** | **0.81** | **-** |

[a] Age structures collected: ds - dorsal spine.

[b] Adjusted body weight represents whole body weight less the liver weight and gonad weight and used for statistical analyses.

### Table F.36: Summary Statistics for Yellow Perch Meristic Data Not Used for the Fish Health Assessment and Collected near Sand Creek, Elk River, and Gold Creek in Koocanusa Reservoir, 2014 to 2016

| Area | Year | Processing Date | Fish ID | Total Length (cm) | Fork Length (cm) | Body Weight (g) | Age Structure Collected[a] | Age | Sex | Abnormalities | Tissue Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sand Creek | 2014 | 12-Apr-14 | SC-YP-01-Apr-14 | 26.0 | 24.5 | 238 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-02-Apr-14 | 14.7 | 14.3 | 40 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-03-Apr-14 | 32.0 | 31.3 | 450 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-04-Apr-14 | 16.0 | 15.1 | 42 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-05-Apr-14 | 17.6 | 16.9 | 54 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-06-Apr-14 | 14.5 | 13.6 | 36 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-07-Apr-14 | 17.7 | 16.6 | 64 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-08-Apr-14 | 14.1 | 13.0 | 32 | sc | - | - | - | - |
| | | 12-Apr-14 | SC-YP-09-Apr-14 | 14.6 | 14.0 | 44 | sc | - | - | - | - |
| | | 21-Aug-14 | SC-YP-01-Aug-14 | 29.0 | 27.2 | 233 | oto, ds | 11 | - | - | muscle |
| | | 21-Aug-14 | SC-YP-02-Aug-14 | 13.6 | 12.9 | 35 | oto, ds | 1 | - | - | muscle |
| | | 21-Aug-14 | SC-YP-03-Aug-14 | 12.1 | 11.8 | 26 | oto, ds | 2 | - | - | muscle |
| | | 23-Aug-14 | SC-YP-04-Aug-14 | 30.1 | 29.0 | 310 | oto, ds | 11 | - | - | muscle |
| | 2015 | 27-Apr-15 | SC-YP-02-Apr-15 | 30.0 | 28.4 | 303 | - | - | - | - | - |
| **total sample size** | | | | **14** | **14** | **14** | **-** | **4** | **-** | **-** | **-** |
| **average** | | | | **20** | **19** | **136** | **-** | **6** | **-** | **-** | **-** |
| **median** | | | | **17** | **16** | **49** | **-** | **7** | **-** | **-** | **-** |
| **standard deviation** | | | | **7.4** | **7.1** | **141** | **-** | **5.5** | **-** | **-** | **-** |
| **standard error** | | | | **2.0** | **1.9** | **38** | **-** | **2.8** | **-** | **-** | **-** |
| **minimum** | | | | **12** | **12** | **26** | **-** | **1** | **-** | **-** | **-** |
| **maximum** | | | | **32** | **31** | **450** | **-** | **11** | **-** | **-** | **-** |
| Elk River | 2015 | 30-Apr-15 | ER-YP-18-Apr-15 | 14.1 | 13.1 | 27 | - | - | - | - | - |
| | 2016 | 26-Apr-16 | ER-YP-31-Apr-16 | 16.0 | 15.4 | 37 | - | - | I | - | - |
| | | 26-Apr-16 | ER-YP-32-Apr-16 | 13.8 | 13.2 | 32 | - | - | I | worms | - |
| **total sample size** | | | | **3** | **3** | **3** | **-** | **-** | **-** | **-** | **-** |
| **average** | | | | **15** | **14** | **32** | **-** | **-** | **-** | **-** | **-** |
| **median** | | | | **14** | **13** | **32** | **-** | **-** | **-** | **-** | **-** |
| **standard deviation** | | | | **1.2** | **1.3** | **5** | **-** | **-** | **-** | **-** | **-** |
| **standard error** | | | | **0.69** | **0.75** | **3** | **-** | **-** | **-** | **-** | **-** |
| **minimum** | | | | **14** | **13** | **27** | **-** | **-** | **-** | **-** | **-** |
| **maximum** | | | | **16** | **15** | **37** | **-** | **-** | **-** | **-** | **-** |
| Gold Creek | 2014 | 20-Feb-14 | GC-YP-01-Feb-14 | 23.0 | 22.0 | 110 | - | - | - | - | - |
| | | 19-Aug-14 | GC-YP-01-Aug-14 | 14.3 | 13.8 | 35 | oto, ds | 2 | - | - | muscle |
| | | 19-Aug-14 | GC-YP-02-Aug-14 | 11.1 | 10.7 | 16 | oto, ds | 1 | - | - | muscle |
| | | 20-Aug-14 | GC-YP-03-Aug-14 | 22.6 | 21.5 | 144 | oto, ds | 3 | F | - | muscle |
| | | 20-Aug-14 | GC-YP-04-Aug-14 | 19.3 | 18.4 | 75 | oto, ds | 3 | - | - | muscle |
| | | 22-Aug-14 | GC-YP-05-Aug-14 | 20.5 | 19.6 | 91 | oto, ds | 3 | F | worms | muscle |
| | | 22-Aug-14 | GC-YP-06-Aug-14 | 17.3 | 16.7 | 53 | ds | 2 | F | - | muscle |
| | | 22-Aug-14 | GC-YP-07-Aug-14 | 22.7 | 22.0 | 135 | oto, ds | 3 | F | - | muscle |
| | | 22-Aug-14 | GC-YP-08-Aug-14 | 17.5 | 16.8 | 62 | oto, ds | 2 | F | - | muscle |
| | | 22-Aug-14 | GC-YP-09-Aug-14 | 18.8 | 17.9 | 63 | oto, ds | 2 | - | - | muscle |
| | | 22-Aug-14 | GC-YP-10-Aug-14 | 15.7 | 14.8 | 42 | oto, ds | 2 | F | - | muscle |
| | 2015 | 25-Apr-15 | GC-YP-13-Apr-15 | 11.4 | 10.2 | 14 | - | - | IF | - | - |
| | 2016 | 21-Apr-16 | GC-YP-08-Apr-16 | 15.5 | 14.6 | 39 | - | - | - | - | - |
| | | 21-Apr-16 | GC-YP-17-Apr-16 | 14.9 | 14.2 | 35 | - | - | - | - | - |
| | | 23-Apr-16 | GC-YP-34-Apr-16 | 15.7 | 14.8 | 39 | - | - | - | - | - |
| **total sample size** | | | | **15** | **15** | **15** | **-** | **10** | **-** | **-** | **-** |
| **average** | | | | **17** | **17** | **63** | **-** | **2** | **-** | **-** | **-** |
| **median** | | | | **17** | **17** | **53** | **-** | **2** | **-** | **-** | **-** |
| **standard deviation** | | | | **3.8** | **3.7** | **40** | **-** | **0.67** | **-** | **-** | **-** |
| **standard error** | | | | **1.0** | **1.0** | **10** | **-** | **0.21** | **-** | **-** | **-** |
| **minimum** | | | | **11** | **10** | **14** | **-** | **1** | **-** | **-** | **-** |
| **maximum** | | | | **23** | **22** | **144** | **-** | **3** | **-** | **-** | **-** |

[a] Age structures collected: sc - scales, oto - otoliths, ds - dorsal spines.

## Table F.37: Summary of Fish Catches at Sand Creek, Oestreich Road, Elk River, Gold Creek Study Areas, February 2014

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bull Trout | Burbot | Largescale Sucker | Northern Pikeminnow | Peamouth Chub | Pumpkin-seed | Rainbow Trout | Redside Shiner | White Sucker | Yellow Perch | | |
| **Sand Creek** | Hoop Netting | Total Caught | 0 | 1 | 0 | 4 | 11 | 1 | 0 | 1 | 0 | 0 | **18** | **6** |
| | | CPUE[a] | 0 | 0.10 | 0 | 0.41 | 1.1 | 0.10 | 0 | 0.10 | 0 | 0 | **1.9** | |
| | Angling | Total Caught | 0 | 5 | 0 | 8 | 0 | 0 | 1 | 0 | 0 | 0 | **14** | |
| | | CPUE[a] | 0 | 4.2 | 0 | 6.8 | 0 | 0 | 0.85 | 0 | 0 | 0 | **12** | |
| **Oestreich Road** | Hoop Netting | Total Caught | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | **2** |
| | | CPUE[a] | 0.11 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0.22** | |
| | Angling | Total Caught | - | - | - | - | - | - | - | - | - | - | **0** | |
| | | CPUE[a] | - | - | - | - | - | - | - | - | - | - | **0** | |
| **Elk River** | Hoop Netting | Total Caught | 0 | 0 | 0 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | **9** | **4** |
| | | CPUE[a] | 0 | 0 | 0 | 0.35 | 0.044 | 0 | 0 | 0 | 0 | 0 | **0.39** | |
| | Angling | Total Caught | 2 | 0 | 0 | 10 | 1 | 0 | 1 | 0 | 0 | 0 | **14** | |
| | | CPUE[a] | 1.3 | 0 | 0 | 6.5 | 0.65 | 0 | 0.65 | 0 | 0 | 0 | **9.2** | |
| **Gold Creek** | Hoop Netting | Total Caught | 0 | 0 | 0 | 5 | 23 | 0 | 0 | 0 | 0 | 1 | **29** | **6** |
| | | CPUE[a] | 0 | 0 | 0 | 0.47 | 2.2 | 0 | 0 | 0 | 0 | 0.095 | **2.8** | |
| | Angling | Total Caught | 1 | 0 | 1 | 26 | 0 | 0 | 2 | 0 | 0 | 0 | **30** | |
| | | CPUE[a] | 0.46 | 0 | 0.46 | 12 | 0 | 0 | 0.91 | 0 | 0 | 0 | **14** | |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area.

**Table F.38:** Summary of Fish Catches at the Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, April 2014

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | | | | | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bull Trout | Burbot | Juvenile Trout | Largescale Sucker | Mountain Whitefish | Northern Pikeminnow | Peamouth Chub | Pumpkin-seed | Rainbow Trout | Redside Shiner | Slimy Sculpin | Westslope Cutthroat Trout | Yellow Perch | | |
| **Sand Creek** | Hoop Netting | Total Caught | 4 | 3 | 1 | 84 | 14 | 11 | 54 | 1 | 3 | 13 | 1 | 1 | 10 | **200** | **13** |
| | | CPUE[a] | 0.078 | 0.058 | 0.019 | 1.6 | 0.27 | 0.21 | 1.1 | 0.019 | 0.058 | 0.25 | 0.019 | 0.019 | 0.19 | **3.9** | |
| | Angling | Total Caught | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 3.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3.0** | |
| **Elk River** | Hoop Netting | Total Caught | 1 | 2 | 0 | 217 | 2 | 23 | 64 | 0 | 0 | 0 | 0 | 0 | 3 | **312** | **7** |
| | | CPUE[a] | 0.021 | 0.041 | 0 | 4.5 | 0.041 | 0.48 | 1.3 | 0 | 0 | 0 | 0 | 0 | 0.062 | **6.5** | |
| | Angling | Total Caught | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| **Gold Creek** | Hoop Netting | Total Caught | 0 | 0 | 0 | 3 | 0 | 25 | 38 | 0 | 0 | 1 | 0 | 0 | 4 | **71** | **5** |
| | | CPUE[a] | 0 | 0 | 0 | 0.11 | 0 | 0.95 | 1.4 | 0 | 0 | 0.038 | 0 | 0 | 0.15 | **2.7** | |
| | Angling | Total Caught | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area.

**Table F.39:** **Summary of Fish Catches at the Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, August 2014**

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | | | | | | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bull Trout | Burbot | Kokanee | Largescale Sucker | Longnose Sucker | Mountain Whitefish | Northern Pikeminnow | Peamouth Chub | Pumpkinseed | Rainbow Trout | Redside Shiner (adult) | Redside Shiner (juvenile) | Westslope Cutthroat Trout | Yellow Perch | | |
| **Sand Creek** | Hoop Netting | Total Caught | 1 | 1 | 28 | 50 | 0 | 0 | 43 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | **128** | **9** |
| | | CPUE[a] | 0.045 | 0.045 | 1.3 | 2.3 | 0 | 0 | 2.0 | 0.14 | 0 | 0 | 0 | 0 | 0 | 0.091 | **5.8** | |
| | Angling | Total Caught | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| | Seining | Total Caught | 0 | 0 | 0 | 200 | 0 | 0 | 40 | 0 | 1 | 0 | 75 | 62 | 0 | 15 | **393** | |
| | | CPUE[a] | 0 | 0 | 0 | 1.7 | 0 | 0 | 0.34 | 0 | 0.0086 | 0 | 0.65 | 0.53 | 0 | 0.13 | **3.4** | |
| **Elk River** | Hoop Netting | Total Caught | 1 | 0 | 24 | 60 | 2 | 0 | 73 | 4 | 0 | 0 | 10 | 0 | 1 | 0 | **175** | **8** |
| | | CPUE[a] | 0.037 | 0 | 0.88 | 2.2 | 0.073 | 0 | 2.7 | 0.15 | 0 | 0 | 0.37 | 0 | 0.037 | 0 | **6.4** | |
| | Angling | Total Caught | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | |
| | | CPUE[a] | 0 | 0 | 3.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3.0** | |
| | Seining | Total Caught | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 50 | 250 | 0 | 0 | **310** | |
| | | CPUE[a] | 0 | 0 | 0 | 0.22 | 0 | 0 | 0.22 | 0 | 0 | 0 | 2.2 | 11 | 0 | 0 | **13** | |
| **Gold Creek** | Hoop Netting | Total Caught | 0 | 0 | 0 | 45 | 0 | 1 | 68 | 1 | 1 | 0 | 1 | 0 | 3 | 53 | **173** | **10** |
| | | CPUE[a] | 0 | 0 | 0 | 1.6 | 0 | 0.036 | 2.4 | 0.036 | 0.036 | 0 | 0.036 | 0 | 0.11 | 1.9 | **6.2** | |
| | Angling | Total Caught | 0 | 0 | 9 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **12** | |
| | | CPUE[a] | 0 | 0 | 12 | 0 | 0 | 0 | 2.7 | 0 | 0 | 1.4 | 0 | 0 | 0 | 0 | **16** | |
| | Seining | Total Caught | 0 | 0 | 0 | 29 | 0 | 0 | 3 | 13 | 0 | 0 | 200 | 500 | 0 | 22 | **767** | |
| | | CPUE[a] | 0 | 0 | 0 | 0.62 | 0 | 0 | 0.065 | 0.28 | 0 | 0 | 4.3 | 11 | 0 | 0.47 | **17** | |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area.

**Table F.40:** Summary of Fish Catches at Sand Creek and Elk River study areas in Koocanusa Reservoir, February 2015[a]

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Bull Trout | Burbot | Northern Pikeminnow | Peamouth Chub | Redside Shiner | | |
| **Sand Creek** | Burbot Trap | Total Caught | 1 | 0 | 2 | 6 | 0 | **9** | **3** |
| | | CPUE[b] | 0.049 | 0 | 0.10 | 0.30 | 0 | **0.44** | |
| | Angling | Total Caught | 0 | 0 | 3 | 2 | 0 | **5** | |
| | | CPUE[b] | 0 | 0 | 14 | 9.4 | 0 | **24** | |
| **Elk River** | Burbot Trap | Total Caught | 0 | 1 | 1 | 5 | 4 | **11** | **4** |
| | | CPUE[b] | 0 | 0.020 | 0.020 | 0.10 | 0.08 | **0.22** | |
| | Angling | Total Caught | 0 | 0 | 14 | 1 | 0 | **15** | |
| | | CPUE[b] | 0 | 0 | 13 | 0.95 | 0 | **14** | |

[a] Gold Creek was not sampled as the ice at Gold Creek mouth was too thin, which presented a risk to health and safety.

[b] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area (i.e., number of fish per angler per 24 hour period, number of fish per burbot trap per 24 hour period).

**Table F.41:** **Summary of Fish Catches at the Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, April 2015**

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | | | | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bull Trout | Burbot | Kokanee | Longnose Sucker | Largescale Sucker | Mountain Whitefish | Northern Pikeminnow | Peamouth Chub | Rainbow Trout | Redside Shiner | Westslope Cutthroat Trout | Yellow Perch | | |
| **Sand Creek** | Angling | Total Caught | 1 | 0 | 1 | 0 | 0 | 0 | 72 | 42 | 0 | 0 | 1 | 0 | **117** | **10** |
| | | CPUE[a] | 0.79 | 0 | 0.79 | 0 | 0 | 0 | 74 | 43 | 0 | 0 | 0.79 | 0 | **120** | |
| | Burbot Trapping | Total Caught | 0 | 2 | 1 | 0 | 2 | 0 | 34 | 8 | 0 | 2 | 0 | 2 | **51** | |
| | | CPUE[a] | 0 | 0.041 | 0.020 | 0 | 0.041 | 0 | 0.70 | 0.16 | 0 | 0.041 | 0 | 0.041 | **1.0** | |
| | Hoop Netting | Total Caught | 2 | 3 | 0 | 6 | 9 | 0 | 44 | 18 | 0 | 7 | 0 | 30 | **119** | |
| | | CPUE[a] | 0.082 | 0.12 | 0 | 0.25 | 0.37 | 0 | 1.8 | 0.74 | 0 | 0.29 | 0 | 1.2 | **4.9** | |
| | Minnow Trapping | Total Caught | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| **Elk River** | Angling | Total Caught | 0 | 0 | 1 | 0 | 0 | 0 | 45 | 114 | 0 | 0 | 0 | 0 | **160** | **9** |
| | | CPUE[a] | 0 | 0 | 0.90 | 0 | 0 | 0 | 41 | 103 | 0 | 0 | 0 | 0 | **144** | |
| | Burbot Trapping | Total Caught | 1 | 0 | 0 | 0 | 0 | 0 | 48 | 45 | 0 | 4 | 0 | 0 | **98** | |
| | | CPUE[a] | 0.021 | 0 | 0 | 0 | 0 | 0 | 1.0 | 0.94 | 0 | 0.084 | 0 | 0 | **2.1** | |
| | Hoop Netting | Total Caught | 0 | 2 | 0 | 3 | 43 | 0 | 45 | 23 | 0 | 11 | 0 | 42 | **169** | |
| | | CPUE[a] | 0 | 0.10 | 0 | 0.15 | 2.2 | 0 | 2.3 | 1.2 | 0 | 0.57 | 0 | 2.2 | **8.7** | |
| | Minnow Trapping | Total Caught | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | **4** | |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.33 | 0 | 0 | **0.33** | |
| **Gold Creek** | Angling | Total Caught | 1 | 0 | 0 | 0 | 0 | 0 | 61 | 92 | 1 | 0 | 0 | 0 | **155** | **9** |
| | | CPUE[a] | 0.63 | 0 | 0 | 0 | 0 | 0 | 38 | 58 | 0.63 | 0 | 0 | 0 | **97** | |
| | Burbot Trapping | Total Caught | 0 | 1 | 0 | 0 | 0 | 0 | 30 | 17 | 0 | 1 | 0 | 7 | **56** | |
| | | CPUE[a] | 0 | 0.021 | 0 | 0 | 0 | 0 | 0.64 | 0.36 | 0 | 0.02 | 0 | 0.15 | **1.2** | |
| | Hoop Netting | Total Caught | 1 | 0 | 0 | 0 | 23 | 1 | 15 | 30 | 0 | 9 | 0 | 32 | **111** | |
| | | CPUE[a] | 0.073 | 0 | 0 | 0 | 1.7 | 0.073 | 1.1 | 2.2 | 0 | 0.66 | 0 | 2.3 | **8.1** | |
| | Minnow Trapping | Total Caught | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** | |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area (i.e., number of fish per angler per 24 hour period, number of fish per trap or hoop net per 24 hour period).

**Table F.42:** **Summary of Fish Catches at the Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, August 2015**

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Kokanee | Largescale Sucker | Northern Pikeminnow | Peamouth Chub | Yellow Perch | | |
| **Sand Creek** | Angling | Total Caught | 0 | 0 | 0 | 0 | 0 | **0** | **5** |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | **0** | |
| | Hoop Netting | Total Caught | 10 | 32 | 40 | 5 | 2 | **89** | |
| | | CPUE[a] | 2.0 | 6.5 | 8.1 | 1.0 | 0.41 | **18** | |
| **Elk River** | Angling | Total Caught | 0 | 0 | 20 | 2 | 0 | **22** | **4** |
| | | CPUE[a] | 0 | 0 | 56 | 5.6 | 0 | **62** | |
| | Hoop Netting | Total Caught | 11 | 11 | 5 | 1 | 0 | **28** | |
| | | CPUE[a] | 12 | 12 | 5.3 | 1.1 | 0 | **30** | |
| **Gold Creek** | Angling | Total Caught | 0 | 0 | 19 | 0 | 0 | **19** | **3** |
| | | CPUE[a] | 0 | 0 | 44 | 0 | 0 | **44** | |
| | Hoop Netting | Total Caught | 0 | 2 | 4 | 1 | 0 | **7** | |
| | | CPUE[a] | 0 | 0.68 | 1.4 | 0.34 | 0 | **2.4** | |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area (i.e., number of fish per angler per 24 hour period, number of fish per hoop net per 24 hour period).

**Table F.43: Summary of Fish Catches at the Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, April 2016**

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | | | | | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bull Trout | Burbot | Kokanee | Largescale Sucker | Longnose Sucker | Mountain Whitefish | Northern Pikeminnow | Peamouth Chub | Rainbow Trout | Redside Shiner | Sculpin | Westslope Cutthroat Trout | Yellow Perch | | |
| **Sand Creek** | Angling | Total Caught | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | **5** | **13** |
| | | CPUE[a] | 3.3 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | **16** | |
| | Gill Netting | Total Caught | 8 | 0 | 1 | 55 | 1 | 0 | 84 | 567 | 4 | 89 | 0 | 1 | 4 | **814** | |
| | | CPUE[a] | 0.35 | 0 | 0.40 | 2.4 | 0.40 | 0 | 3.7 | 25 | 0.18 | 3.9 | 0 | 0.40 | 0.18 | **37** | |
| | Hoop Netting | Total Caught | 14 | 10 | 0 | 179 | 12 | 1 | 70 | 37 | 0 | 1 | 1 | 2 | 34 | **361** | |
| | | CPUE[a] | 0.92 | 0.65 | 0 | 12 | 0.79 | 0.065 | 4.6 | 2.4 | 0 | 0.065 | 0.065 | 0.13 | 2.2 | **24** | |
| **Elk River** | Angling | Total Caught | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 14 | 0 | 0 | 0 | 0 | 0 | **18** | **12** |
| | | CPUE[a] | 9.9 | 0 | 0 | 0 | 0 | 0 | 9.9 | 70 | 0 | 0 | 0 | 0 | 0 | **89** | |
| | Gill Netting | Total Caught | 13 | 0 | 4 | 38 | 0 | 0 | 137 | 177 | 2 | 73 | 0 | 2 | 3 | **449** | |
| | | CPUE[a] | 0.47 | 0 | 0.15 | 1.4 | 0 | 0 | 5.0 | 6.4 | 0.70 | 2.7 | 0 | 0.070 | 0.11 | **17** | |
| | Hoop Netting | Total Caught | 1 | 11 | 0 | 136 | 5 | 1 | 18 | 21 | 0 | 3 | 0 | 0 | 30 | **226** | |
| | | CPUE[a] | 0.076 | 0.84 | 0 | 10 | 0.38 | 0.076 | 1.4 | 1.6 | 0 | 0.23 | 0 | 0 | 2.3 | **17** | |
| **Gold Creek** | Angling | Total Caught | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 28 | 0 | 0 | 0 | 0 | 0 | **35** | **10** |
| | | CPUE[a] | 0 | 0 | 0 | 0 | 0 | 0 | 8.4 | 34 | 0 | 0 | 0 | 0 | 0 | **42** | |
| | Gill Netting | Total Caught | 8 | 0 | 0 | 152 | 0 | 2 | 105 | 242 | 4 | 62 | 0 | 3 | 34 | **612** | |
| | | CPUE[a] | 0.16 | 0 | 0 | 2.9 | 0 | 0.040 | 2.0 | 4.7 | 0.080 | 1.2 | 0 | 0.060 | 0.66 | **12** | |
| | Hoop Netting | Total Caught | 0 | 0 | 0 | 43 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 37 | **84** | |
| | | CPUE[a] | 0 | 0 | 0 | 5.5 | 0.13 | 0 | 0.26 | 0.13 | 0 | 0 | 0 | 0 | 4.8 | **11** | |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area (i.e., number of fish per angler per 24 hour period, number of fish per gill or hoop net per 24 hour period).

## Table F.44: Summary of Fish Catches at the Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, August 2016

| Study Area | Fishing Method | Summary Statistic | Fish Species | | | | | Total by Fishing Method | Total No. Species (all methods) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Kokanee | Largescale Sucker | Mountain Whitefish | Northern Pikeminnow | Yellow Perch | | |
| **Sand Creek** | Gill Netting | Total Caught | 4 | 58 | 5 | 10 | 3 | **80** | **5** |
| | | CPUE[a] | 0.12 | 1.8 | 0.16 | 0.31 | 0.093 | **2.5** | |
| **Elk River** | Gill Netting | Total Caught | 10 | 25 | 11 | 10 | 0 | **56** | **4** |
| | | CPUE[a] | 0.73 | 1.9 | 0.81 | 0.73 | 0 | **4.2** | |
| **Gold Creek** | Gill Netting | Total Caught | 0 | 48 | 0 | 11 | 0 | **59** | **2** |
| | | CPUE[a] | 0 | 3.2 | 0 | 0.72 | 0 | **3.9** | |

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for a fishing method in a study area (i.e., number of fish per angler per 24 hour period, number of fish per hoop net per 24 hour period).

**Table F.45:** Summary of Externally and Internally Observed Fish Abnormalities at Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, 2014

| Fish Species | Study Area | External | | | Internal | | | | Total Proportion of Fish with Abnormalities |
|---|---|---|---|---|---|---|---|---|---|
| | | Sample Size | Damage to Fins, Eye, Operculum, or Scales | Cysts | Sample Size | Excessive Internal Connective Tissue | Parasites | Irregular Size or Discolouration of Liver or Gonads | |
| **Peamouth Chub (April)** | Sand Creek | 36 | 0% | 0% | 36 | 0% | 19% | 2.8% | 22% |
| | Elk River | 33 | 3.0% | 0% | 33 | 0% | 9.1% | 3.0% | 15% |
| | Gold Creek | 34 | 0% | 0% | 34 | 0% | 35% | 0% | 35% |
| **All Other Fish Species (February, April, August)** | Sand Creek[a] | 127 | 0.79% | 0% | 50 | 0% | 0% | 6.0% | 6.8% |
| | Elk River[b] | 105 | 0% | 0% | 46 | 0% | 0% | 0% | 0% |
| | Gold Creek | 102 | 0% | 0% | 38 | 0% | 2.6% | 0% | 2.6% |

[a] Includes fish caught from the Oestreich Road sampling location in Koocanusa reservoir, February 2014.

[b] Includes fish caught from the Englishmen Creek sampling location in Koocanusa reservoir, February 2014.

## Table F.46: Summary of Externally and Internally Observed Fish Abnormalities at Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, 2015

| Fish Species | Study Area | External | | | Internal | | | | Total Proportion of Fish with Abnormalities |
|---|---|---|---|---|---|---|---|---|---|
| | | Sample Size | Damage to Fins, Eye, Operculum, or Scales | Cysts | Sample Size | Excessive Internal Connective Tissue | Parasites[a] | Irregular Size or Discolouration of Liver or Gonads | |
| **Largescale Sucker (April)** | Sand Creek | 7 | 14% | 0% | 7 | 0% | 0% | 0% | 14% |
| | Elk River | 19 | 0% | 0% | 17 | 0% | 0% | 0% | 0% |
| | Gold Creek | 18 | 0% | 0% | 16 | 0% | 0% | 0% | 0% |
| **Northern Pikeminnow (April)** | Sand Creek | 41 | 0% | 0% | 41 | 0% | 0% | 0% | 0% |
| | Elk River | 41 | 2.4% | 0% | 41 | 0% | 0% | 0% | 2.4% |
| | Gold Creek | 41 | 0% | 0% | 41 | 0% | 2.4% | 0% | 2.4% |
| **Peamouth Chub (April)** | Sand Creek | 50 | 2.0% | 0% | 50 | 2.0% | 10% | 0% | 14% |
| | Elk River | 55 | 1.8% | 1.8% | 54 | 0% | 1.9% | 0% | 5.5% |
| | Gold Creek | 57 | 0% | 0% | 57 | 0% | 5.3% | 0% | 5.3% |
| **Redside Shiner (April)** | Sand Creek | 9 | 0% | 0% | 8 | 0% | 11% | 0% | 11% |
| | Elk River | 16 | 0% | 0% | 13 | 0% | 46% | 0% | 46% |
| | Gold Creek | 10 | 0% | 0% | 6 | 0% | 83% | 0% | 83% |
| **Yellow Perch (April)** | Sand Creek | 27 | 0% | 0% | 26 | 0% | 0.038% | 0% | 0.038% |
| | Elk River | 38 | 0% | 0% | 33 | 0% | 3.0% | 0% | 3.0% |
| | Gold Creek | 36 | 0% | 0% | 35 | 0% | 2.9% | 0% | 2.9% |
| **All Other Fish Species (February, April, August)** | Sand Creek | 17 | 0% | 0% | 9 | 0% | 0% | 0% | 0% |
| | Elk River | 15 | 6.7% | 0% | 10 | 0% | 0% | 0% | 6.7% |
| | Gold Creek | 3 | 0% | 0% | 1 | 0% | 0% | 0% | 0% |

[a] Parasites found were almost exclusively tapeworms; however, parasitic flukes (*Clinostomum marginatum* ) were observed on northern pikeminnow at Gold Creek.

## Table F.47: Summary of Externally and Internally Observed Fish Abnormalities at Sand Creek, Elk River, and Gold Creek Study Areas in Koocanusa Reservoir, 2016

| Fish Species | Study Area | External | | | Internal | | | | Total Proportion of Fish with Abnormalities |
|---|---|---|---|---|---|---|---|---|---|
| | | Sample Size | Damage to Fins, Eye, Operculum, or Scales | Cysts | Sample Size | Excessive Internal Connective Tissue | Parasites[a] | Irregular Size or Discolouration of Liver or Gonads | |
| **Largescale Sucker (April)** | Sand Creek | 42 | 7.1% | 0% | 32 | 0% | 6.3% | 0% | 13% |
| | Elk River | 37 | 0% | 0% | 33 | 0% | 0% | 0% | 0% |
| | Gold Creek | 35 | 0% | 0% | 31 | 0% | 19% | 0% | 19% |
| **Northern Pikeminnow (April)** | Sand Creek | 42 | 2.4% | 0% | 39 | 0% | 7.7% | 0% | 10% |
| | Elk River | 43 | 0% | 0% | 41 | 0% | 2.4% | 0% | 2.4% |
| | Gold Creek | 33 | 0% | 0% | 32 | 0% | 3.1% | 0% | 3.1% |
| **Peamouth Chub (April)** | Sand Creek | 50 | 0% | 0% | 50 | 0% | 38% | 0% | 38% |
| | Elk River | 56 | 0% | 1.8% | 53 | 0% | 23% | 0% | 24% |
| | Gold Creek | 68 | 0% | 0% | 66 | 0% | 23% | 0% | 23% |
| **Redside Shiner (April)** | Sand Creek | 43 | 0% | 0% | 43 | 0% | 30% | 0% | 30% |
| | Elk River | 42 | 4.8% | 0% | 42 | 0% | 38% | 0% | 43% |
| | Gold Creek | 44 | 0% | 0% | 43 | 0% | 37% | 0% | 37% |
| **Yellow Perch (April)** | Sand Creek | 34 | 0% | 0% | 34 | 0% | 2.9% | 0% | 2.9% |
| | Elk River | 35 | 0% | 0% | 35 | 0% | 20% | 0% | 20% |
| | Gold Creek | 42 | 0% | 0% | 42 | 0% | 7.1% | 0% | 7.1% |
| **All Other Fish Species[a] (April, August)** | Sand Creek | 27 | 0% | 0% | 3 | 0% | 0% | 0% | 0% |
| | Elk River | 30 | 0% | 0% | 5 | 0% | 0% | 0% | 0% |
| | Gold Creek | 10 | 0% | 10% | 8 | 0% | 0% | 0% | 10% |

[a] Parasites found were exclusively tapeworms; almost all tapeworms were found in body cavity except one found within the operculum of a largescale sucker in Gold Creek.

# APPENDIX G

# TISSUE CHEMISTRY DATA

**Table G.1:** **Metal Concentrations in Zooplankton (August) and Benthic Invertebrates (April and August) in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Tissue Type | Sample Dry Weight (g) | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw | Ga µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | T2-2 ZOOT-14 | Zooplankton | 0.18 | 99.6 | 0.0525 | 1,300 | 3.36 | 2.5 | 36.4 | 0.0514 | 0.0156 | 18,600 | 1.14 | 0.62 | 2.43 | 0.143 | 9.19 | 1,010 | 0.392 |
| | T2-3 ZOOT-14 | Zooplankton | 0.16 | 99.7 | 0.038 | 981 | 3.1 | 2.08 | 33.3 | 0.043 | 0.0139 | 18,000 | 0.966 | 0.437 | 1.73 | 0.12 | 8.57 | 737 | 0.29 |
| | T2-4 ZOOT-14 | Zooplankton | 0.17 | 99.7 | 0.0365 | 989 | 3.07 | 1.94 | 32.5 | 0.048 | 0.0106 | 18,400 | 1.02 | 0.449 | 1.4 | 0.127 | 8.31 | 696 | 0.278 |
| | T2-5 ZOOT-14 | Zooplankton | 0.19 | 99.6 | 0.0374 | 1,040 | 3.43 | 1.86 | 31.2 | 0.0546 | 0.00996 | 17,400 | 0.971 | 0.473 | 1.28 | 0.13 | 7.26 | 680 | 0.294 |
| | T2-6 ZOOT-14 | Zooplankton | 0.29 | 99.4 | 0.0387 | 1,250 | 3.6 | 1.65 | 29.9 | 0.053 | 0.0127 | 17,100 | 1.025 | 0.566 | 1.54 | 0.15 | 7.08 | 812 | 0.382 |
| | T4-2 ZOOT-14 | Zooplankton | 0.20 | 99.6 | 0.0335 | 1,150 | 3.34 | 1.82 | 34.3 | 0.0563 | 0.0122 | 19,100 | 0.926 | 0.598 | 1.62 | 0.125 | 7.62 | 835 | 0.333 |
| | T4-3 ZOOT-14 | Zooplankton | 0.11 | 99.8 | 0.0768 | 982 | 3.2 | 2.68 | 41.6 | 0.0517 | 0.0243 | 23,600 | 1.1 | 0.496 | 1.58 | 0.111 | 8.87 | 746 | 0.298 |
| | T4-4 ZOOT-14 | Zooplankton | 0.14 | 99.7 | 0.0432 | 1,050 | 3.34 | 2.6 | 41.3 | 0.0466 | 0.0211 | 24,400 | 1.02 | 0.539 | 1.63 | 0.12 | 6.92 | 805 | 0.301 |
| | T4-5 ZOOT-14 | Zooplankton | 0.10 | 99.8 | 0.049 | 1,070 | 3.23 | 2.78 | 39.5 | 0.0475 | 0.0336 | 22,600 | 1.05 | 0.521 | 1.88 | 0.118 | 8.3 | 731 | 0.309 |
| | T4-6 ZOOT-153-14 | Zooplankton | 0.11 | 99.8 | 0.069 | 1,160 | 3.09 | 3.04 | 48.1 | 0.046 | 0.0152 | 23,500 | 1.67 | 0.464 | 1.46 | 0.131 | 19.1 | 708 | 0.338 |
| | T4-6 ZOOT-60-14 | Zooplankton | 0.052 | 99.9 | 0.0715 | 5,110 | 3.6 | 6.7 | 85.3 | 0.187 | 0.0628 | 27,600 | 1.46 | 1.33 | 6.57 | 0.492 | 14.9 | 3,090 | 1.59 |
| | T2-B-APR-14 | Benthos | 0.12 | 78.3 | 0.124 | 10,500 | 5.43 | 8.91 | 131 | 0.372 | 0.132 | 44,200 | 2.49 | 5.34 | 13.6 | 1.51 | 42.3 | 11,200 | 3.51 |
| | T4-B-APR-14 | Benthos | 0.17 | 79.8 | 0.0983 | 6,130 | 5.5 | 7.25 | 103 | 0.288 | 0.0964 | 20,500 | 2.72 | 3.67 | 8.42 | 0.916 | 22.9 | 8,500 | 2.11 |
| | T2-B-AUG-14 | Benthos | 0.039 | 95.9 | 0.0786 | 8,210 | 7.02 | 6 | 97.4 | 0.258 | 0.131 | 36,900 | 0.751 | 4.98 | 9.78 | 0.912 | 17.8 | 9,290 | 3.08 |
| | T4-B-AUG-14 | Benthos | 0.017 | 95.8 | 0.224 | 4,870 | 4.61 | 6.7 | 316 | 0.223 | 0.0566 | 14,600 | 2.51 | 4.01 | 5.72 | 0.507 | 20.8 | 3,460 | 1.66 |
| 2015 | TN-01-ZOOT-15 | Zooplankton | 0.034 | 99.9 | 0.0385 | 477 | 3.78 | 8.4 | 61.8 | <0.024 | 0.0242 | 45,300 | 0.773 | 0.359 | 2.31 | 0.0726 | 8.1 | 456 | 0.165 |
| | TN-02-ZOOT-15 | Zooplankton | 0.037 | 99.9 | 0.0313 | 645 | 3.86 | 8.2 | 67.6 | 0.027 | 0.0317 | 54,800 | 0.717 | 0.391 | 1.54 | 0.0895 | 8.82 | 543 | 0.213 |
| | TN-03-ZOOT-15 | Zooplankton | 0.041 | 99.9 | 0.0438 | 431 | 3.84 | 4.5 | 48.1 | <0.024 | 0.0132 | 37,900 | 0.814 | 0.354 | 1.13 | 0.076 | 7.66 | 459 | 0.135 |
| | TN-04-ZOOT-15 | Zooplankton | 0.014 | 100.0 | 0.065 | 1,290 | 10.1 | 37 | 292 | <0.20 | 0.035 | 221,000 | 1.72 | 0.893 | 2.88 | 0.177 | 17.3 | 1,350 | 0.495 |
| | TN-05-ZOOT-15 | Zooplankton | 0.035 | 99.9 | 0.0264 | 229 | 3.59 | 2.9 | 35.5 | <0.022 | 0.0113 | 27,100 | 0.702 | 0.246 | 1.97 | 0.0507 | 7.42 | 232 | 0.0739 |
| | T4-01-ZOOT-15 | Zooplankton | 0.030 | 99.9 | 0.0487 | 344 | 3.51 | 9.9 | 70.9 | <0.027 | 0.009 | 48,600 | 0.777 | 0.283 | 1.1 | 0.0483 | 6.63 | 255 | 0.105 |
| | T4-02-ZOOT-15 | Zooplankton | 0.023 | 99.9 | 0.068 | 584 | 7.35 | 15 | 133 | <0.11 | 0.0196 | 90,900 | 1.96 | 0.603 | 2.29 | 0.0927 | 17.2 | 538 | 0.221 |
| | T4-03-ZOOT-15 | Zooplankton | 0.013 | 100.0 | 0.0199 | 700 | 2.54 | 12.4 | 116 | <0.076 | 0.0142 | 86,300 | 0.464 | 0.353 | 1.15 | 0.104 | 6.61 | 1,390 | 0.274 |
| | T4-04-ZOOT-15 | Zooplankton | 0.013 | 100.0 | 0.0157 | 206 | 2.3 | 14.7 | 105 | <0.075 | 0.0065 | 75,900 | 0.595 | 0.214 | 0.553 | 0.0301 | 5.06 | 206 | 0.082 |
| | T4-05-ZOOT-15 | Zooplankton | 0.018 | 100.0 | 0.0221 | 235 | 2.8 | 8.2 | 90.9 | <0.046 | 0.008 | 65,100 | 0.507 | 0.221 | 1.14 | 0.033 | 6.26 | 234 | 0.088 |
| | T2-B-APR-15 | Benthos | 0.052 | 86.9 | 0.121 | 11,400 | 3.4 | 10.7 | 98.6 | 0.344 | 0.109 | 37,000 | 3.42 | 3.64 | 12.8 | 1.28 | 31 | 9,590 | 3.69 |
| | T4-B-APR-15 | Benthos | 0.046 | 87.4 | 0.103 | 6,730 | 2.92 | 7 | 96.3 | 0.194 | 0.0629 | 23,300 | 3.4 | 2.36 | 7.49 | 0.726 | 21.2 | 5,050 | 2.13 |
| | TN-B-AUG-15 | Benthos | 0.083 | 65.1 | 0.104 | 6,360 | 7.87 | 3.48 | 88.2 | 0.27 | 0.147 | 248,000 | 0.339 | 3.91 | 8.35 | 0.857 | 15.8 | 9,750 | 2.42 |
| | T4-B-AUG-15 | Benthos | 0.032 | 76.8 | 0.207 | 7,960 | 5.12 | 12.8 | 417 | 0.292 | 0.0794 | 27,500 | 2.28 | 5.61 | 8.71 | 0.83 | 19.6 | 6,150 | 2.55 |
| 2016 | TN-01-ZooT-Aug-16 | Zooplankton | 0.081 | 99.8 | 0.0314 | 770 | 2.82 | 3.43 | 60.3 | 0.0276 | 0.0175 | 48,500 | 0.841 | 0.418 | 1.27 | 0.109 | 7.02 | 629 | 0.261 |
| | TN-02-ZooT-Aug-16 | Zooplankton | 0.078 | 99.8 | 0.0303 | 483 | 3.17 | 3.63 | 52.1 | 0.013 | 0.0112 | 46,700 | 0.85 | 0.37 | 0.755 | 0.0924 | 6.61 | 427 | 0.166 |
| | TN-03-ZooT-Aug-16 | Zooplankton | 0.061 | 99.9 | 0.0274 | 617 | 2.64 | 3.69 | 72.7 | 0.026 | 0.012 | 61,000 | 0.753 | 0.391 | 1 | 0.0897 | 6.08 | 587 | 0.206 |
| | TN-04-ZooT-Aug-16 | Zooplankton | 0.076 | 99.8 | 0.0264 | 584 | 2.8 | 3.74 | 63.7 | <0.0092 | 0.00858 | 54,200 | 0.765 | 0.35 | 0.86 | 0.0887 | 6.04 | 456 | 0.198 |
| | TN-05-ZooT-Aug-16 | Zooplankton | 0.077 | 99.8 | 0.0216 | 511 | 2.12 | 3.54 | 52.6 | 0.0268 | 0.0102 | 45,600 | 0.606 | 0.281 | 0.893 | 0.0769 | 4.74 | 419 | 0.175 |
| | T4-02-ZooT-Aug-16 | Zooplankton | 0.072 | 99.8 | 0.0422 | 1,850 | 3.21 | 4.6 | 78.9 | 0.042 | 0.0458 | 40,000 | 0.937 | 1.03 | 4.18 | 0.192 | 10.5 | 2,000 | 0.703 |
| | T4-03-ZooT-Aug-16 | Zooplankton | 0.060 | 99.9 | 0.0263 | 996 | 1.71 | 3.8 | 41.3 | 0.0366 | 0.022 | 25,500 | 0.611 | 0.42 | 1.58 | 0.108 | 6.45 | 775 | 0.348 |
| | T4-04-ZooT-Aug-16 | Zooplankton | 0.050 | 99.9 | 0.0348 | 1,460 | 2.81 | 6.48 | 70.2 | 0.043 | 0.0321 | 44,900 | 0.878 | 0.612 | 2.43 | 0.167 | 8.6 | 1,110 | 0.521 |
| | T4-05-ZooT-Aug-16 | Zooplankton | 0.044 | 99.9 | 0.0374 | 1,520 | 2.87 | 7.49 | 75.5 | 0.061 | 0.0413 | 47,600 | 0.918 | 0.686 | 2.72 | 0.171 | 9.72 | 1,270 | 0.532 |
| | T4-06-ZooT-Aug-16 | Zooplankton | 0.087 | 99.8 | 0.0281 | 679 | 2.4 | 3.34 | 50 | 0.0278 | 0.00803 | 40,100 | 0.966 | 0.356 | 1.52 | 0.0912 | 5.85 | 567 | 0.233 |
| | TN-BIT-Aug-16 | Benthos | 0.04 | 92.5 | 0.0598 | 9,120 | 8.26 | 7.18 | 101 | 0.287 | 0.138 | 46,200 | 0.599 | 4.67 | 11.9 | 1.14 | 15.6 | 12,200 | 3.52 |
| | T4-BIT-Aug-16 | Benthos | 0.029 | 78.4 | 0.191 | 4,770 | 7.76 | 7.43 | 200 | 0.192 | 0.0682 | 112,000 | 2.71 | 2.59 | 6.21 | 0.588 | 23.2 | 6,070 | 1.76 |
| | TN-BIT-1-Apr-16 | Benthos | 0.31 | 65.0 | 0.0346 | 2,690 | 2.84 | 7.64 | 27.8 | 0.038 | 0.0692 | 10,700 | 1.71 | 0.944 | 3.01 | 0.259 | 24.7 | 3,280 | 0.999 |
| | T4-BIT-1-Apr-16 | Benthos | 0.20 | 78.0 | 0.167 | 11,500 | 3.24 | 12 | 125 | 0.377 | 0.125 | 41,800 | 5.36 | 3.35 | 14 | 1.41 | 37.2 | 8,890 | 4.33 |

**Table G.1: Metal Concentrations in Zooplankton (August) and Benthic Invertebrates (April and August) in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Tissue Type | Hg | K | Li | Mg | Mn | Mo | Na | Ni | P | Pb | Rb | Re | Sb | Se | Sn | Sr | Th |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw |
| 2014 | T2-2 ZOOT-14 | Zooplankton | 0.0311 | 6,860 | 1.57 | 3,040 | 64.3 | 0.382 | 2,970 | 1.91 | 9,410 | 5.18 | 9.43 | 0.00179 | 0.0327 | 2.32 | 0.56 | 60.9 | 0.258 |
| | T2-3 ZOOT-14 | Zooplankton | 0.0304 | 5,790 | 1.25 | 2,990 | 48 | 0.34 | 2,630 | 1.54 | 10,100 | 1.79 | 9.42 | 0.00111 | 0.0147 | 2.33 | 0.372 | 63.7 | 0.183 |
| | T2-4 ZOOT-14 | Zooplankton | 0.0322 | 7,500 | 1.23 | 3,170 | 48 | 0.348 | 3,230 | 1.4 | 10,700 | 1.25 | 11.2 | 0.0013 | 0.0127 | 2.59 | 0.272 | 65.2 | 0.179 |
| | T2-5 ZOOT-14 | Zooplankton | 0.0323 | 7,880 | 1.27 | 3,030 | 49.9 | 0.355 | 3,420 | 1.41 | 9,700 | 1.04 | 11.6 | 0.00137 | 0.0183 | 2.61 | 0.15 | 61.4 | 0.181 |
| | T2-6 ZOOT-14 | Zooplankton | 0.0321 | 7,530 | 1.34 | 2,720 | 58.4 | 0.307 | 3,030 | 1.61 | 9,610 | 1.11 | 12.2 | 0.000982 | 0.0135 | 2.64 | 0.147 | 56.0 | 0.229 |
| | T4-2 ZOOT-14 | Zooplankton | 0.0312 | 7,200 | 1.38 | 3,020 | 67.6 | 0.393 | 3,050 | 1.57 | 9,400 | 1.59 | 8.64 | 0.00254 | 0.0164 | 2.48 | 0.143 | 60.4 | 0.223 |
| | T4-3 ZOOT-14 | Zooplankton | 0.0326 | 6,140 | 1.51 | 3,970 | 50.6 | 0.451 | 3,190 | 2.06 | 10,100 | 265 | 8.41 | 0.00199 | 0.0805 | 2.56 | 0.31 | 74.9 | 0.196 |
| | T4-4 ZOOT-14 | Zooplankton | 0.0299 | 6,830 | 1.56 | 4,020 | 53.7 | 0.436 | 3,570 | 1.82 | 9,290 | 774 | 9.13 | 0.0028 | 0.0496 | 2.62 | 0.266 | 80.5 | 0.196 |
| | T4-5 ZOOT-14 | Zooplankton | 0.029 | 6,880 | 1.6 | 4,570 | 51.5 | 0.487 | 3,710 | 2.02 | 9,330 | 635 | 9.45 | 0.00282 | 0.061 | 2.77 | 0.225 | 74.7 | 0.187 |
| | T4-6 ZOOT-153-14 | Zooplankton | 0.0557 | 6,080 | 1.37 | 5,070 | 60.1 | 0.594 | 2,470 | 1.5 | 14,100 | 15 | 9.24 | 0.00284 | 0.0844 | 2.84 | 0.741 | 77.7 | 0.193 |
| | T4-6 ZOOT-60-14 | Zooplankton | 0.0326 | 3,750 | 4.92 | 6,480 | 110 | 0.688 | 1,440 | 4.28 | 8,060 | 129 | 10.9 | 0.0018 | 0.105 | 2.84 | 0.86 | 95.3 | 0.947 |
| | T2-B-APR-14 | Benthos | 0.0778 | 6,380 | 13.7 | 8,070 | 289 | 0.836 | 3,250 | 12 | 4,930 | 8.95 | 17.9 | 0.00105 | 0.0153 | 4.69 | 0.231 | 99.7 | 3.43 |
| | T4-B-APR-14 | Benthos | 0.0614 | 6,220 | 7.24 | 4,330 | 170 | 0.797 | 3,520 | 9.36 | 5,510 | 7.38 | 12.2 | 0.0015 | 0.0365 | 6.18 | 0.205 | 47.5 | 1.92 |
| | T2-B-AUG-14 | Benthos | 0.065 | 6,850 | 10.9 | 8,100 | 181 | 0.583 | 4,080 | 8.52 | 7,090 | 9.06 | 14.2 | 0.00079 | 0.0179 | 4.19 | 0.161 | 90.8 | 2.89 |
| | T4-B-AUG-14 | Benthos | <0.047 | 9,320 | 4.63 | 3,630 | 120 | 0.555 | 4,990 | 4.5 | 10,800 | 4.43 | 11 | 0.0018 | 0.045 | 7.5 | 0.134 | 36.3 | 0.93 |
| 2015 | TN-01-ZOOT-15 | Zooplankton | 0.0429 | 5,770 | 1.95 | 9,160 | 27.7 | 0.822 | 4,750 | 1.59 | 11,100 | 4.26 | 7.5 | 0.00309 | 0.107 | 5.58 | 3.1 | 147 | 0.105 |
| | TN-02-ZOOT-15 | Zooplankton | 0.0419 | 6,970 | 2.76 | 11,800 | 33.2 | 0.962 | 6,000 | 1.62 | 10,600 | 1.47 | 8.68 | 0.00381 | 0.0707 | 5.89 | 1.04 | 174 | 0.134 |
| | TN-03-ZOOT-15 | Zooplankton | 0.0358 | 7,740 | 1.64 | 7,160 | 29.8 | 0.657 | 5,340 | 1.41 | 11,000 | 1.96 | 9.81 | 0.00205 | 0.0518 | 6.37 | 0.502 | 109 | 0.107 |
| | TN-04-ZOOT-15 | Zooplankton | 0.067 | 17,900 | 11.9 | 57,900 | 75.6 | 4.5 | 21,500 | 4.46 | 22,800 | 4.14 | 22.6 | 0.0173 | 0.278 | 14.6 | 2.68 | 797 | 0.376 |
| | TN-05-ZOOT-15 | Zooplankton | 0.0337 | 7,490 | 1.33 | 6,000 | 18.9 | 0.556 | 5,100 | 0.883 | 10,400 | 0.699 | 9.49 | 0.00207 | 0.0498 | 6.16 | 0.269 | 89 | 0.0498 |
| | T4-01-ZOOT-15 | Zooplankton | 0.0303 | 7,510 | 2.73 | 13,000 | 20.3 | 1.11 | 6,220 | 1.34 | 9,640 | 1.21 | 9.59 | 0.00396 | 0.0789 | 5.3 | 0.447 | 173 | 0.0553 |
| | T4-02-ZOOT-15 | Zooplankton | 0.062 | 16,500 | 5.11 | 23,900 | 43.7 | 2.12 | 12,800 | 2.68 | 20,800 | 1.84 | 20.1 | 0.0085 | 0.14 | 13.2 | 0.606 | 319 | 0.134 |
| | T4-03-ZOOT-15 | Zooplankton | 0.035 | 4,410 | 4.12 | 18,000 | 24.4 | 1.34 | 5,960 | 2 | 6,450 | 2.13 | 5.21 | 0.0058 | 0.118 | 4.9 | 0.494 | 284 | 0.229 |
| | T4-04-ZOOT-15 | Zooplankton | 0.028 | 4,820 | 3.98 | 20,600 | 17.1 | 1.59 | 6,670 | 1.14 | 5,900 | 0.672 | 5.76 | 0.006 | 0.098 | 4.6 | 0.266 | 271 | 0.0435 |
| | T4-05-ZOOT-15 | Zooplankton | 0.026 | 5,470 | 3.72 | 17,600 | 19.2 | 1.31 | 6,450 | 1.14 | 7,150 | 0.844 | 5.92 | 0.00752 | 0.092 | 4.32 | 0.393 | 226 | 0.0447 |
| | T2-B-APR-15 | Benthos | 0.0705 | 6,760 | 12 | 7,860 | 255 | 0.499 | 2,530 | 8.53 | 5,260 | 8.01 | 20.8 | 0.00049 | 0.0183 | 5.85 | 0.24 | 88.9 | 2.99 |
| | T4-B-APR-15 | Benthos | 0.0604 | 8,050 | 6.09 | 4,650 | 136 | 0.533 | 4,270 | 4.64 | 7,830 | 3.48 | 12.6 | 0.00097 | 0.0223 | 5.29 | 0.192 | 48.7 | 1.42 |
| | TN-B-AUG-15 | Benthos | 0.0455 | 1,490 | 10.7 | 7,490 | 216 | 0.32 | 275 | 8.9 | 380 | 36.1 | 8.07 | 0.00035 | 0.0172 | 1.98 | 0.122 | 423 | 3.44 |
| | T4-B-AUG-15 | Benthos | 0.0902 | 7,450 | 6.58 | 4,710 | 199 | 0.603 | 2,810 | 7.91 | 7,330 | 5.24 | 15.5 | 0.00234 | 0.0534 | 6.96 | 0.208 | 65.7 | 1.54 |
| 2016 | TN-01-ZooT-Aug-16 | Zooplankton | 0.0441 | 6,360 | 1.51 | 5,560 | 41.2 | 0.556 | 4,680 | 1.44 | 12,300 | 1.54 | 8.1 | 0.00157 | 0.108 | 3.13 | 1.03 | 150 | 0.202 |
| | TN-02-ZooT-Aug-16 | Zooplankton | 0.049 | 7,840 | 1.31 | 6,130 | 34.3 | 0.608 | 6,170 | 1.16 | 12,800 | 0.537 | 9.63 | 0.00178 | 0.0363 | 3.59 | 0.633 | 147 | 0.111 |
| | TN-03-ZooT-Aug-16 | Zooplankton | 0.0462 | 5,630 | 1.53 | 6,610 | 41.6 | 0.597 | 4,780 | 1.24 | 13,900 | 0.908 | 6.84 | 0.00168 | 0.037 | 2.65 | 0.575 | 191 | 0.145 |
| | TN-04-ZooT-Aug-16 | Zooplankton | 0.0471 | 6,030 | 1.46 | 5,970 | 34.9 | 0.571 | 4,940 | 1.21 | 13,000 | 0.587 | 7.61 | 0.0015 | 0.0317 | 2.89 | 0.236 | 170 | 0.126 |
| | TN-05-ZooT-Aug-16 | Zooplankton | 0.0351 | 4,100 | 1.08 | 4,430 | 29.8 | 0.421 | 3,180 | 0.888 | 10,400 | 0.562 | 5.35 | 0.00101 | 0.0247 | 2.15 | 0.254 | 140 | 0.113 |
| | T4-02-ZooT-Aug-16 | Zooplankton | 0.0405 | 6,350 | 2.6 | 5,990 | 77 | 0.719 | 3,420 | 2.72 | 10,800 | 15.9 | 9.28 | 0.00239 | 0.187 | 3.65 | 1.03 | 113 | 1.56 |
| | T4-03-ZooT-Aug-16 | Zooplankton | 0.0271 | 3,190 | 1.24 | 3,030 | 35 | 0.302 | 1,610 | 1.23 | 8,080 | 2.61 | 5.01 | 0.00108 | 0.196 | 2.41 | 1.55 | 72.8 | 0.287 |
| | T4-04-ZooT-Aug-16 | Zooplankton | 0.0461 | 6,890 | 2.65 | 7,830 | 49.1 | 0.714 | 4,310 | 1.9 | 10,100 | 1.74 | 9.66 | 0.00324 | 0.199 | 3.67 | 1.78 | 142 | 0.385 |
| | T4-05-ZooT-Aug-16 | Zooplankton | 0.0425 | 6,140 | 2.47 | 8,090 | 51.6 | 0.749 | 3,880 | 2.38 | 10,500 | 2.44 | 8.97 | 0.00311 | 0.381 | 3.33 | 1.48 | 155 | 0.608 |
| | T4-06-ZooT-Aug-16 | Zooplankton | 0.0369 | 7,360 | 1.59 | 5,310 | 32 | 0.493 | 4,140 | 1.31 | 12,100 | 1.16 | 9.51 | 0.00226 | 0.0331 | 3.21 | 0.23 | 123 | 0.167 |
| | TN-BIT-Aug-16 | Benthos | 0.0788 | 7,080 | 13 | 10,100 | 262 | 0.561 | 5,740 | 9.42 | 6,430 | 8.69 | 16.7 | 0.00032 | 0.0146 | 5.48 | 0.218 | 115 | 3.6 |
| | T4-BIT-Aug-16 | Benthos | 0.0847 | 5,420 | 5 | 3,840 | 129 | 0.449 | 3,170 | 5 | 6,000 | 3.77 | 10.6 | 0.00121 | 0.0219 | 6.03 | 0.107 | 127 | 1.35 |
| | TN-BIT-1-Apr-16 | Benthos | 0.0566 | 8,800 | 2.66 | 3,330 | 60.4 | 0.45 | 5,820 | 2.17 | 10,300 | 2.66 | 10 | <0.00046 | 0.0292 | 7.8 | 0.065 | 27.2 | 0.741 |
| | T4-BIT-1-Apr-16 | Benthos | 0.088 | 8,010 | 10.8 | 8,430 | 264 | 0.614 | 3,570 | 8.79 | 5,510 | 6.98 | 23.1 | 0.00092 | 0.028 | 9.71 | 0.292 | 86.2 | 3.23 |

**Table G.1: Metal Concentrations in Zooplankton (August) and Benthic Invertebrates (April and August) in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Tissue Type | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|
| 2014 | T2-2 ZOOT-14 | Zooplankton | 18.3 | 0.0535 | 0.279 | 1.54 | 0.582 | 80.2 | 2.11 |
| | T2-3 ZOOT-14 | Zooplankton | 12.2 | 0.0557 | 0.259 | 1.06 | 0.41 | 69.4 | 1.5 |
| | T2-4 ZOOT-14 | Zooplankton | 11.6 | 0.0592 | 0.245 | 1.08 | 0.39 | 67.8 | 1.32 |
| | T2-5 ZOOT-14 | Zooplankton | 11.5 | 0.064 | 0.21 | 1.11 | 0.374 | 59.9 | 1.21 |
| | T2-6 ZOOT-14 | Zooplankton | 11.7 | 0.0746 | 0.174 | 1.37 | 0.462 | 65.2 | 1.38 |
| | T4-2 ZOOT-14 | Zooplankton | 12.5 | 0.0477 | 0.206 | 1.26 | 0.476 | 59 | 1.51 |
| | T4-3 ZOOT-14 | Zooplankton | 11.9 | 0.0512 | 0.314 | 1.22 | 0.44 | 76.8 | 1.45 |
| | T4-4 ZOOT-14 | Zooplankton | 11.9 | 0.0574 | 0.296 | 1.28 | 0.473 | 89.8 | 1.36 |
| | T4-5 ZOOT-14 | Zooplankton | 12.6 | 0.0518 | 0.324 | 1.29 | 0.441 | 81.2 | 1.6 |
| | T4-6 ZOOT-153-14 | Zooplankton | 14.7 | 0.0653 | 0.398 | 1.31 | 0.463 | 107 | 4.32 |
| | T4-6 ZOOT-60-14 | Zooplankton | 59.8 | 0.141 | 0.589 | 5.77 | 1.93 | 178 | 7.81 |
| | T2-B-APR-14 | Benthos | 61.4 | 0.276 | 0.667 | 18.9 | 5.38 | 92.1 | 5.93 |
| | T4-B-APR-14 | Benthos | 43.7 | 0.215 | 0.482 | 13.8 | 4.62 | 77.3 | 5.46 |
| | T2-B-AUG-14 | Benthos | 94.9 | 0.134 | 0.529 | 10.6 | 4.34 | 97.1 | 4.72 |
| | T4-B-AUG-14 | Benthos | 55.9 | 0.256 | 0.252 | 8.12 | 2.09 | 168 | 2.41 |
| 2015 | TN-01-ZOOT-15 | Zooplankton | 8.92 | 0.0407 | 0.697 | 0.856 | 0.219 | 76.7 | 0.985 |
| | TN-02-ZOOT-15 | Zooplankton | 11.7 | 0.042 | 0.803 | 1.08 | 0.262 | 68.9 | 1.64 |
| | TN-03-ZOOT-15 | Zooplankton | 7.34 | 0.0394 | 0.484 | 0.807 | 0.217 | 81.9 | 0.764 |
| | TN-04-ZOOT-15 | Zooplankton | 38.8 | 0.128 | 3.65 | 2.72 | 0.606 | 163 | 3.24 |
| | TN-05-ZOOT-15 | Zooplankton | 5.14 | 0.0405 | 0.381 | 0.398 | 0.109 | 71.9 | 0.32 |
| | T4-01-ZOOT-15 | Zooplankton | 13 | 0.0375 | 0.887 | 0.69 | 0.115 | 64.8 | 4.01 |
| | T4-02-ZOOT-15 | Zooplankton | 18.5 | 0.0828 | 1.79 | 1.26 | 0.223 | 164 | 10.3 |
| | T4-03-ZOOT-15 | Zooplankton | 11.9 | 0.0311 | 1.35 | 1.2 | 0.501 | 49.4 | 1.02 |
| | T4-04-ZOOT-15 | Zooplankton | 5.02 | 0.0264 | 1.44 | 0.629 | 0.112 | 44.5 | 0.58 |
| | T4-05-ZOOT-15 | Zooplankton | 8.25 | 0.0305 | 1.21 | 0.617 | 0.105 | 45.5 | 0.532 |
| | T2-B-APR-15 | Benthos | 95.7 | 0.195 | 0.434 | 15.9 | 4.48 | 137 | 4.72 |
| | T4-B-APR-15 | Benthos | 57.8 | 0.143 | 0.227 | 10.3 | 2.54 | 115 | 2.65 |
| | TN-B-AUG-15 | Benthos | 91.9 | 0.0956 | 1.48 | 8.74 | 5.65 | 38.4 | 5.69 |
| | T4-B-AUG-15 | Benthos | 68.7 | 0.255 | 0.416 | 13.5 | 3.3 | 138 | 3.91 |
| 2016 | TN-01-ZooT-Aug-16 | Zooplankton | 12 | 0.0578 | 0.514 | 1.16 | 0.342 | 82.8 | 0.991 |
| | TN-02-ZooT-Aug-16 | Zooplankton | 6.91 | 0.0598 | 0.418 | 0.763 | 0.2 | 73.8 | 0.483 |
| | TN-03-ZooT-Aug-16 | Zooplankton | 8.03 | 0.0557 | 0.584 | 0.946 | 0.263 | 77.3 | 1.05 |
| | TN-04-ZooT-Aug-16 | Zooplankton | 9.91 | 0.0584 | 0.464 | 0.838 | 0.226 | 89.6 | 1.85 |
| | TN-05-ZooT-Aug-16 | Zooplankton | 7.86 | 0.0438 | 0.379 | 0.761 | 0.198 | 76.9 | 0.531 |
| | T4-02-ZooT-Aug-16 | Zooplankton | 32.9 | 0.0589 | 3.01 | 3.3 | 1.78 | 124 | 1.95 |
| | T4-03-ZooT-Aug-16 | Zooplankton | 18.1 | 0.0325 | 0.493 | 1.49 | 0.477 | 80.1 | 1.08 |
| | T4-04-ZooT-Aug-16 | Zooplankton | 26.7 | 0.0516 | 0.829 | 2.14 | 0.65 | 102 | 1.46 |
| | T4-05-ZooT-Aug-16 | Zooplankton | 29.4 | 0.0464 | 1.25 | 2.41 | 0.815 | 108 | 1.72 |
| | T4-06-ZooT-Aug-16 | Zooplankton | 10.5 | 0.0647 | 0.398 | 0.961 | 0.304 | 76.1 | 0.716 |
| | TN-BIT-Aug-16 | Benthos | 94.8 | 0.107 | 0.475 | 11.8 | 4.29 | 82.4 | 4.68 |
| | T4-BIT-Aug-16 | Benthos | 50.3 | 0.158 | 0.219 | 8.61 | 2.13 | 103 | 2.42 |
| | TN-BIT-1-Apr-16 | Benthos | 38.2 | 0.0528 | 0.155 | 3.27 | 1.27 | 128 | 1.19 |
| | T4-BIT-1-Apr-16 | Benthos | 93.8 | 0.275 | 0.515 | 19.1 | 4.95 | 101 | 5.32 |

**Table G.2: Metal Concentrations (µg/g Dry Weight) in Bull Trout Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag | Al | As | B | Ba | Be | Bi | Ca | Cd | Co | Cr | Cs | Cu | Fe |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw |
| 2014 | OR-BT-01M-Feb-14 | Oestreich Road | Muscle Plug | 78 | <0.00078 | 4.93 | 0.220 | <0.11 | 0.306 | <0.0048 | 0.00274 | 994 | 0.0025 | 0.0184 | 0.376 | 0.262 | 0.82 | 16.5 |
| | SC-BT-01M-Aug-14 | Sand Creek | Muscle Plug | 58 | <0.0099 | 8.2 | 0.102 | <1.3 | 0.199 | <0.029 | 0.00872 | 288 | <0.0060 | 0.0276 | 0.393 | 0.103 | 1.08 | 17.5 |
| | ER-BT-01M-Aug-14 | Elk River | Muscle | 80 | <0.00073 | 2.95 | 0.128 | <0.11 | 0.0968 | <0.0036 | 0.000527 | 526 | 0.0089 | 0.0237 | 0.0923 | 0.0176 | 1.14 | 12.4 |
| 2015 | SC-BT-01-Feb-15 | Sand Creek | Muscle | 73 | <0.00089 | 45.1 | 0.26 | <0.33 | 1.19 | <0.018 | 0.0017 | 442 | 0.015 | 0.039 | 1.400 | 0.057 | 1.22 | 49.4 |
| | SC-BT-01-Apr-15 | Sand Creek | Muscle | 67 | <0.0013 | 111.0 | 0.24 | 0.95 | 1.47 | <0.026 | 0.0013 | 2,050 | 0.007 | 0.044 | 0.521 | 0.086 | 0.94 | 68.3 |
| | ER-BT-02-Apr-15 | Elk River | Muscle | 76 | <0.0022 | 15.3 | 0.06 | <0.81 | 0.87 | <0.043 | 0.0022 | 3,250 | 0.013 | 0.120 | 1.720 | 0.078 | 1.72 | 33.3 |
| | GC-BT-01-Apr-15 | Gold Creek | Muscle | 76 | <0.0017 | 5.2 | 0.14 | <0.63 | 0.15 | <0.034 | 0.0008 | 490 | 0.006 | 0.025 | 0.147 | 0.061 | 1.23 | 20.6 |
| 2016 | SC-BT-01-Apr-16 | Sand Creek | Muscle Plug | 72 | <0.0039 | 146 | 0.139 | 0.87 | 1.9 | <0.014 | 0.00202 | 1,710 | 0.0848 | 0.0783 | 5.62 | 0.0733 | 2.09 | 194 |
| | SC-BT-02-Apr-16 | Sand Creek | Muscle Plug | 72 | 0.0063 | 207 | 0.143 | 0.58 | 2.16 | <0.017 | 0.0067 | 1,440 | 0.0301 | 0.164 | 1.77 | 0.146 | 2.11 | 259 |
| | SC-BT-03-Apr-16 | Sand Creek | Muscle Plug | 69 | <0.0025 | 18.7 | 0.091 | <0.21 | 0.637 | <0.0087 | 0.00091 | 2,170 | 0.0144 | 0.0185 | 0.205 | 0.141 | 1.36 | 26.2 |
| | SC-BT-04-Apr-16 | Sand Creek | Muscle Plug | 75 | <0.0027 | 11 | 0.019 | <0.24 | 0.188 | <0.0096 | 0.00167 | 431 | 0.0075 | 0.0159 | 0.236 | 0.108 | 0.798 | 19.3 |
| | SC-BT-05-Apr-16 | Sand Creek | Muscle Plug | 69 | <0.0025 | 44.6 | 0.043 | <0.22 | 0.429 | <0.0088 | 0.00143 | 356 | 0.01 | 0.0178 | 0.179 | 0.136 | 1.12 | 33.2 |
| | SC-BT-06-Apr-16 | Sand Creek | Muscle Plug | 68 | <0.0029 | 14.6 | 0.109 | <0.25 | 0.304 | <0.01 | 0.00079 | 1,400 | 0.0056 | 0.0193 | 0.498 | 0.0736 | 0.872 | 36.7 |
| | SC-BT-07-Apr-16 | Sand Creek | Muscle Plug | 73 | <0.0027 | 4.35 | 0.072 | <0.23 | 0.0787 | <0.0095 | 0.0006 | 316 | <0.0042 | 0.0124 | 0.258 | 0.0989 | 0.873 | 11.6 |
| | SC-BT-08-Apr-16 | Sand Creek | Muscle Plug | 76 | <0.0029 | 28.8 | 0.175 | <0.25 | 0.214 | <0.01 | 0.00106 | 1,100 | <0.0045 | 0.0203 | 0.193 | 0.0776 | 0.867 | 15.6 |
| | SC-BT-09-Apr-16 | Sand Creek | Muscle Plug | 77 | <0.0018 | 35 | 0.565 | <0.16 | 0.391 | <0.0063 | 0.00077 | 1,320 | <0.0028 | 0.0294 | 1.03 | 0.0904 | 0.803 | 44.5 |
| | SC-BT-10-Apr-16 | Sand Creek | Muscle Plug | 76 | <0.0026 | 20.2 | 0.294 | 0.23 | 0.261 | <0.0093 | 0.00127 | 883 | 0.0095 | 0.0215 | 0.383 | 0.1 | 0.984 | 24.4 |
| | ER-BT-04 M-Apr-16 | Elk River | Muscle | 74 | 0.00048 | 2.88 | 0.0992 | 0.1005 | 0.04955 | 0.00515 | 0.00043 | 297 | 0.00235 | 0.009335 | 0.06255 | 0.113 | 1.125 | 13.8 |
| | ER-BT-06 M-Apr-16 | Elk River | Muscle | 73 | <0.00047 | 1.04 | 0.0975 | 0.111 | 0.0204 | <0.0051 | 0.000362 | 196 | <0.0023 | 0.0132 | 0.0484 | 0.138 | 1.15 | 10.6 |
| | ER-BT-10 M-Apr-16 | Elk River | Muscle | 71 | <0.0005 | 4.56 | 0.164 | 0.161 | 0.0585 | <0.0054 | 0.000416 | 351 | <0.0024 | 0.00867 | 0.0578 | 0.123 | 0.952 | 11.1 |
| | ER-BT-06 O-Apr-16 | Elk River | Ovary | 68 | 0.0173 | 1.64 | 0.129 | 0.165 | 0.227 | <0.0031 | 0.000131 | 1,650 | <0.0023 | 0.287 | 0.0867 | 0.0625 | 18.2 | 149 |
| | ER-BT-01-Apr-16 | Elk River | Muscle Plug | 77 | <0.0012 | 7.67 | 0.024 | <0.24 | 0.251 | <0.0077 | 0.00188 | 1,250 | <0.004 | 0.0192 | 0.473 | 0.102 | 1.2 | 14.3 |
| | ER-BT-02-Apr-16 | Elk River | Muscle Plug | 78 | <0.0012 | 4.25 | 0.073 | <0.22 | 0.465 | <0.0071 | 0.0018 | 3,320 | <0.0037 | 0.0243 | 0.552 | 0.0539 | 0.935 | 15.3 |
| | ER-BT-03-Apr-16 | Elk River | Muscle Plug | 76 | <0.0014 | 1.16 | <0.02 | <0.27 | 0.137 | <0.0088 | 0.00269 | 1,230 | <0.0045 | 0.0139 | 0.143 | 0.0762 | 1.05 | 9.02 |
| | ER-BT-05-Apr-16 | Elk River | Muscle Plug | 68 | <0.0025 | 6.38 | 0.153 | <0.47 | 0.0922 | <0.015 | <0.00041 | 228 | <0.0078 | 0.0125 | 0.78 | 0.0867 | 0.853 | 15.3 |
| | ER-BT-07-Apr-16 | Elk River | Muscle Plug | 64 | <0.0024 | 9.42 | 0.256 | <0.46 | 0.133 | <0.015 | 0.00054 | 237 | <0.0078 | 0.0109 | 0.222 | 0.0776 | 0.808 | 12.8 |
| | ER-BT-08-Apr-16 | Elk River | Muscle Plug | 78 | <0.002 | 9.55 | 0.051 | <0.38 | 0.186 | <0.012 | 0.00271 | 838 | <0.0064 | 0.0374 | 0.33 | 0.0953 | 1.53 | 16.7 |
| | ER-BT-09-Apr-16 | Elk River | Muscle Plug | 72 | <0.001 | 22.7 | 0.178 | <0.19 | 0.386 | <0.0064 | 0.00045 | 1,000 | <0.0033 | 0.022 | 0.463 | 0.101 | 0.897 | 26.1 |
| | ER-BT-11-Apr-16 | Elk River | Muscle Plug | 77 | <0.004 | 56.9 | <0.056 | <0.76 | 1.63 | <0.025 | 0.0019 | 427 | <0.013 | 0.0315 | 0.273 | 0.126 | 1.18 | 77.6 |
| | ER-BT-12-Apr-16 | Elk River | Muscle Plug | 64 | <0.0012 | 7.47 | 0.13 | <0.23 | 2.16 | <0.0074 | <0.0002 | 3,920 | <0.0038 | 0.0164 | 0.253 | 0.0823 | 0.576 | 11.5 |
| | GC-BT-02 M-Apr-16 | Gold Creek | Muscle | 77 | 0.000415 | 1.73 | 0.0361 | 0.1 | 0.0268 | 0.0026 | 0.001865 | 403 | 0.0013 | 0.01085 | 0.0718 | 0.116 | 0.947 | 9.065 |
| | GC-BT-03 M-Apr-16 | Gold Creek | Muscle | 79 | <0.00039 | 5.44 | 0.0723 | <0.095 | 0.0839 | <0.0025 | 0.00043 | 390 | 0.0021 | 0.0182 | 0.0788 | 0.0322 | 0.892 | 17.1 |
| | GC-BT-04 M-Apr-16 | Gold Creek | Muscle | 77 | 0.001795 | 1.47 | 0.03555 | 0.1325 | 0.0712 | 0.0025 | 0.00595 | 1,044 | 0.0012 | 0.01715 | 0.0814 | 0.0818 | 1.055 | 9.765 |
| | GC-BT-05 M-Apr-16 | Gold Creek | Muscle | 78 | <0.00042 | 1.57 | 0.0213 | 0.21 | 0.0678 | <0.0027 | 0.00267 | 1,040 | <0.0013 | 0.0182 | 0.0681 | 0.0858 | 1.31 | 12.9 |
| | GC-BT-06 M-Apr-16 | Gold Creek | Muscle | 79 | <0.00039 | 1.11 | 0.0155 | 0.106 | 0.028 | <0.0025 | 0.00112 | 514 | <0.0012 | 0.0211 | 0.0631 | 0.0957 | 0.895 | 11.6 |
| | GC-BT-07 M-Apr-16 | Gold Creek | Muscle | 64 | <0.00041 | 1.58 | 0.33 | 0.18 | 0.025 | <0.0026 | 0.00016 | 264 | <0.0013 | 0.00724 | 0.088 | 0.0699 | 1 | 9.92 |
| | GC-BT-07 O-Apr-16 | Gold Creek | Ovary | 71 | 0.0144 | 0.41 | 0.224 | <0.1 | 0.176 | <0.0026 | <0.00013 | 1,620 | <0.0013 | 0.235 | 0.0825 | 0.0623 | 16 | 177 |
| | GC-BT-01-Apr-16 | Gold Creek | Muscle Plug | 76 | 0.0026 | 72.2 | 0.117 | <0.23 | 0.937 | <0.0072 | 0.00242 | 390 | 0.0141 | 0.0411 | 0.24 | 0.128 | 1.78 | 86.5 |

**Table G.2: Metal Concentrations (µg/g Dry Weight) in Bull Trout Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga | Hg | K | Li | Mg | Mn | Mo | Na | Ni | P | Pb | Rb | Re | Sb | Se |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw |
| 2014 | OR-BT-01M-Feb-14 | Oestreich Road | Muscle Plug | 0.0107 | 0.778 | 16,700 | <0.012 | 1,000 | 0.715 | 0.014 | 3,540 | 0.119 | 10,000 | 0.0294 | 25 | 0.00044 | 0.00294 | 2.61 |
| | SC-BT-01M-Aug-14 | Sand Creek | Muscle Plug | <0.022 | 0.402 | 20,100 | <0.093 | 1,400 | 0.6 | 0.0191 | 932 | 0.247 | 11,900 | 0.0625 | 16.8 | <0.0019 | <0.0066 | 1.91 |
| | ER-BT-01M-Aug-14 | Elk River | Muscle | 0.00968 | 0.0964 | 23,700 | 0.0572 | 1,370 | 0.638 | 0.0060 | 1,240 | 0.0531 | 11,700 | 0.0371 | 9.2 | <0.00010 | 0.00134 | 2.62 |
| 2015 | SC-BT-01-Feb-15 | Sand Creek | Muscle | 0.0209 | 0.500 | 20,100 | 0.047 | 1,230 | 1.41 | 0.0163 | 1,090 | 0.638 | 11,700 | 0.171 | 13.3 | <0.00063 | 0.0166 | 1.92 |
| | SC-BT-01-Apr-15 | Sand Creek | Muscle | 0.0459 | 0.339 | 10,700 | 0.099 | 953 | 3.00 | 0.0221 | 1,690 | 0.441 | 7,890 | 0.169 | 13.6 | <0.00092 | 0.0078 | 1.51 |
| | ER-BT-02-Apr-15 | Elk River | Muscle | 0.0141 | 0.340 | 16,100 | <0.036 | 1,200 | 1.27 | 0.0402 | 2,550 | 0.911 | 11,500 | 0.191 | 17.5 | <0.0015 | 0.0155 | 3.30 |
| | GC-BT-01-Apr-15 | Gold Creek | Muscle | 0.0068 | 0.703 | 19,900 | <0.028 | 1,260 | 0.60 | 0.0123 | 1,150 | 0.198 | 11,300 | 0.038 | 18.2 | <0.0012 | 0.0033 | 1.54 |
| 2016 | SC-BT-01-Apr-16 | Sand Creek | Muscle Plug | 0.057 | 0.134 | 19,500 | 0.119 | 1,400 | 3.51 | 0.0647 | 867 | 0.828 | 11,600 | 0.631 | 16.4 | 0.00027 | 0.0202 | 1.89 |
| | SC-BT-02-Apr-16 | Sand Creek | Muscle Plug | 0.082 | 0.546 | 17,700 | 0.237 | 1,380 | 6.21 | 0.023 | 1,040 | 0.513 | 10,000 | 1.55 | 22.2 | <0.00032 | 0.0361 | 1.3 |
| | SC-BT-03-Apr-16 | Sand Creek | Muscle Plug | 0.0098 | 1.02 | 12,800 | <0.025 | 896 | 0.943 | 0.0092 | 1,040 | 0.124 | 8,950 | 0.225 | 15.5 | <0.00017 | 0.0071 | 1.48 |
| | SC-BT-04-Apr-16 | Sand Creek | Muscle Plug | <0.008 | 0.472 | 19,300 | <0.027 | 1,240 | 0.825 | 0.009 | 805 | 0.0362 | 10,800 | 0.0673 | 22.7 | <0.00018 | 0.0067 | 2.35 |
| | SC-BT-05-Apr-16 | Sand Creek | Muscle Plug | 0.0156 | 0.601 | 18,100 | 0.036 | 1,160 | 0.676 | 0.0078 | 605 | 0.107 | 10,800 | 0.0758 | 23.2 | <0.00017 | 0.0112 | 1.97 |
| | SC-BT-06-Apr-16 | Sand Creek | Muscle Plug | <0.0084 | 0.537 | 11,900 | <0.029 | 946 | 0.676 | 0.0064 | 1,960 | 0.0692 | 7,970 | 0.0495 | 15.8 | <0.00019 | <0.0023 | 1.54 |
| | SC-BT-07-Apr-16 | Sand Creek | Muscle Plug | <0.0079 | 0.506 | 19,200 | <0.027 | 1,220 | 0.412 | 0.0078 | 1,290 | 0.0199 | 10,700 | 0.0149 | 21.1 | <0.00018 | <0.0022 | 1.63 |
| | SC-BT-08-Apr-16 | Sand Creek | Muscle Plug | 0.0126 | 0.514 | 17,000 | <0.029 | 1,160 | 0.588 | 0.0072 | 1,470 | 0.0333 | 10,000 | 0.0271 | 16.4 | <0.0002 | <0.0023 | 1.26 |
| | SC-BT-09-Apr-16 | Sand Creek | Muscle Plug | 0.0208 | 0.208 | 20,300 | 0.022 | 1,320 | 1.53 | 0.0069 | 1,020 | 0.0707 | 11,400 | 0.0886 | 17.4 | <0.00012 | 0.0022 | 1.66 |
| | SC-BT-10-Apr-16 | Sand Creek | Muscle Plug | 0.0127 | 0.44 | 19,500 | <0.027 | 1,250 | 0.795 | 0.0106 | 1,460 | 0.0553 | 11,300 | 0.317 | 20.8 | <0.00018 | 0.0028 | 2.45 |
| | ER-BT-04 M-Apr-16 | Elk River | Muscle | 0.0052 | 1.015 | 17,300 | 0.004 | 1,007 | 0.3785 | 0.00285 | 886 | 0.02465 | 9,910 | 0.01625 | 21.95 | 0.0001155 | 0.00165 | 2.18 |
| | ER-BT-06 M-Apr-16 | Elk River | Muscle | 0.0031 | 0.506 | 18,400 | <0.0034 | 1,090 | 0.201 | <0.0028 | 608 | 0.017 | 10,600 | 0.00391 | 24 | 0.000223 | <0.0011 | 2.36 |
| | ER-BT-10 M-Apr-16 | Elk River | Muscle | 0.0042 | 0.546 | 15,400 | 0.0084 | 958 | 0.469 | <0.003 | 690 | 0.0106 | 8,900 | 0.00435 | 21.1 | 0.000523 | <0.0011 | 2.17 |
| | ER-BT-06 O-Apr-16 | Elk River | Ovary | 0.0056 | 0.0659 | 6,450 | 0.0087 | 1,350 | 1.93 | 0.024 | 4,000 | 0.0142 | 9,600 | 0.00473 | 10.2 | 0.00161 | <0.00097 | 7.17 |
| | ER-BT-01-Apr-16 | Elk River | Muscle Plug | 0.008 | 0.334 | 18,500 | 0.013 | 1,210 | 0.609 | 0.055 | 725 | 0.502 | 11,100 | 0.0645 | 21.5 | <0.000088 | 0.0111 | 2.83 |
| | ER-BT-02-Apr-16 | Elk River | Muscle Plug | 0.0083 | 0.279 | 17,700 | 0.02 | 1,210 | 0.98 | 0.0136 | 1,330 | 0.416 | 12,000 | 0.165 | 18 | 0.000182 | 0.0019 | 2.77 |
| | ER-BT-03-Apr-16 | Elk River | Muscle Plug | 0.0051 | 0.634 | 17,400 | <0.014 | 1,150 | 0.432 | 0.0081 | 1,140 | 0.094 | 10,400 | 0.00858 | 17.8 | <0.0001 | <0.0017 | 2.92 |
| | ER-BT-05-Apr-16 | Elk River | Muscle Plug | <0.0056 | 0.426 | 12,000 | <0.025 | 869 | 0.197 | <0.012 | 822 | 0.085 | 7,150 | 0.0597 | 16.6 | 0.00026 | 0.0049 | 1.68 |
| | ER-BT-07-Apr-16 | Elk River | Muscle Plug | 0.0063 | 0.413 | 9,450 | <0.024 | 753 | 0.312 | <0.012 | 1,460 | 0.079 | 5,930 | 0.009 | 12.8 | <0.00017 | <0.0029 | 1.49 |
| | ER-BT-08-Apr-16 | Elk River | Muscle Plug | 0.007 | 0.301 | 16,600 | 0.037 | 1,070 | 0.5 | <0.01 | 3,060 | 0.101 | 9,740 | 0.0343 | 19.5 | 0.00017 | <0.0023 | 2.8 |
| | ER-BT-09-Apr-16 | Elk River | Muscle Plug | 0.0128 | 0.514 | 13,200 | 0.029 | 940 | 0.811 | 0.0095 | 1,100 | 0.235 | 8,370 | 0.0294 | 18.7 | 0.000428 | 0.0046 | 1.78 |
| | ER-BT-11-Apr-16 | Elk River | Muscle Plug | 0.021 | 1.61 | 13,200 | 0.079 | 1,020 | 1.31 | <0.02 | 1,840 | 0.168 | 8,140 | 0.133 | 14 | <0.00028 | 0.0063 | 2.7 |
| | ER-BT-12-Apr-16 | Elk River | Muscle Plug | 0.0068 | 0.428 | 7,990 | 0.027 | 594 | 0.427 | 0.0082 | 1,950 | 0.129 | 7,380 | 0.0129 | 11.4 | 0.000606 | <0.0014 | 1.55 |
| | GC-BT-02 M-Apr-16 | Gold Creek | Muscle | 0.00754 | 0.6755 | 20,550 | 0.00335 | 1,230 | 0.444 | 0.00635 | 784 | 0.01365 | 10,500 | 0.00215 | 25.6 | 0.0000585 | 0.000985 | 2.26 |
| | GC-BT-03 M-Apr-16 | Gold Creek | Muscle | 0.0093 | 0.413 | 25,700 | 0.0084 | 1,450 | 0.616 | 0.0078 | 1,030 | 0.0146 | 12,700 | 0.0204 | 12.2 | 0.000097 | 0.00104 | 2.55 |
| | GC-BT-04 M-Apr-16 | Gold Creek | Muscle | 0.011095 | 0.542 | 22,450 | 0.00615 | 1,340 | 0.4615 | 0.0069 | 911 | 0.0337 | 11,950 | 0.01025 | 23.95 | 0.0000775 | 0.000715 | 2.72 |
| | GC-BT-05 M-Apr-16 | Gold Creek | Muscle | 0.00673 | 0.447 | 22,400 | <0.0036 | 1,350 | 0.455 | 0.0081 | 991 | 0.0117 | 12,000 | 0.00345 | 21.8 | 0.000128 | <0.00039 | 4.26 |
| | GC-BT-06 M-Apr-16 | Gold Creek | Muscle | 0.00645 | 0.295 | 24,500 | 0.0045 | 1,380 | 0.663 | 0.0069 | 918 | 0.0187 | 12,300 | 0.00122 | 24.1 | 0.000087 | <0.00036 | 2.4 |
| | GC-BT-07 M-Apr-16 | Gold Creek | Muscle | 0.00381 | 0.34 | 11,200 | <0.0032 | 713 | 0.192 | 0.0033 | 664 | 0.0078 | 6,340 | 0.00158 | 15.3 | 0.00039 | <0.00038 | 1.26 |
| | GC-BT-07 O-Apr-16 | Gold Creek | Ovary | 0.0041 | 0.0759 | 6,950 | 0.0089 | 1,190 | 1.59 | 0.0229 | 4,180 | 0.0138 | 8,480 | 0.00168 | 12.4 | 0.00247 | 0.00063 | 7.55 |
| | GC-BT-01-Apr-16 | Gold Creek | Muscle Plug | 0.0299 | 1.96 | 12,500 | 0.054 | 903 | 1.76 | 0.0128 | 2,260 | 0.193 | 8,220 | 0.419 | 12.5 | <0.00027 | 0.0094 | 2.06 |

**Table G.2: Metal Concentrations (µg/g Dry Weight) in Bull Trout Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | OR-BT-01M-Feb-14 | Oestreich Road | Muscle Plug | 0.00438 | 1.22 | 0.000800 | 0.570 | 0.0167 | 0.00051 | 0.0354 | 0.00208 | 28.6 | 0.00419 |
|  | SC-BT-01M-Aug-14 | Sand Creek | Muscle Plug | 0.0128 | 0.154 | 0.00096 | 0.233 | 0.0409 | <0.0016 | 0.0148 | 0.0023 | 16.1 | 0.0184 |
|  | ER-BT-01M-Aug-14 | Elk River | Muscle | 0.00650 | 0.196 | 0.000526 | 0.166 | 0.0657 | 0.00053 | 0.00672 | 0.00187 | 22.9 | 0.0100 |
| 2015 | SC-BT-01-Feb-15 | Sand Creek | Muscle | 0.0300 | 1.040 | 0.00870 | 0.904 | 0.0329 | 0.0018 | 0.0811 | 0.018 | 17.4 | 0.038 |
|  | SC-BT-01-Apr-15 | Sand Creek | Muscle | 0.0300 | 1.910 | 0.01980 | 2.170 | 0.0555 | 0.0044 | 0.1700 | 0.033 | 13.9 | 0.066 |
|  | ER-BT-02-Apr-15 | Elk River | Muscle | 0.0353 | 2.240 | 0.00520 | 0.276 | 0.0437 | 0.0018 | 0.0376 | 0.011 | 35.0 | 0.014 |
|  | GC-BT-01-Apr-15 | Gold Creek | Muscle | 0.0119 | 0.229 | 0.00270 | 0.336 | 0.0316 | 0.0006 | 0.0126 | 0.003 | 27.7 | 0.014 |
| 2016 | SC-BT-01-Apr-16 | Sand Creek | Muscle Plug | 0.0926 | 1.68 | 0.0217 | 3.46 | 0.048 | 0.0093 | 0.471 | 0.0434 | 31.2 | 0.105 |
|  | SC-BT-02-Apr-16 | Sand Creek | Muscle Plug | 0.115 | 2.79 | 0.0493 | 4.73 | 0.0385 | 0.0102 | 0.408 | 0.11 | 18.3 | 0.126 |
|  | SC-BT-03-Apr-16 | Sand Creek | Muscle Plug | 0.0706 | 1.64 | 0.00528 | 0.689 | 0.0281 | 0.00206 | 0.0348 | 0.00684 | 15.2 | 0.0275 |
|  | SC-BT-04-Apr-16 | Sand Creek | Muscle Plug | 0.0254 | 0.196 | 0.0014 | 0.219 | 0.0498 | <0.00081 | 0.0329 | 0.00474 | 16.3 | 0.0163 |
|  | SC-BT-05-Apr-16 | Sand Creek | Muscle Plug | 0.0146 | 0.243 | 0.00643 | 0.487 | 0.0423 | 0.00093 | 0.0692 | 0.0103 | 16.9 | 0.0252 |
|  | SC-BT-06-Apr-16 | Sand Creek | Muscle Plug | 0.0089 | 0.955 | 0.00395 | 0.224 | 0.0278 | 0.00095 | 0.021 | 0.00625 | 14.1 | 0.0377 |
|  | SC-BT-07-Apr-16 | Sand Creek | Muscle Plug | 0.0052 | 0.114 | 0.00051 | 0.132 | 0.0353 | <0.0008 | 0.0062 | 0.00085 | 12.6 | 0.0128 |
|  | SC-BT-08-Apr-16 | Sand Creek | Muscle Plug | 0.0046 | 0.67 | 0.00212 | 0.238 | 0.0271 | <0.00086 | 0.0157 | 0.0037 | 14.9 | 0.0163 |
|  | SC-BT-09-Apr-16 | Sand Creek | Muscle Plug | 0.0084 | 2.82 | 0.0112 | 0.662 | 0.0323 | 0.00157 | 0.0693 | 0.0244 | 14.4 | 0.0195 |
|  | SC-BT-10-Apr-16 | Sand Creek | Muscle Plug | 0.0212 | 0.533 | 0.00358 | 0.286 | 0.038 | 0.00087 | 0.0277 | 0.00612 | 16.3 | 0.0155 |
|  | ER-BT-04 M-Apr-16 | Elk River | Muscle | 0.00491 | 0.0834 | 0.000674 | 0.137 | 0.02905 | 0.000304 | 0.008725 | 0.00134 | 12.25 | 0.008855 |
|  | ER-BT-06 M-Apr-16 | Elk River | Muscle | <0.00099 | 0.0572 | 0.00017 | 0.0815 | 0.0801 | <0.00006 | 0.00303 | 0.00039 | 12.1 | 0.00597 |
|  | ER-BT-10 M-Apr-16 | Elk River | Muscle | 0.0106 | 0.0941 | 0.000804 | 0.133 | 0.0683 | 0.00019 | 0.0088 | 0.00195 | 11.4 | 0.00563 |
|  | ER-BT-06 O-Apr-16 | Elk River | Ovary | <0.0012 | 1.77 | 0.00043 | 0.108 | 0.0933 | 0.000348 | 0.00813 | 0.00241 | 180 | 0.00344 |
|  | ER-BT-01-Apr-16 | Elk River | Muscle Plug | 0.0154 | 0.783 | 0.00067 | 0.257 | 0.0499 | <0.001 | 0.0111 | 0.00202 | 14.5 | 0.0224 |
|  | ER-BT-02-Apr-16 | Elk River | Muscle Plug | 0.008 | 2.13 | 0.00058 | 0.194 | 0.0392 | <0.00092 | 0.011 | 0.00173 | 60.6 | 0.0144 |
|  | ER-BT-03-Apr-16 | Elk River | Muscle Plug | <0.0034 | 0.759 | <0.00026 | 0.108 | 0.0329 | <0.0011 | 0.0032 | <0.00066 | 14.9 | 0.0096 |
|  | ER-BT-05-Apr-16 | Elk River | Muscle Plug | <0.0059 | 0.0886 | 0.00082 | 0.47 | 0.0506 | <0.002 | 0.0127 | 0.0028 | 19.6 | 0.0307 |
|  | ER-BT-07-Apr-16 | Elk River | Muscle Plug | <0.0059 | 0.114 | 0.00153 | 0.18 | 0.0476 | <0.002 | 0.0194 | 0.0028 | 19.7 | 0.0247 |
|  | ER-BT-08-Apr-16 | Elk River | Muscle Plug | <0.0048 | 0.542 | 0.00133 | 0.271 | 0.0488 | <0.0016 | 0.0198 | 0.00259 | 19.8 | 0.0397 |
|  | ER-BT-09-Apr-16 | Elk River | Muscle Plug | 0.0033 | 0.747 | 0.00505 | 0.298 | 0.0628 | 0.00102 | 0.0491 | 0.00964 | 12.2 | 0.025 |
|  | ER-BT-11-Apr-16 | Elk River | Muscle Plug | <0.0096 | 0.467 | 0.016 | 1.21 | 0.021 | <0.0032 | 0.0891 | 0.0167 | 15.8 | 0.0362 |
|  | ER-BT-12-Apr-16 | Elk River | Muscle Plug | <0.0029 | 2.52 | 0.00109 | 0.261 | 0.0476 | 0.00203 | 0.024 | 0.0032 | 144 | 0.0184 |
|  | GC-BT-02 M-Apr-16 | Gold Creek | Muscle | 0.0009 | 0.07095 | 0.000197 | 0.182 | 0.0329 | 0.000076 | 0.00606 | 0.00066 | 13 | 0.00461 |
|  | GC-BT-03 M-Apr-16 | Gold Creek | Muscle | 0.00144 | 0.157 | 0.000999 | 0.198 | 0.0168 | 0.000311 | 0.0116 | 0.00229 | 14.4 | 0.00665 |
|  | GC-BT-04 M-Apr-16 | Gold Creek | Muscle | 0.001465 | 0.4415 | 0.000219 | 0.1165 | 0.0337 | 0.000217 | 0.002875 | 0.00065 | 14.6 | 0.0147 |
|  | GC-BT-05 M-Apr-16 | Gold Creek | Muscle | <0.00077 | 0.523 | 0.000212 | 0.0869 | 0.0514 | 0.000126 | 0.00267 | 0.00041 | 14.5 | 0.00269 |
|  | GC-BT-06 M-Apr-16 | Gold Creek | Muscle | 0.00083 | 0.102 | 0.000114 | 0.133 | 0.0447 | 0.000094 | 0.00373 | 0.00071 | 14.9 | 0.00458 |
|  | GC-BT-07 M-Apr-16 | Gold Creek | Muscle | <0.00076 | 0.077 | 0.000212 | 0.081 | 0.0394 | 0.000127 | 0.00244 | 0.00039 | 14.3 | 0.00267 |
|  | GC-BT-07 O-Apr-16 | Gold Creek | Ovary | 0.00082 | 1.27 | 0.000133 | 0.053 | 0.0973 | 0.00028 | 0.00554 | 0.0023 | 147 | 0.00304 |
|  | GC-BT-01-Apr-16 | Gold Creek | Muscle Plug | 0.027 | 0.538 | 0.0154 | 1.72 | 0.0286 | 0.00294 | 0.116 | 0.0251 | 21.3 | 0.194 |

## Table G.3: Metal Concentrations (μg/g Dry Weight) in Burbot Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | Total Dry Mass (g) | Moisture (%) | Ag μg/g dw | Al μg/g dw | As μg/g dw | B μg/g dw | Ba μg/g dw | Be μg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-BB-01M-Feb-14 | Sand Creek | Muscle Plug | 0.0067 | 73 | <0.0022 | 13.4 | 0.132 | <0.31 | 3.77 | <0.014 |
| | SC-BB-02M-Feb-14 | Sand Creek | Muscle Plug | 0.0066 | 69 | <0.0023 | 3.47 | 0.175 | <0.32 | 0.162 | <0.015 |
| | SC-BB-03M-Feb-14 | Sand Creek | Muscle Plug | 0.0089 | 80 | <0.0018 | 18.8 | 0.121 | <0.24 | 0.551 | <0.011 |
| | SC-BB-04M-Feb-14 | Sand Creek | Muscle Plug | 0.0059 | 76 | <0.0026 | 39.7 | 0.218 | <0.36 | 1.68 | <0.016 |
| | SC-BB-05M-Feb-14 | Sand Creek | Muscle Plug | 0.0135 | 81 | 0.0014 | 22.7 | 0.165 | 0.21 | 0.722 | <0.0075 |
| | SC-BB-06M-Feb-14 | Sand Creek | Muscle | 3.0993 | 79 | <0.00038 | 1.01 | 0.181 | <0.052 | 0.0363 | <0.0024 |
| | SC-BB-06G-Feb-14 | Sand Creek | Ovary | 4.0732 | 79 | 0.00057 | 0.907 | 0.530 | <0.053 | 0.0554 | <0.0025 |
| | OR-BB-01M-Feb-14 | Oestreich Road | Muscle Plug | 0.0153 | 78 | <0.0010 | 7.18 | 0.161 | 0.23 | 0.417 | <0.0062 |
| | SC-BB-01M-Apr-14 | Sand Creek | Muscle Plug | 0.0024 | 77 | <0.0078 | 284 | 0.157 | <1.1 | 2.44 | <0.048 |
| | SC-BB-02M-Apr-14 | Sand Creek | Muscle Plug | 0.0136 | 77 | <0.0011 | 70.1 | 0.274 | <0.15 | 0.821 | <0.0071 |
| | SC-BB-03M-Apr-14 | Sand Creek | Muscle Plug | 0.0054 | 63 | 0.0153 | 578 | 0.29 | <0.41 | 5.77 | <0.019 |
| | ER-BB-01M-Apr-14 | Elk River | Muscle Plug | 0.0044 | 50 | <0.0035 | 114 | 0.11 | <0.47 | 1.22 | <0.022 |
| | ER-BB-02M-Apr-14 | Elk River | Muscle Plug | 0.0070 | 74 | 0.0102 | 1330 | 0.532 | 1.68 | 13.7 | 0.045 |
| | SC-BB-01M-Aug-14 | Sand Creek | Muscle Plug | 0.00357 | 74 | <0.0092 | 67.9 | 0.354 | <1.2 | 3.02 | <0.027 |
| 2015 | SC-BB-01-Apr-15 | Sand Creek | Muscle Plug | 0.0070 | 77 | <0.0015 | 19.2 | 0.14 | <0.54 | 0.27 | <0.029 |
| | SC-BB-02-Apr-15 | Sand Creek | Muscle Plug | 0.0088 | 71 | <0.0012 | 45.2 | 0.10 | <0.44 | 1.99 | <0.023 |
| | SC-BB-03-Apr-15 | Sand Creek | Muscle Plug | 0.0031 | 71 | <0.0034 | 14.1 | 0.24 | <1.3 | 0.37 | <0.067 |
| | SC-BB-04-Apr-15 | Sand Creek | Muscle Plug | 0.0098 | 75 | 0.254 | 16.0 | 0.17 | <0.40 | 0.23 | <0.022 |
| | ER-BB-01-Feb-15 | Elk River | Muscle Plug | 0.0079 | 74 | <0.0012 | 57.2 | 0.17 | <0.45 | 1.64 | <0.024 |
| | ER-BB-02-Apr-15 | Elk River | Muscle Plug | 0.0029 | 82 | <0.0036 | 25.5 | 0.15 | <1.3 | 1.22 | <0.072 |
| | GC-BB-01-Apr-15 | Gold Creek | Muscle Plug | 0.0052 | 80 | <0.0020 | 15.9 | 0.23 | <0.73 | 0.35 | <0.039 |
| | GC-BB-01-Mar-15 | Gold Creek | Muscle Plug | 1.9928 | 75 | 0.0020 | 2.3 | 0.24 | <0.0965 | 0.06 | <0.0052 |
| 2016 | ER-BB-01-Apr-16 | Elk River | Muscle Plug | 0.00511 | 80 | <0.003 | 51.6 | 0.177 | <0.56 | 0.576 | <0.018 |
| | ER-BB-02-Apr-16 | Elk River | Muscle Plug | 0.00647 | 77 | <0.0043 | 41.4 | 0.15 | <0.47 | 0.652 | <0.016 |
| | ER-BB-03-Apr-16 | Elk River | Muscle Plug | 0.00282 | 77 | <0.0097 | 32.3 | 0.194 | <1 | 0.366 | <0.036 |
| | ER-BB-04-Apr-16 | Elk River | Muscle Plug | 0.00184 | 81 | <0.016 | 5.26 | <0.1 | <1.7 | 0.201 | <0.058 |
| | ER-BB-05-Apr-16 | Elk River | Muscle Plug | 0.00449 | 78 | <0.0059 | 9.19 | 0.558 | <0.64 | 0.23 | <0.022 |
| | ER-BB-06-Apr-16 | Elk River | Muscle Plug | 0.01115 | 79 | <0.0026 | 26.8 | 0.203 | <0.28 | 1.31 | <0.0094 |
| | ER-BB-07-Apr-16 | Elk River | Muscle Plug | 0.00541 | 79 | <0.0053 | 9.26 | 0.17 | <0.57 | 0.158 | <0.02 |
| | ER-BB-08-Apr-16 | Elk River | Muscle Plug | 0.00737 | 78 | <0.0038 | 17.1 | 0.146 | <0.42 | 1.09 | <0.014 |
| | ER-BB-09-Apr-16 | Elk River | Muscle Plug | 0.0053 | 81 | <0.005 | 17 | 0.169 | <0.54 | 1.45 | <0.018 |
| | ER-BB-10-Apr-16 | Elk River | Muscle Plug | 0.00467 | 81 | <0.0063 | 16.6 | 0.17 | <0.68 | 0.399 | <0.023 |
| | SC-BB-01-Apr-16 | Sand Creek | Muscle Plug | 0.00332 | 79 | <0.0069 | 95.6 | 0.19 | <0.6 | 2.23 | <0.024 |
| | SC-BB-02-Apr-16 | Sand Creek | Muscle Plug | 0.00675 | 78 | <0.0036 | 27.5 | 0.44 | <0.31 | 0.314 | <0.013 |
| | SC-BB-03-Apr-16 | Sand Creek | Muscle Plug | 0.00362 | 80 | <0.0064 | 409 | 0.226 | <0.55 | 3.7 | <0.022 |
| | SC-BB-04-Apr-16 | Sand Creek | Muscle Plug | 0.00594 | 80 | <0.0041 | 820 | 0.542 | 0.54 | 7.92 | 0.019 |
| | SC-BB-05-Apr-16 | Sand Creek | Muscle Plug | 0.00867 | 81 | <0.0029 | 142 | 0.235 | <0.25 | 1.33 | <0.01 |
| | SC-BB-06-Apr-16 | Sand Creek | Muscle Plug | 0.0124 | 77 | <0.0021 | 53.4 | 0.256 | <0.18 | 3.38 | <0.0074 |
| | SC-BB-07-Apr-16 | Sand Creek | Muscle Plug | 0.00483 | 78 | <0.0048 | 31.2 | 0.552 | <0.42 | 0.394 | <0.017 |
| | SC-BB-08-Apr-16 | Sand Creek | Muscle Plug | 0.00903 | 80 | <0.0027 | 15.9 | 0.363 | <0.23 | 0.14 | <0.0094 |
| | SC-BB-09-Apr-16 | Sand Creek | Muscle Plug | 0.01019 | 79 | <0.0023 | 27.6 | 0.257 | <0.2 | 0.266 | 0.0133 |
| | SC-BB-10-Apr-16 | Sand Creek | Muscle Plug | 0.00891 | 77 | <0.0024 | 7.31 | 0.195 | <0.3 | 0.173 | <0.0092 |

**Table G.3: Metal Concentrations (µg/g Dry Weight) in Burbot Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-BB-01M-Feb-14 | Sand Creek | Muscle Plug | 0.0024 | 730 | 0.0107 | 0.0306 | 1.85 | 0.118 | 0.822 |
| | SC-BB-02M-Feb-14 | Sand Creek | Muscle Plug | 0.00264 | 735 | <0.0058 | 0.121 | 1.49 | 0.157 | 1.66 |
| | SC-BB-03M-Feb-14 | Sand Creek | Muscle Plug | 0.00187 | 1,350 | <0.0044 | 0.0361 | 0.468 | 0.122 | 1.32 |
| | SC-BB-04M-Feb-14 | Sand Creek | Muscle Plug | 0.00162 | 3,160 | 0.0124 | 0.0466 | 0.325 | 0.0842 | 3.03 |
| | SC-BB-05M-Feb-14 | Sand Creek | Muscle Plug | 0.00296 | 1,350 | 0.006 | 0.041 | 0.976 | 0.15 | 1.32 |
| | SC-BB-06M-Feb-14 | Sand Creek | Muscle | 0.0028 | 637 | <0.0010 | 0.00866 | 0.076 | 0.379 | 0.787 |
| | SC-BB-06G-Feb-14 | Sand Creek | Ovary | 0.00561 | 384 | 0.00472 | 0.129 | 0.0808 | 0.187 | 2.38 |
| | OR-BB-01M-Feb-14 | Oestreich Road | Muscle Plug | 0.00202 | 793 | <0.0025 | 0.0261 | 0.5 | 0.12 | 1.01 |
| | SC-BB-01M-Apr-14 | Sand Creek | Muscle Plug | 0.00428 | 2,790 | <0.019 | 0.119 | 0.926 | 0.276 | 3.21 |
| | SC-BB-02M-Apr-14 | Sand Creek | Muscle Plug | 0.0022 | 896 | 0.003 | 0.0374 | 0.191 | 0.191 | 1.68 |
| | SC-BB-03M-Apr-14 | Sand Creek | Muscle Plug | 0.00802 | 4,490 | <0.0074 | 0.182 | 1.47 | 0.356 | 1.39 |
| | ER-BB-01M-Apr-14 | Elk River | Muscle Plug | 0.00172 | 1,470 | <0.0086 | 0.0507 | 0.297 | 0.109 | 0.847 |
| | ER-BB-02M-Apr-14 | Elk River | Muscle Plug | 0.0127 | 5,060 | 0.0531 | 0.368 | 2.61 | 0.3 | 2.03 |
| | SC-BB-01M-Aug-14 | Sand Creek | Muscle Plug | 0.00478 | 875 | 0.0146 | 0.039 | 0.437 | 0.0701 | 2.18 |
| 2015 | SC-BB-01-Apr-15 | Sand Creek | Muscle Plug | 0.0022 | 464 | <0.005 | 0.026 | 1.720 | 0.111 | 1.17 |
| | SC-BB-02-Apr-15 | Sand Creek | Muscle Plug | 0.0030 | 2,000 | 0.117 | 0.036 | 2.460 | 0.151 | 1.85 |
| | SC-BB-03-Apr-15 | Sand Creek | Muscle Plug | <0.0012 | 842 | <0.012 | 0.027 | 1.280 | 0.189 | 1.31 |
| | SC-BB-04-Apr-15 | Sand Creek | Muscle Plug | 0.0025 | 361 | 0.004 | 0.061 | 2.010 | 0.132 | 1.71 |
| | ER-BB-01-Feb-15 | Elk River | Muscle Plug | 0.0044 | 1,750 | 0.005 | 0.044 | 1.360 | 0.189 | 1.56 |
| | ER-BB-02-Apr-15 | Elk River | Muscle Plug | 0.0013 | 1,980 | <0.012 | 0.038 | 1.670 | 0.062 | 1.31 |
| | GC-BB-01-Apr-15 | Gold Creek | Muscle Plug | 0.0029 | 484 | 0.015 | 0.033 | 1.030 | 0.090 | 1.32 |
| | GC-BB-01-Mar-15 | Gold Creek | Muscle Plug | 0.0009 | 272 | 0.002 | 0.013 | 0.064 | 0.145 | 1.70 |
| 2016 | ER-BB-01-Apr-16 | Elk River | Muscle Plug | 0.00207 | 678 | <0.0095 | 0.0295 | 0.177 | 0.104 | 0.74 |
| | ER-BB-02-Apr-16 | Elk River | Muscle Plug | 0.00264 | 805 | <0.012 | 0.0456 | 3.91 | 0.11 | 1.31 |
| | ER-BB-03-Apr-16 | Elk River | Muscle Plug | 0.00148 | 597 | <0.027 | 0.0384 | 0.254 | 0.0788 | 1.31 |
| | ER-BB-04-Apr-16 | Elk River | Muscle Plug | 0.00196 | 482 | <0.043 | 0.0234 | 0.266 | 0.0936 | 1.7 |
| | ER-BB-05-Apr-16 | Elk River | Muscle Plug | 0.002 | 514 | <0.016 | 0.0224 | 0.289 | 0.0843 | 0.773 |
| | ER-BB-06-Apr-16 | Elk River | Muscle Plug | 0.00282 | 2,080 | <0.007 | 0.028 | 0.152 | 0.0715 | 1.25 |
| | ER-BB-07-Apr-16 | Elk River | Muscle Plug | 0.00173 | 610 | <0.015 | 0.0183 | 0.26 | 0.14 | 1 |
| | ER-BB-08-Apr-16 | Elk River | Muscle Plug | 0.00228 | 1,940 | <0.011 | 0.0405 | 1.24 | 0.0833 | 1.37 |
| | ER-BB-09-Apr-16 | Elk River | Muscle Plug | 0.00079 | 1,990 | <0.014 | 0.0374 | 0.092 | 0.0609 | 0.94 |
| | ER-BB-10-Apr-16 | Elk River | Muscle Plug | 0.00092 | 977 | <0.017 | 0.0423 | 0.987 | 0.0494 | 1.83 |
| | SC-BB-01-Apr-16 | Sand Creek | Muscle Plug | 0.0138 | 690 | 0.027 | 0.059 | 3.04 | 0.185 | 1.95 |
| | SC-BB-02-Apr-16 | Sand Creek | Muscle Plug | 0.00274 | 652 | <0.0055 | 0.0222 | 0.376 | 0.114 | 0.769 |
| | SC-BB-03-Apr-16 | Sand Creek | Muscle Plug | 0.00369 | 1,940 | 0.0334 | 0.141 | 3.19 | 0.184 | 1.32 |
| | SC-BB-04-Apr-16 | Sand Creek | Muscle Plug | 0.00713 | 3,670 | 0.0113 | 0.269 | 1.05 | 0.209 | 1.47 |
| | SC-BB-05-Apr-16 | Sand Creek | Muscle Plug | 0.00236 | 952 | <0.0045 | 0.0524 | 1.28 | 0.2 | 1.08 |
| | SC-BB-06-Apr-16 | Sand Creek | Muscle Plug | 0.00194 | 641 | 0.0248 | 0.028 | 0.323 | 0.167 | 0.993 |
| | SC-BB-07-Apr-16 | Sand Creek | Muscle Plug | 0.002 | 783 | 0.0147 | 0.0206 | 0.233 | 0.108 | 1.66 |
| | SC-BB-08-Apr-16 | Sand Creek | Muscle Plug | 0.00161 | 499 | <0.0042 | 0.0178 | 0.076 | 0.15 | 0.857 |
| | SC-BB-09-Apr-16 | Sand Creek | Muscle Plug | 0.00173 | 580 | <0.0036 | 0.0174 | 0.23 | 0.156 | 0.94 |
| | SC-BB-10-Apr-16 | Sand Creek | Muscle Plug | 0.00187 | 690 | <0.0034 | 0.0266 | 1.12 | 0.161 | 0.816 |

**Table G.3: Metal Concentrations (µg/g Dry Weight) in Burbot Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Fe µg/g dw | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-BB-01M-Feb-14 | Sand Creek | Muscle Plug | 35.1 | 0.014 | 0.405 | 16,900 | <0.034 | 1,110 | 1.58 |
| | SC-BB-02M-Feb-14 | Sand Creek | Muscle Plug | 23.8 | 0.0094 | 1.02 | 15,700 | <0.035 | 979 | 1.47 |
| | SC-BB-03M-Feb-14 | Sand Creek | Muscle Plug | 24.9 | 0.0166 | 0.539 | 15,600 | <0.026 | 1,060 | 1.58 |
| | SC-BB-04M-Feb-14 | Sand Creek | Muscle Plug | 48.3 | 0.0218 | 0.462 | 11,600 | 0.043 | 902 | 2.4 |
| | SC-BB-05M-Feb-14 | Sand Creek | Muscle Plug | 30.5 | 0.0216 | 0.443 | 16,900 | 0.025 | 1,070 | 1.8 |
| | SC-BB-06M-Feb-14 | Sand Creek | Muscle | 7.23 | 0.00976 | 1.11 | 19,200 | <0.0058 | 1,150 | 0.915 |
| | SC-BB-06G-Feb-14 | Sand Creek | Ovary | 57.4 | 0.0153 | 0.340 | 17,450 | <0.0058 | 792 | 1.55 |
| | OR-BB-01M-Feb-14 | Oestreich Road | Muscle Plug | 12.2 | 0.0113 | 0.467 | 16,300 | <0.015 | 962 | 0.946 |
| | SC-BB-01M-Apr-14 | Sand Creek | Muscle Plug | 288 | 0.124 | 1.26 | 17,900 | 0.34 | 1,960 | 4.68 |
| | SC-BB-02M-Apr-14 | Sand Creek | Muscle Plug | 76.7 | 0.0345 | 0.958 | 16,700 | 0.053 | 1,100 | 2.06 |
| | SC-BB-03M-Apr-14 | Sand Creek | Muscle Plug | 462 | 0.284 | 0.459 | 18,600 | 0.448 | 1,760 | 9.97 |
| | ER-BB-01M-Apr-14 | Elk River | Muscle Plug | 90 | 0.0515 | 0.231 | 16,400 | 0.098 | 1,140 | 2.78 |
| | ER-BB-02M-Apr-14 | Elk River | Muscle Plug | 1060 | 0.479 | 1.40 | 14,900 | 0.989 | 1,920 | 35.7 |
| | SC-BB-01M-Aug-14 | Sand Creek | Muscle Plug | 69.8 | 0.02 | 0.143 | 12,800 | <0.087 | 1,220 | 2.21 |
| 2015 | SC-BB-01-Apr-15 | Sand Creek | Muscle Plug | 27.9 | 0.0124 | 0.647 | 13,900 | <0.024 | 972 | 0.98 |
| | SC-BB-02-Apr-15 | Sand Creek | Muscle Plug | 58.5 | 0.0229 | 1.330 | 11,500 | 0.066 | 987 | 2.38 |
| | SC-BB-03-Apr-15 | Sand Creek | Muscle Plug | 19.7 | <0.0074 | 0.566 | 16,700 | <0.056 | 1,120 | 1.11 |
| | SC-BB-04-Apr-15 | Sand Creek | Muscle Plug | 26.0 | 0.0112 | 0.675 | 14,000 | <0.018 | 962 | 1.13 |
| | ER-BB-01-Feb-15 | Elk River | Muscle Plug | 66.9 | 0.0251 | 0.477 | 15,200 | 0.069 | 1,060 | 2.57 |
| | ER-BB-02-Apr-15 | Elk River | Muscle Plug | 27.4 | 0.0121 | 0.252 | 13,300 | <0.060 | 1,100 | 2.44 |
| | GC-BB-01-Apr-15 | Gold Creek | Muscle Plug | 42.3 | 0.0124 | 0.387 | 18,600 | <0.033 | 1,270 | 1.22 |
| | GC-BB-01-Mar-15 | Gold Creek | Muscle Plug | 16.1 | 0.0055 | 0.589 | 15,150 | <0.0043 | 966 | 0.42 |
| 2016 | ER-BB-01-Apr-16 | Elk River | Muscle Plug | 40.5 | 0.0194 | 0.223 | 17,000 | 0.059 | 1,230 | 1.62 |
| | ER-BB-02-Apr-16 | Elk River | Muscle Plug | 71.1 | 0.0224 | 0.257 | 17,200 | 0.043 | 1,250 | 1.91 |
| | ER-BB-03-Apr-16 | Elk River | Muscle Plug | 31.1 | 0.013 | 0.296 | 15,900 | 0.047 | 1,140 | 1.3 |
| | ER-BB-04-Apr-16 | Elk River | Muscle Plug | 11.2 | <0.014 | 0.459 | 13,100 | <0.074 | 1,150 | 1.03 |
| | ER-BB-05-Apr-16 | Elk River | Muscle Plug | 11.4 | 0.0068 | 0.442 | 16,100 | <0.028 | 1,200 | 0.917 |
| | ER-BB-06-Apr-16 | Elk River | Muscle Plug | 33.7 | 0.0172 | 0.144 | 13,600 | 0.022 | 1,040 | 2.25 |
| | ER-BB-07-Apr-16 | Elk River | Muscle Plug | 14.9 | 0.01 | 0.247 | 17,400 | <0.025 | 1,260 | 1.35 |
| | ER-BB-08-Apr-16 | Elk River | Muscle Plug | 29.4 | 0.0098 | 0.351 | 13,900 | 0.022 | 990 | 1.97 |
| | ER-BB-09-Apr-16 | Elk River | Muscle Plug | 19 | 0.009 | 0.147 | 13,600 | 0.027 | 1,110 | 2.2 |
| | ER-BB-10-Apr-16 | Elk River | Muscle Plug | 30.8 | 0.0065 | 0.267 | 12,500 | <0.03 | 1,070 | 1.64 |
| | SC-BB-01-Apr-16 | Sand Creek | Muscle Plug | 123 | 0.043 | 0.532 | 17,200 | 0.091 | 1,250 | 4.07 |
| | SC-BB-02-Apr-16 | Sand Creek | Muscle Plug | 27.6 | 0.013 | 0.263 | 15,800 | <0.036 | 1,230 | 1.29 |
| | SC-BB-03-Apr-16 | Sand Creek | Muscle Plug | 357 | 0.163 | 0.327 | 14,900 | 0.449 | 1,430 | 6.88 |
| | SC-BB-04-Apr-16 | Sand Creek | Muscle Plug | 668 | 0.35 | 0.285 | 13,900 | 0.856 | 1,740 | 13.2 |
| | SC-BB-05-Apr-16 | Sand Creek | Muscle Plug | 121 | 0.0519 | 0.359 | 16,700 | 0.144 | 1,240 | 2.77 |
| | SC-BB-06-Apr-16 | Sand Creek | Muscle Plug | 89 | 0.0221 | 0.276 | 16,300 | 0.035 | 1,200 | 1.64 |
| | SC-BB-07-Apr-16 | Sand Creek | Muscle Plug | 30.3 | <0.014 | 0.336 | 15,200 | <0.049 | 1,080 | 1.02 |
| | SC-BB-08-Apr-16 | Sand Creek | Muscle Plug | 19.8 | 0.0098 | 0.265 | 17,400 | <0.027 | 1,200 | 0.932 |
| | SC-BB-09-Apr-16 | Sand Creek | Muscle Plug | 25.1 | 0.0157 | 0.328 | 17,500 | <0.024 | 1,280 | 0.929 |
| | SC-BB-10-Apr-16 | Sand Creek | Muscle Plug | 18.4 | 0.006 | 0.257 | 16,000 | <0.02 | 1,180 | 0.94 |

**Table G.3: Metal Concentrations (µg/g Dry Weight) in Burbot Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-BB-01M-Feb-14 | Sand Creek | Muscle Plug | 0.0262 | 2,200 | 2.18 | 8,700 | 0.373 | 23 | <0.00033 |
| | SC-BB-02M-Feb-14 | Sand Creek | Muscle Plug | 0.0278 | 3,690 | 0.783 | 8,930 | 0.0487 | 24.2 | 0.00173 |
| | SC-BB-03M-Feb-14 | Sand Creek | Muscle Plug | 0.028 | 4,850 | 0.296 | 9,420 | 0.0985 | 21.3 | 0.00185 |
| | SC-BB-04M-Feb-14 | Sand Creek | Muscle Plug | 0.0353 | 5,980 | 0.271 | 9,640 | 0.212 | 13.7 | 0.0073 |
| | SC-BB-05M-Feb-14 | Sand Creek | Muscle Plug | 0.0345 | 4,830 | 0.521 | 9,950 | 0.204 | 23 | 0.00264 |
| | SC-BB-06M-Feb-14 | Sand Creek | Muscle | 0.00554 | 1,850 | 0.0124 | 9,230 | 0.0128 | 31.6 | <0.000056 |
| | SC-BB-06G-Feb-14 | Sand Creek | Ovary | 0.122 | 6,670 | 0.0309 | 15,600 | 0.0140 | 28.3 | 0.000420 |
| | OR-BB-01M-Feb-14 | Oestreich Road | Muscle Plug | 0.0231 | 3,650 | 0.27 | 9,240 | 0.0153 | 21.6 | 0.00127 |
| | SC-BB-01M-Apr-14 | Sand Creek | Muscle Plug | 0.023 | 6,130 | 1.39 | 10,100 | 0.73 | 27.5 | <0.0011 |
| | SC-BB-02M-Apr-14 | Sand Creek | Muscle Plug | 0.0075 | 3,600 | 0.424 | 9,860 | 0.0756 | 24.2 | 0.00107 |
| | SC-BB-03M-Apr-14 | Sand Creek | Muscle Plug | 0.0965 | 3,460 | 3.38 | 11,100 | 0.604 | 30 | <0.00044 |
| | ER-BB-01M-Apr-14 | Elk River | Muscle Plug | 0.0096 | 4,960 | 0.182 | 9,470 | 0.0661 | 22.1 | 0.00157 |
| | ER-BB-02M-Apr-14 | Elk River | Muscle Plug | 0.0838 | 4,650 | 1.48 | 7,920 | 0.644 | 16.9 | 0.00412 |
| | SC-BB-01M-Aug-14 | Sand Creek | Muscle Plug | 0.0207 | 1,510 | 0.385 | 7,200 | 0.329 | 10.1 | <0.0018 |
| 2015 | SC-BB-01-Apr-15 | Sand Creek | Muscle Plug | 0.0299 | 2,730 | 0.831 | 8,360 | 0.185 | 18.3 | <0.0010 |
| | SC-BB-02-Apr-15 | Sand Creek | Muscle Plug | 0.0402 | 1,320 | 1.870 | 8,520 | 0.109 | 19.1 | <0.00083 |
| | SC-BB-03-Apr-15 | Sand Creek | Muscle Plug | 0.0266 | 2,310 | 0.797 | 10,100 | 0.057 | 28.4 | <0.0024 |
| | SC-BB-04-Apr-15 | Sand Creek | Muscle Plug | 0.0432 | 1,800 | 0.981 | 8,620 | 0.050 | 22.9 | <0.00077 |
| | ER-BB-01-Feb-15 | Elk River | Muscle Plug | 0.0280 | 4,310 | 0.688 | 9,630 | 0.186 | 28.9 | <0.00086 |
| | ER-BB-02-Apr-15 | Elk River | Muscle Plug | 0.0583 | 3,190 | 0.680 | 8,860 | 0.049 | 14.2 | <0.0026 |
| | GC-BB-01-Apr-15 | Gold Creek | Muscle Plug | 0.0301 | 1,920 | 0.355 | 10,800 | 0.128 | 22.6 | <0.0014 |
| | GC-BB-01-Mar-15 | Gold Creek | Muscle Plug | 0.0051 | 1,625 | 0.054 | 8,410 | 0.189 | 18.3 | <0.000185 |
| 2016 | ER-BB-01-Apr-16 | Elk River | Muscle Plug | <0.015 | 1,780 | 0.126 | 9,640 | 0.0603 | 21.9 | <0.00021 |
| | ER-BB-02-Apr-16 | Elk River | Muscle Plug | 0.0202 | 2,540 | 0.333 | 10,200 | 0.16 | 21.8 | <0.00026 |
| | ER-BB-03-Apr-16 | Elk River | Muscle Plug | <0.017 | 3,100 | 0.196 | 9,250 | 0.108 | 17.7 | <0.00057 |
| | ER-BB-04-Apr-16 | Elk River | Muscle Plug | <0.027 | 2,850 | 0.381 | 8,640 | 0.048 | 17.1 | <0.00093 |
| | ER-BB-05-Apr-16 | Elk River | Muscle Plug | 0.014 | 2,800 | 0.055 | 9,870 | 0.0266 | 20.3 | <0.00035 |
| | ER-BB-06-Apr-16 | Elk River | Muscle Plug | 0.0226 | 3,520 | 0.291 | 9,840 | 0.059 | 18.2 | 0.00071 |
| | ER-BB-07-Apr-16 | Elk River | Muscle Plug | 0.0117 | 3,100 | 0.141 | 10,200 | 0.0138 | 26.7 | 0.00146 |
| | ER-BB-08-Apr-16 | Elk River | Muscle Plug | 0.0362 | 3,070 | 0.61 | 9,670 | 0.0376 | 18.3 | 0.00028 |
| | ER-BB-09-Apr-16 | Elk River | Muscle Plug | 0.0269 | 3,520 | 0.096 | 9,230 | 0.0517 | 17.2 | 0.00131 |
| | ER-BB-10-Apr-16 | Elk River | Muscle Plug | 0.018 | 4,880 | 0.198 | 8,210 | 0.0784 | 13.9 | 0.00117 |
| | SC-BB-01-Apr-16 | Sand Creek | Muscle Plug | 0.031 | 2,590 | 0.312 | 9,480 | 0.683 | 25.5 | <0.00047 |
| | SC-BB-02-Apr-16 | Sand Creek | Muscle Plug | <0.0072 | 1,990 | 0.134 | 8,660 | 0.0671 | 19.4 | 0.00044 |
| | SC-BB-03-Apr-16 | Sand Creek | Muscle Plug | 0.02 | 4,000 | 0.465 | 8,500 | 0.486 | 21.8 | <0.00043 |
| | SC-BB-04-Apr-16 | Sand Creek | Muscle Plug | 0.0319 | 1,470 | 0.849 | 8,140 | 0.782 | 22.4 | <0.00028 |
| | SC-BB-05-Apr-16 | Sand Creek | Muscle Plug | 0.0208 | 2,280 | 0.266 | 9,540 | 0.15 | 29.8 | <0.00019 |
| | SC-BB-06-Apr-16 | Sand Creek | Muscle Plug | 0.0475 | 1,410 | 0.0917 | 9,780 | 0.111 | 25.6 | <0.00014 |
| | SC-BB-07-Apr-16 | Sand Creek | Muscle Plug | 0.0177 | 3,340 | 0.083 | 8,840 | 0.0821 | 18.2 | 0.00075 |
| | SC-BB-08-Apr-16 | Sand Creek | Muscle Plug | 0.0108 | 2,310 | 0.0383 | 10,000 | 0.0146 | 23.4 | <0.00018 |
| | SC-BB-09-Apr-16 | Sand Creek | Muscle Plug | 0.0093 | 1,710 | 0.0476 | 10,400 | 0.0577 | 29 | <0.00016 |
| | SC-BB-10-Apr-16 | Sand Creek | Muscle Plug | 0.011 | 2,190 | 0.195 | 9,220 | 0.164 | 26.1 | <0.00034 |

**Table G.3: Metal Concentrations (µg/g Dry Weight) in Burbot Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sb µg/g dw | Se µg/g dw | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-BB-01M-Feb-14 | Sand Creek | Muscle Plug | 0.0135 | 3.19 | 0.108 | 1.1 | 0.00124 | 0.894 | 0.00952 |
| | SC-BB-02M-Feb-14 | Sand Creek | Muscle Plug | 0.0035 | 2.56 | 0.0255 | 0.7 | 0.00036 | 0.163 | 0.0106 |
| | SC-BB-03M-Feb-14 | Sand Creek | Muscle Plug | 0.0102 | 2.84 | 0.0404 | 1.62 | 0.00377 | 0.486 | 0.0136 |
| | SC-BB-04M-Feb-14 | Sand Creek | Muscle Plug | 0.0147 | 2.87 | 0.111 | 4.72 | 0.00702 | 1.01 | 0.0191 |
| | SC-BB-05M-Feb-14 | Sand Creek | Muscle Plug | 0.0124 | 2.88 | 0.0975 | 1.94 | 0.00594 | 0.523 | 0.0102 |
| | SC-BB-06M-Feb-14 | Sand Creek | Muscle | 0.00683 | 2.42 | 0.00337 | 0.487 | 0.00017 | 0.108 | 0.0145 |
| | SC-BB-06G-Feb-14 | Sand Creek | Ovary | 0.00467 | 4.33 | 0.00637 | 0.584 | 0.000179 | 0.115 | 0.0525 |
| | OR-BB-01M-Feb-14 | Oestreich Road | Muscle Plug | 0.00204 | 3.34 | 0.00501 | 0.947 | 0.00093 | 0.245 | 0.012 |
| | SC-BB-01M-Apr-14 | Sand Creek | Muscle Plug | 0.023 | 3.49 | 0.0797 | 2.45 | 0.0952 | 4.49 | 0.0106 |
| | SC-BB-02M-Apr-14 | Sand Creek | Muscle Plug | 0.00629 | 2.95 | 0.0188 | 1.21 | 0.0137 | 1.32 | 0.0177 |
| | SC-BB-03M-Apr-14 | Sand Creek | Muscle Plug | 0.0156 | 1.95 | 0.191 | 7.53 | 0.193 | 8.43 | 0.0196 |
| | ER-BB-01M-Apr-14 | Elk River | Muscle Plug | 0.0042 | 3.6 | 0.0081 | 2.02 | 0.0143 | 1.8 | 0.018 |
| | ER-BB-02M-Apr-14 | Elk River | Muscle Plug | 0.0306 | 3.05 | 0.0471 | 7.45 | 0.241 | 13.4 | 0.0359 |
| | SC-BB-01M-Aug-14 | Sand Creek | Muscle Plug | 0.0175 | 1.63 | 0.0472 | 1.47 | 0.0113 | 1.68 | 0.0163 |
| 2015 | SC-BB-01-Apr-15 | Sand Creek | Muscle Plug | 0.0077 | 2.92 | 0.0392 | 0.532 | 0.00580 | 0.565 | 0.0104 |
| | SC-BB-02-Apr-15 | Sand Creek | Muscle Plug | 0.0056 | 2.58 | 0.0215 | 3.370 | 0.00650 | 0.950 | 0.0096 |
| | SC-BB-03-Apr-15 | Sand Creek | Muscle Plug | 0.0059 | 2.90 | 0.0085 | 1.070 | <0.0054 | 0.240 | 0.0212 |
| | SC-BB-04-Apr-15 | Sand Creek | Muscle Plug | 0.0046 | 3.41 | 0.0117 | 0.403 | 0.00190 | 0.365 | 0.0143 |
| | ER-BB-01-Feb-15 | Elk River | Muscle Plug | 0.0104 | 1.87 | 0.0431 | 2.770 | 0.01210 | 2.650 | 0.0173 |
| | ER-BB-02-Apr-15 | Elk River | Muscle Plug | 0.0042 | 5.30 | 0.0112 | 2.880 | <0.0058 | 0.936 | 0.0224 |
| | GC-BB-01-Apr-15 | Gold Creek | Muscle Plug | 0.0094 | 3.08 | 0.0377 | 0.345 | 0.00330 | 0.740 | 0.0267 |
| | GC-BB-01-Mar-15 | Gold Creek | Muscle Plug | 0.0057 | 2.93 | 0.0025 | 0.229 | 0.00045 | 0.129 | 0.0225 |
| 2016 | ER-BB-01-Apr-16 | Elk River | Muscle Plug | 0.0035 | 1.82 | 0.0088 | 0.628 | 0.00758 | 1.03 | 0.0201 |
| | ER-BB-02-Apr-16 | Elk River | Muscle Plug | 0.095 | 3.08 | 0.0142 | 0.958 | 0.00812 | 1.02 | 0.0219 |
| | ER-BB-03-Apr-16 | Elk River | Muscle Plug | <0.011 | 4.3 | 0.016 | 0.486 | 0.0078 | 0.9 | 0.0256 |
| | ER-BB-04-Apr-16 | Elk River | Muscle Plug | <0.018 | <2.9 | <0.023 | 0.53 | <0.0017 | 0.3 | 0.0188 |
| | ER-BB-05-Apr-16 | Elk River | Muscle Plug | <0.0068 | 2.3 | <0.0087 | 0.304 | 0.00097 | 0.5 | 0.0118 |
| | ER-BB-06-Apr-16 | Elk River | Muscle Plug | <0.0029 | 4.09 | 0.0053 | 3.24 | 0.00685 | 0.652 | 0.0187 |
| | ER-BB-07-Apr-16 | Elk River | Muscle Plug | <0.0061 | 2.96 | <0.0078 | 0.371 | 0.00086 | 0.281 | 0.023 |
| | ER-BB-08-Apr-16 | Elk River | Muscle Plug | <0.0044 | 3.54 | <0.0057 | 2.77 | 0.00289 | 0.356 | 0.0167 |
| | ER-BB-09-Apr-16 | Elk River | Muscle Plug | <0.0057 | 3.98 | <0.0073 | 2.87 | 0.00362 | 0.348 | 0.0165 |
| | ER-BB-10-Apr-16 | Elk River | Muscle Plug | 0.0362 | 4.6 | 0.432 | 1.2 | 0.00554 | 0.561 | 0.0184 |
| | SC-BB-01-Apr-16 | Sand Creek | Muscle Plug | 0.0282 | 3.4 | 0.0606 | 1.03 | 0.0141 | 3.15 | 0.0143 |
| | SC-BB-02-Apr-16 | Sand Creek | Muscle Plug | 0.0033 | 6.27 | 0.0107 | 0.485 | 0.00595 | 0.42 | 0.0212 |
| | SC-BB-03-Apr-16 | Sand Creek | Muscle Plug | 0.0119 | 1.63 | 0.0512 | 3.99 | 0.101 | 9.65 | 0.0268 |
| | SC-BB-04-Apr-16 | Sand Creek | Muscle Plug | 0.013 | 2.39 | 0.038 | 8.25 | 0.27 | 16.4 | 0.0268 |
| | SC-BB-05-Apr-16 | Sand Creek | Muscle Plug | 0.004 | 2.26 | 0.0134 | 1.29 | 0.0413 | 2.57 | 0.0139 |
| | SC-BB-06-Apr-16 | Sand Creek | Muscle Plug | 0.0078 | 1.8 | 0.0343 | 1.81 | 0.0068 | 0.687 | 0.0196 |
| | SC-BB-07-Apr-16 | Sand Creek | Muscle Plug | 0.0098 | 4.06 | 0.0343 | 0.764 | 0.00515 | 0.578 | 0.0214 |
| | SC-BB-08-Apr-16 | Sand Creek | Muscle Plug | <0.0022 | 1.39 | 0.0039 | 0.329 | 0.00153 | 0.203 | 0.0201 |
| | SC-BB-09-Apr-16 | Sand Creek | Muscle Plug | <0.0019 | 1.98 | 0.0035 | 0.354 | 0.00305 | 0.399 | 0.0212 |
| | SC-BB-10-Apr-16 | Sand Creek | Muscle Plug | 0.0047 | 2.21 | 0.307 | 0.668 | 0.00247 | 0.35 | 0.0201 |

### Table G.3: Metal Concentrations (µg/g Dry Weight) in Burbot Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|
| 2014 | SC-BB-01M-Feb-14 | Sand Creek | Muscle Plug | <0.00064 | 0.0356 | 0.00394 | 14.8 | 0.0312 |
| | SC-BB-02M-Feb-14 | Sand Creek | Muscle Plug | <0.00067 | 0.0197 | 0.00132 | 33 | 0.0082 |
| | SC-BB-03M-Feb-14 | Sand Creek | Muscle Plug | 0.0008 | 0.0335 | 0.00566 | 30.1 | 0.0167 |
| | SC-BB-04M-Feb-14 | Sand Creek | Muscle Plug | 0.00212 | 0.0555 | 0.0138 | 65.8 | 0.0334 |
| | SC-BB-05M-Feb-14 | Sand Creek | Muscle Plug | 0.00279 | 0.0387 | 0.00963 | 28.2 | 0.0234 |
| | SC-BB-06M-Feb-14 | Sand Creek | Muscle | 0.0002 | 0.00282 | 0.00133 | 15.3 | 0.00502 |
| | SC-BB-06G-Feb-14 | Sand Creek | Ovary | 0.00056 | 0.0147 | 0.00125 | 141 | 0.0152 |
| | OR-BB-01M-Feb-14 | Oestreich Road | Muscle Plug | 0.00032 | 0.0171 | 0.00214 | 24.6 | 0.0089 |
| | SC-BB-01M-Apr-14 | Sand Creek | Muscle Plug | 0.0088 | 0.266 | 0.0911 | 28.2 | 0.178 |
| | SC-BB-02M-Apr-14 | Sand Creek | Muscle Plug | 0.00228 | 0.0935 | 0.0203 | 29.9 | 0.0502 |
| | SC-BB-03M-Apr-14 | Sand Creek | Muscle Plug | 0.0197 | 0.641 | 0.234 | 27.1 | 0.281 |
| | ER-BB-01M-Apr-14 | Elk River | Muscle Plug | 0.003 | 0.18 | 0.0308 | 21 | 0.0667 |
| | ER-BB-02M-Apr-14 | Elk River | Muscle Plug | 0.0574 | 3.32 | 0.674 | 28.5 | 0.717 |
| | SC-BB-01M-Aug-14 | Sand Creek | Muscle Plug | 0.0043 | 0.162 | 0.0281 | 39.8 | 0.0897 |
| 2015 | SC-BB-01-Apr-15 | Sand Creek | Muscle Plug | 0.0016 | 0.0351 | 0.010 | 24.7 | 0.027 |
| | SC-BB-02-Apr-15 | Sand Creek | Muscle Plug | 0.0028 | 0.0844 | 0.017 | 38.5 | 0.034 |
| | SC-BB-03-Apr-15 | Sand Creek | Muscle Plug | 0.0010 | 0.0276 | 0.008 | 25.2 | 0.018 |
| | SC-BB-04-Apr-15 | Sand Creek | Muscle Plug | 0.0010 | 0.0309 | 0.005 | 24.6 | 0.084 |
| | ER-BB-01-Feb-15 | Elk River | Muscle Plug | 0.0030 | 0.1190 | 0.019 | 32.0 | 0.061 |
| | ER-BB-02-Apr-15 | Elk River | Muscle Plug | 0.0024 | 0.0451 | 0.006 | 33.2 | 0.031 |
| | GC-BB-01-Apr-15 | Gold Creek | Muscle Plug | 0.0016 | 0.0306 | 0.004 | 33.5 | 0.033 |
| | GC-BB-01-Mar-15 | Gold Creek | Muscle Plug | 0.0001 | 0.0040 | 0.001 | 24.1 | 0.011 |
| 2016 | ER-BB-01-Apr-16 | Elk River | Muscle Plug | <0.0024 | 0.0986 | 0.0202 | 17.2 | 0.0332 |
| | ER-BB-02-Apr-16 | Elk River | Muscle Plug | 0.0153 | 0.153 | 0.0121 | 38 | 0.0442 |
| | ER-BB-03-Apr-16 | Elk River | Muscle Plug | 0.00164 | 0.0661 | 0.0137 | 29.3 | 0.0382 |
| | ER-BB-04-Apr-16 | Elk River | Muscle Plug | 0.00086 | 0.0124 | 0.004 | 31.8 | 0.0356 |
| | ER-BB-05-Apr-16 | Elk River | Muscle Plug | 0.00098 | 0.0171 | 0.00221 | 24.7 | 0.0199 |
| | ER-BB-06-Apr-16 | Elk River | Muscle Plug | 0.00274 | 0.0598 | 0.0129 | 34.1 | 0.0271 |
| | ER-BB-07-Apr-16 | Elk River | Muscle Plug | 0.00056 | 0.0246 | 0.00184 | 20 | 0.0852 |
| | ER-BB-08-Apr-16 | Elk River | Muscle Plug | 0.00127 | 0.0423 | 0.00786 | 36.5 | 0.0227 |
| | ER-BB-09-Apr-16 | Elk River | Muscle Plug | 0.00171 | 0.0341 | 0.00896 | 28 | 0.0283 |
| | ER-BB-10-Apr-16 | Elk River | Muscle Plug | 0.0102 | 0.0421 | 0.00742 | 45.5 | 0.0314 |
| | SC-BB-01-Apr-16 | Sand Creek | Muscle Plug | 0.0068 | 0.249 | 0.0386 | 27.6 | 0.104 |
| | SC-BB-02-Apr-16 | Sand Creek | Muscle Plug | 0.0014 | 0.0393 | 0.0102 | 16.3 | 0.023 |
| | SC-BB-03-Apr-16 | Sand Creek | Muscle Plug | 0.0138 | 0.576 | 0.155 | 21.1 | 0.167 |
| | SC-BB-04-Apr-16 | Sand Creek | Muscle Plug | 0.0403 | 1.03 | 0.381 | 25.2 | 0.353 |
| | SC-BB-05-Apr-16 | Sand Creek | Muscle Plug | 0.00481 | 0.182 | 0.0589 | 23.3 | 0.088 |
| | SC-BB-06-Apr-16 | Sand Creek | Muscle Plug | 0.00169 | 0.0657 | 0.0101 | 19.4 | 0.0364 |
| | SC-BB-07-Apr-16 | Sand Creek | Muscle Plug | 0.0015 | 0.0455 | 0.0084 | 35.8 | 0.029 |
| | SC-BB-08-Apr-16 | Sand Creek | Muscle Plug | <0.0008 | 0.012 | 0.00302 | 20.8 | 0.0154 |
| | SC-BB-09-Apr-16 | Sand Creek | Muscle Plug | 0.00085 | 0.0426 | 0.00491 | 16.7 | 0.0201 |
| | SC-BB-10-Apr-16 | Sand Creek | Muscle Plug | 0.00318 | 0.0227 | 0.00459 | 18.3 | 0.0566 |

## Table G.4: Metal Concentrations (µg/g Dry Weight) in Kokanee Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | Se | Sn | Sr | Th | Ti | Tl | U | V | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw |
| 2014 | SC-KO-01M-Aug-14 | Sand Creek | Muscle | 1.48 | 0.0796 | 0.43 | 0.00696 | 0.912 | 0.0436 | 0.00206 | 0.0841 | 0.0124 | 21.1 | 0.0461 |
| | SC-KO-10M-Aug-14 | Sand Creek | Muscle | 1.85 | 0.07960 | 0.43 | <0.006960 | 0.9120 | 0.0436 | 0.00206 | 0.08410 | <0.01240 | 21.1 | 0.0461 |
| | SC-KO-11M-Aug-14 | Sand Creek | Muscle | 1.72 | 0.00106 | 0.386 | 0.000135 | 0.0882 | 0.0526 | <0.00023 | 0.00252 | <0.00026 | 26.7 | 0.0137 |
| | SC-KO-12M-Aug-14 | Sand Creek | Muscle | 1.69 | 0.00129 | 0.66 | 0.000121 | 0.097 | 0.0564 | <0.00022 | 0.00273 | <0.00026 | 13.2 | 0.0037 |
| | SC-KO-13M-Aug-14 | Sand Creek | Muscle | 1.99 | 0.00163 | 0.76 | 0.00162 | 0.193 | 0.0559 | 0.00056 | 0.0139 | 0.00303 | 16.5 | 0.00689 |
| | SC-KO-14M-Aug-14 | Sand Creek | Muscle | 2.00 | <0.015 | 0.30 | 0.00115 | 0.47 | 0.0416 | <0.0024 | 0.0196 | <0.0020 | 22.9 | 1.75 |
| | SC-KO-15M-Aug-14 | Sand Creek | Muscle | 1.73 | 0.0227 | 0.401 | 0.0035 | 0.851 | 0.0419 | <0.0016 | 0.0285 | 0.0076 | 21.5 | 0.235 |
| | SC-KO-16M-Aug-14 | Sand Creek | Muscle | 2.9 | 0.063 | 1.07 | 0.0436 | 1.61 | 0.0572 | 0.0243 | 0.134 | 0.134 | 25.8 | 0.394 |
| | SC-KO-17M-Aug-14 | Sand Creek | Muscle | 1.92 | 0.00833 | 0.113 | 0.000364 | 0.146 | 0.0482 | 0.00042 | 0.0056 | 0.00079 | 16.4 | 0.0125 |
| | SC-KO-18M-Aug-14 | Sand Creek | Muscle | 1.89 | 0.00722 | 0.346 | 0.000468 | 0.165 | 0.0642 | 0.00024 | 0.00702 | 0.00129 | 19 | 0.0449 |
| | SC-KO-19M-Aug-14 | Sand Creek | Muscle | 1.66 | 0.00355 | 0.305 | 0.00329 | 0.108 | 0.0488 | 0.00078 | 0.00695 | 0.00396 | 16 | 0.00406 |
| | SC-KO-02M-Aug-14 | Sand Creek | Muscle | 1.82 | 0.0552 | 1.39 | 0.00745 | 1.36 | 0.0494 | 0.00272 | 0.0902 | 0.0144 | 27 | 0.0552 |
| | SC-KO-20M-Aug-14 | Sand Creek | Muscle | 1.93 | 0.029375 | 0.848 | 0.00537 | 0.734 | 0.0491 | <0.00175 | 0.048575 | 0.00918 | 21.5 | 0.02963 |
| | SC-KO-21M-Aug-14 | Sand Creek | Muscle | 2.02 | 0.00183 | 0.178 | 0.000108 | 0.485 | 0.0549 | <0.00020 | 0.0024 | <0.00023 | 17.8 | 0.0372 |
| | SC-KO-22M-Aug-14 | Sand Creek | Muscle | 1.75 | 0.00382 | 0.41 | 0.000148 | 0.133 | 0.0476 | <0.00022 | 0.00421 | 0.00037 | 15.8 | 0.00552 |
| | SC-KO-23M-Aug-14 | Sand Creek | Muscle | 2.2 | 0.00099 | 0.273 | 0.000088 | 0.0879 | 0.049 | <0.00022 | 0.00224 | <0.00025 | 15.7 | 0.00148 |
| | SC-KO-24M-Aug-14 | Sand Creek | Muscle | 2.04 | 0.00201 | 0.489 | 0.000173 | 0.136 | 0.0432 | 0.00029 | 0.00283 | 0.00098 | 15.3 | 0.00572 |
| | SC-KO-25M-Aug-14 | Sand Creek | Muscle | 1.98 | 0.00189 | 0.571 | 0.000146 | 0.129 | 0.0541 | 0.0004 | 0.00428 | 0.00058 | 15.1 | 0.00526 |
| | SC-KO-03M-Aug-14 | Sand Creek | Muscle | 1.25 | 0.0174 | 0.459 | 0.0046 | 0.245 | 0.037 | <0.0013 | 0.0174 | 0.0064 | 24.5 | 0.0668 |
| | SC-KO-04M-Aug-14 | Sand Creek | Muscle | 1.84 | 0.028 | 0.338 | 0.00154 | 1.01 | 0.048 | <0.0016 | 0.0489 | 0.004 | 23.1 | 0.0296 |
| | SC-KO-05M-Aug-14 | Sand Creek | Muscle | 2.72 | 0.032 | 0.371 | 0.0033 | 1.41 | 0.0469 | <0.0020 | 0.0557 | 0.0068 | 20 | 0.0241 |
| | SC-KO-06M-Aug-14 | Sand Creek | Muscle | 1.89 | 0.00312 | 2.51 | 0.000115 | 0.159 | 0.043 | 0.00033 | 0.0141 | <0.00026 | 25.2 | 0.0374 |
| | SC-KO-07M-Aug-14 | Sand Creek | Muscle | 1.94 | 0.00251 | 0.215 | 0.000409 | 0.138 | 0.0468 | <0.00021 | 0.00537 | 0.00084 | 25 | 0.0193 |
| | SC-KO-08M-Aug-14 | Sand Creek | Muscle | 1.83 | 0.00151 | 0.361 | <0.000076 | 0.0879 | 0.0714 | <0.00021 | 0.00207 | <0.00025 | 16.6 | 0.00437 |
| | SC-KO-09M-Aug-14 | Sand Creek | Muscle | 1.74 | 0.00221 | 0.39 | 0.000643 | 0.137 | 0.0488 | 0.00031 | 0.00687 | 0.00126 | 42.6 | 0.00657 |
| | SC-KO-11G-Aug-14 | Sand Creek | Ovary | 5.33 | 0.00108 | 2.18 | 0.000122 | 0.0471 | 0.0173 | 0.00026 | 0.0043 | 0.00056 | 72.7 | 0.00118 |
| | SC-KO-12G-Aug-14 | Sand Creek | Ovary | 4.65 | <0.00081 | 1.68 | <0.000057 | 0.0571 | 0.0209 | 0.00042 | 0.0055 | 0.00082 | 105 | 0.00092 |
| | SC-KO-13G-Aug-14 | Sand Creek | Ovary | 3.59 | <0.00084 | 1.85 | 0.000068 | 0.0713 | 0.00687 | 0.00036 | 0.00591 | 0.00052 | 88.1 | 0.00096 |
| | SC-KO-19G-Aug-14 | Sand Creek | Ovary | 3.12 | <0.00083 | 1.76 | 0.000084 | 0.0651 | 0.00334 | 0.00028 | 0.0107 | 0.00049 | 66.9 | 0.00244 |
| | SC-KO-21G-Aug-14 | Sand Creek | Ovary | 4.23 | 0.0027 | 1.91 | 0.000193 | 0.0852 | 0.00778 | 0.00084 | 0.00809 | 0.00162 | 66.1 | 0.002 |
| | SC-KO-24G-Aug-14 | Sand Creek | Ovary | 3.87 | <0.00086 | 2.02 | <0.000061 | 0.0679 | 0.00379 | 0.00038 | 0.00409 | 0.00040 | 87.8 | 0.00119 |
| | SC-KO-25G-Aug-14 | Sand Creek | Ovary | 4.24 | <0.00083 | 1.68 | 0.000085 | 0.063 | 0.00522 | 0.00049 | 0.00526 | 0.00054 | 96.8 | 0.0008 |
| | SC-KO-07G-Aug-14 | Sand Creek | Ovary | 4.93 | 0.00100 | 1.58 | 0.0001197 | 0.0760 | 0.00866 | 0.00033 | 0.00624 | 0.00080 | 89.7 | 0.00159 |
| | SC-KO-08G-Aug-14 | Sand Creek | Ovary | 4.07 | <0.00084 | 1.64 | 0.000093 | 0.055 | 0.00844 | 0.00018 | 0.00463 | 0.00076 | 89.1 | 0.00217 |
| | ER-KO-01M-Aug-14 | Elk River | Muscle | 1.75 | 0.00222 | 0.325 | 0.000177 | 0.134 | 0.0628 | <0.00011 | 0.00297 | 0.00054 | 15.3 | 0.00369 |
| | ER-KO-10M-Aug-14 | Elk River | Muscle | 1.4 | 0.038 | 2.19 | 0.0168 | 1.22 | 0.0455 | 0.0035 | 0.117 | 0.0287 | 26.3 | 0.0661 |
| | ER-KO-11M-Aug-14 | Elk River | Muscle | 2.01 | 0.00112 | 1.42 | 0.000073 | 0.0906 | 0.0573 | 0.00014 | 0.00331 | <0.00017 | 14.7 | 0.00865 |
| | ER-KO-12M-Aug-14 | Elk River | Muscle | 1.41 | 0.00143 | 0.17 | 0.000201 | 0.0905 | 0.051 | 0.00014 | 0.00274 | 0.00034 | 35 | 0.00915 |
| | ER-KO-13M-Aug-14 | Elk River | Muscle | 1.69 | 0.0012 | 0.356 | 0.000174 | 0.136 | 0.0472 | <0.00011 | 0.00421 | 0.00059 | 26.9 | 0.00497 |
| | ER-KO-14M-Aug-14 | Elk River | Muscle | 1.98 | 0.00149 | 0.276 | 0.000206 | 0.101 | 0.0466 | 0.00013 | 0.00283 | 0.00046 | 14.7 | 0.00375 |
| | ER-KO-15M-Aug-14 | Elk River | Muscle | 1.9 | 0.00194 | 1.08 | 0.000157 | 0.116 | 0.0593 | 0.00025 | 0.00486 | 0.00062 | 21.3 | 0.00428 |
| | ER-KO-16M-Aug-14 | Elk River | Muscle | 2.08 | 0.00187 | 0.61 | 0.000139 | 0.1 | 0.0602 | 0.00012 | 0.00462 | 0.00036 | 14 | 0.00768 |
| | ER-KO-17M-Aug-14 | Elk River | Muscle | 1.64 | 0.00061 | 0.595 | 0.000059 | 0.0824 | 0.0583 | <0.00011 | 0.00201 | 0.00021 | 15.8 | 0.00132 |
| | ER-KO-02M-Aug-14 | Elk River | Muscle | 1.76 | 0.0046 | 0.232 | 0.00041 | 0.14 | 0.0568 | 0.00022 | 0.00592 | 0.00094 | 22.4 | 0.00582 |
| | ER-KO-03M-Aug-14 | Elk River | Muscle | 2.03 | 0.0105 | 0.939 | 0.000587 | 0.191 | 0.0443 | 0.00077 | 0.00744 | 0.00115 | 18.6 | 0.011 |
| | ER-KO-04M-Aug-14 | Elk River | Muscle | 1.89 | 0.00328 | 1.58 | 0.000129 | 0.127 | 0.062 | 0.00037 | 0.00419 | 0.00072 | 20.8 | 0.00553 |
| | ER-KO-05M-Aug-14 | Elk River | Muscle | 2.05 | 0.00363 | 0.326 | 0.000431 | 0.103 | 0.0578 | 0.000152 | 0.00469 | 0.00073 | 18.4 | 0.0572 |
| | ER-KO-06M-Aug-14 | Elk River | Muscle | 2.4 | 0.039 | 0.595 | 0.0088 | 1.45 | 0.0505 | <0.0029 | 0.116 | 0.0157 | 23 | 0.126 |
| | ER-KO-07M-Aug-14 | Elk River | Muscle | 2.3 | 0.052 | 0.971 | 0.0197 | 1.31 | 0.0472 | 0.0033 | 0.117 | 0.0356 | 27.4 | 0.0734 |
| | ER-KO-08M-Aug-14 | Elk River | Muscle | 1.87 | 0.0134 | 1.45 | 0.0168 | 4.08 | 0.0497 | 0.00405 | 0.154 | 0.0417 | 19.9 | 0.118 |
| | ER-KO-09M-Aug-14 | Elk River | Muscle | 2.41 | 0.0245 | 4.69 | 0.0117 | 0.922 | 0.0622 | 0.0047 | 0.0959 | 0.0287 | 26.7 | 0.0819 |
| | ER-KO-01G-Aug-14 | Elk River | Ovary | 3.74 | 0.00112 | 1.33 | 0.000138 | 0.0728 | 0.0248 | 0.00022 | 0.00576 | 0.00086 | 90.2 | 0.00199 |
| | ER-KO-11G-Aug-14 | Elk River | Ovary | 3.57 | 0.00097 | 1.53 | <0.000061 | 0.067 | 0.00453 | 0.00032 | 0.00482 | 0.00044 | 69.1 | 0.00139 |
| | ER-KO-12G-Aug-14 | Elk River | Ovary | 3.44 | <0.00083 | 1.67 | <0.000059 | 0.056 | 0.0161 | 0.00029 | 0.0034 | 0.00049 | 98.5 | 0.0008 |
| | ER-KO-15G-Aug-14 | Elk River | Ovary | 3.13 | <0.00086 | 1.61 | <0.000061 | 0.0733 | 0.0134 | 0.00032 | 0.00484 | 0.00066 | 76.7 | 0.00083 |
| | ER-KO-16G-Aug-14 | Elk River | Ovary | 4.3 | 0.00104 | 1.44 | 0.000062 | 0.0652 | 0.0124 | 0.00025 | 0.00453 | 0.00056 | 82.9 | 0.00072 |
| | ER-KO-04G-Aug-14 | Elk River | Ovary | 3.46 | 0.00098 | 1.44 | 0.000131 | 0.0676 | 0.00363 | 0.00052 | 0.00337 | 0.00051 | 82.7 | 0.00493 |
| | ER-KO-05G-Aug-14 | Elk River | Ovary | 4.37 | 0.0017 | 1.42 | 0.000153 | 0.0631 | 0.0167 | 0.00029 | 0.00508 | 0.0009 | 95.5 | 0.00077 |
| | GC-KO-01M-Aug-14 | Gold Creek | Muscle | 1.86 | 0.00089 | 0.652 | <0.000065 | 0.088 | 0.0596 | <0.00077 | 0.00184 | <0.00019 | 16.8 | 0.00300 |
| | GC-KO-02M-Aug-14 | Gold Creek | Muscle | 1.26 | 0.00269 | 0.434 | 0.000162 | 0.115 | 0.0656 | <0.00082 | 0.00332 | 0.00058 | 15.7 | 0.00509 |
| | GC-KO-03M-Aug-14 | Gold Creek | Muscle | 1.12 | 0.00229 | 0.202 | 0.000716 | 0.127 | 0.0601 | <0.00080 | 0.00411 | 0.00126 | 25.2 | 0.104 |
| | GC-KO-04M-Aug-14 | Gold Creek | Muscle | 1.52 | 0.00209 | 0.65 | 0.000073 | 0.098 | 0.0644 | <0.00086 | 0.00326 | 0.00034 | 16.2 | 0.0268 |
| | GC-KO-05M-Aug-14 | Gold Creek | Muscle | 1.05 | 0.00176 | 0.268 | <0.000066 | 0.076 | 0.072 | <0.00078 | 0.00188 | 0.00028 | 18.4 | 0.0139 |
| | GC-KO-06M-Aug-14 | Gold Creek | Muscle | 1.65 | 0.00448 | 0.274 | 0.000956 | 0.182 | 0.0735 | <0.00083 | 0.00755 | 0.00177 | 23.4 | 0.0319 |
| 2015 | SC-KO-01-Aug-15 | Sand Creek | Muscle | 1.49 | 0.00274 | 0.508 | 0.000397 | 0.163 | 0.0492 | 0.000670 | 0.00808 | 0.000920 | 27.2 | 0.0216 |
| | SC-KO-02-Aug-15 | Sand Creek | Muscle | 1.78 | 0.00197 | 1.27 | 0.000109 | 0.0872 | 0.0492 | 0.000889 | 0.00610 | 0.000605 | 25.5 | 0.00603 |
| | SC-KO-03-Aug-15 | Sand Creek | Muscle | 2.48 | 0.00137 | 0.32 | <0.000079 | 0.0875 | 0.0668 | 0.000187 | 0.00307 | 0.000210 | 28.3 | 0.00570 |
| | SC-KO-04-Aug-15 | Sand Creek | Muscle | 1.88 | 0.00240 | 1.54 | 0.000306 | 0.116 | 0.0529 | 0.000512 | 0.00426 | 0.000360 | 22.0 | 0.00750 |
| | SC-KO-05-Aug-15 | Sand Creek | Muscle | 1.72 | 0.00220 | 1.26 | 0.000993 | 0.115 | 0.0507 | 0.000339 | 0.00784 | 0.00323 | 30.6 | 0.0116 |
| | SC-KO-06-Aug-15 | Sand Creek | Muscle | 1.54 | 0.00188 | 4.51 | 0.000505 | 0.105 | 0.0534 | 0.000693 | 0.00852 | 0.000430 | 37.8 | 0.00852 |
| | SC-KO-07-Aug-15 | Sand Creek | Muscle | 1.83 | 0.00143 | 0.671 | 0.000404 | 0.104 | 0.0654 | 0.000366 | 0.00361 | 0.000610 | 31.3 | 0.00530 |
| | SC-KO-08-Aug-15 | Sand Creek | Muscle | 1.80 | 0.00201 | 0.594 | 0.000191 | 0.0797 | 0.0629 | 0.000153 | 0.00413 | 0.000350 | 21.0 | 0.00809 |
| | SC-KO-09-Aug-15 | Sand Creek | Muscle | 1.53 | 0.00756 | 0.592 | 0.000465 | 0.204 | 0.0540 | 0.000501 | 0.0103 | 0.00123 | 25.3 | 0.00798 |
| | ER-KO-01-Aug-15 | Elk River | Muscle | 1.93 | 0.00225 | 0.587 | <0.000089 | 0.0847 | 0.0482 | 0.000120 | 0.00261 | 0.000190 | 21.8 | 0.0174 |
| | ER-KO-02-Aug-15 | Elk River | Muscle | 1.91 | 0.00174 | 0.672 | 0.000576 | 0.0834 | 0.0462 | 0.000196 | 0.00472 | 0.000860 | 50.8 | 0.00721 |
| | ER-KO-03-Aug-15 | Elk River | Muscle | 1.71 | 0.00208 | 0.553 | 0.000116 | 0.0784 | 0.0438 | 0.0000950 | 0.00283 | 0.000270 | 23.2 | 0.00953 |
| | ER-KO-04-Aug-15 | Elk River | Muscle | 1.96 | 0.000840 | 0.531 | 0.000201 | 0.0941 | 0.0508 | 0.000136 | 0.00458 | 0.000600 | 20.1 | 0.00614 |
| | ER-KO-05-Aug-15 | Elk River | Muscle | 1.82 | 0.00130 | 0.499 | 0.000951 | 0.0782 | 0.0354 | 0.000118 | 0.00319 | 0.000720 | 18.1 | 0.00590 |
| | ER-KO-06-Aug-15 | Elk River | Muscle | 1.93 | 0.00111 | 0.569 | 0.000531 | 0.0968 | 0.0492 | 0.000105 | 0.00368 | 0.000580 | 31.0 | 0.00598 |
| | ER-KO-07-Aug-15 | Elk River | Muscle | 1.58 | 0.00158 | 0.645 | 0.000442 | 0.0795 | 0.0529 | 0.000165 | 0.00380 | 0.000440 | 31.2 | 0.00602 |
| | ER-KO-08-Aug-15 | Elk River | Muscle | 1.49 | 0.00119 | 0.608 | 0.000245 | 0.0745 | 0.0567 | 0.000274 | 0.00498 | 0.000940 | 40.3 | 0.0481 |
| | ER-KO-09-Aug-15 | Elk River | Muscle | 1.51 | 0.00112 | 1.09 | 0.000244 | 0.0734 | 0.0451 | 0.000237 | 0.00344 | 0.000570 | 17.7 | 0.00606 |
| | ER-KO-10-Aug-15 | Elk River | Muscle | 1.77 | 0.00159 | 0.391 | 0.000509 | 0.0746 | 0.0605 | 0.000140 | 0.00476 | 0.000610 | 42.5 | 0.0104 |
| 2016 | ER-KO-01 M-Apr-16 | Elk River | Muscle | 1.69 | 0.00176 | 0.213 | 0.000461 | 0.12 | 0.089 | 0.000218 | 0.00786 | 0.00151 | 19.7 | 0.00573 |
| | ER-KO-02 M-Apr-16 | Elk River | Muscle | 1.62 | <0.001 | 0.594 | 0.00041 | 0.102 | 0.102 | 0.000147 | 0.00628 | 0.00146 | 23.4 | 0.00533 |
| | ER-KO-03 M-Apr-16 | Elk River | Muscle | 2.15 | 0.0016 | 0.445 | 0.000466 | 0.121 | 0.0883 | 0.000321 | 0.00915 | 0.00172 | 34.1 | 0.0094 |
| | ER-KO-04 M-Apr-16 | Elk River | Muscle | 1.78 | <0.00096 | 0.448 | 0.000223 | 0.0758 | 0.104 | 0.000123 | 0.00367 | 0.00048 | 18.2 | 0.00374 |
| | SC-KO-01-Aug-16 | Sand Creek | Muscle | 2.18 | 0.0124 | 0.692 | 0.00108 | 0.476 | 0.0392 | 0.00117 | 0.023 | 0.00363 | 20.3 | 0.0232 |
| | SC-KO-02-Aug-16 | Sand Creek | Muscle | 2.08 | 0.00258 | 0.193 | 0.00013 | 0.134 | 0.0387 | 0.000317 | 0.00336 | <0.00035 | 15.6 | 0.00443 |
| | SC-KO-03-Aug-16 | Sand Creek | Muscle | 1.91 | 0.00609 | 1.05 | 0.00046 | 0.17 | 0.0324 | 0.000424 | 0.00784 | 0.00083 | 15.8 | 0.00631 |
| | SC-KO-04-Aug-16 | Sand Creek | Muscle | 2.28 | 0.00195 | 0.239 | 0.00029 | 0.128 | 0.0354 | 0.000129 | 0.00328 | 0.00045 | 14.4 | 0.0056 |
| | ER-KO-01-Aug-16 | Elk River | Muscle | 2.19 | 0.00077 | 3.24 | 0.00015 | 0.076 | 0.0432 | 0.000614 | 0.00644 | <0.00035 | 23.1 | 0.00259 |
| | ER-KO-02-Aug-16 | Elk River | Muscle | 1.99 | 0.00107 | 0.228 | 0.00016 | 0.106 | 0.0374 | 0.000115 | 0.00312 | <0.00037 | 47.2 | 0.0025 |
| | ER-KO-03-Aug-16 | Elk River | Muscle | 2.38 | 0.00213 | 0.187 | 0.000258 | 0.157 | 0.0433 | 0.000371 | 0.00448 | 0.00058 | 16.6 | 0.0105 |
| | ER-KO-04-Aug-16 | Elk River | Muscle | 2.08 | 0.00161 | 0.492 | 0.000233 | 0.145 | 0.0502 | 0.00049 | 0.00673 | 0.00072 | 18 | 0.007 |
| | ER-KO-05-Aug-16 | Elk River | Muscle | 2.09 | 0.00151 | 0.342 | 0.000147 | 0.117 | 0.0622 | 0.000197 | 0.00446 | 0.00033 | 15.5 | 0.0093 |
| | ER-KO-06-Aug-16 | Elk River | Muscle | 2.17 | 0.00095 | 1.46 | <0.000059 | 0.085 | 0.0604 | 0.000306 | 0.00601 | 0.00057 | 18 | 0.0284 |
| | ER-KO-07-Aug-16 | Elk River | Muscle | 2.02 | 0.00128 | 0.733 | 0.000436 | 0.167 | 0.0558 | 0.000236 | 0.00676 | 0.00197 | 16.8 | 0.0135 |
| | ER-KO-08-Aug-16 | Elk River | Muscle | 2.17 | 0.00799 | 0.747 | 0.00111 | 0.106 | 0.0529 | 0.00034 | 0.00884 | 0.00112 | 17.2 | 0.0104 |
| | ER-KO-09-Aug-16 | Elk River | Muscle | 2.25 | 0.00147 | 0.433 | 0.000158 | 0.122 | 0.0502 | 0.000225 | 0.00493 | 0.0005 | 17.6 | 0.0108 |
| | ER-KO-10-Aug-16 | Elk River | Muscle | 2.32 | 0.00126 | 1.5 | 0.000101 | 0.109 | 0.0433 | 0.00021 | 0.00492 | 0.00054 | 18.5 | 0.0068 |

**Table G.5:** **Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-LSS-01M-APR-14 | Sand Creek | Muscle Plug | 79.25 | 0.0319 | 1.94 | 0.118 | <0.86 | 0.671 | <0.019 | 0.00683 | 1,110 | <0.0068 | 0.015 | 0.696 | 0.0482 | 4.48 |
| | SC-LSS-02M-APR-14 | Sand Creek | Muscle Plug | 74.24 | 0.0163 | 27.8 | 0.189 | <0.41 | 0.485 | <0.0092 | 0.00216 | 671 | <0.0033 | 0.0266 | 0.516 | 0.134 | 0.747 |
| | SC-LSS-03M-APR-14 | Sand Creek | Muscle Plug | 79.58 | <0.0013 | 7.26 | 0.093 | <0.33 | 0.255 | <0.0073 | 0.0116 | 550 | <0.0026 | 0.0148 | 0.415 | 0.0641 | 0.629 |
| | SC-LSS-04M-APR-14 | Sand Creek | Muscle Plug | 82.70 | <0.0025 | 38 | 0.137 | <0.61 | 4.1 | <0.013 | 0.00289 | 10,700 | 0.0328 | 0.073 | 0.272 | 0.101 | 0.961 |
| | SC-LSS-07M-APR-14 | Sand Creek | Muscle Plug | 78.61 | <0.0017 | 18.3 | 0.207 | <0.40 | 0.325 | <0.0089 | 0.00462 | 478 | 0.0042 | 0.0367 | 0.384 | 0.201 | 0.761 |
| | SC-LSS-08M-APR-14 | Sand Creek | Muscle Plug | 81.29 | <0.0021 | 50.1 | 0.234 | <0.51 | 0.744 | <0.011 | 0.0323 | 812 | 0.0066 | 0.0445 | 0.57 | 0.0831 | 0.988 |
| | SC-LSS-09M-APR-14 | Sand Creek | Muscle Plug | 81.08 | <0.0022 | 5.49 | 0.185 | <0.55 | 0.526 | <0.012 | 0.0239 | 519 | 0.0045 | 0.0266 | 0.481 | 0.0942 | 0.698 |
| | SC-LSS-10M-APR-14 | Sand Creek | Muscle Plug | 81.89 | <0.0014 | 24.3 | 0.105 | <0.34 | 0.531 | <0.0076 | 0.0100 | 400 | 0.007 | 0.0431 | 0.434 | 0.0582 | 0.966 |
| | SC-LSS-11M-APR-14 | Sand Creek | Muscle Plug | 81.55 | <0.0018 | 16.9 | 0.188 | <0.44 | 0.752 | <0.0097 | 0.0100 | 379 | 0.0073 | 0.0356 | 0.237 | 0.277 | 0.895 |
| | SC-LSS-12M-APR-14 | Sand Creek | Muscle Plug | 75.99 | <0.0018 | 10 | 0.268 | <0.43 | 0.367 | <0.0096 | 0.00449 | 538 | 0.0036 | 0.0245 | 0.156 | 0.132 | 0.91 |
| | SC-LSS-01M-AUG-14 | Sand Creek | Muscle Plug | 77.98 | <0.0048 | 59.1 | 0.13 | <0.65 | 6.13 | <0.014 | 0.0107 | 622 | 0.0114 | 0.0423 | 3.14 | 0.102 | 1.29 |
| | SC-LSS-02M-AUG-14 | Sand Creek | Muscle Plug | 78.37 | <0.0051 | 19.9 | 0.07 | <0.68 | 2.84 | <0.015 | 0.00816 | 5,880 | 0.0115 | 0.0368 | 0.351 | 0.118 | 0.998 |
| | SC-LSS-03M-AUG-14 | Sand Creek | Muscle Plug | 80.61 | <0.011 | 16.1 | 0.06 | <1.4 | 0.449 | <0.032 | 0.00369 | 742 | <0.0066 | 0.0281 | 0.179 | 0.121 | 0.895 |
| | SC-LSS-04M-AUG-14 | Sand Creek | Muscle Plug | 76.20 | <0.0079 | 64.6 | 0.132 | <1.1 | 3.22 | <0.023 | 0.0216 | 602 | 0.0109 | 0.036 | 0.62 | 0.0729 | 1.87 |
| | ER-LSS-08M-APR-14 | Elk River | Muscle Plug | 78.46 | <0.0017 | 7.55 | 0.121 | <0.42 | 3.78 | <0.0094 | 0.00727 | 9,630 | <0.0033 | 0.0378 | 1.28 | 0.0346 | 1.38 |
| | ER-LSS-09M-APR-14 | Elk River | Muscle Plug | 79.22 | <0.0017 | 5.19 | 0.147 | <0.41 | 1.15 | <0.0091 | 0.00358 | 1,520 | 0.004 | 0.0365 | 0.651 | 0.0644 | 0.871 |
| | ER-LSS-10M-APR-14 | Elk River | Muscle Plug | 79.87 | <0.0015 | 353 | 0.278 | <0.37 | 2.66 | 0.0161 | 0.00725 | 5,520 | 0.0165 | 0.133 | 0.813 | 0.0656 | 1.25 |
| | ER-LSS-11M-APR-14 | Elk River | Muscle Plug | 81.25 | <0.0025 | 210 | 0.293 | <0.60 | 2.69 | <0.013 | 0.0116 | 2,360 | 0.0196 | 0.0923 | 0.665 | 0.0654 | 1.39 |
| | ER-LSS-12M-APR-14 | Elk River | Muscle Plug | 81.06 | <0.0017 | 38.5 | 0.050 | <0.41 | 0.54 | <0.0092 | 0.0125 | 766 | 0.006 | 0.0327 | 0.185 | 0.0638 | 1.01 |
| | ER-LSS-13M-APR-14 | Elk River | Muscle Plug | 76.00 | <0.0020 | 6.26 | 0.126 | <0.49 | 2.28 | <0.011 | 0.00655 | 5,960 | 0.0042 | 0.023 | 0.19 | 0.0489 | 0.958 |
| | ER-LSS-14M-APR-14 | Elk River | Muscle Plug | 80.77 | <0.0028 | 124 | 0.156 | <0.69 | 3.86 | <0.015 | 0.00618 | 9,970 | 0.0063 | 0.0586 | 0.47 | 0.0828 | 1.04 |
| | ER-LSS-15M-APR-14 | Elk River | Muscle Plug | 78.49 | <0.0018 | 108 | 0.155 | <0.43 | 3.26 | <0.0095 | 0.0101 | 7,360 | 0.0037 | 0.0762 | 1.79 | 0.0677 | 1.03 |
| | ER-LSS-16M-APR-14 | Elk River | Muscle Plug | 77.52 | <0.0015 | 25.2 | 0.144 | <0.36 | 2.02 | <0.0080 | 0.011 | 3,930 | <0.0029 | 0.0307 | 0.315 | 0.0423 | 0.966 |
| | ER-LSS-17M-APR-14 | Elk River | Muscle Plug | 79.92 | <0.0013 | 19.8 | 0.104 | <0.33 | 1.74 | <0.0073 | 0.00519 | 5,700 | 0.0031 | 0.0401 | 0.184 | 0.102 | 0.935 |
| | ER-LSS-01M-AUG-14 | Elk River | Muscle Plug | 75.34 | <0.0034 | 53.8 | 0.108 | <0.45 | 1.23 | <0.010 | 0.00548 | 490 | 0.024 | 0.266 | 1.39 | 0.0512 | 1.52 |
| | ER-LSS-02M-AUG-14 | Elk River | Muscle Plug | 76.73 | <0.0068 | 36.9 | 0.084 | <0.91 | 3.55 | <0.020 | 0.0102 | 7,980 | 0.0171 | 0.0443 | 0.744 | 0.0586 | 0.975 |
| | ER-LSS-03M-AUG-14 | Elk River | Muscle Plug | 77.42 | <0.0088 | 11.8 | 0.11 | <1.2 | 0.331 | <0.026 | 0.00772 | 472 | 0.0073 | 0.0226 | 0.23 | 0.0611 | 0.831 |
| | ER-LSS-04M-AUG-14 | Elk River | Muscle Plug | 80.63 | <0.0093 | 14.3 | 0.068 | <1.2 | 0.762 | <0.028 | 0.00698 | 815 | 0.0114 | 0.0396 | 0.309 | 0.079 | 0.715 |
| | ER-LSS-05M-AUG-14 | Elk River | Muscle Plug | 80.91 | <0.0041 | 8.55 | 0.132 | <0.55 | 0.361 | <0.012 | 0.00655 | 599 | 0.0085 | 0.0231 | 0.216 | 0.0782 | 1.08 |
| | ER-LSS-06M-AUG-14 | Elk River | Muscle Plug | 70.38 | <0.0078 | 6.17 | 0.105 | <1.0 | 0.61 | <0.023 | 0.00331 | 385 | 0.0459 | 0.0456 | 0.123 | 0.0917 | 1.66 |
| | ER-LSS-07M-AUG-14 | Elk River | Muscle Plug | 76.33 | <0.0075 | 5.96 | 0.061 | <1.0 | 0.247 | <0.022 | 0.00339 | 416 | 0.0189 | 0.0246 | 0.279 | 0.0663 | 0.805 |
| | ER-LSS-08M-AUG-14 | Elk River | Muscle Plug | 78.57 | <0.0069 | 87.7 | 0.119 | <0.92 | 9.33 | <0.020 | 0.00455 | 26,100 | 0.0266 | 0.0554 | 0.583 | 0.082 | 1.04 |
| | ER-LSS-09M-AUG-14 | Elk River | Muscle Plug | 75.03 | <0.0058 | 5.25 | 0.06 | <0.78 | 0.237 | <0.017 | 0.00922 | 412 | 0.01 | 0.0258 | 0.177 | 0.0548 | 0.979 |
| | ER-LSS-10M-AUG-14 | Elk River | Muscle Plug | 81.01 | <0.0048 | 14.6 | 0.124 | <0.64 | 0.862 | <0.014 | 0.00542 | 403 | 0.0157 | 0.0349 | 1.04 | 0.0597 | 1.3 |
| | GC-LSS-01M-APR-14 | Gold Creek | Muscle Plug | 80.19 | 0.0082 | 8.36 | 0.0768 | <0.25 | 0.607 | <0.0056 | 0.014 | 1,020 | 0.003 | 0.0668 | 1.00 | 0.0349 | 0.782 |
| | GC-LSS-02M-APR-14 | Gold Creek | Muscle Plug | 79.79 | <0.0036 | 29.7 | 0.108 | <0.49 | 2.36 | <0.011 | 0.0186 | 4,370 | 0.0108 | 0.107 | 0.749 | 0.125 | 0.899 |
| | GC-LSS-03M-APR-14 | Gold Creek | Muscle Plug | 79.17 | <0.0011 | 44.2 | 0.186 | <0.28 | 1.97 | <0.0061 | 0.00319 | 627 | 0.0026 | 0.169 | 0.457 | 0.053 | 2.62 |
| | GC-LSS-01M-AUG-14 | Gold Creek | Muscle Plug | 74.83 | <0.0088 | 33.3 | 0.075 | <1.2 | 1.68 | <0.026 | 0.0172 | 517 | 0.0107 | 0.0431 | 1.08 | 0.0283 | 1.19 |
| | GC-LSS-02M-AUG-14 | Gold Creek | Muscle Plug | 78.83 | <0.0071 | 4.29 | 0.072 | <0.95 | 0.425 | <0.021 | 0.0428 | 377 | 0.0068 | 0.0283 | 1.43 | 0.0433 | 0.759 |
| | GC-LSS-03M-AUG-14 | Gold Creek | Muscle Plug | 80.23 | <0.0038 | 16 | 0.06 | <0.51 | 0.815 | <0.011 | 0.0163 | 388 | 0.01 | 0.0268 | 0.272 | 0.064 | 1.04 |
| | GC-LSS-04M-AUG-14 | Gold Creek | Muscle Plug | 74.12 | <0.0081 | 43.9 | 0.115 | <1.1 | 4.47 | <0.024 | 0.00705 | 659 | 0.0727 | 0.0689 | 0.53 | 0.0629 | 1.57 |
| | GC-LSS-05M-AUG-14 | Gold Creek | Muscle Plug | 79.32 | <0.0049 | 5.03 | 0.077 | <0.65 | 0.774 | <0.014 | 0.0113 | 409 | <0.0030 | 0.0186 | 0.198 | 0.0281 | 0.925 |

**Table G.5: Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | GC-LSS-06M-AUG-14 | Gold Creek | Muscle Plug | 75.98 | <0.0074 | 15.8 | 0.098 | <0.99 | 0.758 | <0.022 | 0.01 | 426 | 0.0049 | 0.0254 | 0.243 | 0.0489 | 0.689 |
| | GC-LSS-07M-AUG-14 | Gold Creek | Muscle Plug | 74.95 | <0.0054 | 4.41 | 0.077 | <0.73 | 0.289 | <0.016 | 0.00199 | 387 | <0.0033 | 0.0206 | 0.115 | 0.0445 | 0.924 |
| | GC-LSS-08M-AUG-14 | Gold Creek | Muscle Plug | 78.61 | <0.012 | 6.68 | <0.061 | <1.6 | 1.36 | <0.035 | 0.0129 | 470 | <0.0073 | 0.0348 | 0.391 | 0.0435 | 1.02 |
| | GC-LSS-09M-AUG-14 | Gold Creek | Muscle Plug | 79.76 | <0.0037 | 5.51 | 0.061 | <0.50 | 0.278 | <0.011 | 0.0159 | 435 | 0.0051 | 0.0187 | 0.123 | 0.0616 | 0.684 |
| | GC-LSS-10M-AUG-14 | Gold Creek | Muscle Plug | 80.54 | <0.0048 | 3.95 | 0.123 | <0.65 | 2.23 | <0.014 | 0.00262 | 5,820 | 0.0044 | 0.0207 | 0.145 | 0.0479 | 0.815 |
| 2015 | SC-CSU-02-APR-15 | Sand Creek | Muscle | 81.50 | <0.00046 | 11.90 | 0.0920 | <0.073 | 1.254 | <0.0023 | 0.00926 | 3,128 | 0.0048 | 0.01970 | 0.1340 | 0.0548 | 0.750 |
| | SC-CSU-03-APR-15 | Sand Creek | Muscle | 81.11 | 0.00095 | 44.80 | 0.2650 | 0.130 | 1.350 | <0.0025 | 0.01520 | 2,840 | 0.0063 | 0.04040 | 0.1140 | 0.1770 | 1.230 |
| | SC-CSU-04-APR-15 | Sand Creek | Muscle | 85.33 | 0.00196 | 5.37 | 0.1710 | 0.137 | 1.490 | <0.0025 | 0.00517 | 396 | 0.0276 | 0.10600 | 0.0844 | 0.1600 | 3.500 |
| | SC-CSU-05-APR-15 | Sand Creek | Muscle | 80.76 | 0.00046 | 2.04 | 0.2720 | <0.071 | 1.050 | <0.0022 | 0.00186 | 3,750 | 0.0035 | 0.04030 | 0.0620 | 0.1800 | 1.440 |
| | SC-CSU-06-APR-15 | Sand Creek | Muscle | 83.47 | 0.00120 | 18.40 | 0.2620 | <0.079 | 1.900 | <0.0025 | 0.02580 | 4,630 | 0.0137 | 0.04740 | 0.0811 | 0.1330 | 1.260 |
| | SC-CSU-07-APR-15 | Sand Creek | Muscle | 81.19 | 0.00079 | 6.50 | 0.2120 | <0.072 | 0.437 | <0.0023 | 0.01110 | 1,100 | 0.0066 | 0.05950 | 0.0664 | 0.1530 | 2.430 |
| | SC-CSU-05-APR-15 | Sand Creek | Ovary | 44.23 | 0.02697 | 7.98 | 0.2160 | 0.123 | 0.615 | 0.0023 | 0.00051 | 960 | 0.0103 | 0.18867 | 0.0687 | 0.0244 | 5.650 |
| | ER-CSU-01-APR-15 | Elk River | Muscle | 78.22 | 0.00488 | 597.00 | 0.2700 | 0.914 | 7.780 | 0.0155 | 0.00877 | 3,690 | 0.0300 | 0.16000 | 0.8220 | 0.1050 | 1.720 |
| | ER-CSU-02-APR-15 | Elk River | Muscle | 81.38 | 0.00088 | 1.93 | 0.1135 | 0.137 | 1.335 | <0.0024 | 0.00248 | 3,720 | 0.0038 | 0.03415 | 0.0517 | 0.1145 | 1.090 |
| | ER-CSU-04-APR-15 | Elk River | Muscle | 84.38 | 0.00221 | 82.50 | 0.1370 | 0.300 | 3.760 | 0.0051 | 0.00343 | 7,140 | 0.0332 | 0.07990 | 0.1870 | 0.1110 | 2.560 |
| | ER-CSU-05-APR-15 | Elk River | Muscle | 79.73 | 0.00081 | 8.76 | 0.1310 | 0.140 | 1.350 | <0.0026 | 0.00308 | 2,010 | 0.0056 | 0.03930 | 0.0727 | 0.0451 | 2.080 |
| | ER-CSU-08-APR-15 | Elk River | Muscle | 82.02 | 0.00081 | 16.00 | 0.0569 | 0.120 | 1.960 | <0.0027 | 0.00710 | 4,420 | 0.0081 | 0.04290 | 0.0932 | 0.0508 | 1.250 |
| | ER-CSU-09-APR-15 | Elk River | Muscle | 80.30 | 0.00059 | 2.68 | 0.0985 | <0.13 | 3.610 | <0.00245 | 0.00402 | 7,845 | 0.0040 | 0.01895 | 0.0583 | 0.0813 | 0.721 |
| | ER-CSU-10-APR-15 | Elk River | Muscle | 79.81 | 0.00077 | 20.80 | 0.1290 | <0.13 | 2.490 | <0.0024 | 0.00308 | 3,790 | 0.0061 | 0.03200 | 0.0913 | 0.0517 | 1.450 |
| | ER-CSU-11-APR-15 | Elk River | Muscle | 81.58 | 0.00127 | 21.00 | 0.1440 | 0.123 | 1.920 | <0.0023 | 0.00409 | 3,570 | 0.0068 | 0.05300 | 0.0816 | 0.0673 | 1.710 |
| | ER-CSU-12-APR-15 | Elk River | Muscle | 79.77 | 0.00057 | 6.28 | 0.1180 | 0.105 | 1.570 | <0.0024 | 0.01650 | 3,240 | 0.0186 | 0.02590 | 0.0751 | 0.0641 | 0.878 |
| | ER-CSU-17-APR-15 | Elk River | Muscle | 81.57 | 0.00050 | 5.88 | 0.0387 | <0.11 | 1.430 | <0.00265 | 0.00949 | 3,845 | 0.0073 | 0.03455 | 0.0606 | 0.0550 | 1.145 |
| | GC-CSU-02-APR-15 | Gold Creek | Muscle | 79.92 | 0.00207 | 22.30 | 0.1480 | <0.10 | 0.974 | <0.0026 | 0.00679 | 1,820 | 0.0054 | 0.02580 | 0.0818 | 0.1350 | 0.942 |
| | GC-CSU-08-APR-15 | Gold Creek | Muscle | 81.86 | 0.00166 | 0.68 | 0.0354 | <0.10 | 3.190 | <0.0025 | 0.02220 | 6,040 | 0.0029 | 0.01560 | 0.0679 | 0.0381 | 0.635 |
| | GC-CSU-09-APR-15 | Gold Creek | Muscle | 85.76 | 0.00287 | 5.00 | 0.0772 | <0.11 | 0.620 | <0.0027 | 0.00653 | 417 | 0.0487 | 0.08450 | 0.0695 | 0.0811 | 3.090 |
| | GC-CSU-10-APR-15 | Gold Creek | Muscle | 82.16 | 0.00229 | 2.30 | 0.0840 | 0.105 | 1.385 | <0.00255 | 0.00469 | 2,335 | 0.0059 | 0.02650 | 0.0659 | 0.0266 | 1.200 |
| | GC-CSU-11-APR-15 | Gold Creek | Muscle | 80.51 | 0.00138 | 2.69 | 0.0915 | 0.094 | 2.110 | <0.0023 | 0.00937 | 4,810 | 0.0037 | 0.01750 | 0.0563 | 0.0350 | 0.735 |
| | GC-CSU-13-APR-15 | Gold Creek | Muscle | 80.81 | 0.00140 | 0.65 | 0.1270 | <0.098 | 4.290 | <0.0024 | 0.00530 | 7,730 | 0.0026 | 0.01930 | 0.0564 | 0.0468 | 0.831 |
| | GC-CSU-14-APR-15 | Gold Creek | Muscle | 81.38 | 0.00078 | 0.63 | 0.0563 | 0.110 | 1.310 | <0.0023 | 0.00322 | 4,440 | 0.0046 | 0.02390 | 0.0534 | 0.0560 | 0.687 |
| | GC-CSU-15-APR-15 | Gold Creek | Muscle | 82.01 | 0.00127 | 25.50 | 0.0949 | 0.110 | 11.200 | <0.0026 | 0.00647 | 22,100 | 0.0100 | 0.11300 | 0.0763 | 0.0489 | 1.610 |
| | GC-CSU-17-APR-15 | Gold Creek | Muscle | 83.26 | 0.00093 | 0.66 | 0.0484 | <0.10 | 3.600 | <0.0026 | 0.01970 | 7,150 | 0.0058 | 0.03410 | 0.0480 | 0.0844 | 1.210 |
| | GC-CSU-18-APR-15 | Gold Creek | Muscle | 81.88 | 0.00090 | 8.54 | 0.0815 | <0.10 | 2.130 | <0.0026 | 0.00478 | 5,410 | 0.0124 | 0.03130 | 0.0668 | 0.0590 | 1.320 |
| | GC-CSU-10-APR-15 | Gold Creek | Ovary | 23.70 | 0.0205 | 8.07 | 0.0625 | 0.13 | 0.551 | <0.0027 | 0.00130 | 1,490 | 0.0327 | 0.177 | 0.0620 | 0.00712 | 8.79 |
| 2016 | SC-CSU-08 M-Apr-16 | Sand Creek | Muscle | 79.76 | <0.00065 | 3.81 | 0.0943 | <0.14 | 0.616 | <0.0025 | 0.0113 | 1,820 | <0.0013 | 0.0131 | 0.0906 | 0.0943 | 0.696 |
| | SC-CSU-36 M-Apr-16 | Sand Creek | Muscle | 80.83 | 0.000815 | 2.2 | 0.07925 | 0.155 | 0.16 | 0.00275 | 0.005645 | 454 | 0.0058 | 0.02475 | 0.0577 | 0.06565 | 1.115 |
| | SC-CSU-08 O -Apr-16 | Sand Creek | Ovary | 67.10 | 0.03265 | 1.22 | 0.07935 | 0.265 | 0.375 | 0.0026 | 0.00259 | 619 | 0.0111 | 0.105 | 0.0622 | 0.0114 | 4.875 |
| | SC-CSU-36 O-Apr-16 | Sand Creek | Ovary | 75.11 | 0.0711 | 6.18 | 0.083 | 0.32 | 0.368 | <0.0026 | 0.00171 | 1,170 | 0.0324 | 0.151 | 0.0737 | 0.0165 | 12.2 |
| | ER-CSU-03 M-Apr-16 | Elk River | Muscle | 78.41 | 0.00231 | 3.74 | 0.175 | 0.218 | 0.221 | <0.0026 | 0.0106 | 395 | 0.0027 | 0.0309 | 0.0708 | 0.043 | 1.55 |
| | ER-CSU-04 M-Apr-16 | Elk River | Muscle | 80.57 | 0.00068 | 3.795 | 0.1375 | 0.184 | 1.43 | 0.00235 | 0.00325 | 3,405 | 0.00225 | 0.0152 | 0.05925 | 0.0594 | 0.8405 |
| | ER-CSU-34 M-Apr-16 | Elk River | Muscle | 80.48 | 0.0022 | 5.34 | 0.225 | 0.088 | 0.6825 | 0.0026 | 0.00722 | 1,505 | 0.0087 | 0.0401 | 0.07175 | 0.05525 | 1.495 |
| | ER-CSU-45 M-Apr-16 | Elk River | Muscle | 80.22 | <0.00073 | 1.02 | 0.119 | <0.063 | 0.518 | <0.0026 | 0.00389 | 1,540 | 0.0178 | 0.0191 | 0.0585 | 0.129 | 0.792 |
| | ER-CSU-03 O -Apr-16 | Elk River | Ovary | 67.14 | 0.0845 | 2.705 | 0.1265 | 0.315 | 0.821 | 0.0033 | 0.002755 | 620 | 0.0105 | 0.213 | 0.0686 | 0.00669 | 5.335 |

**Table G.5:** **Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-CSU-04 O-Apr-16 | Elk River | Ovary | 63.44 | 0.029 | 0.63 | 0.146 | 0.165 | 0.5305 | 0.0025 | 0.000443 | 459 | 0.0049 | 0.0657 | 0.06935 | 0.007815 | 3.425 |
| | ER-CSU-34 O-Apr-16 | Elk River | Ovary | 71.69 | 0.124 | 22.1 | 0.221 | <0.18 | 0.931 | <0.0027 | 0.00399 | 1,060 | 0.0504 | 0.278 | 0.0875 | 0.0135 | 8.43 |
| | ER-CSU-45 O-Apr-16 | Elk River | Ovary | 72.40 | 0.0479 | 11.2 | 0.127 | 0.26 | 0.6 | <0.0026 | 0.00119 | 1,210 | 0.109 | 0.133 | 0.0759 | 0.0276 | 7.66 |
| | GC-CSU-04 M-Apr-16 | Gold Creek | Muscle | 77.78 | 0.000625 | 8.275 | 0.0938 | 0.17 | 0.3475 | 0.00235 | 0.001375 | 1,235 | 0.00147 | 0.02365 | 0.06125 | 0.236 | 0.9525 |
| | GC-CSU-05 M-Apr-16 | Gold Creek | Muscle | 81.09 | <0.0006 | 1.67 | 0.107 | 0.191 | 1.94 | <0.0023 | 0.0358 | 4,780 | 0.00197 | 0.0211 | 0.0706 | 0.0441 | 0.851 |
| | GC-CSU-09 M-Apr-16 | Gold Creek | Muscle | 78.36 | 0.00064 | 1.495 | 0.1415 | 0.0865 | 0.8 | 0.0024 | 0.00244 | 2,195 | 0.001375 | 0.03545 | 0.061 | 0.273 | 0.963 |
| | GC-CSU-26 M-Apr-16 | Gold Creek | Muscle | 79.84 | <0.00067 | 2.35 | 0.121 | 0.424 | 1.47 | <0.0025 | 0.00207 | 4,910 | 0.00192 | 0.0182 | 0.0591 | 0.515 | 0.859 |
| | GC-CSU-27 M-Apr-16 | Gold Creek | Muscle | 79.56 | <0.00058 | 6.14 | 0.0636 | 0.114 | 1.15 | <0.0022 | 0.00303 | 3,120 | 0.00237 | 0.0165 | 0.101 | 0.209 | 0.854 |
| | GC-CSU-31 M-Apr-16 | Gold Creek | Muscle | 80.00 | <0.00067 | 1.76 | 0.0718 | 1.24 | 1.06 | <0.0025 | 0.0236 | 3,160 | 0.00162 | 0.0176 | 0.0928 | 0.0501 | 1.15 |
| | GC-CSU-34 M-Apr-16 | Gold Creek | Muscle | 78.74 | <0.00063 | 2.56 | 0.0948 | 0.084 | 0.169 | <0.0024 | 0.00163 | 845 | 0.00241 | 0.025 | 0.0605 | 0.217 | 0.819 |
| | GC-CSU-37 M-Apr-16 | Gold Creek | Muscle | 79.23 | <0.00067 | 4.78 | 0.161 | 0.193 | 5.16 | <0.0025 | 0.00327 | 9,570 | 0.00257 | 0.0296 | 0.0677 | 0.0859 | 0.813 |
| | GC-CSU-43 M-Apr-16 | Gold Creek | Muscle | 78.97 | <0.00068 | 1.63 | 0.243 | 0.138 | 0.468 | <0.0026 | 0.00078 | 2,030 | 0.0016 | 0.0327 | 0.0734 | 0.437 | 1.94 |
| | GC-CSU-04 O-Apr-16 | Gold Creek | Ovary | 62.74 | 0.02075 | 2.05 | 0.10265 | 0.2205 | 0.358 | 0.00475 | 0.000229 | 368 | 0.0021 | 0.103 | 0.0665 | 0.02485 | 3.455 |
| | GC-CSU-05 O-Apr-16 | Gold Creek | Ovary | 65.06 | 0.0283 | 0.82 | 0.0622 | 0.287 | 0.639 | <0.0045 | 0.00558 | 484 | 0.0058 | 0.114 | 0.063 | 0.00426 | 2.97 |
| | GC-CSU-09 O-Apr-16 | Gold Creek | Ovary | 64.82 | 0.0204 | 0.533 | 0.149 | 0.274 | 0.589 | <0.0049 | 0.000228 | 447 | 0.0027 | 0.171 | 0.064 | 0.0358 | 3.95 |
| | GC-CSU-26 O-Apr-16 | Gold Creek | Ovary | 62.82 | 0.013 | 0.747 | 0.13 | 0.238 | 0.383 | <0.0047 | 0.000152 | 411 | 0.0026 | 0.0864 | 0.069 | 0.0442 | 2.78 |
| | GC-CSU-27 O-Apr-16 | Gold Creek | Ovary | 62.48 | 0.0105 | 0.484 | 0.0828 | 0.226 | 0.393 | <0.0044 | 0.000203 | 278 | <0.0011 | 0.0774 | 0.067 | 0.0231 | 3.42 |
| | GC-CSU-31 O-Apr-16 | Gold Creek | Ovary | 70.23 | 0.02095 | 1.25 | 0.0641 | 0.12 | 0.7005 | 0.0035 | 0.005625 | 941 | 0.00365 | 0.127 | 0.0647 | 0.008215 | 3.06 |
| | GC-CSU-34 O-Apr-16 | Gold Creek | Ovary | 64.00 | 0.0122 | 1.01 | 0.116 | 0.12 | 0.254 | <0.0034 | 0.00021 | 353 | 0.0041 | 0.0905 | 0.0719 | 0.0278 | 4.19 |
| | GC-CSU-37 O-Apr-16 | Gold Creek | Ovary | 65.92 | 0.035 | 0.397 | 0.138 | 0.25 | 0.698 | <0.0035 | 0.000465 | 503 | 0.0039 | 0.141 | 0.0676 | 0.00939 | 4.78 |
| | GC-CSU-43 O-Apr-16 | Gold Creek | Ovary | 64.08 | 0.0143 | 0.16 | 0.156 | 0.27 | 0.251 | <0.0036 | 0.000103 | 433 | 0.0036 | 0.0966 | 0.0723 | 0.0595 | 4.01 |

**Table G.5: Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Fe µg/g dw | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-LSS-01M-APR-14 | Sand Creek | Muscle Plug | 8.53 | <0.011 | 0.171 | 22,400 | <0.044 | 1,380 | 1.18 | 0.025 | 1,120 | 0.368 | 10,000 | 0.0126 | 15.7 | <0.0011 |
| | SC-LSS-02M-APR-14 | Sand Creek | Muscle Plug | 26.8 | 0.0173 | 0.234 | 22,100 | 0.027 | 1,400 | 1.2 | 0.0106 | 1,120 | 0.376 | 11,300 | 0.0257 | 22.3 | 0.00106 |
| | SC-LSS-03M-APR-14 | Sand Creek | Muscle Plug | 11.9 | 0.0081 | 0.226 | 23,100 | <0.017 | 1,450 | 0.771 | 0.0078 | 873 | 0.249 | 11,900 | 0.0336 | 15.6 | <0.00042 |
| | SC-LSS-04M-APR-14 | Sand Creek | Muscle Plug | 59 | 0.0199 | 2.18 | 23,100 | 0.067 | 1,330 | 5.71 | 0.0096 | 3,880 | 0.32 | 17,000 | 0.23 | 15.4 | <0.00078 |
| | SC-LSS-07M-APR-14 | Sand Creek | Muscle Plug | 43.4 | 0.0089 | 1.58 | 22,200 | 0.026 | 1,270 | 0.816 | 0.0086 | 1,420 | 0.221 | 11,600 | 0.0859 | 19.5 | <0.00052 |
| | SC-LSS-08M-APR-14 | Sand Creek | Muscle Plug | 67 | 0.018 | 0.809 | 22,900 | 0.053 | 1,300 | 1.7 | 0.0533 | 1,880 | 0.365 | 11,400 | 0.204 | 13 | <0.00065 |
| | SC-LSS-09M-APR-14 | Sand Creek | Muscle Plug | 21.5 | 0.0107 | 1.86 | 22,000 | <0.028 | 1,170 | 0.669 | 0.0046 | 1,920 | 0.112 | 10,800 | 0.128 | 12.4 | <0.00070 |
| | SC-LSS-10M-APR-14 | Sand Creek | Muscle Plug | 49.1 | 0.0131 | 3.08 | 24,900 | 0.024 | 1,160 | 1.1 | 0.0118 | 1,820 | 0.246 | 11,600 | 0.112 | 12.8 | <0.00044 |
| | SC-LSS-11M-APR-14 | Sand Creek | Muscle Plug | 29.9 | 0.0102 | 2.75 | 22,300 | <0.022 | 1,280 | 0.677 | 0.0118 | 2,350 | 0.251 | 12,400 | 0.0729 | 21.9 | <0.00056 |
| | SC-LSS-12M-APR-14 | Sand Creek | Muscle Plug | 25.7 | 0.0082 | 0.658 | 24,300 | <0.022 | 1,330 | 0.627 | 0.0063 | 1,110 | 0.08 | 12,600 | 0.0691 | 17.5 | <0.00056 |
| | SC-LSS-01M-AUG-14 | Sand Creek | Muscle Plug | 63.1 | 0.024 | 0.503 | 24,800 | 0.059 | 1,710 | 1.87 | 0.028 | 989 | 0.859 | 12,600 | 0.21 | 10.7 | <0.00095 |
| | SC-LSS-02M-AUG-14 | Sand Creek | Muscle Plug | 33.8 | 0.016 | 1.14 | 24,500 | <0.048 | 1,650 | 4.8 | 0.0099 | 1,440 | 0.301 | 15,100 | 0.218 | 10.3 | <0.0010 |
| | SC-LSS-03M-AUG-14 | Sand Creek | Muscle Plug | 26.2 | <0.023 | 1.23 | 25,600 | <0.10 | 1,570 | 0.93 | 0.0105 | 2,410 | 0.132 | 12,900 | 0.0849 | 13.9 | <0.0021 |
| | SC-LSS-04M-AUG-14 | Sand Creek | Muscle Plug | 78.3 | 0.028 | 0.715 | 20,000 | <0.075 | 1,610 | 1.8 | 0.0135 | 914 | 0.405 | 9,720 | 1.15 | 9.86 | <0.0016 |
| | ER-LSS-08M-APR-14 | Elk River | Muscle Plug | 26.3 | 0.010 | 0.406 | 20,100 | 0.03 | 1,350 | 2.82 | 0.0196 | 1,550 | 0.76 | 15,900 | 0.0334 | 5.15 | <0.00054 |
| | ER-LSS-09M-APR-14 | Elk River | Muscle Plug | 16.8 | 0.0089 | 0.473 | 24,200 | <0.021 | 1,350 | 1.47 | 0.0156 | 1,630 | 0.421 | 12,900 | 0.0163 | 10.5 | <0.00053 |
| | ER-LSS-10M-APR-14 | Elk River | Muscle Plug | 381 | 0.154 | 0.44 | 22,000 | 0.353 | 1,570 | 11.7 | 0.0224 | 1,400 | 0.498 | 12,100 | 0.238 | 8.28 | <0.00047 |
| | ER-LSS-11M-APR-14 | Elk River | Muscle Plug | 167 | 0.122 | 0.766 | 19,500 | 0.203 | 2,140 | 5.69 | 0.0228 | 2,660 | 0.405 | 10,500 | 0.349 | 8.71 | <0.00077 |
| | ER-LSS-12M-APR-14 | Elk River | Muscle Plug | 39.5 | 0.0195 | 0.549 | 22,200 | 0.035 | 1,300 | 1.25 | 0.0126 | 1,930 | 0.114 | 12,000 | 0.112 | 12.1 | <0.00053 |
| | ER-LSS-13M-APR-14 | Elk River | Muscle Plug | 14 | 0.0084 | 0.448 | 22,400 | 0.037 | 1,420 | 2.86 | 0.0233 | 2,000 | 0.125 | 14,200 | 0.151 | 8.43 | <0.00063 |
| | ER-LSS-14M-APR-14 | Elk River | Muscle Plug | 130 | 0.0504 | 0.756 | 20,700 | 0.139 | 1,700 | 13.2 | 0.0257 | 1,670 | 0.333 | 15,100 | 0.124 | 12.8 | <0.00088 |
| | ER-LSS-15M-APR-14 | Elk River | Muscle Plug | 147 | 0.0446 | 0.344 | 21,700 | 0.117 | 1,720 | 7.89 | 0.0389 | 1,600 | 0.3 | 15,100 | 0.144 | 9.1 | <0.00055 |
| | ER-LSS-16M-APR-14 | Elk River | Muscle Plug | 28.2 | 0.0147 | 0.316 | 21,600 | 0.042 | 1,290 | 1.93 | 0.0341 | 1,620 | 0.152 | 13,300 | 0.0784 | 6.94 | <0.00046 |
| | ER-LSS-17M-APR-14 | Elk River | Muscle Plug | 22.2 | 0.0137 | 0.833 | 22,300 | 0.034 | 1,360 | 3.35 | 0.008 | 1,920 | 0.0912 | 14,600 | 0.09 | 14.9 | <0.00042 |
| | ER-LSS-01M-AUG-14 | Elk River | Muscle Plug | 102 | 0.0243 | 0.381 | 19,700 | 0.056 | 1,460 | 6.94 | 0.0229 | 2,160 | 2.1 | 10,500 | 0.141 | 6.41 | <0.00067 |
| | ER-LSS-02M-AUG-14 | Elk River | Muscle Plug | 44.2 | 0.024 | 0.494 | 25,000 | 0.074 | 1,650 | 5.17 | 0.0109 | 1,670 | 0.486 | 16,100 | 0.201 | 11.7 | <0.0013 |
| | ER-LSS-03M-AUG-14 | Elk River | Muscle Plug | 18.9 | <0.019 | 0.538 | 25,700 | <0.083 | 1,640 | 0.832 | <0.0063 | 1,460 | 0.122 | 12,600 | 0.0553 | 8.8 | <0.0017 |
| | ER-LSS-04M-AUG-14 | Elk River | Muscle Plug | 33.6 | <0.020 | 1.3 | 31,200 | <0.088 | 1,530 | 1.1 | 0.0089 | 3,650 | 0.237 | 15,500 | 0.0617 | 12.9 | <0.0018 |
| | ER-LSS-05M-AUG-14 | Elk River | Muscle Plug | 23.9 | <0.0089 | 0.989 | 24,900 | <0.039 | 1,550 | 1.15 | 0.0186 | 1,600 | 0.112 | 12,600 | 0.0429 | 9.38 | <0.00080 |
| | ER-LSS-06M-AUG-14 | Elk River | Muscle Plug | 45.8 | <0.017 | 1.52 | 25,900 | <0.073 | 1,500 | 0.517 | 0.0099 | 2,350 | 0.104 | 13,200 | 0.0411 | 13.5 | <0.0015 |
| | ER-LSS-07M-AUG-14 | Elk River | Muscle Plug | 18.7 | <0.016 | 1.07 | 27,300 | <0.071 | 1,530 | 0.605 | 0.0111 | 1,910 | 0.141 | 12,900 | 0.0437 | 10.4 | <0.0015 |
| | ER-LSS-08M-AUG-14 | Elk River | Muscle Plug | 126 | 0.044 | 0.943 | 23,200 | 0.179 | 1,920 | 21.6 | 0.0365 | 2,410 | 0.363 | 25,200 | 0.696 | 9.13 | <0.0014 |
| | ER-LSS-09M-AUG-14 | Elk River | Muscle Plug | 24 | <0.013 | 1.26 | 28,400 | <0.055 | 1,680 | 0.426 | 0.0148 | 1,910 | 0.059 | 13,900 | 0.0268 | 8.34 | <0.0012 |
| | ER-LSS-10M-AUG-14 | Elk River | Muscle Plug | 31.5 | 0.012 | 1.21 | 27,100 | <0.045 | 1,650 | 1.04 | 0.0323 | 1,430 | 0.57 | 13,200 | 0.0867 | 9.27 | <0.00095 |
| | GC-LSS-01M-APR-14 | Gold Creek | Muscle Plug | 22.2 | 0.0104 | 1.13 | 26,200 | <0.018 | 1,450 | 0.895 | 0.0365 | 1,150 | 0.576 | 13,100 | 0.0418 | 12.7 | <0.00037 |
| | GC-LSS-02M-APR-14 | Gold Creek | Muscle Plug | 33.3 | 0.0173 | 1.31 | 23,800 | 0.035 | 1,420 | 4.52 | 0.0161 | 2,090 | 0.37 | 13,500 | 0.149 | 17.6 | <0.00072 |
| | GC-LSS-03M-APR-14 | Gold Creek | Muscle Plug | 100 | 0.0201 | 0.765 | 23,400 | 0.044 | 1,350 | 1.46 | 0.0119 | 1,250 | 0.242 | 11,900 | 0.0771 | 13.5 | <0.00035 |
| | GC-LSS-01M-AUG-14 | Gold Creek | Muscle Plug | 63.6 | 0.02 | 1.79 | 25,800 | <0.083 | 1,660 | 2.17 | 0.0266 | 1,500 | 0.637 | 13,200 | 0.256 | 11.1 | <0.0017 |
| | GC-LSS-02M-AUG-14 | Gold Creek | Muscle Plug | 21.3 | <0.015 | 0.776 | 25,600 | <0.067 | 1,570 | 0.942 | 0.0323 | 1,380 | 0.803 | 12,600 | 0.0236 | 13.5 | <0.0014 |
| | GC-LSS-03M-AUG-14 | Gold Creek | Muscle Plug | 31.5 | 0.0118 | 1.18 | 25,500 | <0.036 | 1,560 | 0.862 | 0.0121 | 1,320 | 0.193 | 13,100 | 0.12 | 12.8 | <0.00075 |
| | GC-LSS-04M-AUG-14 | Gold Creek | Muscle Plug | 72.1 | 0.026 | 1.77 | 24,100 | <0.077 | 1,590 | 2.42 | 0.0248 | 1,880 | 0.395 | 12,300 | 0.975 | 11.8 | <0.0016 |
| | GC-LSS-05M-AUG-14 | Gold Creek | Muscle Plug | 16.2 | <0.011 | 0.809 | 24,100 | <0.046 | 1,530 | 0.687 | 0.0042 | 1,340 | 0.151 | 12,300 | 0.0243 | 14 | <0.00096 |

**Table G.5:** **Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Fe µg/g dw | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | GC-LSS-06M-AUG-14 | Gold Creek | Muscle Plug | 25.2 | <0.016 | 0.731 | 23,000 | <0.070 | 1,610 | 0.838 | 0.0084 | 1,430 | 0.084 | 11,700 | 0.103 | 14.1 | <0.0015 |
|  | GC-LSS-07M-AUG-14 | Gold Creek | Muscle Plug | 14 | <0.012 | 0.845 | 23,700 | <0.051 | 1,550 | 0.557 | 0.0065 | 1,280 | 0.079 | 12,300 | 0.032 | 15.6 | <0.0011 |
|  | GC-LSS-08M-AUG-14 | Gold Creek | Muscle Plug | 28.2 | <0.026 | 1.1 | 29,600 | <0.11 | 1,730 | 0.86 | <0.0086 | 2,310 | 0.146 | 14,500 | 0.0523 | 16.9 | <0.0023 |
|  | GC-LSS-09M-AUG-14 | Gold Creek | Muscle Plug | 13.8 | 0.0082 | 0.915 | 26,000 | <0.035 | 1,510 | 0.618 | 0.01 | 1,300 | 0.074 | 12,800 | 0.0273 | 11.2 | <0.00073 |
|  | GC-LSS-10M-AUG-14 | Gold Creek | Muscle Plug | 16 | 0.011 | 0.281 | 22,800 | <0.046 | 1,660 | 5.5 | 0.0062 | 1,570 | 0.103 | 14,700 | 0.0776 | 13.8 | <0.00095 |
| 2015 | SC-CSU-02-APR-15 | Sand Creek | Muscle | 14.9 | 0.00960 | 0.598 | 24,400 | 0.0405 | 1,585 | 3.059 | 0.0081 | 1,435 | 0.0885 | 13,750 | 0.05245 | 12.5 | <0.000027 |
|  | SC-CSU-03-APR-15 | Sand Creek | Muscle | 46.8 | 0.02150 | 1.150 | 24,200 | 0.0409 | 1,360 | 2.680 | 0.0102 | 1,500 | 0.0597 | 12,500 | 0.08140 | 14.4 | <0.000028 |
|  | SC-CSU-04-APR-15 | Sand Creek | Muscle | 76.3 | 0.00773 | 1.340 | 22,400 | 0.0125 | 1,110 | 1.270 | 0.0246 | 5,460 | 0.0719 | 12,000 | 0.05370 | 14.6 | <0.000029 |
|  | SC-CSU-05-APR-15 | Sand Creek | Muscle | 16.2 | 0.00745 | 0.749 | 22,800 | 0.0072 | 1,280 | 2.590 | 0.0100 | 1,360 | 0.0246 | 12,300 | 0.02970 | 17.7 | <0.000026 |
|  | SC-CSU-06-APR-15 | Sand Creek | Muscle | 33.1 | 0.01470 | 1.750 | 26,000 | 0.0259 | 1,350 | 4.330 | 0.0119 | 2,550 | 0.0465 | 13,700 | 0.11300 | 15.5 | <0.000029 |
|  | SC-CSU-07-APR-15 | Sand Creek | Muscle | 36.3 | 0.00801 | 1.040 | 21,700 | 0.0082 | 1,130 | 1.270 | 0.0151 | 1,350 | 0.0237 | 10,600 | 0.01660 | 16.3 | <0.000026 |
|  | SC-CSU-05-APR-15 | Sand Creek | Ovary | 79.1 | 0.01038 | 0.019 | 8,157 | 0.0066 | 831 | 23.600 | 0.1410 | 1,810 | 0.0414 | 10,633 | 0.01271 | 8.0 | 2.827E-05 |
|  | ER-CSU-01-APR-15 | Elk River | Muscle | 377.0 | 0.19600 | 0.583 | 19,900 | 0.4150 | 1,500 | 12.300 | 0.0379 | 1,160 | 0.5020 | 10,100 | 0.24800 | 9.2 | 0.000056 |
|  | ER-CSU-02-APR-15 | Elk River | Muscle | 14.9 | 0.00682 | 0.662 | 23,750 | 0.0212 | 1,230 | 2.425 | 0.0094 | 1,355 | 0.0343 | 12,200 | 0.02790 | 17.2 | <0.000030 |
|  | ER-CSU-04-APR-15 | Elk River | Muscle | 93.2 | 0.03550 | 1.630 | 21,500 | 0.1180 | 1,100 | 3.560 | 0.0275 | 4,080 | 0.1810 | 13,400 | 0.13400 | 14.7 | <0.000030 |
|  | ER-CSU-05-APR-15 | Elk River | Muscle | 34.4 | 0.00814 | 0.432 | 20,900 | 0.0215 | 1,060 | 1.690 | 0.0145 | 1,170 | 0.0568 | 10,800 | 0.01860 | 6.5 | <0.000033 |
|  | ER-CSU-08-APR-15 | Elk River | Muscle | 31.9 | 0.01130 | 1.170 | 21,500 | 0.0258 | 1,060 | 3.140 | 0.0124 | 1,770 | 0.0658 | 11,200 | 0.03840 | 6.8 | <0.000034 |
|  | ER-CSU-09-APR-15 | Elk River | Muscle | 10.2 | 0.00970 | 0.815 | 22,750 | 0.0203 | 1,280 | 5.445 | 0.0111 | 1,080 | 0.0570 | 14,250 | 0.06635 | 11.2 | <0.0000038 |
|  | ER-CSU-10-APR-15 | Elk River | Muscle | 32.1 | 0.01370 | 0.321 | 20,500 | 0.0256 | 1,140 | 3.320 | 0.0175 | 1,280 | 0.0710 | 11,700 | 0.03430 | 12.1 | <0.0000037 |
|  | ER-CSU-11-APR-15 | Elk River | Muscle | 34.2 | 0.01220 | 0.534 | 21,900 | 0.0311 | 1,130 | 2.840 | 0.0129 | 1,350 | 0.0669 | 11,700 | 0.02870 | 9.7 | <0.000029 |
|  | ER-CSU-12-APR-15 | Elk River | Muscle | 15.3 | 0.00830 | 1.020 | 22,600 | 0.0138 | 1,200 | 2.230 | 0.0068 | 1,030 | 0.0410 | 11,600 | 0.04130 | 8.7 | <0.000030 |
|  | ER-CSU-17-APR-15 | Elk River | Muscle | 25.0 | 0.00901 | 1.285 | 23,950 | 0.0280 | 1,200 | 2.735 | 0.0100 | 1,540 | 0.0476 | 12,400 | 0.04485 | 8.0 | <0.000033 |
|  | GC-CSU-02-APR-15 | Gold Creek | Muscle | 34.1 | 0.01330 | 0.806 | 24,000 | 0.0223 | 1,350 | 1.760 | 0.0081 | 1,280 | 0.0334 | 11,600 | 0.01930 | 22.9 | <0.000032 |
|  | GC-CSU-08-APR-15 | Gold Creek | Muscle | 11.3 | 0.00733 | 2.680 | 25,100 | 0.0106 | 1,240 | 4.320 | 0.0068 | 1,630 | 0.0196 | 14,500 | 0.09870 | 12.0 | <0.000032 |
|  | GC-CSU-09-APR-15 | Gold Creek | Muscle | 103.0 | 0.00780 | 1.370 | 23,300 | 0.0147 | 1,010 | 0.815 | 0.0207 | 5,360 | 0.0353 | 12,200 | 0.09940 | 15.5 | <0.000034 |
|  | GC-CSU-10-APR-15 | Gold Creek | Muscle | 16.3 | 0.00690 | 3.055 | 25,600 | 0.0126 | 1,210 | 1.845 | 0.0108 | 1,610 | 0.0417 | 12,800 | 0.02440 | 12.3 | <0.000033 |
|  | GC-CSU-11-APR-15 | Gold Creek | Muscle | 14.0 | 0.00693 | 1.430 | 23,500 | 0.0066 | 1,270 | 3.910 | 0.0072 | 1,100 | 0.0223 | 13,000 | 0.05390 | 9.6 | <0.000029 |
|  | GC-CSU-13-APR-15 | Gold Creek | Muscle | 10.9 | 0.00715 | 2.710 | 25,100 | 0.0114 | 1,280 | 6.590 | 0.0076 | 1,170 | 0.0230 | 15,200 | 0.08600 | 12.0 | <0.000031 |
|  | GC-CSU-14-APR-15 | Gold Creek | Muscle | 8.6 | 0.00763 | 0.563 | 24,900 | 0.0108 | 1,280 | 3.330 | 0.0081 | 1,130 | 0.0331 | 13,100 | 0.02330 | 8.0 | <0.000029 |
|  | GC-CSU-15-APR-15 | Gold Creek | Muscle | 50.7 | 0.02170 | 1.970 | 21,200 | 0.0660 | 1,390 | 12.200 | 0.0121 | 2,450 | 0.0878 | 22,000 | 0.32400 | 14.3 | 0.000033 |
|  | GC-CSU-17-APR-15 | Gold Creek | Muscle | 22.3 | 0.00818 | 2.270 | 26,700 | 0.0093 | 1,230 | 5.490 | 0.0098 | 1,740 | 0.0278 | 15,600 | 0.04390 | 17.5 | <0.000032 |
|  | GC-CSU-18-APR-15 | Gold Creek | Muscle | 21.2 | 0.01110 | 0.837 | 24,700 | 0.0156 | 1,230 | 3.880 | 0.0106 | 1,240 | 0.0289 | 14,100 | 0.04450 | 14.3 | <0.000033 |
|  | GC-CSU-10-APR-15 | Gold Creek | Ovary | 88.7 | 0.00965 | 0.228 | 11,900 | 0.0153 | 1,360 | 23.6 | 0.229 | 3,590 | 0.0393 | 9,850 | 0.0118 | 7.28 | <0.000038 |
| 2016 | SC-CSU-08 M-Apr-16 | Sand Creek | Muscle | 13.8 | 0.00803 | 0.881 | 23,800 | <0.0064 | 1,420 | 1.35 | 0.0046 | 1,250 | 0.0356 | 11,700 | 0.0298 | 14.7 | <0.0000038 |
|  | SC-CSU-36 M-Apr-16 | Sand Creek | Muscle | 17.9 | 0.007435 | 1.105 | 23,750 | 0.0071 | 1,225 | 0.496 | 0.00325 | 1,420 | 0.0183 | 10,850 | 0.006445 | 9.03 | 5.25E-06 |
|  | SC-CSU-08 O -Apr-16 | Sand Creek | Ovary | 53.3 | 0.00802 | 0.02065 | 7,395 | 0.00705 | 831 | 26.05 | 0.08735 | 1,810 | 0.0288 | 10,850 | 0.008475 | 5.535 | 0.000087 |
|  | SC-CSU-36 O-Apr-16 | Sand Creek | Ovary | 109 | 0.00929 | 0.0305 | 10,400 | 0.0121 | 1,160 | 15.3 | 0.106 | 3,320 | 0.102 | 10,500 | 0.0231 | 5.13 | <0.000087 |
|  | ER-CSU-03 M-Apr-16 | Elk River | Muscle | 22.2 | 0.0063 | 0.671 | 20,600 | 0.0113 | 1,210 | 0.541 | 0.0046 | 1,060 | 0.0434 | 10,400 | 0.00762 | 5.97 | <0.00005 |
|  | ER-CSU-04 M-Apr-16 | Elk River | Muscle | 11.65 | 0.00765 | 0.3855 | 23,900 | 0.0146 | 1,300 | 2.48 | 0.00345 | 994 | 0.02 | 12,500 | 0.01835 | 12.4 | 0.000046 |
|  | ER-CSU-34 M-Apr-16 | Elk River | Muscle | 38.15 | 0.01015 | 0.7895 | 22,150 | 0.01025 | 1,130 | 1.002 | 0.00525 | 1,220 | 0.03655 | 11,250 | 0.0129 | 9.025 | 0.0000495 |
|  | ER-CSU-45 M-Apr-16 | Elk River | Muscle | 11 | 0.0085 | 1.91 | 23,600 | 0.0079 | 1,280 | 0.98 | 0.0025 | 1,240 | 0.0247 | 11,400 | 0.012 | 20.6 | <0.000049 |
|  | ER-CSU-03 O -Apr-16 | Elk River | Ovary | 90.35 | 0.0073 | 0.0123 | 6,940 | 0.015 | 776 | 17.65 | 0.107 | 1,960 | 0.117 | 9,855 | 0.00929 | 2.44 | 0.00011 |

**Table G.5:** **Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Fe µg/g dw | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-CSU-04 O-Apr-16 | Elk River | Ovary | 34.55 | 0.006445 | 0.00579 | 6,245 | 0.011 | 677 | 15.7 | 0.0772 | 1,475 | 0.0389 | 10,450 | 0.00418 | 3.82 | 0.000083 |
| | ER-CSU-34 O-Apr-16 | Elk River | Ovary | 151 | 0.0142 | 0.0248 | 8,550 | 0.0468 | 1,060 | 15.9 | 0.156 | 2,380 | 0.143 | 9,630 | 0.0126 | 3.79 | <0.00009 |
| | ER-CSU-45 O-Apr-16 | Elk River | Ovary | 85.3 | 0.00974 | 0.0671 | 8,740 | 0.0217 | 1,050 | 6.82 | 0.204 | 2,960 | 0.0718 | 9,000 | 0.0153 | 8.95 | <0.000089 |
| | GC-CSU-04 M-Apr-16 | Gold Creek | Muscle | 14.25 | 0.009255 | 0.3615 | 21,600 | 0.008 | 1,405 | 1.485 | 0.00346 | 1,070 | 0.02405 | 11,300 | 0.012075 | 16.2 | 0.0000875 |
| | GC-CSU-05 M-Apr-16 | Gold Creek | Muscle | 14.5 | 0.00814 | 2.22 | 23,800 | 0.0076 | 1,410 | 2.27 | 0.00164 | 1,100 | 0.029 | 13,200 | 0.0319 | 10.3 | <0.000084 |
| | GC-CSU-09 M-Apr-16 | Gold Creek | Muscle | 9.285 | 0.00614 | 0.533 | 20,300 | 0.00575 | 1,305 | 2.86 | 0.00477 | 1,135 | 0.02615 | 11,150 | 0.023555 | 16.75 | 0.00009 |
| | GC-CSU-26 M-Apr-16 | Gold Creek | Muscle | 11.5 | 0.00821 | 0.368 | 21,800 | 0.006 | 1,410 | 5.19 | 0.00516 | 1,020 | 0.0201 | 13,000 | 0.0281 | 23.7 | <0.000094 |
| | GC-CSU-27 M-Apr-16 | Gold Creek | Muscle | 13 | 0.0094 | 0.398 | 22,200 | 0.0106 | 1,430 | 2.78 | 0.00605 | 1,080 | 0.0287 | 12,000 | 0.0393 | 12.4 | <0.000081 |
| | GC-CSU-31 M-Apr-16 | Gold Creek | Muscle | 16 | 0.00693 | 0.946 | 23,200 | 0.0074 | 1,360 | 2.41 | 0.00468 | 897 | 0.0231 | 12,300 | 0.02 | 13 | <0.000094 |
| | GC-CSU-34 M-Apr-16 | Gold Creek | Muscle | 10.4 | 0.00646 | 0.769 | 21,800 | <0.0051 | 1,350 | 1.1 | 0.00385 | 1,140 | 0.0146 | 11,200 | 0.0153 | 14.5 | <0.000088 |
| | GC-CSU-37 M-Apr-16 | Gold Creek | Muscle | 10.8 | 0.0103 | 0.627 | 22,200 | 0.0189 | 1,370 | 10.3 | 0.00287 | 1,100 | 0.0442 | 14,900 | 0.121 | 16.7 | <0.000094 |
| | GC-CSU-43 M-Apr-16 | Gold Creek | Muscle | 13 | 0.00592 | 0.435 | 20,000 | <0.0056 | 1,300 | 2.22 | 0.00452 | 1,200 | 0.0226 | 11,500 | 0.034 | 16.5 | <0.000095 |
| | GC-CSU-04 O-Apr-16 | Gold Creek | Ovary | 28.35 | 0.00847 | 0.0081 | 6,690 | 0.00645 | 529 | 19.6 | 0.05785 | 1,355 | 0.03165 | 11,050 | 0.00571 | 5.34 | 0.000102 |
| | GC-CSU-05 O-Apr-16 | Gold Creek | Ovary | 60.7 | 0.00616 | 0.0582 | 6,580 | <0.0061 | 761 | 19.8 | 0.0738 | 1,440 | 0.0214 | 10,400 | 0.00333 | 3.26 | <0.000096 |
| | GC-CSU-09 O-Apr-16 | Gold Creek | Ovary | 31.8 | 0.00621 | 0.0097 | 6,910 | <0.0066 | 709 | 16.2 | 0.084 | 1,650 | 0.0423 | 11,000 | 0.00668 | 6.22 | <0.0001 |
| | GC-CSU-26 O-Apr-16 | Gold Creek | Ovary | 23.1 | 0.00711 | 0.0067 | 6,070 | <0.0063 | 503 | 19.7 | 0.0551 | 1,260 | 0.022 | 10,700 | 0.00257 | 7.27 | <0.000099 |
| | GC-CSU-27 O-Apr-16 | Gold Creek | Ovary | 25.4 | 0.00635 | 0.009 | 6,760 | <0.0059 | 642 | 6.47 | 0.052 | 1,400 | 0.0145 | 11,000 | 0.00338 | 4.09 | <0.000092 |
| | GC-CSU-31 O-Apr-16 | Gold Creek | Ovary | 56.35 | 0.0073 | 0.02875 | 7,720 | 0.012 | 1,020 | 40.4 | 0.174 | 1,930 | 0.04015 | 9,875 | 0.00569 | 5.045 | 0.00012 |
| | GC-CSU-34 O-Apr-16 | Gold Creek | Ovary | 30.9 | 0.00569 | 0.014 | 6,620 | <0.012 | 629 | 13.4 | 0.0526 | 1,420 | 0.0232 | 11,400 | 0.00526 | 4.77 | <0.00012 |
| | GC-CSU-37 O-Apr-16 | Gold Creek | Ovary | 43.1 | 0.00612 | 0.0114 | 6,800 | <0.012 | 693 | 28.8 | 0.092 | 1,720 | 0.0604 | 10,300 | 0.00483 | 5.54 | <0.00012 |
| | GC-CSU-43 O-Apr-16 | Gold Creek | Ovary | 31 | 0.0061 | 0.00997 | 6,790 | <0.012 | 618 | 16 | 0.0663 | 1,350 | 0.0172 | 11,100 | 0.00278 | 6.25 | <0.00012 |

**Table G.5:** **Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sb µg/g dw | Se µg/g dw | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-LSS-01M-APR-14 | Sand Creek | Muscle Plug | 0.0042 | 2.84 | 0.0184 | 0.846 | 0.00107 | 0.15 | 0.0287 | <0.0063 | 0.0084 | <0.0015 | 22.5 | 0.0279 |
| | SC-LSS-02M-APR-14 | Sand Creek | Muscle Plug | 0.0024 | 1.65 | 0.0119 | 0.41 | 0.0084 | 0.438 | 0.0352 | <0.0030 | 0.0417 | 0.00723 | 27.9 | 0.0304 |
| | SC-LSS-03M-APR-14 | Sand Creek | Muscle Plug | 0.0023 | 2.21 | 0.0082 | 0.183 | 0.00156 | 0.241 | 0.0584 | <0.0024 | 0.0117 | 0.0023 | 28.3 | 0.0285 |
| | SC-LSS-04M-APR-14 | Sand Creek | Muscle Plug | 0.0041 | 2.43 | 0.135 | 8.73 | 0.00838 | 1.55 | 0.0151 | 0.0068 | 0.0792 | 0.0186 | 56.4 | 0.0567 |
| | SC-LSS-07M-APR-14 | Sand Creek | Muscle Plug | 0.0188 | 1.35 | 0.0182 | 0.297 | 0.00377 | 0.414 | 0.0209 | <0.0029 | 0.0261 | 0.00542 | 46.2 | 0.0168 |
| | SC-LSS-08M-APR-14 | Sand Creek | Muscle Plug | 0.0498 | 2.8 | 0.0225 | 0.79 | 0.0161 | 0.961 | 0.00624 | <0.0037 | 0.0753 | 0.0249 | 63.2 | 0.0797 |
| | SC-LSS-09M-APR-14 | Sand Creek | Muscle Plug | 0.0062 | 1.91 | 0.014 | 0.296 | 0.00163 | 0.198 | 0.00568 | <0.0040 | 0.013 | 0.0036 | 57.2 | 0.0446 |
| | SC-LSS-10M-APR-14 | Sand Creek | Muscle Plug | 0.0177 | 2.88 | 0.0119 | 0.218 | 0.00484 | 0.49 | 0.0125 | <0.0025 | 0.0295 | 0.0104 | 63.3 | 0.0261 |
| | SC-LSS-11M-APR-14 | Sand Creek | Muscle Plug | 0.0087 | 1.24 | 0.0127 | 0.245 | 0.00271 | 0.35 | 0.00739 | <0.0032 | 0.0197 | 0.00463 | 116 | 0.0259 |
| | SC-LSS-12M-APR-14 | Sand Creek | Muscle Plug | 0.0034 | 3.1 | 0.0131 | 0.337 | 0.00228 | 0.34 | 0.0272 | <0.0032 | 0.0149 | 0.00321 | 72 | 0.0183 |
| | SC-LSS-01M-AUG-14 | Sand Creek | Muscle Plug | 0.0098 | 1.17 | 0.0175 | 1.39 | 0.0164 | 7.91 | 0.00432 | 0.00328 | 0.111 | 0.045 | 36.8 | 0.62 |
| | SC-LSS-02M-AUG-14 | Sand Creek | Muscle Plug | 0.007 | 1.64 | 0.0453 | 5.27 | 0.00496 | 0.762 | 0.0126 | 0.00346 | 0.0403 | 0.0183 | 42.9 | 0.0637 |
| | SC-LSS-03M-AUG-14 | Sand Creek | Muscle Plug | <0.0072 | 1.1 | 0.011 | 0.498 | 0.00453 | 0.47 | 0.0044 | <0.0017 | 0.0232 | 0.0034 | 24.5 | 0.0218 |
| | SC-LSS-04M-AUG-14 | Sand Creek | Muscle Plug | 0.0181 | 3.12 | 0.124 | 0.784 | 0.00878 | 2.44 | 0.00562 | 0.0088 | 0.126 | 0.0261 | 39.1 | 0.0735 |
| | ER-LSS-08M-APR-14 | Elk River | Muscle Plug | 0.0038 | 5.51 | 0.0114 | 8.22 | 0.00102 | 0.255 | 0.00831 | <0.0031 | 0.0348 | 0.00348 | 33.3 | 0.0108 |
| | ER-LSS-09M-APR-14 | Elk River | Muscle Plug | <0.0020 | 3.65 | 0.009 | 1.37 | 0.00074 | 0.19 | 0.0242 | <0.0030 | 0.0169 | 0.00295 | 40.3 | 0.0097 |
| | ER-LSS-10M-APR-14 | Elk River | Muscle Plug | 0.0076 | 9.85 | 0.0202 | 5.78 | 0.0921 | 6.92 | 0.0284 | 0.0131 | 0.82 | 0.191 | 38.7 | 0.146 |
| | ER-LSS-11M-APR-14 | Elk River | Muscle Plug | 0.0115 | 3.96 | 0.0359 | 1.47 | 0.146 | 4.4 | 0.0182 | 0.0211 | 0.392 | 0.109 | 49.6 | 0.137 |
| | ER-LSS-12M-APR-14 | Elk River | Muscle Plug | 0.0047 | 4.02 | 0.0134 | 0.943 | 0.00682 | 1.14 | 0.00716 | <0.0030 | 0.0477 | 0.014 | 33.2 | 0.0701 |
| | ER-LSS-13M-APR-14 | Elk River | Muscle Plug | 0.0029 | 6.13 | 0.0148 | 5.57 | 0.00139 | 0.29 | 0.0204 | <0.0036 | 0.0173 | 0.00319 | 27.7 | 0.0199 |
| | ER-LSS-14M-APR-14 | Elk River | Muscle Plug | 0.0038 | 4.47 | 0.0177 | 9.83 | 0.0447 | 1.49 | 0.0319 | 0.009 | 0.166 | 0.101 | 93.3 | 0.077 |
| | ER-LSS-15M-APR-14 | Elk River | Muscle Plug | 0.0041 | 4.87 | 0.0133 | 6.57 | 0.022 | 5.18 | 0.0353 | 0.0059 | 0.244 | 0.0479 | 67.6 | 0.0589 |
| | ER-LSS-16M-APR-14 | Elk River | Muscle Plug | 0.002 | 4.16 | 0.0102 | 3.35 | 0.0019 | 0.584 | 0.00691 | <0.0026 | 0.0342 | 0.00374 | 22.8 | 0.0197 |
| | ER-LSS-17M-APR-14 | Elk River | Muscle Plug | 0.0055 | 2.14 | 0.01 | 5.05 | 0.00418 | 0.436 | 0.0202 | 0.0036 | 0.031 | 0.00636 | 31.8 | 0.0163 |
| | ER-LSS-01M-AUG-14 | Elk River | Muscle Plug | 0.0067 | 4.99 | 0.0178 | 0.386 | 0.00756 | 3.23 | 0.0216 | 0.00376 | 0.133 | 0.0715 | 72.4 | 0.0627 |
| | ER-LSS-02M-AUG-14 | Elk River | Muscle Plug | 0.0093 | 6.73 | 0.0223 | 6.87 | 0.00675 | 1.28 | 0.00748 | 0.0044 | 0.0768 | 0.0192 | 39.7 | 0.0555 |
| | ER-LSS-03M-AUG-14 | Elk River | Muscle Plug | 0.0269 | 9.86 | 0.0116 | 0.294 | 0.00077 | 0.387 | 0.00832 | <0.0014 | 0.0247 | 0.0027 | 36.3 | 0.0202 |
| | ER-LSS-04M-AUG-14 | Elk River | Muscle Plug | 0.011 | 5.1 | <0.0092 | 0.704 | 0.00322 | 0.472 | 0.00893 | <0.0015 | 0.0239 | 0.0048 | 95.1 | 0.0179 |
| | ER-LSS-05M-AUG-14 | Elk River | Muscle Plug | 0.0062 | 9.39 | 0.0109 | 0.482 | 0.00458 | 0.31 | 0.00692 | 0.00219 | 0.017 | 0.00964 | 34.3 | 0.0189 |
| | ER-LSS-06M-AUG-14 | Elk River | Muscle Plug | 0.017 | 2.25 | 0.0199 | 0.262 | 0.00164 | 0.187 | 0.0169 | <0.0012 | 0.0143 | 0.0024 | 33.8 | 0.0141 |
| | ER-LSS-07M-AUG-14 | Elk River | Muscle Plug | <0.0050 | 4.59 | 0.0145 | 0.242 | 0.0016 | 0.233 | 0.00817 | <0.0012 | 0.0164 | 0.00409 | 30.8 | 0.0206 |
| | ER-LSS-08M-AUG-14 | Elk River | Muscle Plug | 0.0235 | 6.29 | 0.0416 | 23.4 | 0.0223 | 1.93 | 0.0117 | 0.0145 | 0.204 | 0.0361 | 51.8 | 0.106 |
| | ER-LSS-09M-AUG-14 | Elk River | Muscle Plug | 0.0081 | 9.27 | <0.0057 | 0.189 | 0.00066 | 0.211 | 0.00782 | <0.00094 | 0.0089 | 0.00121 | 34.5 | 0.011 |
| | ER-LSS-10M-AUG-14 | Elk River | Muscle Plug | 0.0055 | 9.03 | 0.0117 | 0.272 | 0.00394 | 0.492 | 0.0147 | 0.00106 | 0.0434 | 0.0078 | 30.5 | 0.0295 |
| | GC-LSS-01M-APR-14 | Gold Creek | Muscle Plug | 0.0037 | 2.62 | 0.0069 | 0.607 | 0.00193 | 0.282 | 0.0113 | 0.00084 | 0.0212 | 0.00384 | 25 | 0.0106 |
| | GC-LSS-02M-APR-14 | Gold Creek | Muscle Plug | 0.0061 | 1.85 | 0.0119 | 3.42 | 0.00632 | 0.564 | 0.00499 | 0.00269 | 0.0514 | 0.00994 | 22.3 | 0.0249 |
| | GC-LSS-03M-APR-14 | Gold Creek | Muscle Plug | 0.0044 | 2.83 | 0.0087 | 0.786 | 0.0281 | 0.742 | 0.0289 | 0.0064 | 0.0716 | 0.0263 | 23.4 | 0.0717 |
| | GC-LSS-01M-AUG-14 | Gold Creek | Muscle Plug | 0.0126 | 3.13 | 0.0304 | 0.408 | 0.00744 | 1.13 | 0.0034 | 0.0026 | 0.0869 | 0.0156 | 48.6 | 0.122 |
| | GC-LSS-02M-AUG-14 | Gold Creek | Muscle Plug | <0.0047 | 3.79 | 0.0137 | 0.144 | 0.00131 | 0.237 | 0.00349 | <0.0011 | 0.0185 | 0.00276 | 36.1 | 0.0244 |
| | GC-LSS-03M-AUG-14 | Gold Creek | Muscle Plug | 0.0068 | 6.12 | 0.011 | 0.222 | 0.00218 | 1.69 | 0.00367 | 0.0012 | 0.0306 | 0.00707 | 43.1 | 0.0918 |
| | GC-LSS-04M-AUG-14 | Gold Creek | Muscle Plug | 0.0161 | 2.53 | 0.0746 | 1.5 | 0.00791 | 1.51 | 0.00432 | 0.0047 | 0.0859 | 0.0234 | 78.9 | 0.0828 |
| | GC-LSS-05M-AUG-14 | Gold Creek | Muscle Plug | <0.0033 | 4.04 | 0.0163 | 0.203 | 0.00058 | 0.2 | 0.0035 | <0.00078 | 0.0114 | 0.00081 | 51.9 | 0.0139 |

**Table G.5:** **Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sb µg/g dw | Se µg/g dw | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | GC-LSS-06M-AUG-14 | Gold Creek | Muscle Plug | <0.0050 | 3.58 | 0.0163 | 0.25 | 0.00174 | 0.483 | 0.00307 | <0.0012 | 0.0309 | 0.0072 | 45.5 | 0.0393 |
| | GC-LSS-07M-AUG-14 | Gold Creek | Muscle Plug | 0.0039 | 2.43 | 0.0104 | 0.175 | 0.00087 | 0.17 | 0.00481 | <0.00087 | 0.0085 | 0.00184 | 30.4 | 0.0117 |
| | GC-LSS-08M-AUG-14 | Gold Creek | Muscle Plug | 0.0094 | 4.95 | 0.017 | 0.377 | 0.0023 | 0.25 | 0.0041 | <0.0019 | 0.0153 | 0.0024 | 118 | 0.103 |
| | GC-LSS-09M-AUG-14 | Gold Creek | Muscle Plug | 0.0038 | 3.63 | 0.0075 | 0.179 | 0.00079 | 0.233 | 0.00879 | <0.00059 | 0.012 | 0.00188 | 25.7 | 0.021 |
| | GC-LSS-10M-AUG-14 | Gold Creek | Muscle Plug | 0.004 | 3.73 | 0.0089 | 5.17 | 0.00057 | 0.176 | 0.0128 | 0.00106 | 0.0112 | 0.00158 | 36.4 | 0.0134 |
| 2015 | SC-CSU-02-APR-15 | Sand Creek | Muscle | 0.0039 | 3.68 | 0.00820 | 2.67 | 0.00068 | 0.2045 | 0.0108 | 0.00083 | 0.01160 | 0.00158 | 31.1 | 0.0172 |
| | SC-CSU-03-APR-15 | Sand Creek | Muscle | 0.0037 | 1.79 | 0.00716 | 2.81 | 0.01030 | 0.8280 | 0.0155 | 0.00232 | 0.06400 | 0.01440 | 23.4 | 0.0849 |
| | SC-CSU-04-APR-15 | Sand Creek | Muscle | 0.0068 | 1.60 | 0.00784 | 0.29 | 0.00133 | 0.2040 | 0.0331 | 0.00113 | 0.01610 | 0.00225 | 87.0 | 0.0291 |
| | SC-CSU-05-APR-15 | Sand Creek | Muscle | <0.0010 | 1.34 | 0.00145 | 3.92 | 0.00040 | 0.1010 | 0.0153 | 0.00125 | 0.00591 | 0.00074 | 37.2 | 0.0159 |
| | SC-CSU-06-APR-15 | Sand Creek | Muscle | 0.0050 | 3.23 | 0.00441 | 4.12 | 0.00430 | 0.4250 | 0.0073 | 0.00293 | 0.02960 | 0.00703 | 29.0 | 0.0572 |
| | SC-CSU-07-APR-15 | Sand Creek | Muscle | 0.0029 | 1.74 | 0.00151 | 0.96 | 0.00183 | 0.1840 | 0.0243 | 0.00070 | 0.01140 | 0.00261 | 36.8 | 0.0225 |
| | SC-CSU-05-APR-15 | Sand Creek | Ovary | 0.0013 | 2.60 | 0.00103 | 0.89 | 0.00233 | 0.1567 | 0.0133 | 0.00634 | 0.01222 | 0.00927 | 111.0 | 0.0086 |
| | ER-CSU-01-APR-15 | Elk River | Muscle | 0.0128 | 6.58 | 0.02460 | 4.21 | 0.12200 | 6.1600 | 0.0348 | 0.03040 | 1.44000 | 0.32600 | 29.9 | 0.2760 |
| | ER-CSU-02-APR-15 | Elk River | Muscle | 0.0012 | 3.17 | 0.00141 | 3.58 | 0.00029 | 0.1290 | 0.0321 | 0.00106 | 0.00972 | 0.00117 | 31.0 | 0.0061 |
| | ER-CSU-04-APR-15 | Elk River | Muscle | 0.0051 | 2.82 | 0.01090 | 6.92 | 0.01920 | 1.4500 | 0.0411 | 0.00605 | 0.22300 | 0.04380 | 95.0 | 0.0507 |
| | ER-CSU-05-APR-15 | Elk River | Muscle | 0.0023 | 5.13 | 0.00143 | 1.71 | 0.00179 | 0.2830 | 0.0241 | 0.00084 | 0.02330 | 0.00395 | 51.0 | 0.0092 |
| | ER-CSU-08-APR-15 | Elk River | Muscle | 0.0024 | 5.69 | 0.00129 | 4.12 | 0.00325 | 0.3930 | 0.0157 | 0.00206 | 0.05050 | 0.00792 | 35.6 | 0.0154 |
| | ER-CSU-09-APR-15 | Elk River | Muscle | 0.0018 | 4.46 | 0.00172 | 7.28 | 0.00051 | 0.1125 | 0.0286 | 0.00146 | 0.00991 | 0.00204 | 38.9 | 0.0089 |
| | ER-CSU-10-APR-15 | Elk River | Muscle | 0.0021 | 4.61 | 0.00220 | 3.92 | 0.00511 | 0.4240 | 0.0329 | 0.00224 | 0.05530 | 0.01200 | 38.2 | 0.0157 |
| | ER-CSU-11-APR-15 | Elk River | Muscle | 0.0029 | 5.09 | 0.00172 | 3.46 | 0.00408 | 0.4570 | 0.0377 | 0.00197 | 0.05900 | 0.01130 | 37.4 | 0.0167 |
| | ER-CSU-12-APR-15 | Elk River | Muscle | 0.0019 | 3.50 | 0.00060 | 3.09 | 0.00172 | 0.2040 | 0.0237 | 0.00072 | 0.01910 | 0.00373 | 36.6 | 0.0059 |
| | ER-CSU-17-APR-15 | Elk River | Muscle | 0.0029 | 8.35 | 0.00172 | 3.40 | 0.00132 | 0.4640 | 0.0219 | 0.00141 | 0.01820 | 0.00398 | 33.3 | 0.0083 |
| | GC-CSU-02-APR-15 | Gold Creek | Muscle | 0.0021 | 2.15 | 0.00530 | 1.67 | 0.00533 | 0.6620 | 0.0219 | 0.00163 | 0.03360 | 0.01540 | 27.6 | 0.0187 |
| | GC-CSU-08-APR-15 | Gold Creek | Muscle | 0.0034 | 2.64 | 0.00084 | 4.81 | 0.00019 | 0.0820 | 0.0050 | 0.00245 | 0.00972 | 0.00175 | 27.2 | 0.0146 |
| | GC-CSU-09-APR-15 | Gold Creek | Muscle | 0.0078 | 5.70 | 0.00496 | 0.33 | 0.00109 | 0.1690 | 0.0195 | 0.00107 | 0.01810 | 0.00331 | 67.8 | 0.0085 |
| | GC-CSU-10-APR-15 | Gold Creek | Muscle | 0.0018 | 0.97 | 0.00261 | 1.58 | 0.00035 | 0.1305 | 0.0082 | 0.00176 | 0.00576 | 0.00121 | 26.3 | 0.0063 |
| | GC-CSU-11-APR-15 | Gold Creek | Muscle | 0.0023 | 3.01 | 0.00231 | 3.82 | 0.00054 | 0.1200 | 0.0097 | 0.00241 | 0.00982 | 0.00194 | 26.9 | 0.0062 |
| | GC-CSU-13-APR-15 | Gold Creek | Muscle | 0.0016 | 1.93 | <0.00055 | 5.88 | 0.00016 | 0.0910 | 0.0053 | 0.00440 | 0.00492 | 0.00236 | 21.5 | 0.0075 |
| | GC-CSU-14-APR-15 | Gold Creek | Muscle | 0.0013 | 4.86 | <0.00051 | 4.20 | 0.00026 | 0.0840 | 0.0224 | 0.00107 | 0.00572 | 0.00164 | 22.3 | 0.0067 |
| | GC-CSU-15-APR-15 | Gold Creek | Muscle | 0.0060 | 2.32 | 0.00151 | 19.60 | 0.00824 | 0.6790 | 0.0251 | 0.01110 | 0.04930 | 0.01610 | 44.9 | 0.0311 |
| | GC-CSU-17-APR-15 | Gold Creek | Muscle | 0.0022 | 2.89 | 0.00099 | 6.44 | 0.00035 | 0.0990 | 0.0071 | 0.00220 | 0.00862 | 0.00152 | 31.9 | 0.0060 |
| | GC-CSU-18-APR-15 | Gold Creek | Muscle | 0.0026 | 4.34 | 0.00197 | 5.01 | 0.00141 | 0.2180 | 0.0149 | 0.00210 | 0.01610 | 0.00414 | 41.6 | 0.0132 |
| | GC-CSU-10-APR-15 | Gold Creek | Ovary | 0.00149 | 2.40 | 0.000690 | 0.378 | 0.00443 | 0.293 | 0.0147 | 0.00718 | 0.0170 | 0.0176 | 146 | 0.0112 |
| 2016 | SC-CSU-08 M-Apr-16 | Sand Creek | Muscle | 0.00216 | 2.02 | 0.00339 | 1.54 | 0.00079 | 0.152 | 0.00357 | 0.00087 | 0.00841 | 0.00114 | 21.7 | 0.00504 |
| | SC-CSU-36 M-Apr-16 | Sand Creek | Muscle | 0.00128 | 5.165 | 0.00086 | 0.1215 | 0.000695 | 0.1185 | 0.009715 | 0.00027 | 0.00435 | 0.00096 | 26.1 | 0.00426 |
| | SC-CSU-08 O -Apr-16 | Sand Creek | Ovary | 0.002605 | 2.64 | 0.00088 | 0.3655 | 0.0006525 | 0.08065 | 0.003205 | 0.00735 | 0.006795 | 0.008265 | 97.3 | 0.00794 |
| | SC-CSU-36 O-Apr-16 | Sand Creek | Ovary | 0.00211 | 5.21 | 0.00447 | 0.414 | 0.00214 | 0.16 | 0.015 | 1.02 | 0.015 | 0.0144 | 158 | 0.00945 |
| | ER-CSU-03 M-Apr-16 | Elk River | Muscle | 0.00243 | 6.64 | 0.00138 | 0.151 | 0.000776 | 0.172 | 0.00909 | 0.00025 | 0.00893 | 0.0016 | 21 | 0.006 |
| | ER-CSU-04 M-Apr-16 | Elk River | Muscle | 0.001575 | 4.055 | 0.000825 | 3.07 | 0.0005615 | 0.1625 | 0.01475 | 0.000805 | 0.0109 | 0.00162 | 24.5 | 0.0056 |
| | ER-CSU-34 M-Apr-16 | Elk River | Muscle | 0.003105 | 6.415 | 0.00107 | 1.2345 | 0.001655 | 0.236 | 0.02335 | 0.000885 | 0.0275 | 0.00287 | 25.35 | 0.00805 |
| | ER-CSU-45 M-Apr-16 | Elk River | Muscle | 0.00092 | 2.25 | <0.00088 | 1.24 | 0.000757 | 0.09 | 0.0224 | 0.00055 | 0.00537 | 0.00062 | 21.7 | 0.036 |
| | ER-CSU-03 O -Apr-16 | Elk River | Ovary | 0.003035 | 9.07 | 0.001815 | 0.3465 | 0.000618 | 0.111 | 0.00803 | 0.00227 | 0.010465 | 0.010035 | 114.95 | 0.007455 |

**Table G.5:** **Metal Concentrations (µg/g Dry Weight) in Largescale Sucker Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sb µg/g dw | Se µg/g dw | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-CSU-04 O-Apr-16 | Elk River | Ovary | 0.00097 | 3.845 | 0.000615 | 0.275 | 0.000254 | 0.0687 | 0.009855 | 0.00094 | 0.00453 | 0.0026 | 72.65 | 0.00229 |
| | ER-CSU-34 O-Apr-16 | Elk River | Ovary | 0.0046 | 6.9 | 0.00158 | 0.505 | 0.00576 | 0.28 | 0.0247 | 0.00999 | 0.052 | 0.0374 | 128 | 0.0215 |
| | ER-CSU-45 O-Apr-16 | Elk River | Ovary | 0.0022 | 3.24 | 0.00171 | 0.524 | 0.004 | 0.301 | 0.0217 | 0.00855 | 0.0434 | 0.0351 | 128 | 0.0184 |
| | GC-CSU-04 M-Apr-16 | Gold Creek | Muscle | 0.0008 | 0.72 | 0.001495 | 0.9845 | 0.001665 | 0.247 | 0.006425 | 0.0007 | 0.010155 | 0.00397 | 18.2 | 0.02595 |
| | GC-CSU-05 M-Apr-16 | Gold Creek | Muscle | 0.00246 | 3.77 | 0.00087 | 3.95 | 0.00025 | 0.123 | 0.00145 | 0.00109 | 0.00666 | 0.00125 | 19.8 | 0.0108 |
| | GC-CSU-09 M-Apr-16 | Gold Creek | Muscle | 0.00081 | 0.82 | 0.0012 | 2.03 | 0.00031 | 0.1295 | 0.00756 | 0.001055 | 0.00328 | 0.0013 | 16.3 | 0.00544 |
| | GC-CSU-26 M-Apr-16 | Gold Creek | Muscle | 0.00115 | 1.45 | <0.00088 | 5.04 | 0.00045 | 0.119 | 0.0122 | 0.00144 | 0.00565 | 0.0011 | 20.7 | 0.0109 |
| | GC-CSU-27 M-Apr-16 | Gold Creek | Muscle | 0.00113 | 1.5 | 0.00202 | 2.83 | 0.00113 | 0.16 | 0.00629 | 0.00193 | 0.0105 | 0.00207 | 22.1 | 0.0255 |
| | GC-CSU-31 M-Apr-16 | Gold Creek | Muscle | 0.00133 | 4.21 | 0.0012 | 2.71 | 0.00036 | 0.133 | 0.00732 | 0.00076 | 0.00651 | 0.0011 | 16.3 | 0.00723 |
| | GC-CSU-34 M-Apr-16 | Gold Creek | Muscle | 0.00118 | 1.05 | <0.00083 | 0.522 | 0.0006 | 0.151 | 0.00979 | 0.00043 | 0.0045 | 0.00092 | 18.7 | 0.00534 |
| | GC-CSU-37 M-Apr-16 | Gold Creek | Muscle | 0.00112 | 3.29 | 0.00133 | 9.53 | 0.00154 | 0.166 | 0.0241 | 0.00406 | 0.0143 | 0.00243 | 22.1 | 0.0118 |
| | GC-CSU-43 M-Apr-16 | Gold Creek | Muscle | 0.00064 | 0.71 | 0.00155 | 1.79 | 0.00029 | 0.102 | 0.0113 | 0.00092 | 0.00351 | 0.00067 | 23.3 | 0.00706 |
| | GC-CSU-04 O-Apr-16 | Gold Creek | Ovary | 0.000545 | 0.9615 | 0.00065 | 0.2995 | 0.000517 | 0.13575 | 0.00368 | 0.00157 | 0.00602 | 0.00237 | 83.35 | 0.005695 |
| | GC-CSU-05 O-Apr-16 | Gold Creek | Ovary | 0.00274 | 6.54 | <0.00042 | 0.268 | 0.000472 | 0.0669 | 0.00153 | 0.00155 | 0.00505 | 0.0111 | 86.9 | 0.0037 |
| | GC-CSU-09 O-Apr-16 | Gold Creek | Ovary | 0.00173 | 1.45 | 0.00051 | 0.344 | 0.000282 | 0.0621 | 0.00519 | 0.00215 | 0.00349 | 0.00202 | 88.3 | 0.00372 |
| | GC-CSU-26 O-Apr-16 | Gold Creek | Ovary | 0.00118 | 1.13 | <0.00044 | 0.312 | 0.000245 | 0.0654 | 0.00759 | 0.00148 | 0.00244 | 0.00076 | 75 | 0.00185 |
| | GC-CSU-27 O-Apr-16 | Gold Creek | Ovary | 0.00118 | 1.21 | <0.00041 | 0.213 | 0.000235 | 0.0554 | 0.00518 | 0.00175 | 0.00259 | 0.00096 | 81.1 | 0.00366 |
| | GC-CSU-31 O-Apr-16 | Gold Creek | Ovary | 0.001985 | 5.845 | 0.000675 | 0.442 | 0.0005095 | 0.0895 | 0.006125 | 0.00174 | 0.006175 | 0.007485 | 145.5 | 0.00487 |
| | GC-CSU-34 O-Apr-16 | Gold Creek | Ovary | 0.00095 | 1.46 | <0.00062 | 0.233 | 0.000264 | 0.048 | 0.00799 | 0.00206 | 0.00482 | 0.00219 | 74.2 | 0.00838 |
| | GC-CSU-37 O-Apr-16 | Gold Creek | Ovary | 0.00105 | 4.9 | <0.00064 | 0.322 | 0.000286 | 0.064 | 0.0167 | 0.00225 | 0.00562 | 0.00377 | 84.9 | 0.00522 |
| | GC-CSU-43 O-Apr-16 | Gold Creek | Ovary | 0.00092 | 1.16 | <0.00065 | 0.318 | 0.000106 | 0.053 | 0.00497 | 0.00138 | 0.00307 | 0.0012 | 76.9 | 0.00346 |

## Table G.6: Metal Concentrations (µg/g Dry Weight) in Mountain Whitefish Tissues Collected in Koocanusa Reservoir, April 2015 and 2016 and August 2016

| Year | Sample ID | Area | Tissue Type | Total wet mass | Total dry mass | Dry matter | Moisture | Ag | Al | As | B | Ba | Be | Bi | Ca | Cd | Co | Cr | Cs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | g | g | % | % | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | GC-MW-01-Apr-15 | Gold Creek | Muscle | 3.79187 | 0.8841 | 0.23 | 77 | <0.00030 | 1.9 | 0.17 | <0.11 | 0.15 | <0.0060 | 0.0019 | 769 | 0.003 | 0.040 | 0.070 | 0.017 |
| 2016 | SC-MW-01 M-Apr-16 | Sand Creek | Muscle | 4.208 | 0.878 | 0.20865 | 79 | <0.00052 | 1.93 | 0.254 | 0.134 | 0.0574 | <0.0056 | 0.00156 | 598 | 0.0062 | 0.0256 | 0.0503 | 0.0932 |
| | GC-MW-01-Apr-16 | Gold Creek | Muscle plug | 0.0359 | 0.0052 | 0.144847 | 86 | 0.0054 | 55 | 0.159 | 0.79 | 1.54 | <0.0065 | 0.0689 | 519 | 0.0399 | 0.0837 | 0.367 | 0.122 |
| | GC-MW-02 M-Apr-16 | Gold Creek | Muscle | 5.92572 | 1.35917 | 0.229368 | 77 | <0.00042 | 7.32 | 0.243 | 0.1 | 0.212 | <0.0026 | 0.0021 | 1,190 | 0.002 | 0.0241 | 0.104 | 0.0372 |
| | ER-MW-01-Aug-16 | Elk River | Muscle | 0.03347 | 0.00894 | 0.267105 | 73 | <0.0011 | 17.3 | 0.113 | <0.39 | 1.04 | <0.0098 | 0.00026 | 361 | 0.0072 | 0.17 | 3.42 | 0.0271 |
| | ER-MW-02-Aug-16 | Elk River | Muscle | 0.06418 | 0.01537 | 0.239483 | 76 | 0.00068 | 11.7 | 0.0476 | <0.23 | 0.744 | <0.0057 | 0.000785 | 366 | <0.0031 | 0.141 | 3.46 | 0.0213 |
| | ER-MW-03A-Aug-16 avg | Elk River | Muscle | 0.10241 | 0.02699 | 0.263548 | 73 | <0.000625 | 1.53 | 0.106 | <0.235 | 0.1373 | <0.0058 | 0.0002975 | 237.5 | 0.0035 | 0.0497 | 2.59 | 0.0421 |
| | ER-MW-04-Aug-16 | Elk River | Muscle | 0.05299 | 0.01444 | 0.272504 | 73 | <0.00065 | 3.14 | 0.0845 | <0.24 | 0.0417 | <0.0060 | 0.00014 | 292 | <0.0032 | 0.0622 | 10.9 | 0.0634 |
| | ER-MW-05-Aug-16 | Elk River | Muscle | 0.04461 | 0.01187 | 0.266084 | 73 | <0.00076 | 3.61 | 0.0464 | <0.28 | 0.188 | <0.0070 | 0.00054 | 323 | 0.0043 | 0.0717 | 2.46 | 0.0206 |
| | ER-MW-06-Aug-16 | Elk River | Muscle | 0.07757 | 0.01859 | 0.239655 | 76 | <0.00051 | 11.6 | 0.183 | 0.28 | 1.25 | <0.0047 | 0.000423 | 375 | 0.0055 | 0.0925 | 2.93 | 0.038 |
| | ER-MW-07-Aug-16 | Elk River | Muscle | 0.0507 | 0.01394 | 0.274951 | 73 | <0.00066 | 3.14 | 0.232 | <0.25 | 0.106 | <0.0061 | 0.00036 | 313 | <0.0033 | 0.0406 | 0.357 | 0.067 |
| | ER-MW-08-Aug-16 | Elk River | Muscle | 0.08222 | 0.01977 | 0.240452 | 76 | 0.00068 | 24.5 | 0.135 | <0.21 | 0.282 | <0.0052 | 0.000489 | 413 | <0.0028 | 0.0635 | 1.74 | 0.028 |
| | ER-MW-09-Aug-16 | Elk River | Muscle | 0.05775 | 0.01412 | 0.244502 | 76 | <0.00066 | 26.8 | 0.128 | 0.27 | 0.35 | <0.0061 | 0.00052 | 408 | 0.0045 | 0.0791 | 0.583 | 0.0356 |
| | ER-MW-10-Aug-16 | Elk River | Muscle | 0.06388 | 0.01704 | 0.26675 | 73 | <0.00056 | 24.9 | 0.293 | <0.21 | 0.312 | <0.0052 | 0.000457 | 407 | <0.0028 | 0.048 | 0.352 | 0.0375 |
| | SC-MW-01-Aug-16 | Sand Creek | Muscle plug | 0.04367 | 0.01044 | 0.239066 | 76 | 0.0063 | 4.42 | 0.04 | <0.34 | 0.126 | <0.0083 | 0.0002 | 372 | <0.0045 | 0.0843 | 2.77 | 0.0201 |
| | SC-MW-02-Aug-16 avg | Sand Creek | Muscle plug | 0.13864 | 0.03451 | 0.248918 | 75 | 0.000575 | 2.22 | 0.223 | 0.21 | 0.0692 | 0.0053 | 0.0002665 | 358 | 0.0132 | 0.03765 | 1.5 | 0.04475 |
| | SC-MW-03-Aug-16 | Sand Creek | Muscle plug | 0.06573 | 0.01502 | 0.228511 | 77 | <0.00064 | 5.1 | 0.0698 | 0.61 | 0.11 | <0.0059 | 0.0004 | 357 | 0.0273 | 0.0984 | 9.6 | 0.0259 |
| | SC-MW-04-Aug-16 | Sand Creek | Muscle plug | 0.0509 | 0.01261 | 0.247741 | 75 | 0.00081 | 31.8 | 0.134 | <0.27 | 0.431 | <0.0068 | 0.00071 | 449 | <0.0037 | 0.0714 | 1.66 | 0.0432 |
| | SC-MW-05-Aug-16 | Sand Creek | Muscle plug | 0.05096 | 0.01246 | 0.244505 | 76 | <0.00083 | 63.9 | 0.0565 | <0.31 | 0.756 | <0.0077 | 0.00116 | 568 | 0.0057 | 0.0795 | 0.923 | 0.0389 |

## **Table G.6:** Metal Concentrations (µg/g Dry Weight) in Mountain Whitefish Tissues Collected in Koocanusa Reservoir, April 2015 and 2016 and August 2016

| Year | Sample ID | Area | Tissue Type | Cu | Fe | Ga | Hg | K | Li | Mg | Mn | Mo | Na | Ni | P | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | GC-MW-01-Apr-15 | Gold Creek | Muscle | 1.40 | 13.4 | 0.0081 | 0.310 | 20,300 | <0.0050 | 1,380 | 0.88 | 0.0035 | 835 | 0.014 | 10,900 | 0.009 |
| 2016 | SC-MW-01 M-Apr-16 | Sand Creek | Muscle | 1.03 | 14.8 | 0.0039 | 0.376 | 24,900 | 0.0297 | 1,480 | 0.707 | <0.0031 | 1,080 | 0.0274 | 13,200 | 0.00819 |
| | GC-MW-01-Apr-16 | Gold Creek | Muscle plug | 1.86 | 61.1 | 0.022 | 0.301 | 14,400 | 0.095 | 1,080 | 1.65 | 0.0373 | 1,290 | 0.516 | 8,640 | 1.82 |
| | GC-MW-02 M-Apr-16 | Gold Creek | Muscle | 0.653 | 13.3 | 0.00936 | 0.148 | 22,600 | 0.0354 | 1,470 | 0.764 | 0.0062 | 758 | 0.024 | 11,700 | 0.00889 |
| | ER-MW-01-Aug-16 | Elk River | Muscle | 1.41 | 75.7 | 0.0136 | 0.0711 | 17,400 | 0.129 | 1380 | 3.56 | 0.0348 | 900 | 0.844 | 10,900 | 0.053 |
| | ER-MW-02-Aug-16 | Elk River | Muscle | 1.53 | 73.9 | 0.0124 | 0.0791 | 17,400 | 0.169 | 1400 | 3.07 | 0.0238 | 942 | 0.411 | 11,200 | 0.0611 |
| | ER-MW-03A-Aug-16 avg | Elk River | Muscle | 0.9445 | 41.1 | 0.00555 | 0.06955 | 14,600 | 0.2135 | 1145 | 0.5 | 0.01465 | 950 | 0.1955 | 9,505 | 0.021495 |
| | ER-MW-04-Aug-16 | Elk River | Muscle | 1.49 | 86.3 | 0.0087 | 0.0876 | 17,200 | 0.092 | 1330 | 0.792 | 0.0501 | 948 | 0.77 | 11,500 | 0.0119 |
| | ER-MW-05-Aug-16 | Elk River | Muscle | 1.3 | 44 | 0.0057 | 0.2 | 17,200 | 0.111 | 1320 | 0.967 | 0.0225 | 1040 | 0.823 | 11,100 | 0.0185 |
| | ER-MW-06-Aug-16 | Elk River | Muscle | 1.74 | 122 | 0.0129 | 0.0604 | 18,400 | 0.0844 | 1400 | 2.54 | 0.0269 | 1020 | 0.355 | 11,700 | 0.135 |
| | ER-MW-07-Aug-16 | Elk River | Muscle | 1.92 | 27.9 | 0.0081 | 0.0585 | 15,100 | 0.044 | 1100 | 1.02 | 0.0116 | 739 | 0.165 | 9,540 | 0.021 |
| | ER-MW-08-Aug-16 | Elk River | Muscle | 4.09 | 54.1 | 0.0138 | 0.0943 | 16,100 | 0.094 | 1230 | 1.35 | 0.0345 | 960 | 0.868 | 10,800 | 0.0409 |
| | ER-MW-09-Aug-16 | Elk River | Muscle | 1.61 | 45.9 | 0.0137 | 0.154 | 16,400 | 0.334 | 1330 | 1.5 | 0.0166 | 900 | 0.228 | 10,700 | 0.0579 |
| | ER-MW-10-Aug-16 | Elk River | Muscle | 1.28 | 31 | 0.0121 | 0.122 | 16,300 | 0.083 | 1270 | 1.16 | 0.0115 | 1030 | 0.142 | 10,500 | 0.0419 |
| | SC-MW-01-Aug-16 | Sand Creek | Muscle plug | 1.4 | 33.6 | 0.0072 | 0.086 | 15,300 | 0.242 | 1240 | 0.846 | 0.0446 | 973 | 1.25 | 10,200 | 0.0229 |
| | SC-MW-02-Aug-16 avg | Sand Creek | Muscle plug | 1.895 | 25.6 | 0.0048 | 0.1095 | 18,000 | 0.0854 | 1350 | 0.67 | 0.01755 | 1125 | 0.494 | 11,750 | 0.02015 |
| | SC-MW-03-Aug-16 | Sand Creek | Muscle plug | 2.28 | 95.6 | 0.0076 | 0.0815 | 17,800 | 0.1 | 1330 | 1.22 | 0.0454 | 1260 | 0.586 | 11,500 | 0.0356 |
| | SC-MW-04-Aug-16 | Sand Creek | Muscle plug | 1.79 | 46.8 | 0.0155 | 0.0851 | 18,900 | 0.086 | 1430 | 1.39 | 0.0338 | 1130 | 0.667 | 11,400 | 0.161 |
| | SC-MW-05-Aug-16 | Sand Creek | Muscle plug | 2.1 | 87.5 | 0.027 | 0.091 | 17,200 | 0.146 | 1300 | 2.45 | 0.0229 | 1350 | 0.369 | 10,200 | 0.0879 |

### **Table G.6:** Metal Concentrations (µg/g Dry Weight) in Mountain Whitefish Tissues Collected in Koocanusa Reservoir, April 2015 and 2016 and August 2016

| Year | Sample ID | Area | Tissue Type | Rb | Re | Sb | Se | Sn | Sr | Th | Ti | Tl | U | V | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | GC-MW-01-Apr-15 | Gold Creek | Muscle | 10.1 | <0.00021 | 0.0010 | 3.76 | 0.0009 | 0.299 | 0.01340 | 0.094 | 0.0356 | 0.0003 | 0.0046 | 0.001 | 14.5 | 0.169 |
| 2016 | SC-MW-01 M-Apr-16 | Sand Creek | Muscle | 13.9 | 0.000122 | 0.0014 | 3.88 | 0.0015 | 0.186 | 0.000523 | 0.163 | 0.0256 | 0.000274 | 0.00622 | 0.00084 | 41.0 | 0.00524 |
| | GC-MW-01-Apr-16 | Gold Creek | Muscle plug | 13.5 | 0.00036 | 0.144 | 2.71 | 0.0696 | 0.651 | 0.0109 | 2.39 | 0.0321 | 0.00478 | 0.0911 | 0.0233 | 112.0 | 1.58 |
| | GC-MW-02 M-Apr-16 | Gold Creek | Muscle | 9.7 | 0.000093 | 0.00067 | 4.3 | 0.00083 | 0.651 | 0.00203 | 0.253 | 0.0133 | 0.000837 | 0.0173 | 0.00531 | 14.1 | 0.00716 |
| | ER-MW-01-Aug-16 | Elk River | Muscle | 7.25 | <0.00018 | <0.0030 | 4.56 | 0.0137 | 0.0808 | 0.02 | 0.237 | 0.0561 | 0.684 | 0.028 | 0.127 | 18.2 | 0.0321 |
| | ER-MW-02-Aug-16 | Elk River | Muscle | 4.22 | <0.00011 | 0.0026 | 7.71 | 0.0115 | 0.0995 | 0.00989 | 0.506 | 0.0336 | 0.133 | 0.115 | 0.0264 | 29.8 | 0.016 |
| | ER-MW-03A-Aug-16 avg | Elk River | Muscle | 8.06 | <0.000108 | <0.00175 | 4.605 | 0.006675 | 0.07155 | 0.001015 | 0.2085 | 0.133 | 0.01239 | 0.02915 | 0.00099 | 19.25 | 0.01145 |
| | ER-MW-04-Aug-16 | Elk River | Muscle | 9.88 | 0.00015 | 0.0036 | 4.16 | 0.015 | 0.0367 | 0.00043 | 0.122 | 0.169 | 0.00956 | 0.0565 | 0.00231 | 22.2 | 0.011 |
| | ER-MW-05-Aug-16 | Elk River | Muscle | 3.13 | <0.00013 | 0.0035 | 7.33 | 0.0118 | 0.0959 | 0.00134 | 0.159 | 0.0363 | 0.0225 | 0.0232 | 0.00525 | 23.3 | 0.0163 |
| | ER-MW-06-Aug-16 | Elk River | Muscle | 8.16 | 0.000108 | 0.0024 | 4.96 | 0.0103 | 0.104 | 0.0195 | 0.534 | 0.0417 | 0.338 | 0.0393 | 0.0748 | 28 | 0.0262 |
| | ER-MW-07-Aug-16 | Elk River | Muscle | 10.3 | <0.00011 | 0.002 | 5.2 | 0.0102 | 0.106 | 0.00127 | 0.296 | 0.155 | 0.0178 | 0.00925 | 0.00395 | 39.4 | 0.013 |
| | ER-MW-08-Aug-16 | Elk River | Muscle | 5.09 | 0.000117 | 0.0028 | 5.49 | 0.0091 | 0.221 | 0.00792 | 1.45 | 0.0398 | 0.00414 | 0.0597 | 0.0153 | 26.4 | 0.0299 |
| | ER-MW-09-Aug-16 | Elk River | Muscle | 5.38 | <0.00011 | 0.0033 | 5.24 | 0.0071 | 0.3 | 0.00469 | 1.02 | 0.0314 | 0.00931 | 0.042 | 0.0133 | 22.6 | 0.0288 |
| | ER-MW-10-Aug-16 | Elk River | Muscle | 8.85 | <0.000095 | 0.0023 | 3.77 | 0.00626 | 0.2 | 0.00407 | 0.741 | 0.0313 | 0.00339 | 0.0345 | 0.0165 | 28.4 | 0.0277 |
| | SC-MW-01-Aug-16 | Sand Creek | Muscle plug | 3.26 | <0.00015 | 0.0043 | 7.08 | 0.0099 | 0.272 | 0.00078 | 0.164 | 0.0401 | 0.00161 | 0.019 | 0.00113 | 24.2 | 0.0102 |
| | SC-MW-02-Aug-16 avg | Sand Creek | Muscle plug | 10.6 | 0.000143 | 0.0019 | 3.605 | 0.01237 | 0.06625 | 0.001035 | 0.146 | 0.03745 | 0.003345 | 0.0131 | 0.00122 | 18.6 | 0.00134 |
| | SC-MW-03-Aug-16 | Sand Creek | Muscle plug | 7.03 | <0.00011 | 0.0042 | 6.43 | 0.0405 | 0.177 | 0.00096 | 0.417 | 0.0621 | 0.00566 | 0.0653 | 0.00275 | 15.9 | 0.0127 |
| | SC-MW-04-Aug-16 | Sand Creek | Muscle plug | 9.21 | 0.00015 | 0.0053 | 4.57 | 0.0144 | 0.234 | 0.0056 | 0.692 | 0.0453 | 0.00576 | 0.0488 | 0.0126 | 21.9 | 0.0334 |
| | SC-MW-05-Aug-16 | Sand Creek | Muscle plug | 7.46 | 0.00015 | 0.0061 | 6.12 | 0.0107 | 0.495 | 0.0154 | 1.98 | 0.0545 | 0.00669 | 0.112 | 0.0249 | 20.6 | 0.0623 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | EC-PM-01M-Feb-14 | Englishman Creek | Muscle | 78 | <0.00097 | 7.51 | 0.0169 | <0.17 | 0.335 | <0.0027 | 0.00243 | 546 | 0.0034 | 0.0071 | 0.122 | 0.109 | 0.798 | 13 |
| | EC-PM-01G-Feb-14 | Englishman Creek | Ovary | 77 | 0.00266 | 14.1 | 0.23 | <0.081 | 0.608 | <0.0040 | 0.00078 | 532 | 0.0125 | 0.053 | 0.187 | 0.0715 | 2.87 | 111 |
| | SC-PM-05M-Feb-14 | Sand Creek | Muscle | 79 | <0.00096 | 2.76 | 0.0138 | <0.17 | 0.289 | <0.0027 | 0.00261 | 1,290 | 0.0018 | 0.0047 | 0.0802 | 0.177 | 0.653 | 10 |
| | SC-PM-10M-Feb-14 | Sand Creek | Muscle | 77 | <0.00094 | 1.97 | 0.0338 | <0.17 | 0.132 | <0.0026 | 0.00107 | 552 | 0.00214 | 0.0037 | 0.0788 | 0.170 | 1.016 | 9.15 |
| | SC-PM-01M-Apr-14 | Sand Creek | Muscle | 78 | <0.00079 | 6.61 | 0.0193 | <0.084 | 0.526 | <0.0023 | 0.00177 | 2,405 | 0.00111 | 0.00707 | 0.0758 | 0.173 | 0.656 | 16.5 |
| | SC-PM-02M-Apr-14 | Sand Creek | Muscle | 77 | <0.00080 | 16.9 | 0.024 | <0.085 | 0.49 | <0.0023 | 0.00315 | 686 | 0.00161 | 0.00865 | 0.0874 | 0.115 | 0.822 | 31.5 |
| | SC-PM-03M-Apr-14 | Sand Creek | Muscle | 79 | <0.00081 | 12.7 | 0.0147 | <0.086 | 0.26 | <0.0024 | 0.00229 | 566 | 0.00151 | 0.00889 | 0.107 | 0.106 | 0.936 | 17 |
| | SC-PM-04M-Apr-14 | Sand Creek | Muscle | 77 | <0.00079 | 11.8 | 0.0219 | <0.084 | 0.714 | <0.0023 | 0.00151 | 1,650 | 0.00259 | 0.00838 | 0.0859 | 0.174 | 0.65 | 15 |
| | SC-PM-05M-Apr-14 | Sand Creek | Muscle | 81 | <0.00080 | 12.9 | 0.0124 | <0.085 | 0.458 | <0.0024 | 0.00115 | 1,040 | 0.00103 | 0.00776 | 0.0736 | 0.243 | 0.656 | 19.4 |
| | SC-PM-06M-Apr-14 | Sand Creek | Muscle | 77 | <0.00078 | 7.96 | 0.0241 | <0.083 | 0.278 | <0.0023 | 0.00106 | 565 | 0.0022 | 0.0071 | 0.298 | 0.127 | 0.823 | 15.6 |
| | SC-PM-07M-Apr-14 | Sand Creek | Muscle | 77 | <0.00073 | 26 | 0.021 | <0.078 | 0.474 | <0.0022 | 0.00355 | 1,370 | 0.00178 | 0.0115 | 0.0954 | 0.136 | 0.654 | 39.1 |
| | SC-PM-08M-Apr-14 | Sand Creek | Muscle | 78 | <0.00084 | 4.6 | 0.0182 | <0.090 | 0.458 | <0.0025 | 0.00147 | 1,340 | <0.00069 | 0.00587 | 0.103 | 0.158 | 0.68 | 11.4 |
| | SC-PM-09M-Apr-14 | Sand Creek | Muscle | 76 | <0.00081 | 17.9 | 0.032 | <0.086 | 0.28 | <0.0024 | 0.00133 | 656 | 0.00163 | 0.00841 | 0.0877 | 0.108 | 0.775 | 20 |
| | SC-PM-10M-Apr-14 | Sand Creek | Muscle | 78 | <0.00077 | 4.1 | 0.0212 | <0.082 | 0.302 | <0.0023 | 0.00192 | 642 | 0.00107 | 0.00538 | 0.072 | 0.124 | 0.613 | 10.3 |
| | SC-PM-01M-Aug-14 | Sand Creek | Muscle | 79 | <0.00078 | 2.76 | 0.0219 | <0.12 | 0.465 | <0.0039 | 0.00182 | 1,520 | 0.00830 | 0.0065 | 0.109 | 0.131 | 0.662 | 11.3 |
| | SC-PM-02M-Aug-14 | Sand Creek | Muscle | 78 | <0.00078 | 11.6 | 0.0384 | <0.12 | 0.688 | <0.0039 | 0.00204 | 682 | 0.0121 | 0.0113 | 0.129 | 0.104 | 1.39 | 32.4 |
| | SC-PM-03M-Aug-14 | Sand Creek | Muscle | 78 | <0.00074 | 11.6 | 0.0246 | 0.13 | 0.383 | <0.0037 | 0.00221 | 1,060 | 0.00423 | 0.0094 | 0.118 | 0.106 | 0.665 | 19.9 |
| | SC-PM-04M-Aug-14 | Sand Creek | Muscle | 79 | <0.00079 | 1.16 | 0.0157 | <0.12 | 0.618 | <0.0039 | 0.0018 | 2,730 | 0.00159 | 0.0051 | 0.0808 | 0.0888 | 0.766 | 9.08 |
| | SC-PM-05M-Aug-14 | Sand Creek | Muscle | 78 | <0.00079 | 6.74 | 0.0448 | <0.12 | 0.162 | <0.0039 | 0.00245 | 556 | 0.00274 | 0.0077 | 0.0905 | 0.0691 | 0.742 | 13.4 |
| | SC-PM-06M-Aug-14 | Sand Creek | Muscle | 79 | <0.00080 | 2.86 | 0.0225 | <0.12 | 0.582 | <0.0039 | 0.00176 | 2,120 | 0.00203 | 0.0068 | 0.234 | 0.0885 | 0.630 | 11.4 |
| | SC-PM-07M-Aug-14 | Sand Creek | Muscle | 79 | <0.00073 | 4.56 | 0.024 | <0.11 | 0.318 | <0.0036 | 0.00209 | 763 | 0.00225 | 0.00514 | 0.0942 | 0.0921 | 0.74 | 16.1 |
| | SC-PM-08M-Aug-14 | Sand Creek | Muscle | 79 | <0.00078 | 10.1 | 0.0212 | <0.12 | 0.933 | <0.0039 | 0.00296 | 1,720 | 0.00304 | 0.009 | 0.106 | 0.136 | 1.11 | 16 |
| | SC-PM-09M-Aug-14 | Sand Creek | Muscle | 79 | <0.00077 | 1.56 | 0.0084 | <0.12 | 0.245 | <0.0038 | 0.00273 | 519 | 0.00177 | 0.0041 | 0.0656 | 0.079 | 0.682 | 9.54 |
| | SC-PM-10M-Aug-14 | Sand Creek | Muscle | 79 | <0.00083 | 13.6 | 0.102 | <0.13 | 0.714 | <0.0041 | 0.00162 | 666 | 0.00631 | 0.0144 | 0.129 | 0.0855 | 1.88 | 32.6 |
| | SC-PM-05G-Feb-14 | Sand Creek | Ovary | 76 | 0.00326 | 64.6 | 0.143 | <0.076 | 0.815 | <0.0037 | 0.00159 | 1,620 | 0.0094 | 0.0581 | 0.147 | 0.142 | 2.9 | 173 |
| | SC-PM-10G-Feb-14 | Sand Creek | Ovary | 73 | 0.00476 | 2.23 | 0.104 | <0.077 | 0.0599 | <0.0037 | 0.00025 | 1,173 | 0.00267 | 0.0467 | 0.0786 | 0.109 | 2.85 | 109 |
| | SC-PM-01G-Apr-14 | Sand Creek | Ovary | 76 | 0.00276 | 16.8 | 0.0638 | <0.079 | 0.216 | <0.0038 | 0.00056 | 1,170 | 0.006 | 0.0434 | 0.0875 | 0.121 | 2.76 | 211 |
| | SC-PM-10G-Apr-14 | Sand Creek | Ovary | 81 | 0.00352 | 15.6 | 0.101 | <0.080 | 0.744 | <0.0039 | 0.00063 | 880 | 0.0262 | 0.0597 | 0.09 | 0.146 | 4.4 | 318 |
| | ER-PM-06M-Feb-14 | Elk River | Muscle | 77 | <0.00097 | 4.55 | 0.0295 | <0.17 | 0.532 | <0.0027 | 0.00216 | 1,020 | 0.0053 | 0.0071 | 0.12 | 0.0705 | 1 | 11.7 |
| | ER-PM-09M-Feb-14 | Elk River | Muscle | 80 | <0.00096 | 5.73 | 0.0526 | <0.17 | 0.255 | <0.0026 | 0.00213 | 477 | 0.0038 | 0.0066 | 0.0909 | 0.114 | 0.864 | 11.4 |
| | ER-PM-12M-Feb-14 | Elk River | Muscle | 78 | <0.00098 | 1.83 | 0.0198 | <0.18 | 1.16 | <0.0027 | 0.00366 | 2,970 | 0.0017 | 0.0091 | 0.0713 | 0.0481 | 0.913 | 11 |
| | ER-PM-01M-Apr-14 | Elk River | Muscle | 80 | <0.00090 | 23 | 0.0156 | 0.28 | 0.758 | <0.0025 | 0.002 | 1,700 | 0.00272 | 0.0097 | 0.125 | 0.0664 | 0.769 | 29.5 |
| | ER-PM-02M-Apr-14 | Elk River | Muscle | 78 | <0.00099 | 3 | 0.0158 | 2.96 | 0.995 | <0.0027 | 0.00189 | 3,290 | 0.0023 | 0.0052 | 0.0689 | 0.0451 | 0.688 | 9 |
| | ER-PM-03M-Apr-14 | Elk River | Muscle | 78 | <0.00096 | 12.1 | 0.021 | <0.17 | 0.34 | <0.0027 | 0.00145 | 550 | 0.0022 | 0.0086 | 0.091 | 0.0948 | 0.779 | 19.4 |
| | ER-PM-04M-Apr-14 | Elk River | Muscle | 77 | <0.00086 | 37.5 | 0.0324 | 0.19 | 0.942 | <0.0024 | 0.00154 | 1,160 | 0.00605 | 0.018 | 0.135 | 0.0487 | 1.17 | 48.8 |
| | ER-PM-05M-Apr-14 | Elk River | Muscle | 78 | <0.0010 | 9.26 | 0.0213 | <0.18 | 0.922 | <0.0028 | 0.00113 | 2,630 | 0.0034 | 0.0084 | 0.0878 | 0.0447 | 0.776 | 14.1 |
| | ER-PM-06M-Apr-14 | Elk River | Muscle | 78 | <0.00092 | 7.02 | 0.0205 | <0.16 | 0.219 | <0.0025 | 0.000907 | 615 | 0.00419 | 0.00893 | 0.0894 | 0.184 | 0.883 | 17.2 |
| | ER-PM-07M-Apr-14 | Elk River | Muscle | 79 | <0.00096 | 6.31 | 0.0228 | <0.17 | 0.968 | <0.0027 | 0.00198 | 3,235 | 0.0024 | 0.0073 | 0.0771 | 0.0836 | 0.628 | 16.8 |
| | ER-PM-08M-Apr-14 | Elk River | Muscle | 76 | <0.00098 | 15.6 | 0.0185 | <0.17 | 0.385 | <0.0027 | 0.00197 | 600 | 0.0025 | 0.0125 | 0.105 | 0.0926 | 0.924 | 23.9 |
| | ER-PM-09M-Apr-14 | Elk River | Muscle | 80 | <0.00095 | 33.6 | 0.0274 | <0.17 | 1.05 | <0.0026 | 0.00151 | 2,140 | 0.0036 | 0.0132 | 0.123 | 0.0784 | 1.15 | 41.6 |
| | ER-PM-10M-Apr-14 | Elk River | Muscle | 78 | <0.00096 | 13.7 | 0.0171 | <0.17 | 0.425 | <0.0027 | 0.00135 | 1,110 | 0.0016 | 0.0079 | 0.0887 | 0.0917 | 0.773 | 20.3 |
| | ER-PM-11M-Apr-14 | Elk River | Muscle | 77 | <0.00091 | 8.89 | 0.0151 | <0.16 | 0.246 | <0.0025 | 0.00237 | 540 | 0.00155 | 0.00634 | 0.102 | 0.11 | 0.654 | 15.8 |
| | ER-PM-12M-Apr-14 | Elk River | Muscle | 80 | <0.00095 | 10.1 | 0.0164 | <0.17 | 0.474 | <0.0026 | 0.000633 | 599 | 0.0022 | 0.0074 | 0.0794 | 0.0553 | 0.685 | 18 |
| | ER-PM-13M-Apr-14 | Elk River | Muscle | 78 | <0.00096 | 11 | 0.0152 | <0.17 | 0.569 | <0.0026 | 0.00088 | 1,430 | 0.0022 | 0.0065 | 0.0798 | 0.0674 | 0.763 | 18.6 |
| | ER-PM-14M-Apr-14 | Elk River | Muscle | 77 | <0.00097 | 16.8 | 0.0175 | <0.17 | 0.345 | <0.0027 | 0.00159 | 549 | 0.0029 | 0.0081 | 0.0963 | 0.0631 | 0.696 | 24.5 |
| | ER-PM-01M-Aug-14 | Elk River | Muscle | 79 | <0.00083 | 1.18 | 0.02 | <0.088 | 0.818 | <0.0024 | 0.000869 | 2,890 | 0.00427 | 0.00413 | 0.0687 | 0.0559 | 0.55 | 8.45 |
| | ER-PM-02M-Aug-14 | Elk River | Muscle | 79 | <0.00080 | 2.72 | 0.0191 | <0.085 | 0.464 | <0.0024 | 0.000793 | 1,200 | 0.00386 | 0.00496 | 0.0846 | 0.0575 | 0.928 | 11.4 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | ER-PM-03M-Aug-14 | Elk River | Muscle | 78 | <0.00080 | 1.36 | 0.0194 | <0.086 | 0.63 | <0.0024 | 0.000756 | 2,090 | 0.00327 | 0.00607 | 0.0693 | 0.0548 | 0.653 | 7.48 |
| | ER-PM-04M-Aug-14 | Elk River | Muscle | 79 | <0.00080 | 4.99 | 0.0247 | <0.086 | 0.341 | <0.0024 | 0.0014 | 1,390 | 0.00182 | 0.00509 | 0.0829 | 0.102 | 0.72 | 12.6 |
| | ER-PM-05M-Aug-14 | Elk River | Muscle | 79 | <0.00082 | 1.64 | 0.0136 | <0.087 | 0.557 | <0.0024 | 0.00464 | 1,430 | 0.00634 | 0.00576 | 0.0696 | 0.0494 | 0.742 | 10.8 |
| | ER-PM-06M-Aug-14 | Elk River | Muscle | 78 | <0.00078 | 1.99 | 0.0230 | <0.083 | 0.202 | <0.0024 | 0.00189 | 501 | 0.00333 | 0.00488 | 0.0775 | 0.163 | 0.670 | 7.03 |
| | ER-PM-07M-Aug-14 | Elk River | Muscle | 78 | 0.00128 | 1.86 | 0.0218 | <0.087 | 1.57 | <0.0024 | 0.00213 | 4,440 | 0.00477 | 0.00815 | 0.0575 | 0.0665 | 0.713 | 8.3 |
| | ER-PM-08M-Aug-14 | Elk River | Muscle | 78 | 0.00088 | 1.93 | 0.0304 | <0.085 | 0.293 | <0.0023 | 0.00408 | 873 | 0.00296 | 0.00425 | 0.0653 | 0.0761 | 0.725 | 8.58 |
| | ER-PM-09M-Aug-14 | Elk River | Muscle | 78 | <0.00074 | 0.731 | 0.0117 | <0.079 | 0.755 | <0.0022 | 0.00231 | 2,880 | 0.0026 | 0.00454 | 0.0612 | 0.103 | 0.591 | 7.5 |
| | ER-PM-10M-Aug-14 | Elk River | Muscle | 79 | <0.00084 | 1.19 | 0.0096 | <0.090 | 0.245 | <0.0025 | 0.00277 | 651 | 0.00192 | 0.00629 | 0.0801 | 0.0544 | 0.629 | 8.83 |
| | ER-PM-06G-Feb-14 | Elk River | Ovary | 75 | 0.00366 | 5.04 | 0.0539 | <0.077 | 0.537 | <0.0037 | 0.00047 | 2,115 | 0.0120 | 0.0533 | 0.0849 | 0.0469 | 2.36 | 129 |
| | ER-PM-09G-Feb-14 | Elk River | Ovary | 83 | 0.00201 | 12.7 | 0.189 | 0.081 | 0.83 | <0.0039 | 0.00112 | 802 | 0.0175 | 0.048 | 0.128 | 0.108 | 3.14 | 150 |
| | ER-PM-12G-Feb-14 | Elk River | Ovary | 79 | 0.00698 | 1.63 | 0.094 | <0.079 | 0.497 | <0.0039 | 0.00265 | 1,500 | 0.0755 | 0.0585 | 0.0931 | 0.0403 | 4.14 | 147 |
| | ER-PM-07G-Apr-14 | Elk River | Ovary | 73 | 0.00439 | 44.7 | 0.0712 | 0.17 | 0.673 | <0.0038 | 0.00051 | 1,330 | 0.0118 | 0.0529 | 0.147 | 0.0559 | 2.71 | 138 |
| | ER-PM-11G-Apr-14 | Elk River | Ovary | 71 | 0.00433 | 12.1 | 0.101 | <0.079 | 0.256 | <0.0038 | 0.00037 | 1,190 | 0.0121 | 0.035 | 0.121 | 0.0712 | 2.23 | 90.3 |
| | ER-PM-14G-Apr-14 | Elk River | Ovary | 77 | 0.00415 | 12.6 | 0.0188 | <0.078 | 0.375 | <0.0038 | 0.00029 | 2,670 | 0.0164 | 0.0545 | 0.111 | 0.0605 | 3.53 | 185 |
| | GC-PM-23M-Feb-14 | Gold Creek | Muscle | 79 | <0.00096 | 2.2 | 0.054 | <0.17 | 0.232 | <0.0026 | 0.00208 | 577 | 0.0015 | 0.0054 | 0.078 | 0.0624 | 0.866 | 8.44 |
| | GC-PM-28M-Feb-14 | Gold Creek | Muscle | 78 | <0.00096 | 7.16 | 0.0134 | <0.17 | 0.541 | <0.0027 | 0.00336 | 573 | 0.0035 | 0.0064 | 0.0971 | 0.0676 | 0.699 | 12.2 |
| | GC-PM-29M-Feb-14 | Gold Creek | Muscle | 78 | <0.00087 | 1.2 | 0.0189 | <0.16 | 0.307 | <0.0024 | 0.00289 | 1,290 | <0.00093 | 0.00308 | 0.0692 | 0.0852 | 0.739 | 5.53 |
| | GC-PM-31M-Feb-14 | Gold Creek | Muscle | 79 | <0.00091 | 2.29 | 0.0181 | <0.16 | 0.966 | <0.0025 | 0.00224 | 4,420 | 0.00186 | 0.00542 | 0.0707 | 0.0961 | 0.725 | 10.8 |
| | GC-PM-01M-Apr-14 | Gold Creek | Muscle | 78 | <0.00097 | 6.18 | 0.0252 | <0.17 | 0.919 | <0.0027 | 0.00146 | 2,090 | 0.003 | 0.0085 | 0.0614 | 0.049 | 0.732 | 14.3 |
| | GC-PM-02M-Apr-14 | Gold Creek | Muscle | 78 | <0.00098 | 14.6 | 0.0256 | <0.18 | 0.664 | <0.0027 | 0.00236 | 653 | 0.0016 | 0.0094 | 0.0789 | 0.0664 | 0.666 | 19.5 |
| | GC-PM-03M-Apr-14 | Gold Creek | Muscle | 78 | <0.00097 | 2.64 | 0.0118 | 0.31 | 1.1 | <0.0027 | 0.00308 | 3,740 | <0.0010 | 0.0063 | 0.0648 | 0.0481 | 0.699 | 7.85 |
| | GC-PM-04M-Apr-14 | Gold Creek | Muscle | 79 | <0.00096 | 11.5 | 0.0417 | 0.38 | 0.434 | <0.0027 | 0.00121 | 534 | 0.0012 | 0.00825 | 0.0780 | 0.140 | 0.974 | 20.4 |
| | GC-PM-05M-Apr-14 | Gold Creek | Muscle | 78 | <0.00098 | 4.02 | 0.0182 | <0.17 | 1.52 | <0.0027 | 0.00135 | 4,840 | 0.0037 | 0.0088 | 0.0732 | 0.0573 | 0.623 | 11.2 |
| | GC-PM-06M-Apr-14 | Gold Creek | Muscle | 79 | <0.00084 | 6.19 | 0.0138 | 0.36 | 0.48 | <0.0023 | 0.0049 | 570 | 0.0016 | 0.00884 | 0.171 | 0.0537 | 0.781 | 16.1 |
| | GC-PM-07M-Apr-14 | Gold Creek | Muscle | 79 | <0.00097 | 3.32 | 0.03315 | <0.17 | 0.4155 | <0.0027 | 0.001007 | 539 | 0.00165 | 0.00705 | 0.07395 | 0.09445 | 0.815 | 18.35 |
| | GC-PM-08M-Apr-14 | Gold Creek | Muscle | 76 | <0.00096 | 41.4 | 0.0317 | <0.17 | 0.643 | <0.0026 | 0.00304 | 772 | 0.0026 | 0.0163 | 0.134 | 0.09 | 0.891 | 43.4 |
| | GC-PM-09M-Apr-14 | Gold Creek | Muscle | 78 | <0.00080 | 7.99 | 0.0206 | <0.14 | 1.75 | <0.0022 | 0.00262 | 5,550 | 0.00175 | 0.0073 | 0.0781 | 0.0537 | 0.727 | 17.1 |
| | GC-PM-10M-Apr-14 | Gold Creek | Muscle | 79 | <0.0010 | 3.21 | 0.0136 | <0.18 | 0.311 | <0.0028 | 0.00437 | 520 | <0.0011 | 0.0057 | 0.073 | 0.0669 | 0.619 | 13.3 |
| | GC-PM-11M-Apr-14 | Gold Creek | Muscle | 79 | <0.00097 | 27.8 | 0.0389 | <0.17 | 0.45 | <0.0027 | 0.00138 | 988 | 0.0019 | 0.0128 | 0.112 | 0.0673 | 0.633 | 31.5 |
| | GC-PM-12M-Apr-14 | Gold Creek | Muscle | 79 | <0.00098 | 4.66 | 0.0134 | <0.17 | 0.376 | <0.0027 | 0.000679 | 546 | 0.0017 | 0.0052 | 0.0825 | 0.0604 | 0.705 | 20.6 |
| | GC-PM-13M-Apr-14 | Gold Creek | Muscle | 78 | <0.00096 | 4.46 | 0.0173 | <0.17 | 0.398 | <0.0027 | 0.00286 | 859 | 0.0016 | 0.0071 | 0.087 | 0.0564 | 0.727 | 12.5 |
| | GC-PM-01M-Aug-14 | Gold Creek | Muscle | 78 | <0.00073 | 4.07 | 0.0138 | <0.078 | 0.377 | <0.0030 | 0.00233 | 817 | 0.00165 | 0.00506 | 0.0749 | 0.056 | 0.637 | 11.7 |
| | GC-PM-02M-Aug-14 | Gold Creek | Muscle | 81 | <0.00070 | 12.1 | 0.0308 | <0.075 | 1.34 | <0.0029 | 0.00238 | 3,870 | 0.00907 | 0.00834 | 0.103 | 0.0549 | 0.742 | 15.3 |
| | GC-PM-03M-Aug-14 | Gold Creek | Muscle | 78 | <0.00072 | 5.23 | 0.0377 | <0.077 | 0.798 | <0.0030 | 0.00249 | 1,485 | 0.0113 | 0.0067 | 0.0909 | 0.0731 | 0.898 | 11.0 |
| | GC-PM-04M-Aug-14 | Gold Creek | Muscle | 77 | <0.00071 | 3.02 | 0.0112 | <0.075 | 0.41 | <0.0029 | 0.00284 | 523 | 0.0071 | 0.00513 | 0.508 | 0.0479 | 0.805 | 11.3 |
| | GC-PM-05M-Aug-14 | Gold Creek | Muscle | 78 | <0.00068 | 4.55 | 0.0141 | <0.073 | 0.254 | <0.0029 | 0.00156 | 836 | 0.00684 | 0.00599 | 0.0941 | 0.151 | 0.914 | 11.7 |
| | GC-PM-06M-Aug-14 | Gold Creek | Muscle | 78 | <0.00069 | 3.67 | 0.0243 | <0.074 | 0.379 | <0.0029 | 0.000932 | 664 | 0.00235 | 0.0052 | 0.0899 | 0.117 | 0.971 | 11.4 |
| | GC-PM-07M-Aug-14 | Gold Creek | Muscle | 78 | <0.00075 | 1.34 | 0.0186 | <0.080 | 0.528 | <0.0031 | 0.00224 | 1,110 | 0.00322 | 0.00477 | 0.0675 | 0.106 | 0.865 | 8.39 |
| | GC-PM-08M-Aug-14 | Gold Creek | Muscle | 78 | <0.00068 | 2.27 | 0.0204 | <0.073 | 0.33 | <0.0028 | 0.00256 | 1,200 | 0.00343 | 0.0036 | 0.075 | 0.0391 | 0.701 | 7.62 |
| | GC-PM-09M-Aug-14 | Gold Creek | Muscle | 79 | <0.00076 | 4.13 | 0.0207 | <0.12 | 0.48 | <0.0037 | 0.00369 | 617 | 0.00199 | 0.005 | 0.092 | 0.0964 | 1.06 | 16.1 |
| | GC-PM-10M-Aug-14 | Gold Creek | Muscle | 77 | <0.00073 | 0.993 | 0.0263 | <0.11 | 0.416 | <0.0036 | 0.00617 | 603 | 0.00188 | 0.00531 | 0.0721 | 0.0903 | 0.803 | 7.92 |
| | GC-PM-23G-Feb-14 | Gold Creek | Ovary | 70 | 0.00199 | 7.97 | 0.154 | <0.078 | 0.334 | <0.0038 | 0.00061 | 856 | 0.0092 | 0.0309 | 0.101 | 0.0376 | 1.93 | 87.5 |
| | GC-PM-28G-Feb-14 | Gold Creek | Ovary | 83 | 0.00365 | 13.7 | 0.12 | <0.077 | 3.64 | <0.0037 | 0.00119 | 455 | 0.0089 | 0.0557 | 0.106 | 0.0724 | 4.68 | 134 |
| | GC-PM-29G-Feb-14 | Gold Creek | Ovary | 74 | 0.00158 | 8.99 | 0.292 | <0.079 | 0.244 | <0.0039 | 0.00065 | 483 | 0.0076 | 0.0337 | 0.107 | 0.0448 | 2.52 | 90.2 |
| | GC-PM-31G-Feb-14 | Gold Creek | Ovary | 78 | 0.0152 | 4.8 | 0.117 | <0.080 | 0.462 | <0.0039 | 0.00246 | 1,190 | 0.0957 | 0.0613 | 0.116 | 0.0707 | 9.28 | 193 |
| | GC-PM-10G-Apr-14 | Gold Creek | Ovary | 71 | 0.00419 | 16.8 | 0.0712 | <0.080 | 0.439 | <0.0039 | 0.00067 | 1,020 | 0.0044 | 0.0517 | 0.137 | 0.0368 | 2.51 | 132 |

**Table G.7:** **Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | SC-NSC-13-Apr-15 | Sand Creek | Muscle | 79 | <0.00051 | 0.959 | 0.0085 | <0.083 | 0.271 | <0.0027 | 0.00289 | 2,600 | <0.0016 | 0.00438 | 0.0529 | 0.1600 | 0.700 | 8.4 |
| | SC-NSC-23-Apr-15 | Sand Creek | Muscle | 78 | <0.00047 | 0.401 | 0.0503 | <0.076 | 0.294 | <0.0024 | 0.00226 | 1,500 | <0.0014 | 0.00335 | 0.0534 | 0.1140 | 0.660 | 6.2 |
| | SC-NSC-28-Apr-15 | Sand Creek | Muscle | 78 | <0.00045 | 0.470 | 0.0181 | <0.072 | 0.328 | <0.0023 | 0.00065 | 1,550 | <0.0014 | 0.00348 | 0.0572 | 0.3290 | 0.688 | 6.5 |
| | SC-NSC-33-Apr-15 | Sand Creek | Muscle | 79 | <0.00047 | 1.030 | 0.0256 | <0.077 | 0.177 | <0.0024 | 0.00137 | 506 | <0.0014 | 0.00385 | 0.0752 | 0.1170 | 0.946 | 12.0 |
| | SC-NSC-36-Apr-15 | Sand Creek | Muscle | 78 | <0.00041 | 1.070 | 0.0119 | 0.091 | 0.492 | <0.0021 | 0.00118 | 2,120 | 0.0015 | 0.00330 | 0.1340 | 0.1500 | 0.675 | 7.1 |
| | SC-NSC-37-Apr-15 | Sand Creek | Muscle | 79 | <0.00048 | 0.562 | 0.0656 | 0.441 | 0.397 | <0.0024 | 0.00140 | 527 | 0.0016 | 0.00886 | 0.0763 | 0.1380 | 1.550 | 17.0 |
| | SC-NSC-39-Apr-15 | Sand Creek | Muscle | 79 | <0.00047 | 0.800 | 0.0153 | 0.081 | 0.357 | <0.0024 | 0.00109 | 1,460 | <0.0014 | 0.00317 | 0.0602 | 0.1500 | 0.674 | 6.4 |
| | SC-NSC-44-Apr-15 | Sand Creek | Muscle | 78 | <0.00047 | 3.230 | 0.0317 | <0.076 | 1.030 | <0.0024 | 0.00139 | 3,940 | 0.0019 | 0.00786 | 0.0679 | 0.1810 | 1.320 | 17.7 |
| | SC-NSC-46-Apr-15 | Sand Creek | Muscle | 80 | <0.00048 | 2.900 | 0.0106 | <0.078 | 0.209 | <0.0025 | 0.00263 | 764 | 0.0054 | 0.00605 | 0.0638 | 0.1515 | 0.866 | 10.6 |
| | SC-NSC-47-Apr-15 | Sand Creek | Muscle | 79 | <0.00048 | 0.349 | 0.0197 | <0.077 | 1.250 | <0.0024 | 0.00215 | 3,350 | 0.0046 | 0.00482 | 0.0593 | 0.1210 | 0.675 | 10.2 |
| | SC-NSC-01-Aug-15 | Sand Creek | Muscle | 77 | 0.00115 | 3.23 | 0.103 | <0.24 | 1.75 | <0.0026 | 0.00143 | 311 | 0.00630 | 0.0204 | 0.158 | 0.0880 | 3.81 | 54.2 |
| | SC-NSC-02-Aug-15 | Sand Creek | Muscle | 78 | <0.00025 | 1.22 | 0.0150 | <0.24 | 0.851 | <0.0026 | 0.000689 | 1,740 | 0.00510 | 0.00460 | 0.0659 | 0.0756 | 0.763 | 10.5 |
| | SC-NSC-03-Aug-15 | Sand Creek | Muscle | 78 | 0.000310 | 1.60 | 0.0560 | <0.23 | 0.551 | <0.0025 | 0.00137 | 807 | 0.00260 | 0.00512 | 0.0935 | 0.0473 | 0.844 | 9.78 |
| | SC-NSC-04-Aug-15 | Sand Creek | Muscle | 79 | 0.000260 | 1.46 | 0.0860 | <0.24 | 0.803 | <0.0026 | 0.00138 | 784 | 0.00370 | 0.00762 | 0.0772 | 0.0969 | 1.01 | 16.4 |
| | SC-NSC-05-Aug-15 | Sand Creek | Muscle | 80 | 0.000420 | 1.59 | 0.0362 | <0.21 | 0.789 | <0.0023 | 0.00204 | 1,020 | 0.00440 | 0.00679 | 0.0639 | 0.108 | 0.671 | 14.6 |
| | SC-NSC-06-Aug-15 | Sand Creek | Muscle | 79 | 0.000405 | 1.33 | 0.0350 | <0.24 | 0.767 | <0.0026 | 0.00105 | 581 | 0.00290 | 0.00619 | 0.0722 | 0.147 | 0.994 | 17.4 |
| | SC-NSC-07-Aug-15 | Sand Creek | Muscle | 78 | <0.00025 | 2.70 | 0.0130 | <0.25 | 0.308 | <0.0027 | 0.00204 | 671 | 0.00400 | 0.00533 | 0.0904 | 0.105 | 0.612 | 52.8 |
| | SC-NSC-08-Aug-15 | Sand Creek | Muscle | 79 | 0.000390 | 2.78 | 0.0330 | <0.25 | 0.284 | <0.0027 | 0.00222 | 910 | 0.00420 | 0.00472 | 0.0747 | 0.118 | 0.748 | 13.9 |
| | SC-NSC-09-Aug-15 | Sand Creek | Muscle | 79 | 0.000300 | 1.44 | 0.0300 | <0.24 | 0.971 | <0.0026 | 0.00142 | 587 | <0.0023 | 0.00680 | 0.0713 | 0.0877 | 1.07 | 14.5 |
| | SC-NSC-10-Aug-15 | Sand Creek | Muscle | 78 | 0.000510 | 4.74 | 0.0860 | <0.23 | 0.426 | <0.0025 | 0.00158 | 1,150 | 0.00510 | 0.00556 | 0.140 | 0.112 | 0.785 | 18.6 |
| | SC-NSC-11-Aug-15 | Sand Creek | Muscle | 78 | 0.000320 | 1.10 | 0.0401 | <0.21 | 0.149 | <0.0023 | 0.000799 | 681 | 0.00200 | 0.00336 | 0.0693 | 0.520 | 0.771 | 25.1 |
| | SC-NSC-13-Apr-15 | Sand Creek | Ovary | 69 | 0.00448 | 1.14 | 0.202 | <0.14 | 0.104 | <0.0025 | 0.000610 | 992 | 0.00430 | 0.0269 | 0.0901 | 0.0872 | 2.10 | 68.6 |
| | SC-NSC-33-Apr-15 | Sand Creek | Ovary | 75 | 0.00296 | 1.19 | 0.0971 | <0.14 | 0.111 | <0.0025 | 0.000430 | 921 | 0.00440 | 0.0388 | 0.0816 | 0.0795 | 2.97 | 96.3 |
| | SC-NSC-36-Apr-15 | Sand Creek | Ovary | 64 | 0.00128 | 6.03 | 0.425 | 0.22 | 0.393 | <0.0025 | 0.00208 | 435 | 0.00610 | 0.0229 | 0.0873 | 0.0603 | 1.71 | 90.2 |
| | SC-NSC-37-Apr-15 | Sand Creek | Ovary | 74 | 0.00323 | 1.16 | 0.148 | 0.30 | 0.255 | <0.0025 | 0.000490 | 1,140 | 0.00730 | 0.0402 | 0.0680 | 0.101 | 2.64 | 107 |
| | SC-NSC-39-Apr-15 | Sand Creek | Ovary | 72 | 0.00353 | 1.17 | 0.169 | <0.14 | 0.0637 | <0.0026 | 0.000290 | 913 | 0.0119 | 0.0423 | 0.0840 | 0.0914 | 2.06 | 81.8 |
| | SC-NSC-44-Apr-15 | Sand Creek | Ovary | 73 | 0.00337 | 3.30 | 0.124 | <0.12 | 0.132 | <0.0023 | 0.00107 | 1,180 | 0.0155 | 0.0391 | 0.102 | 0.115 | 2.79 | 197 |
| | SC-NSC-46-Apr-15 | Sand Creek | Ovary | 76 | 0.00660 | 2.03 | 0.0332 | <0.14 | 0.0963 | <0.0026 | 0.000825 | 1,345 | 0.00885 | 0.0413 | 0.0638 | 0.0835 | 2.48 | 102 |
| | SC-NSC-47-Apr-15 | Sand Creek | Ovary | 72 | 0.00353 | 5.01 | 0.0902 | <0.14 | 0.201 | <0.0026 | 0.000430 | 666 | 0.0246 | 0.0427 | 0.0911 | 0.0833 | 2.88 | 127 |
| | ER-NSC-06-Apr-15 | Elk River | Muscle | 80 | 0.00077 | 7.040 | 0.0153 | <0.14 | 0.975 | <0.0026 | 0.00362 | 3,500 | 0.0032 | 0.00770 | 0.0737 | 0.1040 | 0.728 | 17.2 |
| | ER-NSC-08-Apr-15 | Elk River | Muscle | 79 | <0.00039 | 1.600 | 0.0326 | <0.15 | 0.371 | <0.0027 | 0.00160 | 617 | 0.0019 | 0.00486 | 0.0588 | 0.0875 | 0.757 | 9.5 |
| | ER-NSC-13-Apr-15 | Elk River | Muscle | 79 | <0.00035 | 0.829 | 0.0405 | <0.13 | 0.548 | <0.00245 | 0.00208 | 2,760 | <0.00165 | 0.00239 | 0.0540 | 0.0958 | 0.536 | 6.7 |
| | ER-NSC-14-Apr-15 | Elk River | Muscle | 80 | <0.00038 | 2.620 | 0.0324 | 0.160 | 0.350 | <0.0026 | 0.00138 | 1,400 | 0.0027 | 0.00524 | 0.0530 | 0.1440 | 0.703 | 13.5 |
| | ER-NSC-17-Apr-15 | Elk River | Muscle | 80 | <0.00037 | 4.950 | 0.0630 | <0.14 | 0.400 | <0.0026 | 0.00164 | 1,200 | 0.0028 | 0.00540 | 0.0662 | 0.0936 | 0.631 | 13.5 |
| | ER-NSC-19-Apr-15 | Elk River | Muscle | 80 | 0.00114 | 2.070 | 0.0366 | <0.14 | 0.386 | <0.0026 | 0.00145 | 906 | 0.0028 | 0.00511 | 0.0636 | 0.1070 | 0.629 | 8.0 |
| | ER-NSC-25-Apr-15 | Elk River | Muscle | 80 | <0.00036 | 0.700 | 0.0128 | <0.14 | 0.197 | <0.0025 | 0.00227 | 974 | 0.0021 | 0.00466 | 0.0607 | 0.1060 | 0.643 | 8.7 |
| | ER-NSC-29-Apr-15 | Elk River | Muscle | 80 | <0.00039 | 0.453 | 0.0239 | <0.15 | 0.295 | <0.0027 | 0.00176 | 1,040 | 0.0026 | 0.00383 | 0.0605 | 0.0702 | 0.558 | 9.5 |
| | ER-NSC-43-Apr-15 | Elk River | Muscle | 79 | <0.00037 | 3.690 | 0.0362 | <0.14 | 0.818 | <0.0026 | 0.00184 | 588 | 0.0112 | 0.00799 | 0.0672 | 0.0650 | 1.170 | 16.6 |
| | ER-NSC-01-Aug-15 | Elk River | Muscle | 79 | 0.000510 | 2.86 | 0.0187 | 0.20 | 0.374 | <0.0023 | 0.00210 | 1,380 | 0.00760 | 0.00583 | 0.0911 | 0.123 | 0.707 | 13.5 |
| | ER-NSC-02-Aug-15 | Elk River | Muscle | 78 | <0.00044 | 1.20 | 0.0923 | 0.18 | 0.509 | <0.0022 | 0.00125 | 467 | 0.00280 | 0.00873 | 0.0866 | 0.298 | 1.99 | 25.7 |
| | ER-NSC-03-Aug-15 | Elk River | Muscle | 80 | 0.00173 | 29.9 | 0.0301 | 0.29 | 0.862 | <0.0025 | 0.00283 | 1,191 | 0.0168 | 0.0112 | 0.0913 | 0.141 | 1.32 | 33.8 |
| | ER-NSC-04-Aug-15 | Elk River | Muscle | 79 | <0.00022 | 0.937 | 0.0344 | <0.22 | 0.925 | <0.0024 | 0.00156 | 2,000 | 0.00290 | 0.00502 | 0.0569 | 0.131 | 0.799 | 11.7 |
| | ER-NSC-05-Aug-15 | Elk River | Muscle | 80 | 0.000370 | 1.95 | 0.176 | <0.24 | 0.346 | <0.0026 | 0.000669 | 874 | 0.00430 | 0.00467 | 0.0663 | 0.105 | 1.24 | 14.2 |
| | ER-NSC-06-Aug-15 | Elk River | Muscle | 78 | <0.00025 | 0.786 | 0.0200 | <0.24 | 0.859 | <0.0027 | 0.000754 | 4,120 | 0.00340 | 0.00474 | 0.0609 | 0.0598 | 0.819 | 9.14 |
| | ER-NSC-07-Aug-15 | Elk River | Muscle | 80 | <0.00022 | 0.869 | 0.319 | <0.22 | 0.630 | <0.0024 | 0.00102 | 1,470 | 0.00600 | 0.00404 | 0.0630 | 0.0926 | 0.719 | 12.1 |
| | ER-NSC-08-Aug-15 | Elk River | Muscle | 79 | 0.000310 | 2.45 | 0.714 | <0.24 | 1.55 | <0.0027 | 0.00119 | 1,890 | 0.00920 | 0.00791 | 0.0689 | 0.0929 | 0.996 | 18.2 |
| | ER-NSC-09-Aug-15 | Elk River | Muscle | 80 | 0.000280 | 1.14 | 0.137 | 0.40 | 1.52 | <0.0025 | 0.00125 | 1,190 | 0.00980 | 0.0117 | 0.0739 | 0.0505 | 1.81 | 25.7 |
| | ER-NSC-10-Aug-15 | Elk River | Muscle | 81 | <0.00025 | 2.39 | 0.0740 | <0.25 | 1.77 | <0.0027 | 0.000955 | 749 | 0.00760 | 0.00988 | 0.0819 | 0.107 | 1.43 | 24.0 |
| | ER-NSC-05-Apr-15 | Elk River | Ovary | 46 | 0.00233 | 3.72 | 0.436 | 0.13 | 0.126 | <0.0021 | 0.000190 | 145 | 0.00400 | 0.0145 | 0.116 | 0.0330 | 0.929 | 37.0 |
| | ER-NSC-13-Apr-15 | Elk River | Ovary | 73 | 0.00935 | 5.00 | 0.102 | 0.15 | 0.199 | <0.0024 | 0.000440 | 994 | 0.00520 | 0.0234 | 0.0835 | 0.0693 | 2.34 | 97.1 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-NSC-25-Apr-15 | Elk River | Ovary | 77 | 0.00395 | 3.01 | 0.0490 | <0.12 | 0.276 | <0.0023 | 0.000620 | 1,330 | 0.0183 | 0.0589 | 0.0666 | 0.0737 | 3.62 | 98.8 |
|  | ER-NSC-43-Apr-15 | Elk River | Ovary | 76 | 0.00572 | 6.91 | 0.0852 | 0.15 | 0.565 | <0.0023 | 0.000870 | 963 | 0.0449 | 0.0511 | 0.0873 | 0.0535 | 3.20 | 123 |
|  | GC-NSC-02-Apr-15 | Gold Creek | Muscle | 79 | <0.00046 | 5.275 | 0.0164 | 0.081 | 0.580 | <0.0024 | 0.00187 | 2,185 | <0.0014 | 0.00558 | 0.1002 | 0.0685 | 0.588 | 9.7 |
|  | GC-NSC-04-Apr-15 | Gold Creek | Muscle | 78 | <0.00044 | 0.665 | 0.0222 | 0.122 | 0.776 | <0.0023 | 0.00164 | 2,340 | 0.0019 | 0.00440 | 0.0565 | 0.0616 | 0.703 | 10.1 |
|  | GC-NSC-10-Apr-15 | Gold Creek | Muscle | 81 | 0.00051 | 0.586 | 0.0137 | <0.077 | 0.638 | <0.0024 | 0.00217 | 1,580 | 0.0028 | 0.00507 | 0.0560 | 0.0607 | 0.605 | 8.7 |
|  | GC-NSC-13-Apr-15 | Gold Creek | Muscle | 78 | <0.00042 | 1.200 | 0.0421 | <0.068 | 1.760 | <0.0022 | 0.00143 | 602 | 0.0040 | 0.01360 | 0.0577 | 0.0384 | 1.820 | 24.7 |
|  | GC-NSC-20-Apr-15 | Gold Creek | Muscle | 80 | 0.00432 | 0.277 | 0.0256 | <0.10 | 0.770 | <0.0025 | 0.00143 | 2,100 | 0.0027 | 0.00866 | 0.0474 | 0.0888 | 1.340 | 17.2 |
|  | GC-NSC-31-Apr-15 | Gold Creek | Muscle | 79 | 0.00373 | 0.312 | 0.0307 | <0.11 | 0.597 | <0.0027 | 0.00229 | 1,750 | 0.0014 | 0.00383 | 0.0475 | 0.0764 | 0.617 | 7.6 |
|  | GC-NSC-33-Apr-15 | Gold Creek | Muscle | 79 | 0.00266 | 0.757 | 0.0121 | <0.10 | 0.086 | <0.0026 | 0.00282 | 560 | <0.0011 | 0.00358 | 0.0538 | 0.0924 | 0.638 | 6.2 |
|  | GC-NSC-34-Apr-15 | Gold Creek | Muscle | 79 | 0.00235 | 1.270 | 0.0693 | <0.096 | 0.334 | <0.0024 | 0.00092 | 587 | 0.0014 | 0.00490 | 0.0573 | 0.0840 | 0.939 | 11.9 |
|  | GC-NSC-37-Apr-15 | Gold Creek | Muscle | 79 | 0.00174 | 0.533 | 0.0223 | <0.11 | 0.474 | <0.0026 | 0.00208 | 1,580 | 0.0019 | 0.00351 | 0.0559 | 0.0623 | 0.584 | 6.4 |
|  | GC-NSC-49-Apr-15 | Gold Creek | Muscle | 75 | 0.00110 | 1.100 | 0.0860 | <0.096 | 0.171 | <0.0024 | 0.00053 | 566 | <0.0011 | 0.00434 | 0.0681 | 0.1100 | 1.350 | 11.8 |
|  | GC-NSC-01-Aug-15 | Gold Creek | Muscle | 82 | <0.00024 | 0.588 | 0.0130 | <0.24 | 0.960 | <0.0026 | 0.00325 | 818 | <0.0022 | 0.00392 | 0.0652 | 0.0691 | 0.653 | 11.1 |
|  | GC-NSC-02-Aug-15 | Gold Creek | Muscle | 79 | <0.00023 | 0.552 | 0.0273 | <0.22 | 0.304 | <0.0024 | 0.00455 | 535 | 0.00220 | 0.00580 | 0.0595 | 0.0802 | 0.863 | 16.5 |
|  | GC-NSC-03-Aug-15 | Gold Creek | Muscle | 80 | 0.000270 | 1.06 | 0.0850 | <0.24 | 0.847 | <0.0026 | 0.00274 | 1,020 | 0.00440 | 0.00955 | 0.0613 | 0.0772 | 1.12 | 17.2 |
|  | GC-NSC-04-Aug-15 | Gold Creek | Muscle | 80 | 0.000270 | 2.51 | 0.0460 | <0.24 | 1.58 | <0.0026 | 0.00137 | 2,370 | 0.00430 | 0.00576 | 0.0585 | 0.0663 | 0.803 | 16.2 |
|  | GC-NSC-05-Aug-15 | Gold Creek | Muscle | 80 | <0.00025 | 3.91 | 0.100 | <0.25 | 3.31 | <0.0027 | 0.00187 | 2,840 | 0.00550 | 0.0155 | 0.0769 | 0.0348 | 0.950 | 21.4 |
|  | GC-NSC-06-Aug-15 | Gold Creek | Muscle | 79 | <0.00025 | 1.30 | 0.0510 | <0.24 | 0.946 | <0.0026 | 0.00144 | 3,360 | <0.0023 | 0.00421 | 0.0599 | 0.0933 | 0.541 | 11.4 |
|  | GC-NSC-07-Aug-15 | Gold Creek | Muscle | 79 | <0.00023 | 1.60 | 0.0365 | <0.23 | 0.845 | <0.0025 | 0.00164 | 1,400 | <0.0022 | 0.00699 | 0.0647 | 0.0384 | 1.24 | 14.8 |
|  | GC-NSC-08-Aug-15 | Gold Creek | Muscle | 80 | <0.00022 | 0.621 | 0.0361 | <0.22 | 1.07 | <0.0024 | 0.00149 | 1,910 | 0.00240 | 0.00851 | 0.0608 | 0.0680 | 0.842 | 12.6 |
|  | GC-NSC-09-Aug-15 | Gold Creek | Muscle | 79 | <0.00024 | 3.55 | 0.127 | <0.24 | 1.02 | <0.0026 | 0.00146 | 1,350 | 0.00480 | 0.00795 | 0.0734 | 0.0482 | 0.901 | 16.6 |
|  | GC-NSC-10-Aug-15 | Gold Creek | Muscle | 79 | <0.00024 | 1.51 | 0.0150 | <0.24 | 0.326 | <0.0026 | 0.00422 | 591 | <0.0022 | 0.00638 | 0.0657 | 0.0891 | 0.919 | 14.7 |
|  | GC-NSC-13-Apr-15 | Gold Creek | Ovary | 74 | 0.00278 | 2.32 | 0.0527 | <0.11 | 0.766 | <0.0025 | 0.000510 | 1,420 | 0.0131 | 0.0522 | 0.0700 | 0.0301 | 2.85 | 101 |
|  | GC-NSC-31-Apr-15 | Gold Creek | Ovary | 66 | 0.00118 | 3.31 | 0.333 | 0.11 | 0.669 | <0.0024 | 0.000330 | 692 | 0.00500 | 0.0276 | 0.0966 | 0.0430 | 1.83 | 77.7 |
|  | GC-NSC-33-Apr-15 | Gold Creek | Ovary | 67 | 0.00121 | 10.9 | 0.340 | 0.17 | 0.489 | <0.0025 | 0.000800 | 403 | 0.00780 | 0.0362 | 0.117 | 0.0468 | 2.09 | 82.6 |
|  | GC-NSC-34-Apr-15 | Gold Creek | Ovary | 70 | 0.000870 | 8.85 | 0.268 | 0.25 | 1.05 | <0.0025 | 0.000960 | 228 | 0.0197 | 0.0226 | 0.102 | 0.0524 | 1.96 | 98.8 |
|  | GC-NSC-49-Apr-15 | Gold Creek | Ovary | 72 | 0.00321 | 1.52 | 0.0908 | <0.12 | 0.0603 | <0.0026 | 0.000165 | 1,150 | 0.00210 | 0.0412 | 0.0680 | 0.0728 | 3.00 | 92.6 |
| 2016 | SC-NSC-03 O-Apr-16 | Sand Creek | Ovary | 71 | 0.00369 | 0.886 | 0.214 | 0.21 | 0.0514 | <0.0025 | 0.000219 | 910 | 0.0045 | 0.0401 | 0.0941 | 0.082 | 2.77 | 118 |
|  | SC-NSC-09 O-Apr-16 | Sand Creek | Ovary | 68 | 0.004675 | 6.27 | 0.1445 | 0.1125 | 0.2305 | 0.0035 | 0.000479 | 862 | 0.02265 | 0.03505 | 0.10055 | 0.06925 | 2.315 | 208.5 |
|  | SC-NSC-21 O-Apr-16 | Sand Creek | Ovary | 60 | 0.00202 | 3.63 | 0.194 | 0.111 | 0.0842 | <0.0035 | 0.000988 | 490 | 0.003 | 0.0269 | 0.109 | 0.0519 | 2.27 | 59.1 |
|  | SC-NSC-25 O-Apr-16 | Sand Creek | Ovary | 68 | 0.0019 | 1.33 | 0.0681 | 0.277 | 0.0905 | <0.0035 | 0.000269 | 657 | 0.0015 | 0.0403 | 0.125 | 0.155 | 3 | 101 |
|  | SC-NSC-29 O-Apr-16 | Sand Creek | Ovary | 66 | 0.00377 | 11.6 | 0.257 | 0.321 | 0.241 | <0.0035 | 0.000683 | 642 | 0.0099 | 0.0491 | 0.103 | 0.073 | 2.62 | 83.7 |
|  | SC-NSC-32 O-Apr-16 | Sand Creek | Ovary | 72 | 0.00574 | 0.926 | 0.0787 | 0.106 | 0.0674 | <0.0033 | 0.000132 | 911 | 0.0016 | 0.0405 | 0.0712 | 0.0837 | 2.86 | 105 |
|  | SC-NSC-33 O-Apr-16 | Sand Creek | Ovary | 69 | 0.00539 | 1.07 | 0.0558 | <0.083 | 0.0707 | <0.0033 | 0.000102 | 564 | 0.0021 | 0.0296 | 0.0687 | 0.0866 | 3.61 | 73.7 |
|  | SC-NSC-34 O-Apr-16 | Sand Creek | Ovary | 72 | 0.00258 | 9.51 | 0.15 | 0.107 | 0.0896 | <0.0035 | 0.000283 | 1,470 | 0.002 | 0.0508 | 0.0776 | 0.0896 | 2.77 | 113 |
|  | SC-NSC-35 O-Apr-16 | Sand Creek | Ovary | 73 | 0.00507 | 3.89 | 0.0906 | 0.103 | 0.0671 | <0.0035 | 0.000158 | 1,120 | 0.0021 | 0.0494 | 0.0676 | 0.0971 | 3.1 | 120 |
|  | SC-NSC-36 O-Apr-16 | Sand Creek | Ovary | 67 | 0.00251 | 7.52 | 0.252 | 0.093 | 0.143 | <0.0032 | 0.000463 | 780 | 0.002 | 0.0327 | 0.111 | 0.0693 | 2.09 | 80.6 |
|  | SC-NSC-03 M-Apr-16 | Sand Creek | Muscle | 78 | <0.0007 | 0.956 | 0.0145 | 0.17 | 0.0864 | <0.0027 | 0.00109 | 532 | <0.0014 | 0.00316 | 0.0789 | 0.149 | 0.675 | 7.2 |
|  | SC-NSC-09 M-Apr-16 | Sand Creek | Muscle | 79 | <0.00069 | 0.676 | 0.0318 | <0.15 | 1.2 | <0.0027 | 0.00205 | 3,620 | <0.0014 | 0.0049 | 0.0615 | 0.131 | 0.899 | 12.6 |
|  | SC-NSC-21 M-Apr-16 | Sand Creek | Muscle | 78 | <0.00071 | 0.376 | 0.0234 | 0.21 | 0.209 | <0.0027 | 0.00179 | 1,120 | <0.0014 | 0.00432 | 0.059 | 0.149 | 0.766 | 6.98 |
|  | SC-NSC-25 M-Apr-16 | Sand Creek | Muscle | 79 | 0.000655 | 0.2 | 0.0164 | 0.195 | 0.3095 | 0.00255 | 0.00121 | 1,860 | 0.00135 | 0.00603 | 0.05665 | 0.3985 | 1.135 | 15.2 |
|  | SC-NSC-29 M-Apr-16 | Sand Creek | Muscle | 79 | <0.00072 | 0.624 | 0.0149 | 0.34 | 0.291 | <0.0028 | 0.00131 | 2,110 | <0.0015 | 0.00543 | 0.0675 | 0.187 | 0.871 | 8.4 |
|  | SC-NSC-32 M-Apr-16 | Sand Creek | Muscle | 78 | <0.00071 | 1.03 | 0.0291 | 0.24 | 0.109 | <0.0028 | 0.000546 | 611 | <0.0014 | 0.00218 | 0.068 | 0.15 | 0.57 | 6.44 |
|  | SC-NSC-33 M-Apr-16 | Sand Creek | Muscle | 78 | <0.00063 | 7.23 | 0.064 | 0.42 | 0.0823 | <0.0024 | 0.000753 | 466 | <0.0013 | 0.00589 | 0.0687 | 0.189 | 0.645 | 11.4 |
|  | SC-NSC-34 M-Apr-16 | Sand Creek | Muscle | 78 | 0.000715 | 6.84 | 0.0359 | 0.155 | 0.2105 | 0.0028 | 0.0009035 | 1,485 | 0.0014 | 0.003385 | 0.08835 | 0.17 | 0.734 | 9.12 |
|  | SC-NSC-35 M-Apr-16 | Sand Creek | Muscle | 79 | <0.00072 | 2.66 | 0.022 | <0.16 | 0.0867 | <0.0028 | 0.000596 | 662 | <0.0014 | 0.00308 | 0.0651 | 0.167 | 0.603 | 7.43 |
|  | SC-NSC-36 M-Apr-16 | Sand Creek | Muscle | 78 | <0.00062 | 2.11 | 0.0226 | <0.14 | 0.95 | <0.0024 | 0.000642 | 6,090 | <0.0012 | 0.00348 | 0.0672 | 0.155 | 0.664 | 9.25 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-NSC-09 M-Apr-16 | Elk River | Muscle | 72 | <0.00071 | 3.77 | 0.258 | 0.205 | 0.322 | <0.0025 | 0.000861 | 304 | 0.0012 | 0.0072 | 0.0832 | 0.0919 | 1.25 | 14.8 |
| | ER-NSC-15 M-Apr-16 | Elk River | Muscle | 75 | <0.00074 | 1.62 | 0.112 | 0.29 | 0.0723 | <0.0026 | 0.00043 | 559 | <0.0011 | 0.0029 | 0.0709 | 0.131 | 0.745 | 9.4 |
| | ER-NSC-16 M-Apr-16 | Elk River | Muscle | 79 | <0.00074 | 2.81 | 0.0478 | 0.114 | 0.143 | <0.0026 | 0.000365 | 524 | <0.0012 | 0.0027 | 0.0761 | 0.128 | 0.788 | 9.32 |
| | ER-NSC-17 M-Apr-16 | Elk River | Muscle | 79 | <0.00074 | 0.742 | 0.0216 | <0.064 | 0.328 | <0.0026 | 0.000427 | 1,420 | 0.0014 | 0.0029 | 0.0666 | 0.158 | 0.721 | 7.12 |
| | ER-NSC-19 M-Apr-16 | Elk River | Muscle | 79 | <0.00071 | 0.601 | 0.0197 | <0.062 | 0.791 | <0.0025 | 0.000875 | 3,870 | <0.0011 | 0.0039 | 0.065 | 0.133 | 0.605 | 5.82 |
| | ER-NSC-21 M-Apr-16 | Elk River | Muscle | 78 | <0.00074 | 6.43 | 0.0172 | 0.08 | 0.823 | <0.0026 | 0.000961 | 1,420 | 0.002 | 0.0047 | 0.0965 | 0.0648 | 0.729 | 9.94 |
| | ER-NSC-27 M-Apr-16 | Elk River | Muscle | 72 | <0.0007 | 0.694 | 0.15 | 0.075 | 0.126 | <0.0025 | 0.000519 | 312 | 0.0011 | 0.0051 | 0.0719 | 0.153 | 1.23 | 11.4 |
| | ER-NSC-28 M-Apr-16 | Elk River | Muscle | 75 | 0.00074 | 0.75 | 0.06815 | 0.2225 | 0.3065 | 0.00265 | 0.000418 | 1,560 | 0.00125 | 0.00305 | 0.0822 | 0.1385 | 0.744 | 6.395 |
| | ER-NSC-29 M-Apr-16 | Elk River | Muscle | 78 | <0.00073 | 1.07 | 0.0584 | 0.283 | 0.0608 | <0.0026 | 0.00134 | 494 | <0.0011 | 0.0039 | 0.115 | 0.17 | 0.675 | 9.14 |
| | ER-NSC-38 M-Apr-16 | Elk River | Muscle | 74 | <0.00068 | 0.478 | 0.323 | 0.097 | 0.0982 | <0.0024 | 0.000214 | 182 | 0.0012 | 0.0094 | 0.0874 | 0.0741 | 2.58 | 30.1 |
| | ER-NSC-09 O-Apr-16 | Elk River | Ovary | 75 | 0.00813 | 5.92 | 0.0831 | 0.35 | 0.0913 | <0.0026 | 0.00034 | 1,110 | 0.005 | 0.0437 | 0.0801 | 0.0816 | 2.87 | 108 |
| | ER-NSC-15 O-Apr-16 | Elk River | Ovary | 70 | 0.00705 | 0.755 | 0.0682 | <0.16 | 0.168 | <0.0025 | <0.000095 | 758 | 0.0023 | 0.033 | 0.064 | 0.0658 | 3.36 | 57.8 |
| | ER-NSC-16 O-Apr-16 | Elk River | Ovary | 75 | 0.00334 | 1.61 | 0.0796 | <0.17 | 0.0506 | <0.0026 | <0.000097 | 1,290 | 0.0027 | 0.0484 | 0.0626 | 0.0796 | 2.96 | 130 |
| | ER-NSC-17 O-Apr-16 | Elk River | Ovary | 76 | 0.00652 | 1.37 | 0.0696 | <0.15 | 0.0537 | <0.0023 | 0.000172 | 1,250 | 0.0087 | 0.0395 | 0.0775 | 0.115 | 3.42 | 173 |
| | ER-NSC-19 O-Apr-16 | Elk River | Ovary | 66 | 0.00501 | 4.3 | 0.336 | <0.15 | 0.202 | <0.0023 | 0.000421 | 928 | 0.0123 | 0.0289 | 0.175 | 0.0566 | 1.83 | 103 |
| | ER-NSC-21 O-Apr-16 | Elk River | Ovary | 68 | 0.00782 | 4.91 | 0.0735 | <0.16 | 0.382 | <0.0025 | 0.000354 | 822 | 0.0064 | 0.0293 | 0.081 | 0.0297 | 2.01 | 83.5 |
| | ER-NSC-27 O -Apr-16 | Elk River | Ovary | 70 | 0.003345 | 1.3 | 0.1775 | 0.245 | 0.10165 | 0.0024 | 0.0004685 | 1,205 | 0.0044 | 0.03295 | 0.0685 | 0.0985 | 2.53 | 98.5 |
| | ER-NSC-28 O-Apr-16 | Elk River | Ovary | 66 | 0.00536 | 1.47 | 0.0734 | 0.33 | 0.11 | <0.0023 | <0.000087 | 584 | 0.0019 | 0.0269 | 0.0635 | 0.0543 | 3.39 | 59.5 |
| | ER-NSC-29 O-Apr-16 | Elk River | Ovary | 67 | 0.00537 | 0.43 | 0.0492 | <0.17 | 0.0521 | <0.0025 | <0.000096 | 651 | <0.0016 | 0.0287 | 0.0647 | 0.0747 | 2.67 | 61.3 |
| | ER-NSC-38 O-Apr-16 | Elk River | Ovary | 73 | 0.00486 | 1.21 | 0.0962 | 0.29 | 0.0732 | <0.0026 | 0.000274 | 1,050 | 0.0081 | 0.0534 | 0.0605 | 0.0778 | 3.18 | 102 |
| | GC-NSC-01 M-Apr-16 | Gold Creek | Muscle | 79 | 0.000335 | 1.4 | 0.0229 | 0.085 | 1.289 | 0.00475 | 0.00152 | 3,626 | 0.00115 | 0.00566 | 0.066 | 0.08425 | 0.822 | 10.75 |
| | GC-NSC-05 M-Apr-16 | Gold Creek | Muscle | 78 | <0.00035 | 1.66 | 0.0322 | 0.125 | 0.125 | <0.005 | 0.00219 | 455 | <0.0012 | 0.00335 | 0.133 | 0.137 | 0.831 | 12.9 |
| | GC-NSC-06 M-Apr-16 | Gold Creek | Muscle | 79 | <0.00034 | 1.01 | 0.0275 | 0.25 | 0.104 | <0.0049 | 0.0012 | 545 | <0.0012 | 0.00414 | 0.063 | 0.115 | 0.895 | 10 |
| | GC-NSC-08 M-Apr-16 | Gold Creek | Muscle | 76 | <0.00034 | 2.54 | 0.0648 | 0.118 | 0.3 | <0.0048 | 0.00143 | 1,700 | <0.0012 | 0.00532 | 0.071 | 0.128 | 0.776 | 12.9 |
| | GC-NSC-12 M-Apr-16 | Gold Creek | Muscle | 77 | <0.00034 | 0.818 | 0.0931 | 0.08 | 0.441 | <0.0048 | 0.000996 | 940 | <0.0012 | 0.00651 | 0.067 | 0.0821 | 1.41 | 15.7 |
| | GC-NSC-13 M-Apr-16 | Gold Creek | Muscle | 78 | <0.00034 | 0.293 | 0.0704 | 0.091 | 1.26 | <0.0048 | 0.000475 | 8,520 | <0.0012 | 0.00315 | 0.064 | 0.12 | 0.563 | 4.59 |
| | GC-NSC-14 M-Apr-16 | Gold Creek | Muscle | 79 | <0.00035 | 2.01 | 0.0198 | 0.125 | 0.526 | <0.005 | 0.00455 | 2,080 | 0.0026 | 0.00567 | 0.064 | 0.102 | 0.995 | 14.6 |
| | GC-NSC-16 M-Apr-16 | Gold Creek | Muscle | 79 | <0.00035 | 0.453 | 0.0729 | 0.267 | 0.419 | <0.0049 | 0.000446 | 1,950 | <0.0012 | 0.00522 | 0.062 | 0.135 | 1.03 | 11.4 |
| | GC-NSC-17 M-Apr-16 | Gold Creek | Muscle | 81 | <0.00035 | 1.44 | 0.0281 | 0.071 | 0.204 | <0.005 | 0.00216 | 892 | <0.0012 | 0.00479 | 0.274 | 0.0881 | 0.622 | 10.5 |
| | GC-NSC-24 M-Apr-16 | Gold Creek | Muscle | 76 | <0.00033 | 0.867 | 0.084 | 0.087 | 0.21 | <0.0046 | 0.000648 | 1,350 | <0.0011 | 0.0078 | 3.34 | 0.0984 | 0.755 | 26.5 |
| | GC-NSC-26 M -Apr-16 | Gold Creek | Muscle | 75 | 0.000325 | 0.72 | 0.05675 | 0.219 | 0.127 | 0.0046 | 0.0008115 | 511 | 0.00115 | 0.00369 | 0.062 | 0.1195 | 0.7985 | 7.93 |
| | GC-NSC-01 O-Apr-16 | Gold Creek | Ovary | 74 | 0.00304 | 11.3 | 0.091 | 0.13 | 0.187 | <0.0035 | 0.00106 | 1,030 | 0.0058 | 0.046 | 0.0881 | 0.0485 | 2.68 | 128 |
| | GC-NSC-05 O-Apr-16 | Gold Creek | Ovary | 71 | 0.00566 | 1 | 0.0476 | <0.12 | 0.0949 | <0.0035 | 0.00033 | 722 | 0.0032 | 0.0356 | 0.067 | 0.0542 | 3.42 | 78.8 |
| | GC-NSC-06 O-Apr-16 | Gold Creek | Ovary | 75 | 0.00329 | 2.36 | 0.134 | <0.12 | 0.0532 | <0.0035 | 0.000623 | 1,110 | 0.0026 | 0.0416 | 0.0716 | 0.0679 | 2.58 | 108 |
| | GC-NSC-08 O-Apr-16 | Gold Creek | Ovary | 72 | 0.00576 | 1.52 | 0.0401 | <0.11 | 0.0732 | <0.0032 | 0.00043 | 978 | <0.0013 | 0.0465 | 0.0728 | 0.0663 | 3.4 | 98.6 |
| | GC-NSC-12 O-Apr-16 | Gold Creek | Ovary | 69 | 0.00566 | 2.97 | 0.107 | 0.11 | 0.108 | <0.0032 | 0.000155 | 788 | 0.0027 | 0.0428 | 0.0746 | 0.0472 | 3.21 | 81.9 |
| | GC-NSC-13 O -Apr-16 | Gold Creek | Ovary | 67 | 0.0063 | 3.46 | 0.07715 | 0.24 | 0.117 | 0.0034 | 0.000139 | 494 | 0.0015 | 0.0261 | 0.0675 | 0.047 | 3.21 | 80.85 |
| | GC-NSC-14 O-Apr-16 | Gold Creek | Ovary | 74 | 0.00767 | 6.36 | 0.0687 | 0.34 | 0.151 | <0.0035 | 0.000953 | 1,380 | 0.0094 | 0.052 | 0.0718 | 0.0599 | 2.52 | 127 |
| | GC-NSC-16 O-Apr-16 | Gold Creek | Ovary | 65 | 0.00225 | 2.55 | 0.399 | 0.25 | 0.102 | <0.0036 | 0.000203 | 476 | 0.0086 | 0.0328 | 0.0908 | 0.0593 | 2.45 | 82.5 |
| | GC-NSC-17 O-Apr-16 | Gold Creek | Ovary | 77 | 0.00424 | 6.79 | 0.0837 | 0.18 | 0.275 | <0.0035 | 0.00087 | 888 | 0.0055 | 0.0394 | 0.156 | 0.0558 | 2.7 | 160 |
| | GC-NSC-24 O-Apr-16 | Gold Creek | Ovary | 63 | 0.00414 | 0.602 | 0.127 | 0.22 | 0.302 | <0.0036 | <0.000075 | 486 | <0.0014 | 0.0282 | 0.0815 | 0.0369 | 3.37 | 60.5 |
| | GC-NSC-26 O-Apr-16 | Gold Creek | Ovary | 68 | 0.0083 | 0.576 | 0.037 | <0.12 | 0.102 | <0.0035 | 0.000148 | 571 | <0.0014 | 0.0319 | 0.0646 | 0.052 | 3.33 | 67 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | SC-NSC-01A avg | Sand Creek | Muscle | 80 | 0.000525 | 0.885 | 0.02845 | 0.0865 | 1.06 | 0.00255 | 0.002255 | 2,160 | 0.00215 | 0.009605 | 0.0769 | 0.173 | 1.165 | 20.15 |
| | SC-NSC-02A | Sand Creek | Muscle | 79 | 0.00105 | 1.27 | 0.0718 | 0.229 | 0.968 | <0.0027 | 0.00086 | 2210 | 0.0014 | 0.00474 | 0.0588 | 0.17 | 0.881 | 16.5 |
| | SC-NSC-03A | Sand Creek | Muscle | 77 | 0.00066 | 1.16 | 0.381 | 0.277 | 0.203 | <0.0024 | 0.00072 | 762 | 0.0018 | 0.00732 | 0.0691 | 0.272 | 1.91 | 21.8 |
| | SC-NSC-04A | Sand Creek | Muscle | 78 | 0.00032 | 0.426 | 0.0249 | 0.08 | 0.428 | <0.0025 | 0.00226 | 2030 | <0.0011 | 0.00325 | 0.0595 | 0.345 | 0.698 | 8.3 |
| | SC-NSC-05A | Sand Creek | Muscle | 77 | 0.00054 | 1.38 | 0.135 | <0.063 | 0.542 | <0.0026 | 0.00114 | 388 | 0.0028 | 0.0129 | 0.0886 | 0.104 | 2.85 | 30.4 |
| | SC-NSC-06A | Sand Creek | Muscle | 80 | 0.00042 | 2.52 | 0.0538 | <0.062 | 0.556 | <0.0025 | 0.00118 | 761 | 0.002 | 0.008 | 0.07 | 0.0973 | 1.05 | 15.5 |
| | SC-NSC-07A | Sand Creek | Muscle | 78 | <0.00029 | 1.69 | 0.0195 | 0.111 | 0.14 | <0.0026 | 0.00068 | 583 | <0.0011 | 0.00365 | 0.0624 | 0.174 | 0.809 | 7.89 |
| | SC-NSC-08A | Sand Creek | Muscle | 81 | 0.00083 | 2.57 | 0.0703 | <0.064 | 0.174 | <0.0026 | 0.00093 | 383 | 0.0022 | 0.00712 | 0.0742 | 0.121 | 1.31 | 15.3 |
| | SC-NSC-09A | Sand Creek | Muscle | 78 | <0.00029 | 1.77 | 0.0294 | 0.105 | 0.359 | <0.0026 | 0.00124 | 1410 | <0.0011 | 0.00425 | 0.0608 | 0.177 | 0.692 | 16.8 |
| | SC-NSC-10A | Sand Creek | Muscle | 77 | 0.00038 | 2.94 | 0.0649 | 0.147 | 0.813 | <0.0025 | 0.00139 | 2160 | 0.0021 | 0.00685 | 0.0744 | 0.139 | 1.12 | 23 |
| | GC-NSC-01A avg | Gold Creek | Muscle | 78 | 0.00183 | 2.88 | 0.05595 | 0.2565 | 0.5065 | 0.00255 | 0.003615 | 1,181 | 0.00455 | 0.007705 | 0.146 | 0.07865 | 1.03 | 18.35 |
| | GC-NSC-02A | Gold Creek | Muscle | 78 | 0.00032 | 0.42 | 0.0999 | 0.152 | 0.417 | <0.0027 | 0.0004 | 1540 | <0.0012 | 0.00304 | 0.0613 | 0.105 | 0.655 | 6.05 |
| | GC-NSC-03A | Gold Creek | Muscle | 78 | <0.00028 | 0.537 | 0.0858 | 0.168 | 0.572 | <0.0025 | 0.00123 | 547 | 0.0027 | 0.00982 | 0.0666 | 0.336 | 2.12 | 23.3 |
| | GC-NSC-04A | Gold Creek | Muscle | 78 | <0.00029 | 0.818 | 0.0791 | 0.182 | 0.675 | <0.0026 | 0.00351 | 2310 | 0.0013 | 0.0034 | 0.059 | 0.0923 | 0.674 | 7.56 |
| | GC-NSC-05A | Gold Creek | Muscle | 79 | <0.00030 | 0.595 | 0.181 | <0.065 | 0.93 | <0.0027 | 0.00329 | 2820 | 0.0013 | 0.00417 | 0.0611 | 0.0775 | 0.6 | 12.6 |
| | GC-NSC-06A | Gold Creek | Muscle | 77 | <0.00026 | 0.577 | 0.204 | 0.292 | 0.707 | <0.0024 | 0.0013 | 447 | 0.0011 | 0.00663 | 0.0671 | 0.0764 | 1.5 | 18.7 |
| | GC-NSC-07A | Gold Creek | Muscle | 80 | <0.00029 | 0.958 | 0.045 | 0.089 | 0.342 | <0.0026 | 0.00397 | 1420 | <0.0012 | 0.0046 | 0.057 | 0.0769 | 0.83 | 9.14 |
| | GC-NSC-08A | Gold Creek | Muscle | 79 | <0.00030 | 0.858 | 0.0391 | 0.071 | 0.484 | <0.0027 | 0.00314 | 1160 | <0.0012 | 0.00387 | 0.0579 | 0.0727 | 0.742 | 9.61 |
| | GC-NSC-09A | Gold Creek | Muscle | 80 | <0.00029 | 0.902 | 0.175 | <0.065 | 0.666 | <0.0027 | 0.00293 | 2230 | <0.0012 | 0.00417 | 0.0638 | 0.093 | 0.634 | 7.9 |
| | GC-NSC-10A | Gold Creek | Muscle | 78 | <0.00028 | 0.682 | 0.454 | 0.11 | 2.17 | <0.0026 | 0.00253 | 3230 | 0.0018 | 0.00895 | 0.0631 | 0.0537 | 1.37 | 22.9 |
| | ER-NSC-01A avg | Elk River | Muscle | 73 | 0.000385 | 2.88 | 0.2635 | 0.0965 | 0.138 | 0.0026 | 0.000505 | 299 | 0.0013 | 0.007 | 0.0849 | 0.105 | 1.355 | 16.5 |
| | ER-NSC-02A avg | Elk River | Muscle | 72 | 0.00028 | 2.88 | 0.3395 | 0.13 | 0.1605 | 0.0026 | 0.0006055 | 496 | 0.0014 | 0.005935 | 0.0739 | 0.106 | 1.094 | 11.3 |
| | ER-NSC-03A | Elk River | Muscle | 76 | 0.00039 | 1.21 | 0.277 | 0.134 | 0.29 | <0.0026 | 0.00052 | 328 | 0.0031 | 0.00994 | 0.0743 | 0.122 | 2.11 | 25.5 |
| | ER-NSC-04A avg | Elk River | Muscle | 75 | 0.00028 | 2.88 | 0.118 | 0.2305 | 0.184 | 0.0026 | 0.00048 | 655 | 0.00185 | 0.004685 | 0.07205 | 0.129 | 0.975 | 12.5 |
| | ER-NSC-05A | Elk River | Muscle | 80 | 0.00043 | 0.896 | 0.0337 | 0.185 | 1.59 | <0.0026 | 0.00122 | 1560 | 0.0031 | 0.00903 | 0.067 | 0.0649 | 1.31 | 14.7 |
| | ER-NSC-06A | Elk River | Muscle | 79 | 0.0003 | 1.54 | 0.0318 | 0.32 | 0.669 | <0.0025 | 0.00181 | 1450 | 0.0035 | 0.00601 | 0.0613 | 0.0763 | 1.08 | 12.3 |
| | ER-NSC-07A | Elk River | Muscle | 79 | <0.00029 | 1.82 | 0.0503 | 0.472 | 1.43 | <0.0026 | 0.00071 | 4000 | 0.0032 | 0.00754 | 0.083 | 0.0406 | 0.807 | 18.6 |
| | ER-NSC-08A | Elk River | Muscle | 69 | <0.00028 | 4.12 | 0.302 | 0.217 | 0.172 | <0.0026 | 0.00041 | 659 | <0.0011 | 0.00557 | 0.0848 | 0.103 | 0.953 | 15.7 |
| | ER-NSC-09A | Elk River | Muscle | 71 | <0.00026 | 0.994 | 0.217 | 0.242 | 0.15 | <0.0023 | 0.00046 | 257 | 0.001 | 0.00754 | 0.0725 | 0.108 | 1.49 | 12.8 |
| | ER-NSC-10A | Elk River | Muscle | 77 | <0.00028 | 2.81 | 0.124 | 0.204 | 0.487 | <0.0026 | 0.00077 | 2360 | 0.0012 | 0.00518 | 0.0761 | 0.167 | 0.996 | 15.8 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | EC-PM-01M-Feb-14 | Englishman Creek | Muscle | 0.0085 | 1.05 | 18,900 | 0.015 | 1,210 | 0.622 | 0.00329 | 1,000 | 0.0566 | 8,620 | 0.0495 | 19.3 | <0.00012 | 0.00597 | 2.65 |
| | EC-PM-01G-Feb-14 | Englishman Creek | Ovary | 0.0139 | 0.059 | 13,800 | 0.0259 | 746 | 1.54 | 0.0727 | 2,670 | 0.146 | 11,400 | 0.0879 | 14.7 | <0.000079 | 0.00531 | 22 |
| | SC-PM-05M-Feb-14 | Sand Creek | Muscle | 0.0072 | 1.37 | 20,600 | <0.010 | 1,280 | 0.632 | 0.0017 | 1,040 | 0.0201 | 9,800 | 0.0133 | 25.7 | <0.00011 | 0.00062 | 1.59 |
| | SC-PM-10M-Feb-14 | Sand Creek | Muscle | 0.0077 | 1.41 | 19,700 | <0.0099 | 1,225 | 0.273 | 0.00195 | 870 | 0.0321 | 9,560 | 0.0264 | 24.9 | <0.00011 | 0.00470 | 1.20 |
| | SC-PM-01M-Apr-14 | Sand Creek | Muscle | 0.00923 | 1.30 | 19,600 | 0.0115 | 1,275 | 0.828 | 0.00384 | 995 | 0.0571 | 10,060 | 0.0186 | 18.0 | <0.000048 | 0.00137 | 2.94 |
| | SC-PM-02M-Apr-14 | Sand Creek | Muscle | 0.0115 | 1.29 | 19,400 | 0.0181 | 1,210 | 0.873 | 0.00323 | 898 | 0.0509 | 9,020 | 0.0395 | 19.6 | <0.000048 | 0.00135 | 2.44 |
| | SC-PM-03M-Apr-14 | Sand Creek | Muscle | 0.0103 | 1.27 | 20,900 | 0.0164 | 1,220 | 0.798 | 0.00254 | 962 | 0.0642 | 8,950 | 0.0216 | 18 | <0.000049 | 0.00072 | 1.7 |
| | SC-PM-04M-Apr-14 | Sand Creek | Muscle | 0.00907 | 1.50 | 19,200 | 0.0106 | 1,280 | 0.897 | 0.00284 | 670 | 0.101 | 9,700 | 0.0207 | 21.9 | <0.000048 | 0.00141 | 1.76 |
| | SC-PM-05M-Apr-14 | Sand Creek | Muscle | 0.0103 | 2.48 | 21,550 | 0.0141 | 1,220 | 0.720 | 0.00297 | 1,085 | 0.0324 | 10,025 | 0.0115 | 21.8 | <0.000049 | 0.00062 | 1.47 |
| | SC-PM-06M-Apr-14 | Sand Creek | Muscle | 0.00989 | 1.22 | 19,700 | 0.0083 | 1,220 | 0.603 | 0.00265 | 765 | 0.0263 | 9,050 | 0.0112 | 19.6 | <0.000048 | <0.00048 | 1.39 |
| | SC-PM-07M-Apr-14 | Sand Creek | Muscle | 0.0137 | 1.83 | 18,400 | 0.0269 | 1,240 | 1.04 | 0.00329 | 854 | 0.0458 | 8,900 | 0.0294 | 20.5 | <0.000045 | 0.00102 | 2.09 |
| | SC-PM-08M-Apr-14 | Sand Creek | Muscle | 0.00595 | 0.996 | 20,000 | 0.0076 | 1,270 | 0.639 | 0.00183 | 801 | 0.0419 | 9,880 | 0.00758 | 24.2 | <0.000051 | <0.00052 | 1.55 |
| | SC-PM-09M-Apr-14 | Sand Creek | Muscle | 0.0109 | 0.618 | 18,900 | 0.0175 | 1,300 | 0.766 | 0.00196 | 825 | 0.0981 | 8,730 | 0.0224 | 16.9 | <0.000049 | 0.00066 | 1.65 |
| | SC-PM-10M-Apr-14 | Sand Creek | Muscle | 0.00628 | 1.30 | 19,900 | 0.0058 | 1,230 | 0.546 | 0.00168 | 695 | 0.0178 | 9,030 | 0.0074 | 18.9 | <0.000047 | 0.00073 | 1.63 |
| | SC-PM-01M-Aug-14 | Sand Creek | Muscle | 0.00926 | 1.19 | 20,550 | 0.0118 | 1,305 | 0.781 | 0.0039 | 1,300 | 0.0601 | 10,130 | 0.0285 | 20.9 | <0.00011 | 0.00236 | 1.73 |
| | SC-PM-02M-Aug-14 | Sand Creek | Muscle | 0.0109 | 0.625 | 20,300 | 0.0138 | 1,330 | 1.06 | 0.0101 | 1,450 | 0.0664 | 9,850 | 0.116 | 13.5 | <0.00011 | 0.00354 | 2.75 |
| | SC-PM-03M-Aug-14 | Sand Creek | Muscle | 0.0115 | 0.754 | 20,900 | 0.0136 | 1,370 | 1.08 | 0.0057 | 1,660 | 0.148 | 9,820 | 0.136 | 18.1 | <0.00010 | 0.00322 | 2 |
| | SC-PM-04M-Aug-14 | Sand Creek | Muscle | 0.00903 | 0.909 | 20,700 | 0.008 | 1,350 | 1.29 | 0.0029 | 1,310 | 0.0235 | 11,000 | 0.0102 | 15.8 | <0.00011 | 0.00053 | 2.78 |
| | SC-PM-05M-Aug-14 | Sand Creek | Muscle | 0.0101 | 0.929 | 20,600 | 0.0118 | 1,410 | 0.725 | 0.0062 | 1,520 | 0.0479 | 9,980 | 0.0532 | 14.6 | <0.00011 | 0.00225 | 1.84 |
| | SC-PM-06M-Aug-14 | Sand Creek | Muscle | 0.00989 | 0.463 | 21,050 | 0.0091 | 1,430 | 1.19 | 0.0058 | 1,325 | 0.0413 | 10,750 | 0.0208 | 16.7 | <0.00011 | 0.00085 | 2.47 |
| | SC-PM-07M-Aug-14 | Sand Creek | Muscle | 0.00877 | 1.21 | 20,600 | 0.0107 | 1,330 | 0.68 | 0.0035 | 1,960 | 0.0978 | 9,950 | 0.0859 | 15.7 | <0.00010 | 0.00189 | 2.78 |
| | SC-PM-08M-Aug-14 | Sand Creek | Muscle | 0.0106 | 1.34 | 19,900 | 0.014 | 1,360 | 0.968 | 0.005 | 1,840 | 0.0809 | 10,400 | 0.0915 | 21.6 | <0.00011 | 0.0034 | 1.6 |
| | SC-PM-09M-Aug-14 | Sand Creek | Muscle | 0.00883 | 1.31 | 20,100 | 0.0073 | 1,300 | 0.509 | 0.0028 | 1,760 | 0.0131 | 9,520 | 0.00733 | 16.4 | <0.00011 | 0.0007 | 1.53 |
| | SC-PM-10M-Aug-14 | Sand Creek | Muscle | 0.00988 | 0.615 | 17,900 | 0.0226 | 1,130 | 0.925 | 0.0061 | 2,020 | 0.119 | 8,930 | 0.176 | 16.5 | <0.00012 | 0.00367 | 1.83 |
| | SC-PM-05G-Feb-14 | Sand Creek | Ovary | 0.0351 | 0.0544 | 13,500 | 0.0344 | 852 | 2.84 | 0.115 | 1,690 | 0.0714 | 11,700 | 0.0573 | 19.6 | <0.000074 | 0.00162 | 13.7 |
| | SC-PM-10G-Feb-14 | Sand Creek | Ovary | 0.00856 | 0.0623 | 10,867 | <0.0070 | 847 | 1.54 | 0.117 | 1,917 | 0.0251 | 8,870 | 0.0120 | 16.7 | <0.000075 | 0.00287 | 3.79 |
| | SC-PM-01G-Apr-14 | Sand Creek | Ovary | 0.0151 | 0.0426 | 14,700 | 0.0152 | 947 | 2.5 | 0.0434 | 2,390 | 0.135 | 10,700 | 0.0208 | 15.8 | <0.000076 | 0.0009 | 30.7 |
| | SC-PM-10G-Apr-14 | Sand Creek | Ovary | 0.0193 | 0.105 | 24,300 | 0.0142 | 1,130 | 1.55 | 0.0759 | 2,060 | 0.0305 | 18,400 | 0.0151 | 25.6 | <0.000077 | 0.00152 | 17 |
| | ER-PM-06M-Feb-14 | Elk River | Muscle | 0.0081 | 0.812 | 20,300 | <0.010 | 1,210 | 0.473 | 0.00696 | 1,010 | 0.0728 | 9,740 | 0.109 | 11.7 | <0.00012 | 0.00501 | 4.98 |
| | ER-PM-09M-Feb-14 | Elk River | Muscle | 0.008 | 1.09 | 18,700 | <0.010 | 1,210 | 0.586 | 0.00273 | 1,120 | 0.158 | 8,410 | 0.0991 | 16.9 | <0.00011 | 0.00677 | 1.64 |
| | ER-PM-12M-Feb-14 | Elk River | Muscle | 0.0071 | 1.24 | 17,700 | 0.015 | 1,160 | 0.922 | 0.00272 | 2,600 | 0.0233 | 9,990 | 0.009 | 17 | <0.00012 | 0.00037 | 2.37 |
| | ER-PM-01M-Apr-14 | Elk River | Muscle | 0.0139 | 0.963 | 20,500 | 0.0292 | 1,290 | 1.07 | 0.00267 | 891 | 0.0588 | 10,500 | 0.0238 | 14.5 | <0.00011 | 0.00341 | 5.46 |
| | ER-PM-02M-Apr-14 | Elk River | Muscle | 0.0083 | 0.756 | 20,000 | 0.017 | 1,310 | 1.42 | 0.0021 | 864 | 0.0231 | 10,900 | 0.00535 | 12.6 | <0.00012 | 0.00222 | 5.84 |
| | ER-PM-03M-Apr-14 | Elk River | Muscle | 0.0097 | 1.63 | 19,200 | 0.017 | 1,110 | 0.769 | 0.0023 | 999 | 0.0255 | 9,200 | 0.0077 | 17.3 | <0.00012 | 0.00261 | 2.84 |
| | ER-PM-04M-Apr-14 | Elk River | Muscle | 0.0179 | 0.542 | 18,200 | 0.0494 | 1,200 | 1.36 | 0.00452 | 1,180 | 0.0641 | 9,150 | 0.0331 | 11.4 | <0.00010 | 0.0037 | 5.92 |
| | ER-PM-05M-Apr-14 | Elk River | Muscle | 0.01 | 0.574 | 20,000 | 0.016 | 1,280 | 1.08 | 0.00202 | 954 | 0.0355 | 10,500 | 0.0103 | 13 | <0.00012 | 0.00281 | 5.8 |
| | ER-PM-06M-Apr-14 | Elk River | Muscle | 0.0082 | 0.611 | 20,100 | 0.012 | 1,220 | 0.567 | 0.0029 | 1,080 | 0.0313 | 9,750 | 0.0064 | 14.2 | <0.00011 | 0.00221 | 5.97 |
| | ER-PM-07M-Apr-14 | Elk River | Muscle | 0.0132 | 1.09 | 20,400 | 0.021 | 1,210 | 1.091 | 0.00211 | 958 | 0.0362 | 10,950 | 0.00785 | 15.8 | <0.00012 | 0.00265 | 4.60 |
| | ER-PM-08M-Apr-14 | Elk River | Muscle | 0.0121 | 1.89 | 18,900 | 0.017 | 1,220 | 0.796 | 0.00248 | 950 | 0.0401 | 9,230 | 0.0126 | 17.1 | <0.00012 | 0.00329 | 3.13 |
| | ER-PM-09M-Apr-14 | Elk River | Muscle | 0.0164 | 1.82 | 17,700 | 0.04 | 1,210 | 1.41 | 0.00458 | 952 | 0.0662 | 9,460 | 0.0348 | 10.3 | <0.00011 | 0.00274 | 5.44 |
| | ER-PM-10M-Apr-14 | Elk River | Muscle | 0.0097 | 1.36 | 19,200 | 0.015 | 1,180 | 0.725 | 0.00278 | 991 | 0.0474 | 9,750 | 0.0124 | 11.7 | <0.00011 | 0.00099 | 5.49 |
| | ER-PM-11M-Apr-14 | Elk River | Muscle | 0.008 | 1.03 | 18,700 | 0.0116 | 1,150 | 0.547 | 0.00312 | 851 | 0.0462 | 8,910 | 0.00748 | 21.1 | <0.00011 | 0.00103 | 2.53 |
| | ER-PM-12M-Apr-14 | Elk River | Muscle | 0.009 | 1.68 | 20,800 | 0.016 | 1,210 | 0.682 | 0.00216 | 1,220 | 0.0449 | 10,100 | 0.0096 | 7.74 | <0.00011 | 0.00073 | 7.08 |
| | ER-PM-13M-Apr-14 | Elk River | Muscle | 0.0094 | 1.07 | 19,500 | 0.017 | 1,230 | 0.926 | 0.00171 | 947 | 0.0264 | 10,000 | 0.00783 | 10.3 | <0.00011 | 0.00092 | 6.47 |
| | ER-PM-14M-Apr-14 | Elk River | Muscle | 0.0097 | 0.736 | 18,800 | 0.02 | 1,190 | 0.693 | 0.00207 | 797 | 0.0251 | 8,680 | 0.00859 | 14 | <0.00012 | 0.0008 | 6.17 |
| | ER-PM-01M-Aug-14 | Elk River | Muscle | 0.00643 | 0.589 | 22,400 | 0.0157 | 1,480 | 1.24 | 0.0024 | 1,150 | 0.0245 | 11,600 | 0.0134 | 12.9 | <0.000050 | 0.00094 | 3.02 |
| | ER-PM-02M-Aug-14 | Elk River | Muscle | 0.00860 | 0.651 | 21,550 | 0.0149 | 1,460 | 0.712 | 0.00227 | 1,640 | 0.0423 | 10,850 | 0.0242 | 10.6 | <0.000049 | 0.00093 | 7.42 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | ER-PM-03M-Aug-14 | Elk River | Muscle | 0.00653 | 0.615 | 21,800 | 0.0131 | 1,490 | 1.16 | 0.00348 | 1,560 | 0.0276 | 11,300 | 0.0233 | 12.8 | <0.000049 | 0.00098 | 3.26 |
| | ER-PM-04M-Aug-14 | Elk River | Muscle | 0.00595 | 0.759 | 20,400 | 0.0225 | 1,390 | 0.782 | 0.00388 | 1,720 | 0.0507 | 9,980 | 0.0301 | 22.9 | <0.000049 | 0.00152 | 2.98 |
| | ER-PM-05M-Aug-14 | Elk River | Muscle | 0.00667 | 0.827 | 20,600 | 0.0149 | 1,360 | 0.847 | 0.00307 | 1,350 | 0.0498 | 10,200 | 0.0594 | 12.3 | <0.000050 | 0.00311 | 5.02 |
| | ER-PM-06M-Aug-14 | Elk River | Muscle | 0.00908 | 4.26 | 22,600 | 0.0168 | 1,255 | 0.292 | 0.00234 | 1,215 | 0.0262 | 10,810 | 0.0218 | 18.1 | <0.000047 | 0.00184 | 2.62 |
| | ER-PM-07M-Aug-14 | Elk River | Muscle | 0.008 | 0.943 | 20,800 | 0.0193 | 1,440 | 1.47 | 0.0039 | 1,540 | 0.0384 | 12,000 | 0.0133 | 14.7 | <0.000049 | 0.00068 | 7.12 |
| | ER-PM-08M-Aug-14 | Elk River | Muscle | 0.00699 | 1.11 | 21,000 | 0.0138 | 1,390 | 0.519 | 0.00198 | 1,140 | 0.0268 | 10,300 | 0.0296 | 12.7 | <0.000048 | 0.00053 | 5.81 |
| | ER-PM-09M-Aug-14 | Elk River | Muscle | 0.00681 | 1.29 | 20,600 | 0.0129 | 1,360 | 0.994 | 0.0021 | 1,460 | 0.0233 | 11,200 | 0.00908 | 17.7 | <0.000045 | 0.00083 | 4.95 |
| | ER-PM-10M-Aug-14 | Elk River | Muscle | 0.00629 | 1.23 | 20,500 | 0.0121 | 1,340 | 0.555 | 0.00386 | 1,570 | 0.0214 | 9,700 | 0.00743 | 13.3 | <0.000051 | 0.00067 | 4.98 |
| | ER-PM-06G-Feb-14 | Elk River | Ovary | 0.0106 | 0.0355 | 12,800 | 0.0143 | 885 | 4.05 | 0.150 | 2,455 | 0.0481 | 10,950 | 0.0684 | 8.48 | <0.000074 | 0.00232 | 40.1 |
| | ER-PM-09G-Feb-14 | Elk River | Ovary | 0.0177 | 0.0551 | 18,800 | 0.0202 | 949 | 1.51 | 0.068 | 3,320 | 0.096 | 15,900 | 0.062 | 17.8 | <0.000077 | 0.00678 | 25.7 |
| | ER-PM-12G-Feb-14 | Elk River | Ovary | 0.00948 | 0.161 | 15,900 | 0.0106 | 1,080 | 2.65 | 0.141 | 3,880 | 0.0268 | 10,800 | 0.013 | 15.3 | <0.000077 | 0.00089 | 3.29 |
| | ER-PM-07G-Apr-14 | Elk River | Ovary | 0.0242 | 0.0411 | 13,200 | 0.0458 | 950 | 3.84 | 0.132 | 2,170 | 0.07 | 10,800 | 0.0269 | 10.8 | <0.000077 | 0.0023 | 21.9 |
| | ER-PM-11G-Apr-14 | Elk River | Ovary | 0.0129 | 0.0307 | 12,700 | 0.0157 | 752 | 1.51 | 0.111 | 1,390 | 0.0316 | 10,200 | 0.00908 | 15.3 | <0.000077 | 0.00108 | 8.62 |
| | ER-PM-14G-Apr-14 | Elk River | Ovary | 0.0154 | 0.0328 | 17,800 | 0.0164 | 1,070 | 3.89 | 0.177 | 1,480 | 0.0422 | 13,800 | 0.00874 | 15 | <0.000076 | 0.00065 | 40.1 |
| | GC-PM-23M-Feb-14 | Gold Creek | Muscle | 0.0053 | 1.47 | 18,700 | <0.010 | 1,100 | 0.416 | 0.00219 | 908 | 0.0417 | 8,570 | 0.0333 | 21 | <0.00011 | 0.00298 | 2.81 |
| | GC-PM-28M-Feb-14 | Gold Creek | Muscle | 0.0085 | 1.29 | 19,600 | <0.010 | 1,190 | 0.709 | 0.00399 | 1,140 | 0.0334 | 8,830 | 0.0578 | 19.7 | <0.00012 | 0.00408 | 2.19 |
| | GC-PM-29M-Feb-14 | Gold Creek | Muscle | 0.0061 | 1.27 | 19,900 | <0.0095 | 1,240 | 0.578 | 0.00162 | 659 | 0.0237 | 9,440 | 0.0117 | 22.3 | <0.00010 | 0.00201 | 2.45 |
| | GC-PM-31M-Feb-14 | Gold Creek | Muscle | 0.0083 | 0.824 | 20,400 | 0.0209 | 1,200 | 1.38 | 0.00287 | 2,020 | 0.028 | 11,900 | 0.0083 | 24.5 | <0.00011 | 0.0008 | 2.4 |
| | GC-PM-01M-Apr-14 | Gold Creek | Muscle | 0.008 | 0.714 | 20,500 | <0.011 | 1,280 | 1.35 | 0.00225 | 990 | 0.0268 | 9,820 | 0.00867 | 13.6 | <0.00012 | 0.00053 | 2.2 |
| | GC-PM-02M-Apr-14 | Gold Creek | Muscle | 0.0104 | 0.556 | 20,100 | 0.012 | 1,240 | 0.842 | 0.0013 | 909 | 0.0358 | 9,560 | 0.201 | 18.3 | <0.00012 | 0.00866 | 2.32 |
| | GC-PM-03M-Apr-14 | Gold Creek | Muscle | 0.008 | 0.631 | 21,400 | <0.010 | 1,360 | 1.67 | <0.00071 | 828 | 0.0227 | 11,800 | 0.00639 | 19.2 | <0.00012 | 0.00055 | 2.04 |
| | GC-PM-04M-Apr-14 | Gold Creek | Muscle | 0.0118 | 2.82 | 19,850 | <0.012 | 1,170 | 0.544 | 0.00294 | 1,145 | 0.0303 | 9,865 | 0.0180 | 22.4 | <0.00012 | 0.00202 | 1.76 |
| | GC-PM-05M-Apr-14 | Gold Creek | Muscle | 0.0085 | 0.702 | 20,100 | <0.011 | 1,330 | 2.1 | 0.0104 | 988 | 0.0527 | 11,800 | 0.0128 | 14.5 | <0.00012 | 0.00086 | 2.92 |
| | GC-PM-06M-Apr-14 | Gold Creek | Muscle | 0.0089 | 2.43 | 20,500 | <0.0091 | 1,240 | 0.774 | 0.00179 | 962 | 0.0162 | 9,780 | 0.00698 | 12.9 | <0.00010 | 0.00041 | 2.55 |
| | GC-PM-07M-Apr-14 | Gold Creek | Muscle | 0.0076 | 3.59 | 20,250 | <0.010 | 1,175 | 0.510 | 0.00126 | 1,100 | 0.0303 | 9,180 | 0.0116 | 20.2 | <0.00012 | 0.00064 | 1.28 |
| | GC-PM-08M-Apr-14 | Gold Creek | Muscle | 0.0189 | 1.25 | 17,400 | 0.04 | 1,190 | 1.17 | 0.00311 | 918 | 0.0593 | 8,630 | 0.03 | 19.6 | <0.00011 | 0.00247 | 2.37 |
| | GC-PM-09M-Apr-14 | Gold Creek | Muscle | 0.0113 | 0.966 | 21,100 | 0.0145 | 1,370 | 2.17 | 0.00283 | 971 | 0.0394 | 12,300 | 0.0109 | 20.3 | <0.000096 | 0.00056 | 2.11 |
| | GC-PM-10M-Apr-14 | Gold Creek | Muscle | 0.0072 | 2.21 | 21,300 | <0.011 | 1,190 | 0.498 | 0.00219 | 1,060 | 0.0262 | 9,860 | 0.00484 | 18.7 | <0.00012 | 0.00042 | 2.27 |
| | GC-PM-11M-Apr-14 | Gold Creek | Muscle | 0.0169 | 0.66 | 19,800 | 0.03 | 1,300 | 1.27 | 0.00257 | 1,390 | 0.0487 | 9,060 | 0.0161 | 14.1 | <0.00012 | 0.00104 | 1.72 |
| | GC-PM-12M-Apr-14 | Gold Creek | Muscle | 0.0085 | 2.43 | 20,200 | <0.011 | 1,200 | 0.531 | 0.00304 | 1,140 | 0.0267 | 9,270 | 0.00527 | 12 | <0.00012 | <0.00031 | 5.77 |
| | GC-PM-13M-Apr-14 | Gold Creek | Muscle | 0.0082 | 0.704 | 21,000 | <0.010 | 1,310 | 0.75 | 0.00143 | 1,000 | 0.0256 | 9,650 | 0.00597 | 16.8 | <0.00011 | <0.00030 | 2.66 |
| | GC-PM-01M-Aug-14 | Gold Creek | Muscle | 0.00826 | 0.732 | 21,300 | 0.0104 | 1,340 | 0.807 | 0.00495 | 1,450 | 0.0307 | 10,600 | 0.0437 | 18.6 | <0.00027 | 0.00118 | 2.07 |
| | GC-PM-02M-Aug-14 | Gold Creek | Muscle | 0.0107 | 0.686 | 18,800 | 0.0288 | 1,340 | 1.56 | 0.00759 | 1,640 | 0.0829 | 11,300 | 0.052 | 17 | <0.00026 | 0.00289 | 1.96 |
| | GC-PM-03M-Aug-14 | Gold Creek | Muscle | 0.00776 | 0.790 | 20,550 | 0.0137 | 1,340 | 1.05 | 0.00433 | 1,495 | 0.201 | 10,650 | 0.286 | 18.4 | <0.00027 | 0.0140 | 2.39 |
| | GC-PM-04M-Aug-14 | Gold Creek | Muscle | 0.00737 | 1.62 | 21,000 | 0.0079 | 1,340 | 0.641 | 0.00516 | 1,270 | 0.0398 | 10,400 | 0.0336 | 13.4 | <0.00026 | 0.00104 | 2.21 |
| | GC-PM-05M-Aug-14 | Gold Creek | Muscle | 0.00836 | 0.723 | 20,700 | 0.0088 | 1,400 | 0.652 | 0.00518 | 1,180 | 0.23 | 10,600 | 0.298 | 19.6 | <0.00025 | 0.014 | 2.48 |
| | GC-PM-06M-Aug-14 | Gold Creek | Muscle | 0.0072 | 0.871 | 20,200 | 0.0149 | 1,300 | 0.54 | 0.00444 | 1,690 | 0.132 | 10,200 | 0.0504 | 22.1 | <0.00026 | 0.00128 | 1.76 |
| | GC-PM-07M-Aug-14 | Gold Creek | Muscle | 0.00759 | 1.29 | 21,300 | 0.0105 | 1,360 | 0.675 | 0.00258 | 1,180 | 0.0373 | 10,500 | 0.0435 | 23.2 | <0.00028 | 0.00331 | 2.11 |
| | GC-PM-08M-Aug-14 | Gold Creek | Muscle | 0.00746 | 0.871 | 21,300 | 0.0135 | 1,370 | 0.689 | 0.00489 | 1,260 | 0.0619 | 10,800 | 0.13 | 12.9 | <0.00025 | 0.00572 | 1.68 |
| | GC-PM-09M-Aug-14 | Gold Creek | Muscle | 0.00942 | 1.53 | 20,900 | 0.0108 | 1,340 | 0.675 | 0.0037 | 2,010 | 0.0755 | 9,710 | 0.0554 | 21.5 | <0.00011 | 0.00173 | 2.18 |
| | GC-PM-10M-Aug-14 | Gold Creek | Muscle | 0.00831 | 2.60 | 20,100 | 0.0053 | 1,310 | 0.554 | 0.0026 | 1,270 | 0.0122 | 9,720 | 0.0131 | 21.4 | <0.00010 | 0.00072 | 2.37 |
| | GC-PM-23G-Feb-14 | Gold Creek | Ovary | 0.0107 | 0.0366 | 10,700 | <0.0071 | 585 | 1.15 | 0.0838 | 1,100 | 0.0436 | 8,930 | 0.0295 | 13.6 | <0.000076 | 0.00288 | 7.62 |
| | GC-PM-28G-Feb-14 | Gold Creek | Ovary | 0.0199 | 0.09 | 22,000 | 0.0149 | 1,080 | 2.11 | 0.0934 | 4,310 | 0.117 | 18,100 | 0.056 | 23.2 | <0.000075 | 0.00896 | 15.4 |
| | GC-PM-29G-Feb-14 | Gold Creek | Ovary | 0.0109 | 0.0522 | 11,200 | 0.0082 | 595 | 1.09 | 0.0581 | 2,270 | 0.0338 | 9,830 | 0.0335 | 12.7 | <0.000077 | 0.00201 | 10.3 |
| | GC-PM-31G-Feb-14 | Gold Creek | Ovary | 0.0136 | 0.0974 | 16,800 | 0.0224 | 1,230 | 1.94 | 0.102 | 2,970 | 0.0426 | 14,100 | 0.0319 | 20 | <0.000078 | 0.00089 | 4.05 |
| | GC-PM-10G-Apr-14 | Gold Creek | Ovary | 0.0146 | 0.095 | 12,900 | 0.0124 | 805 | 2.01 | 0.0991 | 1,340 | 0.0382 | 10,700 | 0.0131 | 12.1 | <0.000078 | 0.0007 | 5 |

**Table G.7:** **Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | SC-NSC-13-Apr-15 | Sand Creek | Muscle | 0.00534 | 1.180 | 20,800 | 0.0195 | 1,225 | 0.870 | 0.0059 | 850 | 0.0330 | 10,250 | 0.00648 | 23.0 | <0.000030 | 0.0018 | 1.51 |
|  | SC-NSC-23-Apr-15 | Sand Creek | Muscle | 0.00548 | 0.994 | 20,700 | <0.0067 | 1,300 | 0.917 | 0.0034 | 774 | 0.0101 | 9,720 | 0.00299 | 21.0 | <0.000028 | 0.0019 | 2.56 |
|  | SC-NSC-28-Apr-15 | Sand Creek | Muscle | 0.00545 | 0.882 | 19,900 | <0.0064 | 1,170 | 0.713 | 0.0045 | 849 | 0.0141 | 9,450 | 0.00284 | 33.1 | <0.000026 | 0.0015 | 1.46 |
|  | SC-NSC-33-Apr-15 | Sand Creek | Muscle | 0.00471 | 0.803 | 20,500 | <0.0068 | 1,190 | 0.435 | 0.0054 | 1,020 | 0.0138 | 9,090 | 0.00434 | 18.2 | <0.000028 | <0.0011 | 1.39 |
|  | SC-NSC-36-Apr-15 | Sand Creek | Muscle | 0.00513 | 0.892 | 20,300 | <0.0059 | 1,220 | 0.708 | 0.0056 | 861 | 0.0197 | 10,100 | 0.07080 | 25.5 | <0.000024 | <0.00097 | 1.86 |
|  | SC-NSC-37-Apr-15 | Sand Creek | Muscle | 0.00492 | 0.853 | 20,100 | <0.0069 | 1,140 | 0.451 | 0.0066 | 1,420 | 0.0101 | 9,140 | 0.00664 | 22.3 | <0.000028 | <0.0011 | 1.69 |
|  | SC-NSC-39-Apr-15 | Sand Creek | Muscle | 0.00554 | 0.949 | 21,200 | <0.0067 | 1,240 | 0.551 | 0.0060 | 895 | 0.0086 | 9,930 | 0.00542 | 23.9 | <0.000028 | 0.0012 | 1.98 |
|  | SC-NSC-44-Apr-15 | Sand Creek | Muscle | 0.00719 | 1.190 | 20,200 | 0.0070 | 1,250 | 1.030 | 0.0079 | 1,010 | 0.0205 | 11,100 | 0.01770 | 24.7 | <0.000028 | 0.0013 | 2.37 |
|  | SC-NSC-46-Apr-15 | Sand Creek | Muscle | 0.00639 | 2.010 | 21,750 | <0.0069 | 1,195 | 0.543 | 0.0056 | 978 | 0.0119 | 9,625 | 0.02235 | 27.9 | <0.000029 | <0.0012 | 1.69 |
|  | SC-NSC-47-Apr-15 | Sand Creek | Muscle | 0.00553 | 1.020 | 22,100 | 0.0072 | 1,270 | 1.110 | 0.0038 | 857 | 0.0130 | 10,900 | 0.00758 | 21.8 | <0.000028 | <0.0011 | 2.43 |
|  | SC-NSC-01-Aug-15 | Sand Creek | Muscle | 0.00591 | 0.946 | 15,700 | 0.0124 | 854 | 0.679 | 0.0148 | 1,550 | 0.0370 | 8,610 | 0.0350 | 11.9 | <0.0000031 | 0.00261 | 1.97 |
|  | SC-NSC-02-Aug-15 | Sand Creek | Muscle | 0.00625 | 1.94 | 20,800 | 0.00820 | 1,280 | 1.06 | 0.00790 | 1,280 | 0.0274 | 10,700 | 0.0159 | 12.8 | <0.0000031 | 0.00130 | 4.16 |
|  | SC-NSC-03-Aug-15 | Sand Creek | Muscle | 0.00617 | 0.593 | 21,300 | 0.0121 | 1,350 | 0.672 | 0.00790 | 1,630 | 0.0297 | 10,400 | 0.0150 | 13.0 | <0.0000030 | 0.00153 | 3.19 |
|  | SC-NSC-04-Aug-15 | Sand Creek | Muscle | 0.00539 | 0.902 | 21,900 | 0.0102 | 1,320 | 0.852 | 0.00880 | 1,530 | 0.0219 | 10,600 | 0.0101 | 15.5 | <0.0000031 | 0.000750 | 2.37 |
|  | SC-NSC-05-Aug-15 | Sand Creek | Muscle | 0.00591 | 1.21 | 22,300 | 0.00800 | 1,340 | 0.748 | 0.00900 | 1,910 | 0.0202 | 11,000 | 0.00698 | 17.3 | <0.0000027 | 0.000570 | 2.58 |
|  | SC-NSC-06-Aug-15 | Sand Creek | Muscle | 0.00922 | 1.35 | 21,500 | 0.00695 | 1,215 | 0.512 | 0.00785 | 1,355 | 0.0278 | 10,500 | 0.0293 | 20.4 | <0.0000031 | 0.00154 | 2.69 |
|  | SC-NSC-07-Aug-15 | Sand Creek | Muscle | 0.00649 | 0.848 | 20,600 | 0.00690 | 1,330 | 0.616 | 0.00890 | 1,270 | 0.0285 | 9,790 | 0.0140 | 18.8 | <0.0000031 | 0.00120 | 3.07 |
|  | SC-NSC-08-Aug-15 | Sand Creek | Muscle | 0.00687 | 0.938 | 21,800 | 0.0117 | 1,300 | 0.759 | 0.0108 | 1,490 | 0.0395 | 10,300 | 0.0205 | 17.4 | <0.0000032 | 0.00255 | 2.86 |
|  | SC-NSC-09-Aug-15 | Sand Creek | Muscle | 0.00550 | 0.976 | 21,100 | 0.00940 | 1,290 | 0.722 | 0.0134 | 1,410 | 0.0370 | 10,300 | 0.0199 | 17.4 | <0.0000031 | 0.000990 | 2.38 |
|  | SC-NSC-10-Aug-15 | Sand Creek | Muscle | 0.00728 | 0.986 | 21,200 | 0.0110 | 1,250 | 0.777 | 0.00840 | 1,450 | 0.0218 | 10,400 | 0.0154 | 20.5 | 0.00000600 | 0.00137 | 2.48 |
|  | SC-NSC-11-Aug-15 | Sand Creek | Muscle | 0.00462 | 0.874 | 21,000 | 0.00355 | 1,315 | 0.432 | 0.0108 | 966 | 0.0274 | 10,750 | 0.00642 | 35.5 | <0.0000027 | 0.000730 | 1.36 |
|  | SC-NSC-13-Apr-15 | Sand Creek | Ovary | 0.00620 | 0.0477 | 9,760 | 0.00530 | 644 | 1.38 | 0.106 | 1,490 | 0.0341 | 7,990 | 0.00812 | 14.6 | <0.0000039 | 0.0148 | 6.15 |
|  | SC-NSC-33-Apr-15 | Sand Creek | Ovary | 0.00660 | 0.0398 | 14,600 | 0.00530 | 856 | 2.25 | 0.104 | 1,590 | 0.0121 | 10,900 | 0.00545 | 16.3 | <0.0000039 | <0.0011 | 11.4 |
|  | SC-NSC-36-Apr-15 | Sand Creek | Ovary | 0.00590 | 0.0238 | 8,280 | 0.00620 | 458 | 0.552 | 0.0504 | 995 | 0.0210 | 7,040 | 0.325 | 13.2 | <0.0000039 | 0.00310 | 4.80 |
|  | SC-NSC-37-Apr-15 | Sand Creek | Ovary | 0.00790 | 0.0489 | 15,000 | 0.00620 | 894 | 1.79 | 0.133 | 2,210 | 0.0167 | 11,300 | 0.0125 | 21.0 | <0.0000038 | <0.0011 | 7.21 |
|  | SC-NSC-39-Apr-15 | Sand Creek | Ovary | 0.00740 | 0.0352 | 14,200 | <0.0052 | 736 | 1.27 | 0.103 | 1,350 | 0.0224 | 10,800 | 0.00768 | 20.6 | <0.0000040 | 0.00360 | 11.6 |
|  | SC-NSC-44-Apr-15 | Sand Creek | Ovary | 0.00777 | 0.0655 | 12,900 | 0.00770 | 878 | 1.91 | 0.131 | 2,080 | 0.0252 | 9,770 | 0.0195 | 21.8 | <0.0000035 | 0.00180 | 15.1 |
|  | SC-NSC-46-Apr-15 | Sand Creek | Ovary | 0.00630 | 0.122 | 13,300 | 0.00615 | 979 | 5.45 | 0.150 | 2,090 | 0.0151 | 9,700 | 0.0262 | 22.9 | <0.0000040 | <0.0011 | 5.82 |
|  | SC-NSC-47-Apr-15 | Sand Creek | Ovary | 0.00780 | 0.0360 | 14,200 | 0.00990 | 780 | 1.43 | 0.110 | 1,590 | 0.0309 | 11,500 | 0.0446 | 18.2 | <0.0000040 | 0.00290 | 18.3 |
|  | ER-NSC-06-Apr-15 | Elk River | Muscle | 0.00760 | 1.210 | 21,500 | 0.0094 | 1,170 | 1.170 | 0.0124 | 1,140 | 0.0368 | 10,900 | 0.03590 | 23.7 | <0.0000041 | 0.0032 | 2.75 |
|  | ER-NSC-08-Apr-15 | Elk River | Muscle | 0.00610 | 0.817 | 21,200 | 0.0057 | 1,180 | 0.501 | 0.0093 | 980 | 0.0226 | 9,500 | 0.01020 | 22.6 | <0.0000042 | 0.0022 | 2.18 |
|  | ER-NSC-13-Apr-15 | Elk River | Muscle | 0.00647 | 0.940 | 20,600 | 0.0078 | 1,155 | 0.849 | 0.0058 | 735 | 0.0133 | 10,275 | 0.01195 | 19.7 | 0.00002075 | 0.0013 | 5.95 |
|  | ER-NSC-14-Apr-15 | Elk River | Muscle | 0.00630 | 1.200 | 20,700 | 0.0066 | 1,170 | 0.549 | 0.0052 | 1,130 | 0.0133 | 9,910 | 0.00920 | 24.0 | <0.0000041 | 0.0032 | 1.85 |
|  | ER-NSC-17-Apr-15 | Elk River | Muscle | 0.00690 | 0.877 | 22,600 | <0.0054 | 1,220 | 0.861 | 0.0099 | 899 | 0.0146 | 10,100 | 0.02320 | 21.9 | 0.0000061 | <0.0012 | 2.23 |
|  | ER-NSC-19-Apr-15 | Elk River | Muscle | 0.00790 | 0.913 | 21,100 | 0.0071 | 1,190 | 0.628 | 0.0087 | 655 | 0.0136 | 9,610 | 0.10200 | 22.1 | 0.0000198 | <0.0012 | 7.3 |
|  | ER-NSC-25-Apr-15 | Elk River | Muscle | 0.00574 | 1.320 | 22,500 | 0.0069 | 1,200 | 0.476 | 0.0096 | 913 | 0.0102 | 10,000 | 0.00660 | 22.5 | <0.0000039 | <0.0011 | 3.14 |
|  | ER-NSC-29-Apr-15 | Elk River | Muscle | 0.00570 | 0.713 | 21,200 | 0.0091 | 1,120 | 0.654 | 0.0111 | 725 | 0.0091 | 9,450 | 0.00946 | 15.6 | <0.0000042 | <0.0012 | 5.92 |
|  | ER-NSC-43-Apr-15 | Elk River | Muscle | 0.00620 | 0.807 | 20,300 | <0.0053 | 1,110 | 0.655 | 0.0104 | 1,040 | 0.0178 | 9,160 | 0.03180 | 16.7 | <0.0000040 | <0.0012 | 4.13 |
|  | ER-NSC-01-Aug-15 | Elk River | Muscle | 0.00746 | 0.675 | 21,500 | 0.00710 | 1,290 | 0.846 | 0.00649 | 1,150 | 0.0213 | 10,600 | 0.0179 | 22.5 | <0.000036 | 0.00200 | 2.72 |
|  | ER-NSC-02-Aug-15 | Elk River | Muscle | 0.00410 | 0.638 | 17,500 | 0.00900 | 1,010 | 0.536 | 0.0109 | 1,340 | 0.0240 | 8,970 | 0.00648 | 17.7 | <0.000033 | 0.000820 | 4.75 |
|  | ER-NSC-03-Aug-15 | Elk River | Muscle | 0.0147 | 1.43 | 22,650 | 0.0267 | 1,380 | 1.26 | 0.0194 | 1,340 | 0.0445 | 10,450 | 0.0575 | 24.9 | 0.0000104 | 0.00107 | 2.64 |
|  | ER-NSC-04-Aug-15 | Elk River | Muscle | 0.00628 | 1.17 | 21,500 | 0.00670 | 1,390 | 0.943 | 0.0109 | 1,270 | 0.0230 | 11,300 | 0.00810 | 21.4 | 0.00000480 | 0.000770 | 2.32 |
|  | ER-NSC-05-Aug-15 | Elk River | Muscle | 0.00552 | 0.600 | 22,700 | 0.00860 | 1,390 | 0.667 | 0.0156 | 1,370 | 0.0408 | 10,900 | 0.0336 | 21.7 | <0.0000030 | 0.00109 | 2.14 |
|  | ER-NSC-06-Aug-15 | Elk River | Muscle | 0.00617 | 0.556 | 21,600 | 0.0109 | 1,440 | 1.30 | 0.0136 | 1,060 | 0.0276 | 12,200 | 0.00623 | 11.9 | <0.0000031 | 0.000850 | 7.92 |
|  | ER-NSC-07-Aug-15 | Elk River | Muscle | 0.00671 | 0.814 | 22,600 | 0.00880 | 1,340 | 1.05 | 0.0160 | 1,360 | 0.0160 | 11,300 | 0.00654 | 19.7 | 0.00000420 | 0.00115 | 2.94 |
|  | ER-NSC-08-Aug-15 | Elk River | Muscle | 0.00664 | 1.07 | 21,400 | 0.0164 | 1,380 | 1.06 | 0.0196 | 1,590 | 0.0291 | 11,400 | 0.0138 | 16.9 | 0.00000400 | 0.000870 | 2.71 |
|  | ER-NSC-09-Aug-15 | Elk River | Muscle | 0.00556 | 0.597 | 21,600 | 0.00770 | 1,210 | 0.744 | 0.0197 | 1,840 | 0.0720 | 11,300 | 0.00794 | 13.6 | 0.00000340 | 0.000940 | 2.93 |
|  | ER-NSC-10-Aug-15 | Elk River | Muscle | 0.00642 | 0.903 | 21,200 | 0.00900 | 1,230 | 0.757 | 0.0155 | 1,500 | 0.0358 | 10,700 | 0.0291 | 20.2 | <0.0000032 | 0.00202 | 1.96 |
|  | ER-NSC-05-Apr-15 | Elk River | Ovary | 0.00309 | 0.0129 | 4,940 | 0.00460 | 252 | 0.319 | 0.0244 | 664 | 0.0151 | 4,470 | 0.292 | 7.65 | <0.000031 | 0.00127 | 3.97 |
|  | ER-NSC-13-Apr-15 | Elk River | Ovary | 0.00630 | 0.0326 | 11,500 | 0.0139 | 850 | 2.02 | 0.132 | 1,640 | 0.0204 | 9,730 | 0.144 | 13.4 | <0.000036 | 0.000910 | 11.8 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-NSC-25-Apr-15 | Elk River | Ovary | 0.00671 | 0.0534 | 14,400 | 0.0135 | 891 | 3.77 | 0.169 | 2,120 | 0.0248 | 11,500 | 0.0120 | 18.3 | <0.000034 | 0.00195 | 9.19 |
| | ER-NSC-43-Apr-15 | Elk River | Ovary | 0.00848 | 0.0389 | 14,900 | 0.0170 | 817 | 2.84 | 0.121 | 1,920 | 0.0369 | 11,100 | 0.120 | 16.1 | <0.000035 | 0.00127 | 12.9 |
| | GC-NSC-02-Apr-15 | Gold Creek | Muscle | 0.00716 | 0.680 | 20,500 | 0.0091 | 1,215 | 0.893 | 0.0067 | 912 | 0.0349 | 9,405 | 0.00936 | 20.6 | <0.000027 | <0.0011 | 2.01 |
| | GC-NSC-04-Apr-15 | Gold Creek | Muscle | 0.00491 | 0.903 | 19,700 | <0.0064 | 1,180 | 1.090 | 0.0062 | 920 | 0.0107 | 9,440 | 0.00434 | 17.3 | <0.000026 | <0.0011 | 2.66 |
| | GC-NSC-10-Apr-15 | Gold Creek | Muscle | 0.00648 | 0.878 | 20,800 | <0.0068 | 1,180 | 1.010 | 0.0050 | 1,390 | 0.0135 | 9,120 | 0.03800 | 19.9 | <0.000028 | <0.0011 | 2.14 |
| | GC-NSC-13-Apr-15 | Gold Creek | Muscle | 0.00507 | 1.210 | 17,900 | <0.0061 | 1,050 | 0.792 | 0.0081 | 1,240 | 0.0094 | 8,640 | 0.00666 | 13.0 | <0.000025 | 0.0010 | 1.94 |
| | GC-NSC-20-Apr-15 | Gold Creek | Muscle | 0.00441 | 0.651 | 19,200 | 0.0073 | 1,110 | 0.696 | 0.0050 | 1,270 | 0.0200 | 10,300 | 0.00208 | 20.5 | <0.000032 | 0.0010 | 1.94 |
| | GC-NSC-31-Apr-15 | Gold Creek | Muscle | 0.00614 | 1.550 | 19,600 | <0.0067 | 1,180 | 0.589 | 0.0046 | 948 | 0.0231 | 10,100 | 0.00148 | 17.4 | <0.000034 | <0.00037 | 1.96 |
| | GC-NSC-33-Apr-15 | Gold Creek | Muscle | 0.00427 | 1.250 | 20,300 | <0.0066 | 1,170 | 0.379 | 0.0046 | 825 | 0.0067 | 9,550 | 0.00749 | 23.5 | <0.000033 | 0.0009 | 2.26 |
| | GC-NSC-34-Apr-15 | Gold Creek | Muscle | 0.00457 | 0.941 | 19,300 | <0.0061 | 1,170 | 0.456 | 0.0044 | 1,010 | 0.0097 | 9,670 | 0.00772 | 19.0 | 0.000035 | 0.0011 | 1.55 |
| | GC-NSC-37-Apr-15 | Gold Creek | Muscle | 0.00512 | 0.957 | 19,400 | <0.0067 | 1,270 | 0.771 | 0.0042 | 774 | 0.0082 | 10,100 | 0.00597 | 18.0 | <0.000033 | 0.0010 | 2.05 |
| | GC-NSC-49-Apr-15 | Gold Creek | Muscle | 0.00481 | 0.855 | 16,850 | <0.0061 | 1,065 | 0.263 | 0.0051 | 828 | 0.0060 | 9,005 | 0.01755 | 19.2 | <0.000030 | 0.0011 | 1.31 |
| | GC-NSC-01-Aug-15 | Gold Creek | Muscle | 0.00520 | 1.12 | 22,900 | 0.00630 | 1,280 | 0.580 | 0.0120 | 1,420 | 0.00930 | 10,800 | 0.00361 | 19.2 | <0.0000030 | 0.000940 | 2.39 |
| | GC-NSC-02-Aug-15 | Gold Creek | Muscle | 0.00937 | 1.72 | 21,800 | 0.00495 | 1,270 | 0.563 | 0.0105 | 1,190 | 0.00900 | 10,400 | 0.00344 | 24.4 | 0.0000165 | 0.00104 | 2.26 |
| | GC-NSC-03-Aug-15 | Gold Creek | Muscle | 0.00618 | 0.801 | 22,500 | 0.00690 | 1,240 | 0.824 | 0.0152 | 1,370 | 0.00890 | 10,700 | 0.0163 | 19.1 | <0.0000031 | 0.00141 | 2.45 |
| | GC-NSC-04-Aug-15 | Gold Creek | Muscle | 0.00794 | 0.796 | 21,200 | 0.00810 | 1,250 | 1.29 | 0.00890 | 1,540 | 0.0104 | 10,400 | 0.00649 | 16.9 | <0.0000030 | 0.00106 | 3.93 |
| | GC-NSC-05-Aug-15 | Gold Creek | Muscle | 0.00711 | 0.546 | 22,000 | 0.0279 | 1,330 | 1.61 | 0.0168 | 1,640 | 0.0304 | 11,500 | 0.00919 | 11.3 | <0.0000032 | 0.00127 | 2.57 |
| | GC-NSC-06-Aug-15 | Gold Creek | Muscle | 0.00684 | 0.676 | 22,500 | 0.00760 | 1,420 | 1.13 | 0.0146 | 1,190 | 0.0136 | 12,100 | 0.00692 | 20.4 | <0.0000031 | 0.000880 | 2.26 |
| | GC-NSC-07-Aug-15 | Gold Creek | Muscle | 0.00680 | 0.390 | 21,200 | 0.00920 | 1,320 | 0.844 | 0.0198 | 1,510 | 0.0112 | 10,800 | 0.00930 | 12.2 | 0.0000161 | 0.00108 | 1.77 |
| | GC-NSC-08-Aug-15 | Gold Creek | Muscle | 0.00615 | 0.767 | 21,000 | 0.00830 | 1,270 | 0.945 | 0.0155 | 1,630 | 0.00850 | 11,100 | 0.00574 | 18.0 | <0.0000028 | 0.000630 | 2.39 |
| | GC-NSC-09-Aug-15 | Gold Creek | Muscle | 0.00736 | 0.479 | 21,800 | 0.00790 | 1,320 | 1.14 | 0.0163 | 1,180 | 0.0138 | 10,600 | 0.00595 | 16.8 | <0.0000031 | 0.00102 | 2.52 |
| | GC-NSC-10-Aug-15 | Gold Creek | Muscle | 0.00640 | 1.14 | 21,500 | 0.00610 | 1,180 | 0.565 | 0.0148 | 1,250 | 0.0113 | 10,000 | 0.00386 | 22.2 | <0.0000031 | 0.00112 | 2.69 |
| | GC-NSC-13-Apr-15 | Gold Creek | Ovary | 0.00726 | 0.0713 | 14,400 | 0.00640 | 978 | 9.93 | 0.128 | 2,070 | 0.0197 | 11,100 | 0.0167 | 13.2 | <0.000036 | 0.000670 | 5.17 |
| | GC-NSC-31-Apr-15 | Gold Creek | Ovary | 0.00543 | 0.0498 | 11,000 | 0.00480 | 570 | 0.769 | 0.0406 | 1,360 | 0.0175 | 10,500 | 0.0164 | 11.6 | <0.000034 | 0.00121 | 13.8 |
| | GC-NSC-33-Apr-15 | Gold Creek | Ovary | 0.00767 | 0.0302 | 11,500 | 0.0103 | 571 | 0.782 | 0.0361 | 1,480 | 0.0224 | 10,400 | 0.118 | 14.7 | <0.000035 | 0.000690 | 7.93 |
| | GC-NSC-34-Apr-15 | Gold Creek | Ovary | 0.0110 | 0.0391 | 13,500 | 0.0106 | 650 | 0.755 | 0.0287 | 1,520 | 0.505 | 11,800 | 0.0499 | 14.4 | <0.000036 | 0.00123 | 7.60 |
| | GC-NSC-49-Apr-15 | Gold Creek | Ovary | 0.00500 | 0.0611 | 11,400 | 0.00680 | 864 | 0.892 | 0.129 | 1,795 | 0.00865 | 9,105 | 0.0108 | 16.6 | <0.000038 | 0.000660 | 3.53 |
| 2016 | SC-NSC-03 O-Apr-16 | Sand Creek | Ovary | 0.00556 | 0.0413 | 10,100 | <0.0068 | 873 | 1.88 | 0.105 | 1,960 | 0.0167 | 9,190 | 0.00453 | 15.9 | <0.000084 | 0.00108 | 7.83 |
| | SC-NSC-09 O-Apr-16 | Sand Creek | Ovary | 0.0085 | 0.0572 | 9,845 | 0.0122 | 668 | 2.45 | 0.1025 | 1,325 | 0.0236 | 8,775 | 0.007505 | 13.15 | 0.00017 | 0.00098 | 17.6 |
| | SC-NSC-21 O-Apr-16 | Sand Creek | Ovary | 0.0047 | 0.0358 | 7,840 | 0.0061 | 499 | 0.861 | 0.0806 | 1,030 | 0.0206 | 6,830 | 0.00801 | 11.3 | <0.00017 | 0.0009 | 12.2 |
| | SC-NSC-25 O-Apr-16 | Sand Creek | Ovary | 0.006 | 0.0286 | 8,590 | <0.0037 | 753 | 3.09 | 0.0931 | 1,650 | 0.0142 | 9,140 | 0.00282 | 12.8 | <0.00017 | 0.00077 | 17 |
| | SC-NSC-29 O-Apr-16 | Sand Creek | Ovary | 0.0067 | 0.0365 | 7,430 | 0.0136 | 703 | 3.32 | 0.0835 | 1,650 | 0.0443 | 6,550 | 0.0268 | 12.1 | <0.00017 | 0.00101 | 4.6 |
| | SC-NSC-32 O-Apr-16 | Sand Creek | Ovary | 0.005 | 0.0456 | 10,300 | 0.0066 | 944 | 1.29 | 0.122 | 2,030 | 0.0099 | 10,000 | 0.00536 | 19.8 | <0.00016 | 0.00116 | 4.1 |
| | SC-NSC-33 O-Apr-16 | Sand Creek | Ovary | 0.0064 | 0.133 | 8,960 | <0.0035 | 671 | 0.766 | 0.0869 | 1,950 | 0.0054 | 10,700 | 0.00301 | 15.6 | <0.00016 | 0.00104 | 5.39 |
| | SC-NSC-34 O-Apr-16 | Sand Creek | Ovary | 0.0129 | 0.105 | 9,820 | 0.0131 | 987 | 4.2 | 0.127 | 2,080 | 0.018 | 8,760 | 0.0131 | 16.7 | <0.00017 | 0.00092 | 7.03 |
| | SC-NSC-35 O-Apr-16 | Sand Creek | Ovary | 0.0058 | 0.0573 | 10,400 | 0.0108 | 952 | 1.97 | 0.13 | 2,330 | 0.0119 | 9,430 | 0.00404 | 20.8 | <0.00017 | <0.00064 | 5.03 |
| | SC-NSC-36 O-Apr-16 | Sand Creek | Ovary | 0.0055 | 0.0397 | 7,600 | 0.0144 | 694 | 1.57 | 0.0965 | 1,630 | 0.0176 | 6,590 | 0.017 | 13.6 | <0.00016 | 0.00091 | 3.2 |
| | SC-NSC-03 M-Apr-16 | Sand Creek | Muscle | 0.00523 | 0.999 | 18,500 | <0.0069 | 1,220 | 0.348 | 0.0022 | 938 | 0.0253 | 9,120 | 0.00197 | 22.9 | <0.0000041 | <0.00055 | 1.26 |
| | SC-NSC-09 M-Apr-16 | Sand Creek | Muscle | 0.00693 | 1.24 | 20,200 | <0.0068 | 1,330 | 1.18 | 0.0021 | 1,040 | 0.0119 | 11,600 | 0.00461 | 20.2 | <0.0000041 | <0.00055 | 2.01 |
| | SC-NSC-21 M-Apr-16 | Sand Creek | Muscle | 0.00555 | 0.929 | 20,500 | <0.007 | 1,340 | 0.52 | 0.0025 | 922 | 0.0104 | 10,200 | 0.00147 | 23.8 | <0.0000042 | <0.00056 | 1.94 |
| | SC-NSC-25 M-Apr-16 | Sand Creek | Muscle | 0.00701 | 0.703 | 20,250 | 0.0065 | 1,320 | 0.814 | 0.0027 | 1,280 | 0.01033 | 10,950 | 0.00197 | 22.1 | 0.0000255 | 0.00052 | 2.565 |
| | SC-NSC-29 M-Apr-16 | Sand Creek | Muscle | 0.00698 | 1.03 | 21,300 | <0.0072 | 1,300 | 0.585 | 0.0027 | 1,070 | 0.015 | 10,900 | 0.00404 | 25 | 0.0000116 | 0.00084 | 1.52 |
| | SC-NSC-32 M-Apr-16 | Sand Creek | Muscle | 0.00554 | 1.17 | 19,400 | <0.0071 | 1,240 | 0.184 | 0.0026 | 824 | 0.0067 | 9,480 | 0.00398 | 26.1 | 0.0000115 | 0.00087 | 1.4 |
| | SC-NSC-33 M-Apr-16 | Sand Creek | Muscle | 0.0177 | 2.86 | 18,200 | 0.0062 | 1,120 | 0.316 | 0.0018 | 997 | 0.0127 | 8,950 | 0.00571 | 23.3 | 0.0000073 | 0.00112 | 1.27 |
| | SC-NSC-34 M-Apr-16 | Sand Creek | Muscle | 0.007255 | 1.215 | 20,200 | 0.0077 | 1,225 | 0.3275 | 0.00145 | 917 | 0.0123 | 10,105 | 0.005405 | 24.8 | 0.0000085 | 0.00086 | 1.345 |
| | SC-NSC-35 M-Apr-16 | Sand Creek | Muscle | 0.00555 | 1.12 | 20,700 | <0.0071 | 1,350 | 0.261 | 0.0015 | 815 | 0.0095 | 10,100 | 0.0034 | 27.9 | 0.0000155 | 0.00133 | 1.39 |
| | SC-NSC-36 M-Apr-16 | Sand Creek | Muscle | 0.00712 | 1.13 | 18,500 | 0.012 | 1,330 | 1.02 | 0.0019 | 882 | 0.0188 | 12,200 | 0.00827 | 25.1 | <0.0000037 | 0.00121 | 1.39 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-NSC-09 M-Apr-16 | Elk River | Muscle | 0.0047 | 1.36 | 11,600 | 0.0085 | 694 | 0.28 | 0.0029 | 944 | 0.0151 | 6,320 | 0.0159 | 14.7 | <0.000048 | <0.00057 | 1.18 |
| | ER-NSC-15 M-Apr-16 | Elk River | Muscle | 0.0048 | 1.99 | 15,200 | <0.0075 | 1,040 | 0.158 | 0.0022 | 1,090 | 0.0118 | 8,350 | 0.00196 | 19.7 | <0.00005 | <0.0006 | 1.52 |
| | ER-NSC-16 M-Apr-16 | Elk River | Muscle | 0.0065 | 1.17 | 18,500 | <0.0075 | 1,130 | 0.192 | 0.0017 | 912 | 0.0535 | 8,940 | 0.00668 | 24.8 | <0.00005 | <0.0006 | 1.6 |
| | ER-NSC-17 M-Apr-16 | Elk River | Muscle | 0.0062 | 1.08 | 19,000 | <0.0075 | 1,220 | 0.435 | <0.0015 | 792 | 0.0172 | 9,470 | 0.00202 | 27.5 | <0.00005 | <0.00059 | 2.04 |
| | ER-NSC-19 M-Apr-16 | Elk River | Muscle | 0.0047 | 1.05 | 21,000 | 0.0086 | 1,310 | 0.919 | <0.0014 | 888 | 0.0194 | 11,300 | 0.0128 | 23.1 | <0.000048 | 0.00086 | 1.7 |
| | ER-NSC-21 M-Apr-16 | Elk River | Muscle | 0.0066 | 1.86 | 19,300 | 0.0119 | 1,200 | 0.726 | 0.002 | 857 | 0.0273 | 9,470 | 0.0142 | 15.1 | <0.00005 | 0.00115 | 2.88 |
| | ER-NSC-27 M-Apr-16 | Elk River | Muscle | 0.0035 | 0.757 | 13,100 | <0.007 | 909 | 0.187 | 0.0022 | 752 | 0.0096 | 7,750 | 0.0106 | 21.1 | <0.000047 | <0.00056 | 1.28 |
| | ER-NSC-28 M-Apr-16 | Elk River | Muscle | 0.0045 | 1.635 | 15,800 | 0.0075 | 1,110 | 0.294 | 0.0018 | 847 | 0.02495 | 9,050 | 0.00287 | 19.5 | 0.00005 | 0.0006 | 1.665 |
| | ER-NSC-29 M-Apr-16 | Elk River | Muscle | 0.0041 | 2.63 | 18,100 | <0.0074 | 1,120 | 0.185 | 0.0018 | 881 | 0.0126 | 8,850 | 0.00328 | 23.5 | <0.00005 | <0.00059 | 1.63 |
| | ER-NSC-38 M-Apr-16 | Elk River | Muscle | 0.0025 | 0.501 | 9,630 | <0.0069 | 579 | 0.234 | 0.0035 | 660 | 0.0054 | 5,810 | 0.00675 | 12.3 | <0.000046 | <0.00055 | 1.45 |
| | ER-NSC-09 O-Apr-16 | Elk River | Ovary | 0.00853 | 0.148 | 11,600 | 0.0181 | 929 | 1.39 | 0.141 | 2,640 | 0.0212 | 9,450 | 0.0187 | 18.6 | <0.000088 | 0.00083 | 3.1 |
| | ER-NSC-15 O-Apr-16 | Elk River | Ovary | 0.00669 | 0.108 | 9,350 | <0.0068 | 819 | 1.28 | 0.0911 | 1,930 | 0.0066 | 10,400 | 0.00192 | 14.5 | <0.000084 | 0.00037 | 3.01 |
| | ER-NSC-16 O-Apr-16 | Elk River | Ovary | 0.00624 | 0.0711 | 12,000 | <0.007 | 981 | 1.38 | 0.141 | 2,330 | 0.0146 | 10,300 | 0.00313 | 19.2 | <0.000086 | <0.00037 | 8.24 |
| | ER-NSC-17 O-Apr-16 | Elk River | Ovary | 0.00675 | 0.0503 | 14,000 | 0.0141 | 1,060 | 1.8 | 0.141 | 2,230 | 0.0247 | 11,100 | 0.00443 | 24.4 | <0.000077 | <0.00034 | 6.24 |
| | ER-NSC-19 O-Apr-16 | Elk River | Ovary | 0.00587 | 0.0292 | 9,130 | 0.0095 | 626 | 1.37 | 0.081 | 1,550 | 0.0222 | 7,650 | 0.0427 | 14.2 | <0.000077 | 0.00143 | 6.95 |
| | ER-NSC-21 O-Apr-16 | Elk River | Ovary | 0.00673 | 0.0756 | 8,410 | 0.011 | 785 | 3.41 | 0.0992 | 1,900 | 0.0276 | 8,630 | 0.0251 | 8.91 | <0.000084 | 0.00132 | 10.9 |
| | ER-NSC-27 O -Apr-16 | Elk River | Ovary | 0.00512 | 0.0387 | 10,085 | 0.0066 | 823 | 1.44 | 0.113 | 1,955 | 0.0158 | 8,345 | 0.02835 | 18.75 | 0.0000815 | 0.00103 | 7.615 |
| | ER-NSC-28 O-Apr-16 | Elk River | Ovary | 0.00538 | 0.0812 | 8,110 | 0.0084 | 666 | 0.674 | 0.0806 | 1,490 | 0.0084 | 10,100 | 0.003 | 11.7 | <0.000078 | 0.00053 | 5.54 |
| | ER-NSC-29 O-Apr-16 | Elk River | Ovary | 0.00573 | 0.114 | 8,650 | <0.0069 | 731 | 0.993 | 0.0887 | 1,700 | 0.0232 | 10,100 | 0.00161 | 14.4 | <0.000086 | 0.00043 | 3.59 |
| | ER-NSC-38 O-Apr-16 | Elk River | Ovary | 0.00604 | 0.0427 | 11,400 | 0.0149 | 967 | 1.15 | 0.138 | 2,320 | 0.0136 | 9,550 | 0.0178 | 17.9 | <0.000088 | 0.00074 | 9.86 |
| | GC-NSC-01 M-Apr-16 | Gold Creek | Muscle | 0.00634 | 1.245 | 18,800 | 0.00755 | 1,205 | 0.9415 | 0.001825 | 917 | 0.02125 | 11,175 | 0.006115 | 23.95 | 0.000099 | 0.000665 | 1.565 |
| | GC-NSC-05 M-Apr-16 | Gold Creek | Muscle | 0.00531 | 3.9 | 18,100 | <0.0067 | 1,160 | 0.279 | 0.00164 | 1,010 | 0.0177 | 9,290 | 0.00346 | 21.7 | <0.00011 | 0.00091 | 1.6 |
| | GC-NSC-06 M-Apr-16 | Gold Creek | Muscle | 0.00603 | 2.43 | 18,900 | <0.0066 | 1,170 | 0.276 | 0.00313 | 1,130 | 0.0169 | 9,590 | 0.00274 | 25.7 | <0.0001 | 0.00067 | 1.7 |
| | GC-NSC-08 M-Apr-16 | Gold Creek | Muscle | 0.00589 | 1.17 | 17,100 | 0.0075 | 1,180 | 0.46 | 0.00181 | 1,040 | 0.0085 | 9,530 | 0.0042 | 25.1 | <0.0001 | 0.00147 | 2.16 |
| | GC-NSC-12 M-Apr-16 | Gold Creek | Muscle | 0.00433 | 1.29 | 15,600 | <0.0066 | 1,050 | 0.367 | 0.00282 | 959 | 0.0115 | 9,010 | 0.0019 | 23.6 | <0.0001 | 0.00124 | 1.32 |
| | GC-NSC-13 M-Apr-16 | Gold Creek | Muscle | 0.0069 | 2.04 | 16,800 | 0.0121 | 1,220 | 0.78 | 0.00191 | 816 | 0.0214 | 12,800 | 0.00683 | 20.2 | <0.0001 | 0.00079 | 1.6 |
| | GC-NSC-14 M-Apr-16 | Gold Creek | Muscle | 0.00548 | 1.27 | 19,200 | 0.0075 | 1,270 | 0.685 | 0.00276 | 1,210 | 0.0118 | 10,600 | 0.00684 | 27.4 | <0.00011 | 0.00058 | 1.99 |
| | GC-NSC-16 M-Apr-16 | Gold Creek | Muscle | 0.00442 | 0.976 | 18,900 | <0.0066 | 1,100 | 0.405 | 0.00201 | 1,210 | 0.0166 | 10,300 | 0.00224 | 27 | <0.0001 | 0.00059 | 1.62 |
| | GC-NSC-17 M-Apr-16 | Gold Creek | Muscle | 0.00529 | 1.08 | 19,300 | <0.0067 | 1,180 | 0.628 | 0.00269 | 935 | 0.0242 | 9,400 | 0.0075 | 23.6 | <0.0001 | 0.00167 | 2.06 |
| | GC-NSC-24 M-Apr-16 | Gold Creek | Muscle | 0.00576 | 1.5 | 16,800 | <0.0063 | 1,120 | 0.37 | 0.158 | 876 | 0.0561 | 9,590 | 0.00166 | 21.6 | <0.000097 | 0.00093 | 1.43 |
| | GC-NSC-26 M -Apr-16 | Gold Creek | Muscle | 0.005345 | 1.55 | 15,850 | 0.0062 | 1,135 | 0.1945 | 0.001605 | 796 | 0.0084 | 8,795 | 0.001575 | 22.05 | 0.0000965 | 0.001395 | 1.52 |
| | GC-NSC-01 O-Apr-16 | Gold Creek | Ovary | 0.00776 | 0.0628 | 11,700 | <0.012 | 776 | 2.2 | 0.111 | 2,020 | 0.177 | 10,000 | 0.0329 | 19.1 | <0.00012 | 0.00231 | 12.9 |
| | GC-NSC-05 O-Apr-16 | Gold Creek | Ovary | 0.00551 | 0.228 | 9,210 | <0.012 | 745 | 0.979 | 0.0899 | 2,440 | 0.0132 | 10,200 | 0.00494 | 13.8 | <0.00012 | 0.00048 | 4.06 |
| | GC-NSC-06 O-Apr-16 | Gold Creek | Ovary | 0.00428 | 0.109 | 10,700 | <0.012 | 871 | 1.17 | 0.114 | 1,970 | 0.0229 | 9,530 | 0.00663 | 18.8 | <0.00012 | 0.00086 | 6.2 |
| | GC-NSC-08 O-Apr-16 | Gold Creek | Ovary | 0.00744 | 0.059 | 10,300 | <0.011 | 1,030 | 4.16 | 0.113 | 2,110 | 0.0095 | 9,670 | 0.00355 | 19.9 | <0.00011 | 0.00061 | 5.33 |
| | GC-NSC-12 O-Apr-16 | Gold Creek | Ovary | 0.00454 | 0.0688 | 8,750 | <0.011 | 904 | 1.25 | 0.11 | 1,890 | 0.0094 | 8,650 | 0.0054 | 16.8 | <0.00011 | 0.00086 | 3.89 |
| | GC-NSC-13 O -Apr-16 | Gold Creek | Ovary | 0.005365 | 0.06885 | 7,655 | 0.012 | 608 | 0.6395 | 0.0683 | 1,645 | 0.01235 | 10,300 | 0.006265 | 12 | 0.000115 | 0.00076 | 3.715 |
| | GC-NSC-14 O-Apr-16 | Gold Creek | Ovary | 0.00683 | 0.0658 | 11,600 | 0.014 | 1,010 | 4.39 | 0.148 | 2,460 | 0.0329 | 9,240 | 0.0157 | 22.5 | <0.00012 | 0.002 | 8.91 |
| | GC-NSC-16 O-Apr-16 | Gold Creek | Ovary | 0.00403 | 0.0268 | 9,270 | <0.012 | 513 | 0.685 | 0.0446 | 1,330 | 0.0227 | 8,020 | 0.00848 | 15.7 | <0.00012 | 0.00056 | 4.3 |
| | GC-NSC-17 O-Apr-16 | Gold Creek | Ovary | 0.00759 | 0.0623 | 13,000 | <0.012 | 832 | 2.64 | 0.101 | 1,760 | 0.0501 | 11,900 | 0.0218 | 20.2 | <0.00012 | 0.00166 | 8.96 |
| | GC-NSC-24 O-Apr-16 | Gold Creek | Ovary | 0.00431 | 0.0606 | 7,040 | <0.012 | 677 | 0.897 | 0.0779 | 1,570 | 0.0056 | 8,620 | 0.00163 | 11.6 | <0.00012 | <0.00045 | 3.81 |
| | GC-NSC-26 O-Apr-16 | Gold Creek | Ovary | 0.00489 | 0.0755 | 8,360 | <0.012 | 698 | 0.608 | 0.0727 | 1,690 | 0.0084 | 10,600 | 0.00117 | 14.6 | <0.00012 | 0.00046 | 3.76 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | SC-NSC-01A avg | Sand Creek | Muscle | 0.0066 | 1.23 | 18,250 | 0.013 | 1,270 | 0.848 | 0.0048 | 1,290 | 0.035 | 10,215 | 0.038 | 25.85 | 0.000046 | 0.0022 | 1.81 |
| | SC-NSC-02A | Sand Creek | Muscle | 0.0059 | 1.3 | 19100 | 0.011 | 1280 | 0.481 | 0.003 | 1810 | 0.0197 | 10800 | 0.0089 | 22.9 | <0.000048 | 0.0006 | 1.71 |
| | SC-NSC-03A | Sand Creek | Muscle | 0.0046 | 0.681 | 15400 | <0.0078 | 1050 | 0.484 | 0.0045 | 1160 | 0.0131 | 8830 | 0.0082 | 23.3 | <0.000044 | 0.00077 | 1.68 |
| | SC-NSC-04A | Sand Creek | Muscle | 0.0055 | 0.93 | 19100 | 0.009 | 1330 | 0.682 | 0.004 | 1120 | 0.0142 | 10800 | 0.0069 | 28.5 | <0.000045 | 0.00144 | 1.8 |
| | SC-NSC-05A | Sand Creek | Muscle | 0.004 | 0.816 | 13800 | <0.0083 | 906 | 0.388 | 0.0068 | 1290 | 0.0161 | 7900 | 0.0111 | 14.7 | <0.000046 | 0.00087 | 1.92 |
| | SC-NSC-06A | Sand Creek | Muscle | 0.0047 | 0.827 | 17700 | 0.0084 | 1260 | 0.572 | 0.0055 | 1490 | 0.019 | 9410 | 0.0131 | 17.7 | <0.000046 | 0.00076 | 2.31 |
| | SC-NSC-07A | Sand Creek | Muscle | 0.0056 | 1.46 | 19200 | <0.0084 | 1250 | 0.248 | 0.0019 | 1030 | 0.0274 | 9870 | 0.00927 | 24.4 | <0.000047 | 0.00098 | 1.81 |
| | SC-NSC-08A | Sand Creek | Muscle | 0.0065 | 1.12 | 17700 | 0.0104 | 1170 | 0.405 | 0.0048 | 1520 | 0.0246 | 9590 | 0.00746 | 19.2 | <0.000047 | 0.00085 | 2.35 |
| | SC-NSC-09A | Sand Creek | Muscle | 0.0045 | 1.29 | 18900 | <0.0084 | 1210 | 0.438 | 0.0033 | 1280 | 0.0177 | 10300 | 0.00963 | 24.5 | <0.000047 | 0.00089 | 1.77 |
| | SC-NSC-10A | Sand Creek | Muscle | 0.0049 | 0.833 | 17100 | 0.0148 | 1160 | 0.68 | 0.0045 | 1620 | 0.0225 | 9800 | 0.01 | 21.6 | <0.000045 | <0.00045 | 1.95 |
| | GC-NSC-01A avg | Gold Creek | Muscle | 0.00925 | 1.225 | 19,150 | 0.0211 | 1,230 | 0.6295 | 0.0051 | 1,285 | 0.0589 | 10,200 | 0.1333 | 23.1 | 0.000046 | 0.00525 | 2.305 |
| | GC-NSC-02A | Gold Creek | Muscle | 0.0047 | 1.55 | 18300 | <0.0086 | 1260 | 0.486 | 0.0015 | 1170 | 0.0111 | 10100 | 0.00326 | 24 | <0.000048 | <0.00047 | 1.23 |
| | GC-NSC-03A | Gold Creek | Muscle | 0.004 | 0.714 | 17500 | <0.0081 | 1110 | 0.451 | 0.0053 | 1200 | 0.0131 | 9410 | 0.00235 | 21.2 | <0.000045 | 0.00068 | 2.27 |
| | GC-NSC-04A | Gold Creek | Muscle | 0.005 | 1.65 | 21000 | 0.0095 | 1340 | 0.845 | 0.0013 | 1230 | 0.0161 | 11500 | 0.00521 | 29.5 | <0.000047 | 0.00086 | 1.84 |
| | GC-NSC-05A | Gold Creek | Muscle | 0.004 | 1.51 | 22200 | 0.0099 | 1400 | 1.36 | 0.0018 | 1450 | 0.021 | 11200 | 0.00385 | 22 | <0.000048 | 0.00061 | 2.6 |
| | GC-NSC-06A | Gold Creek | Muscle | 0.0043 | 1.02 | 15600 | 0.0085 | 959 | 0.315 | 0.0045 | 1230 | 0.016 | 8150 | 0.00199 | 20.6 | <0.000043 | 0.00068 | 1.71 |
| | GC-NSC-07A | Gold Creek | Muscle | 0.0052 | 1.47 | 19100 | 0.0099 | 1260 | 0.519 | 0.0025 | 1150 | 0.0112 | 10500 | 0.00368 | 24.8 | <0.000047 | 0.00064 | 2.75 |
| | GC-NSC-08A | Gold Creek | Muscle | 0.0054 | 1.83 | 19800 | <0.0086 | 1290 | 0.672 | 0.0019 | 1230 | 0.0161 | 10400 | 0.00422 | 18.3 | <0.000048 | 0.00057 | 2.2 |
| | GC-NSC-09A | Gold Creek | Muscle | 0.0057 | 1.71 | 20000 | 0.0102 | 1280 | 0.619 | 0.003 | 1640 | 0.0171 | 10400 | 0.00452 | 25.3 | <0.000048 | 0.0011 | 2.22 |
| | GC-NSC-10A | Gold Creek | Muscle | 0.0048 | 1.86 | 19600 | 0.0097 | 1240 | 1.28 | 0.0041 | 1180 | 0.0215 | 11200 | 0.00512 | 17.2 | <0.000046 | 0.0006 | 2.05 |
| | ER-NSC-01A avg | Elk River | Muscle | 0.0035 | 1.515 | 12,350 | 0.0084 | 733 | 0.176 | 0.00315 | 764 | 0.015 | 6,885 | 0.0175 | 16.05 | 0.0000465 | 0.001025 | 1.19 |
| | ER-NSC-02A avg | Elk River | Muscle | 0.00355 | 1.91 | 13,350 | 0.00705 | 880 | 0.181 | 0.002075 | 927 | 0.00855 | 7,535 | 0.0125 | 16.2 | 0.000048 | 0.000785 | 1.25 |
| | ER-NSC-03A | Elk River | Muscle | 0.004 | 2.05 | 13200 | 0.0106 | 741 | 0.276 | 0.0066 | 1110 | 0.0109 | 7050 | 0.0119 | 16.3 | <0.000046 | 0.00077 | 1.61 |
| | ER-NSC-04A avg | Elk River | Muscle | 0.0038 | 1.415 | 16,700 | 0.01035 | 1,024 | 0.174 | 0.0022 | 1,140 | 0.0193 | 9,160 | 0.009125 | 20.8 | 0.000046 | 0.00127 | 1.6 |
| | ER-NSC-05A | Elk River | Muscle | 0.0056 | 2.2 | 17600 | 0.0261 | 1120 | 0.844 | 0.0037 | 1220 | 0.0291 | 10000 | 0.0103 | 13.6 | <0.000047 | 0.00093 | 3.71 |
| | ER-NSC-06A | Elk River | Muscle | 0.0055 | 1.4 | 17900 | 0.0219 | 1210 | 0.638 | 0.004 | 1440 | 0.0191 | 10000 | 0.0111 | 17.2 | <0.000044 | 0.00077 | 5.39 |
| | ER-NSC-07A | Elk River | Muscle | 0.0064 | 0.574 | 18600 | 0.0278 | 1330 | 1.55 | 0.0053 | 1460 | 0.0268 | 11500 | 0.0149 | 10.9 | <0.000047 | 0.00086 | 4.85 |
| | ER-NSC-08A | Elk River | Muscle | 0.0049 | 1.67 | 13900 | 0.0097 | 851 | 0.239 | 0.0045 | 923 | 0.0156 | 7500 | 0.0186 | 18.2 | <0.000046 | 0.00066 | 1.49 |
| | ER-NSC-09A | Elk River | Muscle | 0.0033 | 1.96 | 12200 | 0.0087 | 792 | 0.159 | 0.0023 | 929 | 0.0169 | 7360 | 0.00517 | 15.2 | <0.000042 | 0.00078 | 1.83 |
| | ER-NSC-10A | Elk River | Muscle | 0.0052 | 1.72 | 16100 | 0.0169 | 1050 | 0.246 | 0.0022 | 1040 | 0.0247 | 9410 | 0.0196 | 21.9 | <0.000046 | 0.00169 | 1.67 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | EC-PM-01M-Feb-14 | Englishman Creek | Muscle | 0.0189 | 0.215 | 0.00186 | 0.38 | 0.0118 | 0.00044 | 0.0165 | 0.00317 | 22.4 | 0.0097 |
| | EC-PM-01G-Feb-14 | Englishman Creek | Ovary | 0.0426 | 0.298 | 0.00251 | 0.421 | 0.0333 | 0.0009 | 0.0333 | 0.00435 | 263 | 0.0161 |
| | SC-PM-05M-Feb-14 | Sand Creek | Muscle | 0.00512 | 0.859 | 0.000346 | 0.176 | 0.0162 | <0.00033 | 0.00646 | 0.00073 | 20.1 | 0.00397 |
| | SC-PM-10M-Feb-14 | Sand Creek | Muscle | 0.00974 | 0.313 | 0.000283 | 0.175 | 0.00949 | <0.00032 | 0.00452 | 0.00076 | 16.3 | 0.00849 |
| | SC-PM-01M-Apr-14 | Sand Creek | Muscle | 0.00894 | 1.89 | 0.00178 | 0.231 | 0.0100 | 0.00088 | 0.0136 | 0.00241 | 22.8 | 0.00875 |
| | SC-PM-02M-Apr-14 | Sand Creek | Muscle | 0.0146 | 0.475 | 0.00405 | 0.416 | 0.016 | 0.00095 | 0.0216 | 0.013 | 26.5 | 0.0309 |
| | SC-PM-03M-Apr-14 | Sand Creek | Muscle | 0.0039 | 0.22 | 0.00323 | 0.254 | 0.00801 | 0.00074 | 0.0191 | 0.00395 | 18.8 | 0.0214 |
| | SC-PM-04M-Apr-14 | Sand Creek | Muscle | 0.0061 | 1.21 | 0.00243 | 0.452 | 0.0154 | 0.00096 | 0.0184 | 0.00338 | 26.7 | 0.00805 |
| | SC-PM-05M-Apr-14 | Sand Creek | Muscle | 0.00370 | 0.725 | 0.00228 | 0.311 | 0.00952 | 0.00066 | 0.0185 | 0.00432 | 18.1 | 0.00748 |
| | SC-PM-06M-Apr-14 | Sand Creek | Muscle | 0.00328 | 0.231 | 0.00367 | 0.222 | 0.00998 | 0.00029 | 0.0132 | 0.00306 | 19.7 | 0.0151 |
| | SC-PM-07M-Apr-14 | Sand Creek | Muscle | 0.00465 | 0.941 | 0.0062 | 0.512 | 0.0132 | 0.00128 | 0.0364 | 0.00894 | 20.6 | 0.0114 |
| | SC-PM-08M-Apr-14 | Sand Creek | Muscle | 0.00343 | 0.849 | 0.000863 | 0.193 | 0.0272 | 0.00037 | 0.00803 | 0.00141 | 19.5 | 0.00315 |
| | SC-PM-09M-Apr-14 | Sand Creek | Muscle | 0.00807 | 0.36 | 0.00431 | 0.375 | 0.0156 | 0.00086 | 0.0246 | 0.00708 | 30.1 | 0.0298 |
| | SC-PM-10M-Apr-14 | Sand Creek | Muscle | 0.00141 | 0.249 | 0.000859 | 0.177 | 0.0282 | 0.00035 | 0.0133 | 0.00157 | 22 | 0.00532 |
| | SC-PM-01M-Aug-14 | Sand Creek | Muscle | 0.0182 | 0.951 | 0.000690 | 0.234 | 0.00506 | 0.00050 | 0.00973 | 0.00148 | 20.5 | 0.0178 |
| | SC-PM-02M-Aug-14 | Sand Creek | Muscle | 0.0266 | 0.378 | 0.00266 | 0.542 | 0.00713 | 0.00161 | 0.0267 | 0.00517 | 31.5 | 0.0212 |
| | SC-PM-03M-Aug-14 | Sand Creek | Muscle | 0.0249 | 0.609 | 0.00182 | 0.48 | 0.00313 | 0.00254 | 0.026 | 0.0044 | 27.9 | 0.0237 |
| | SC-PM-04M-Aug-14 | Sand Creek | Muscle | 0.00576 | 2.05 | 0.000248 | 0.122 | 0.00591 | 0.00172 | 0.00741 | 0.00062 | 24.4 | 0.0318 |
| | SC-PM-05M-Aug-14 | Sand Creek | Muscle | 0.018 | 0.169 | 0.00134 | 0.435 | 0.00189 | 0.001 | 0.0177 | 0.00295 | 25.2 | 0.0103 |
| | SC-PM-06M-Aug-14 | Sand Creek | Muscle | 0.00988 | 1.58 | 0.0006225 | 0.183 | 0.00698 | 0.00038 | 0.0102 | 0.00127 | 30.3 | 0.00423 |
| | SC-PM-07M-Aug-14 | Sand Creek | Muscle | 0.00708 | 0.338 | 0.000675 | 0.262 | 0.00382 | 0.00041 | 0.00953 | 0.00166 | 25.8 | 0.0073 |
| | SC-PM-08M-Aug-14 | Sand Creek | Muscle | 0.0114 | 1.59 | 0.00188 | 0.431 | 0.00374 | 0.00091 | 0.0192 | 0.00454 | 23.7 | 0.012 |
| | SC-PM-09M-Aug-14 | Sand Creek | Muscle | 0.00292 | 0.148 | 0.000261 | 0.144 | 0.00235 | <0.00022 | 0.00577 | 0.00054 | 16.5 | 0.00347 |
| | SC-PM-10M-Aug-14 | Sand Creek | Muscle | 0.0318 | 0.444 | 0.00213 | 0.454 | 0.00705 | 0.00074 | 0.0246 | 0.00445 | 59.7 | 0.0208 |
| | SC-PM-05G-Feb-14 | Sand Creek | Ovary | 0.0118 | 0.935 | 0.0144 | 2.43 | 0.0458 | 0.00454 | 0.12 | 0.0176 | 235 | 0.0186 |
| | SC-PM-10G-Feb-14 | Sand Creek | Ovary | 0.00711 | 0.327 | 0.000532 | 0.125 | 0.0216 | 0.00046 | 0.0212 | 0.00229 | 142 | 0.00271 |
| | SC-PM-01G-Apr-14 | Sand Creek | Ovary | 0.0179 | 0.434 | 0.00387 | 0.299 | 0.0225 | 0.00256 | 0.0529 | 0.0148 | 183 | 0.0256 |
| | SC-PM-10G-Apr-14 | Sand Creek | Ovary | 0.00401 | 0.561 | 0.00453 | 0.336 | 0.0886 | 0.00424 | 0.0761 | 0.0148 | 457 | 0.022 |
| | ER-PM-06M-Feb-14 | Elk River | Muscle | 0.0463 | 0.77 | 0.000871 | 0.283 | 0.0121 | 0.00047 | 0.0127 | 0.00265 | 24.5 | 0.0139 |
| | ER-PM-09M-Feb-14 | Elk River | Muscle | 0.0158 | 0.206 | 0.000998 | 0.252 | 0.00851 | 0.00043 | 0.00987 | 0.00194 | 18.9 | 0.0162 |
| | ER-PM-12M-Feb-14 | Elk River | Muscle | 0.0037 | 2.36 | 0.000375 | 0.162 | 0.0115 | 0.00082 | 0.0192 | 0.00076 | 34.7 | 0.00569 |
| | ER-PM-01M-Apr-14 | Elk River | Muscle | 0.0127 | 1.24 | 0.00532 | 0.391 | 0.0156 | 0.00100 | 0.0308 | 0.00691 | 28.4 | 0.0159 |
| | ER-PM-02M-Apr-14 | Elk River | Muscle | 0.00202 | 2.66 | 0.000498 | 0.167 | 0.0137 | 0.00095 | 0.0122 | 0.0011 | 21.2 | 0.00497 |
| | ER-PM-03M-Apr-14 | Elk River | Muscle | 0.00272 | 0.302 | 0.00224 | 0.32 | 0.00624 | 0.00069 | 0.0329 | 0.00607 | 18.3 | 0.0143 |
| | ER-PM-04M-Apr-14 | Elk River | Muscle | 0.0074 | 0.836 | 0.00745 | 0.61 | 0.0181 | 0.00203 | 0.0957 | 0.0165 | 33.2 | 0.0655 |
| | ER-PM-05M-Apr-14 | Elk River | Muscle | 0.00413 | 2.04 | 0.00184 | 0.246 | 0.0117 | 0.00091 | 0.0206 | 0.00389 | 27.6 | 0.00785 |
| | ER-PM-06M-Apr-14 | Elk River | Muscle | 0.00295 | 0.348 | 0.00152 | 0.221 | 0.0113 | 0.00049 | 0.0166 | 0.00378 | 15.8 | 0.0151 |
| | ER-PM-07M-Apr-14 | Elk River | Muscle | 0.00148 | 2.31 | 0.00175 | 0.291 | 0.0133 | 0.00078 | 0.0258 | 0.00245 | 20.9 | 0.00793 |
| | ER-PM-08M-Apr-14 | Elk River | Muscle | 0.00662 | 0.3 | 0.00312 | 0.313 | 0.00896 | 0.00075 | 0.0379 | 0.00522 | 16.8 | 0.0143 |
| | ER-PM-09M-Apr-14 | Elk River | Muscle | 0.00716 | 1.54 | 0.00627 | 0.57 | 0.00954 | 0.00185 | 0.0612 | 0.0132 | 19.9 | 0.0307 |
| | ER-PM-10M-Apr-14 | Elk River | Muscle | 0.00371 | 0.727 | 0.00352 | 0.338 | 0.012 | 0.00098 | 0.0256 | 0.00581 | 20.8 | 0.0106 |
| | ER-PM-11M-Apr-14 | Elk River | Muscle | 0.00304 | 0.242 | 0.00212 | 0.242 | 0.0184 | 0.00042 | 0.0176 | 0.00339 | 17.7 | 0.00823 |
| | ER-PM-12M-Apr-14 | Elk River | Muscle | 0.0045 | 0.331 | 0.00229 | 0.283 | 0.00774 | 0.00054 | 0.0221 | 0.00411 | 19.4 | 0.0152 |
| | ER-PM-13M-Apr-14 | Elk River | Muscle | 0.00176 | 1.01 | 0.00212 | 0.302 | 0.0093 | 0.00091 | 0.0247 | 0.00422 | 26 | 0.00856 |
| | ER-PM-14M-Apr-14 | Elk River | Muscle | 0.00208 | 0.204 | 0.00352 | 0.483 | 0.0209 | 0.00077 | 0.0357 | 0.00601 | 24.3 | 0.0118 |
| | ER-PM-01M-Aug-14 | Elk River | Muscle | 0.00155 | 2.12 | 0.000131 | 0.235 | 0.0125 | 0.00039 | 0.00562 | <0.00018 | 30.3 | 0.00615 |
| | ER-PM-02M-Aug-14 | Elk River | Muscle | 0.00408 | 0.643 | 0.0007605 | 0.161 | 0.0109 | 0.00019 | 0.00638 | 0.00142 | 24.4 | 0.00812 |

**Table G.7:** **Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | ER-PM-03M-Aug-14 | Elk River | Muscle | 0.00145 | 1.5 | 0.000194 | 0.152 | 0.00592 | 0.00031 | 0.00572 | 0.00051 | 29.2 | 0.00253 |
| | ER-PM-04M-Aug-14 | Elk River | Muscle | 0.00648 | 0.735 | 0.000808 | 0.284 | 0.00703 | 0.00033 | 0.0102 | 0.00195 | 24.7 | 0.00639 |
| | ER-PM-05M-Aug-14 | Elk River | Muscle | 0.00596 | 0.883 | 0.000242 | 0.148 | 0.00717 | 0.00045 | 0.0085 | 0.00067 | 22.4 | 0.00314 |
| | ER-PM-06M-Aug-14 | Elk River | Muscle | 0.00458 | 0.149 | 0.000447 | 0.189 | 0.00517 | 0.00027 | 0.00943 | 0.00058 | 16.0 | 0.00787 |
| | ER-PM-07M-Aug-14 | Elk River | Muscle | 0.00371 | 3.38 | 0.000135 | 0.152 | 0.00529 | 0.00152 | 0.0105 | 0.00195 | 25.9 | 0.00645 |
| | ER-PM-08M-Aug-14 | Elk River | Muscle | 0.0115 | 0.429 | 0.000249 | 0.171 | 0.00899 | 0.00038 | 0.00537 | 0.00066 | 19.9 | 0.00891 |
| | ER-PM-09M-Aug-14 | Elk River | Muscle | 0.00202 | 1.98 | 0.000104 | 0.104 | 0.00502 | 0.00069 | 0.0048 | 0.00029 | 20.2 | 0.00397 |
| | ER-PM-10M-Aug-14 | Elk River | Muscle | 0.00288 | 0.184 | 0.00101 | 0.122 | 0.00265 | 0.0002 | 0.00631 | 0.00035 | 19.9 | 0.0046 |
| | ER-PM-06G-Feb-14 | Elk River | Ovary | 0.00973 | 0.874 | 0.00133 | 0.258 | 0.0259 | 0.00165 | 0.0348 | 0.00604 | 187 | 0.00734 |
| | ER-PM-09G-Feb-14 | Elk River | Ovary | 0.0279 | 0.62 | 0.00243 | 0.371 | 0.0337 | 0.001 | 0.0309 | 0.00415 | 412 | 0.0167 |
| | ER-PM-12G-Feb-14 | Elk River | Ovary | 0.00217 | 1.15 | 0.000624 | 0.13 | 0.0136 | 0.00187 | 0.0649 | 0.00456 | 130 | 0.168 |
| | ER-PM-07G-Apr-14 | Elk River | Ovary | 0.00746 | 0.609 | 0.00942 | 0.787 | 0.0402 | 0.00264 | 0.113 | 0.0213 | 199 | 0.0299 |
| | ER-PM-11G-Apr-14 | Elk River | Ovary | 0.00243 | 0.424 | 0.00242 | 0.28 | 0.0342 | 0.0008 | 0.0328 | 0.00504 | 193 | 0.0131 |
| | ER-PM-14G-Apr-14 | Elk River | Ovary | 0.00328 | 1.29 | 0.00254 | 0.273 | 0.0592 | 0.00081 | 0.0449 | 0.00756 | 256 | 0.00875 |
| | GC-PM-23M-Feb-14 | Gold Creek | Muscle | 0.00878 | 0.215 | 0.000418 | 0.154 | 0.00754 | <0.00032 | 0.00608 | 0.00124 | 17.7 | 0.00467 |
| | GC-PM-28M-Feb-14 | Gold Creek | Muscle | 0.00924 | 0.241 | 0.00129 | 0.362 | 0.00717 | 0.00042 | 0.0168 | 0.00274 | 21.6 | 0.0103 |
| | GC-PM-29M-Feb-14 | Gold Creek | Muscle | 0.00352 | 0.709 | 0.000255 | 0.14 | 0.0147 | <0.00030 | 0.00528 | 0.00048 | 18.2 | 0.0179 |
| | GC-PM-31M-Feb-14 | Gold Creek | Muscle | 0.00315 | 3.65 | 0.000363 | 0.136 | 0.00979 | 0.00117 | 0.0147 | 0.00083 | 25 | 0.00355 |
| | GC-PM-01M-Apr-14 | Gold Creek | Muscle | 0.00479 | 1.38 | 0.00118 | 0.403 | 0.00967 | 0.00068 | 0.0115 | 0.00261 | 27.3 | 0.0114 |
| | GC-PM-02M-Apr-14 | Gold Creek | Muscle | 0.00497 | 0.354 | 0.00258 | 0.583 | 0.00558 | 0.00037 | 0.0204 | 0.00506 | 35.2 | 0.00927 |
| | GC-PM-03M-Apr-14 | Gold Creek | Muscle | 0.00183 | 2.65 | 0.000454 | 0.175 | 0.00802 | 0.00091 | 0.00646 | 0.00128 | 24.4 | 0.00281 |
| | GC-PM-04M-Apr-14 | Gold Creek | Muscle | 0.00325 | 0.261 | 0.00340 | 0.468 | 0.00798 | 0.00051 | 0.0237 | 0.00397 | 23.3 | 0.00857 |
| | GC-PM-05M-Apr-14 | Gold Creek | Muscle | 0.0039 | 3.82 | 0.00073 | 0.181 | 0.00824 | 0.00093 | 0.0116 | 0.00175 | 26.4 | 0.00477 |
| | GC-PM-06M-Apr-14 | Gold Creek | Muscle | 0.0045 | 0.202 | 0.00128 | 0.216 | 0.00376 | <0.00028 | 0.0148 | 0.00228 | 20.9 | 0.0804 |
| | GC-PM-07M-Apr-14 | Gold Creek | Muscle | 0.00242 | 0.196 | 0.0008175 | 0.215 | 0.0102 | <0.00033 | 0.0110 | 0.00116 | 17.0 | 0.00499 |
| | GC-PM-08M-Apr-14 | Gold Creek | Muscle | 0.00636 | 0.547 | 0.0105 | 0.758 | 0.0159 | 0.00151 | 0.0694 | 0.0145 | 20.4 | 0.0554 |
| | GC-PM-09M-Apr-14 | Gold Creek | Muscle | 0.00169 | 4.01 | 0.00207 | 0.244 | 0.00858 | 0.00269 | 0.024 | 0.00569 | 23.1 | 0.0169 |
| | GC-PM-10M-Apr-14 | Gold Creek | Muscle | 0.00168 | 0.199 | 0.00131 | 0.168 | 0.00418 | <0.00034 | 0.00763 | 0.00197 | 24.1 | 0.00827 |
| | GC-PM-11M-Apr-14 | Gold Creek | Muscle | 0.00436 | 0.682 | 0.00795 | 0.572 | 0.00637 | 0.00223 | 0.0467 | 0.0136 | 31.2 | 0.0216 |
| | GC-PM-12M-Apr-14 | Gold Creek | Muscle | 0.00183 | 0.229 | 0.000852 | 0.181 | 0.0117 | <0.00033 | 0.00988 | 0.00174 | 18.5 | 0.0122 |
| | GC-PM-13M-Apr-14 | Gold Creek | Muscle | 0.00541 | 0.442 | 0.0009 | 0.182 | 0.0107 | 0.00044 | 0.00969 | 0.00235 | 24.6 | 0.00722 |
| | GC-PM-01M-Aug-14 | Gold Creek | Muscle | 0.00849 | 0.353 | 0.000793 | 0.208 | 0.00263 | <0.00041 | 0.0089 | 0.00157 | 21.6 | 0.0146 |
| | GC-PM-02M-Aug-14 | Gold Creek | Muscle | 0.0196 | 2.95 | 0.0021 | 0.468 | 0.00474 | 0.00134 | 0.0248 | 0.00859 | 40.7 | 0.0357 |
| | GC-PM-03M-Aug-14 | Gold Creek | Muscle | 0.0209 | 0.923 | 0.0006435 | 0.257 | 0.00481 | 0.00054 | 0.0115 | 0.00187 | 22.9 | 0.0132 |
| | GC-PM-04M-Aug-14 | Gold Creek | Muscle | 0.0116 | 0.167 | 0.000727 | 0.186 | 0.00234 | <0.00040 | 0.00922 | 0.00095 | 18.6 | 0.0105 |
| | GC-PM-05M-Aug-14 | Gold Creek | Muscle | 0.011 | 0.515 | 0.000704 | 0.248 | 0.00308 | <0.00038 | 0.0102 | 0.00179 | 24.3 | 0.0109 |
| | GC-PM-06M-Aug-14 | Gold Creek | Muscle | 0.0156 | 0.255 | 0.000467 | 0.193 | 0.00605 | <0.00039 | 0.00882 | 0.0013 | 26.1 | 0.00835 |
| | GC-PM-07M-Aug-14 | Gold Creek | Muscle | 0.00238 | 0.595 | 0.0001 | 0.145 | 0.0037 | <0.00042 | 0.00434 | 0.00045 | 18.8 | 0.00301 |
| | GC-PM-08M-Aug-14 | Gold Creek | Muscle | 0.00448 | 0.629 | 0.000248 | 0.144 | 0.00184 | <0.00038 | 0.00558 | 0.00078 | 20.4 | 0.00572 |
| | GC-PM-09M-Aug-14 | Gold Creek | Muscle | 0.00804 | 0.198 | 0.000887 | 0.185 | 0.00391 | 0.00035 | 0.0103 | 0.0022 | 19.5 | 0.0105 |
| | GC-PM-10M-Aug-14 | Gold Creek | Muscle | 0.00172 | 0.256 | 0.000105 | 0.127 | 0.00284 | <0.00021 | 0.00372 | 0.00029 | 20.3 | 0.00405 |
| | GC-PM-23G-Feb-14 | Gold Creek | Ovary | 0.00982 | 0.246 | 0.00103 | 0.384 | 0.0187 | 0.00042 | 0.0285 | 0.0026 | 194 | 0.0109 |
| | GC-PM-28G-Feb-14 | Gold Creek | Ovary | 0.034 | 0.275 | 0.00261 | 0.557 | 0.0301 | 0.00095 | 0.0463 | 0.0068 | 502 | 0.022 |
| | GC-PM-29G-Feb-14 | Gold Creek | Ovary | 0.0064 | 0.186 | 0.00123 | 0.306 | 0.0268 | 0.00033 | 0.0255 | 0.00312 | 237 | 0.0111 |
| | GC-PM-31G-Feb-14 | Gold Creek | Ovary | 0.00556 | 0.78 | 0.000854 | 0.229 | 0.0147 | 0.00086 | 0.0429 | 0.00209 | 306 | 0.00461 |
| | GC-PM-10G-Apr-14 | Gold Creek | Ovary | 0.00947 | 0.279 | 0.00322 | 0.368 | 0.0104 | 0.00081 | 0.0561 | 0.00713 | 205 | 0.00962 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | SC-NSC-13-Apr-15 | Sand Creek | Muscle | 0.00141 | 1.67 | <0.00042 | 0.1076 | 0.0162 | 0.00041 | 0.00335 | 0.00031 | 19.3 | 0.0249 |
| | SC-NSC-23-Apr-15 | Sand Creek | Muscle | 0.00151 | 0.96 | 0.00044 | 0.0988 | 0.0129 | 0.00023 | 0.00194 | <0.00020 | 19.7 | 0.0475 |
| | SC-NSC-28-Apr-15 | Sand Creek | Muscle | 0.00073 | 1.19 | <0.00037 | 0.0838 | 0.0110 | 0.00040 | 0.00163 | 0.00024 | 23.2 | 0.0136 |
| | SC-NSC-33-Apr-15 | Sand Creek | Muscle | 0.00102 | 0.16 | <0.00039 | 0.0932 | 0.0111 | <0.00022 | 0.00274 | <0.00020 | 33.8 | 0.0184 |
| | SC-NSC-36-Apr-15 | Sand Creek | Muscle | 0.00132 | 1.69 | <0.00034 | 0.1070 | 0.0195 | 0.00036 | 0.00520 | 0.00047 | 20.7 | 0.0104 |
| | SC-NSC-37-Apr-15 | Sand Creek | Muscle | 0.00082 | 0.19 | <0.00039 | 0.0829 | 0.0186 | <0.00022 | 0.00341 | 0.00033 | 52.6 | 0.0120 |
| | SC-NSC-39-Apr-15 | Sand Creek | Muscle | 0.00098 | 1.04 | <0.00039 | 0.0824 | 0.0148 | 0.00031 | 0.00314 | 0.00033 | 18.5 | 0.0066 |
| | SC-NSC-44-Apr-15 | Sand Creek | Muscle | 0.00140 | 3.37 | 0.00043 | 0.1030 | 0.0153 | 0.00094 | 0.00855 | 0.00088 | 25.7 | 0.0069 |
| | SC-NSC-46-Apr-15 | Sand Creek | Muscle | 0.00099 | 0.40 | 0.00062 | 0.1445 | 0.0058 | 0.00030 | 0.00750 | 0.00116 | 17.4 | 0.0075 |
| | SC-NSC-47-Apr-15 | Sand Creek | Muscle | <0.00069 | 2.58 | <0.00039 | 0.0961 | 0.0153 | 0.00087 | 0.00596 | <0.00020 | 17.6 | 0.2270 |
| | SC-NSC-01-Aug-15 | Sand Creek | Muscle | 0.0461 | 0.155 | 0.000618 | 0.181 | 0.00559 | 0.000369 | 0.0128 | 0.00130 | 56.7 | 0.0287 |
| | SC-NSC-02-Aug-15 | Sand Creek | Muscle | 0.0206 | 1.17 | 0.000121 | 0.0970 | 0.00364 | 0.000411 | 0.00534 | 0.000530 | 24.6 | 0.0170 |
| | SC-NSC-03-Aug-15 | Sand Creek | Muscle | 0.0332 | 0.391 | 0.000211 | 0.146 | 0.00182 | 0.000110 | 0.00580 | 0.000570 | 48.7 | 0.0647 |
| | SC-NSC-04-Aug-15 | Sand Creek | Muscle | 0.0224 | 0.325 | 0.000174 | 0.105 | 0.00340 | 0.000249 | 0.00509 | 0.000480 | 38.0 | 0.0368 |
| | SC-NSC-05-Aug-15 | Sand Creek | Muscle | 0.0101 | 0.554 | 0.000398 | 0.111 | 0.00758 | 0.000242 | 0.00475 | 0.000470 | 35.3 | 0.0164 |
| | SC-NSC-06-Aug-15 | Sand Creek | Muscle | 0.0197 | 0.136 | 0.000494 | 0.124 | 0.00695 | 0.0000955 | 0.00535 | 0.000600 | 33.1 | 0.0146 |
| | SC-NSC-07-Aug-15 | Sand Creek | Muscle | 0.0172 | 0.186 | 0.000627 | 0.273 | 0.00683 | 0.000321 | 0.0863 | 0.00125 | 23.6 | 0.0414 |
| | SC-NSC-08-Aug-15 | Sand Creek | Muscle | 0.0377 | 0.432 | 0.000650 | 0.178 | 0.00433 | 0.000333 | 0.00678 | 0.00113 | 25.5 | 0.0275 |
| | SC-NSC-09-Aug-15 | Sand Creek | Muscle | 0.0304 | 0.169 | 0.000569 | 0.140 | 0.00532 | 0.000217 | 0.00584 | 0.00146 | 36.4 | 0.0222 |
| | SC-NSC-10-Aug-15 | Sand Creek | Muscle | 0.0155 | 0.712 | 0.00117 | 0.179 | 0.00458 | 0.000461 | 0.00943 | 0.00161 | 24.1 | 0.0155 |
| | SC-NSC-11-Aug-15 | Sand Creek | Muscle | 0.00182 | 0.314 | 0.000475 | 0.118 | 0.00711 | 0.000362 | 0.00340 | 0.000460 | 19.5 | 0.0104 |
| | SC-NSC-13-Apr-15 | Sand Creek | Ovary | 0.00190 | 0.351 | 0.000424 | 0.0710 | 0.0222 | 0.000394 | 0.0157 | 0.000930 | 150 | 0.00568 |
| | SC-NSC-33-Apr-15 | Sand Creek | Ovary | <0.0011 | 0.264 | 0.000272 | 0.0762 | 0.0247 | 0.000184 | 0.0107 | 0.000680 | 235 | 0.00585 |
| | SC-NSC-36-Apr-15 | Sand Creek | Ovary | 0.00290 | 0.167 | 0.00114 | 0.142 | 0.0305 | 0.00110 | 0.0163 | 0.00459 | 189 | 0.0110 |
| | SC-NSC-37-Apr-15 | Sand Creek | Ovary | 0.00110 | 0.350 | 0.000333 | 0.0813 | 0.0391 | 0.000436 | 0.0193 | 0.00140 | 214 | 0.00656 |
| | SC-NSC-39-Apr-15 | Sand Creek | Ovary | <0.0012 | 0.281 | 0.000195 | 0.0763 | 0.0443 | 0.000439 | 0.0197 | 0.000810 | 224 | 0.0667 |
| | SC-NSC-44-Apr-15 | Sand Creek | Ovary | 0.00180 | 0.326 | 0.00174 | 0.115 | 0.0289 | 0.00652 | 0.0671 | 0.0125 | 175 | 0.0287 |
| | SC-NSC-46-Apr-15 | Sand Creek | Ovary | 0.00150 | 0.357 | 0.0004905 | 0.113 | 0.0119 | 0.000627 | 0.0362 | 0.00275 | 155 | 0.00695 |
| | SC-NSC-47-Apr-15 | Sand Creek | Ovary | 0.00200 | 0.216 | 0.000912 | 0.140 | 0.0418 | 0.00110 | 0.0510 | 0.00498 | 271 | 0.0205 |
| | ER-NSC-06-Apr-15 | Elk River | Muscle | 0.00630 | 2.77 | 0.00147 | 0.2360 | 0.0112 | 0.00113 | 0.01630 | 0.00287 | 22.8 | 0.0091 |
| | ER-NSC-08-Apr-15 | Elk River | Muscle | 0.00350 | 0.18 | 0.00033 | 0.1200 | 0.0106 | 0.00022 | 0.00361 | 0.00081 | 31.2 | 0.0043 |
| | ER-NSC-13-Apr-15 | Elk River | Muscle | 0.00115 | 1.76 | 0.000123 | 0.0756 | 0.0142 | 0.00038 | 0.00737 | 0.00037 | 18.0 | 0.0037 |
| | ER-NSC-14-Apr-15 | Elk River | Muscle | 0.00260 | 0.88 | 0.000465 | 0.1420 | 0.0096 | 0.00039 | 0.00715 | 0.00101 | 35.9 | 0.0505 |
| | ER-NSC-17-Apr-15 | Elk River | Muscle | 0.00150 | 0.68 | 0.000998 | 0.1510 | 0.0093 | 0.00030 | 0.00909 | 0.00120 | 25.9 | 0.0306 |
| | ER-NSC-19-Apr-15 | Elk River | Muscle | 0.00200 | 0.40 | 0.00049 | 0.1180 | 0.0122 | 0.00025 | 0.00542 | 0.00081 | 24.6 | 0.0240 |
| | ER-NSC-25-Apr-15 | Elk River | Muscle | <0.0011 | 0.44 | 0.000122 | 0.0909 | 0.0083 | 0.00014 | 0.00286 | 0.00022 | 20.3 | 0.0119 |
| | ER-NSC-29-Apr-15 | Elk River | Muscle | <0.0012 | 0.59 | <0.000086 | 0.0890 | 0.0166 | 0.00013 | 0.00281 | 0.00028 | 20.9 | 0.0073 |
| | ER-NSC-43-Apr-15 | Elk River | Muscle | 0.00160 | 0.20 | 0.000763 | 0.1420 | 0.0289 | 0.00024 | 0.01330 | 0.00253 | 25.1 | 0.0106 |
| | ER-NSC-01-Aug-15 | Elk River | Muscle | 0.00720 | 0.842 | 0.000540 | 0.206 | 0.00713 | 0.000490 | 0.0108 | 0.000810 | 27.5 | 0.0126 |
| | ER-NSC-02-Aug-15 | Elk River | Muscle | 0.00236 | 0.201 | 0.000229 | 0.0940 | 0.00811 | <0.00030 | 0.00435 | 0.000370 | 52.6 | 0.00730 |
| | ER-NSC-03-Aug-15 | Elk River | Muscle | 0.00374 | 0.842 | 0.00464 | 0.428 | 0.0100 | 0.00276 | 0.0473 | 0.0187 | 37.7 | 0.0271 |
| | ER-NSC-04-Aug-15 | Elk River | Muscle | 0.00277 | 1.36 | <0.000084 | 0.105 | 0.00673 | 0.000445 | 0.00494 | 0.000490 | 27.9 | 0.0132 |
| | ER-NSC-05-Aug-15 | Elk River | Muscle | 0.00303 | 0.375 | 0.000351 | 0.146 | 0.00452 | 0.000299 | 0.00477 | 0.00102 | 27.8 | 0.0159 |
| | ER-NSC-06-Aug-15 | Elk River | Muscle | 0.00142 | 2.89 | <0.000094 | 0.105 | 0.0102 | 0.000504 | 0.00649 | 0.000480 | 33.7 | 0.00750 |
| | ER-NSC-07-Aug-15 | Elk River | Muscle | 0.00173 | 0.912 | 0.000127 | 0.0941 | 0.00845 | 0.000297 | 0.00591 | 0.000370 | 33.3 | 0.00655 |
| | ER-NSC-08-Aug-15 | Elk River | Muscle | 0.00190 | 1.46 | 0.000184 | 0.153 | 0.00630 | 0.000628 | 0.00971 | 0.000760 | 37.4 | 0.00789 |
| | ER-NSC-09-Aug-15 | Elk River | Muscle | 0.00200 | 0.759 | 0.000119 | 0.103 | 0.00724 | 0.000197 | 0.00662 | 0.000360 | 74.2 | 0.00621 |
| | ER-NSC-10-Aug-15 | Elk River | Muscle | 0.00472 | 0.497 | 0.000391 | 0.154 | 0.00645 | 0.000332 | 0.0105 | 0.00116 | 54.1 | 0.0220 |
| | ER-NSC-05-Apr-15 | Elk River | Ovary | 0.00488 | 0.0854 | 0.000714 | 0.0830 | 0.0126 | <0.00028 | 0.0102 | 0.00129 | 111 | 0.00680 |
| | ER-NSC-13-Apr-15 | Elk River | Ovary | 0.00250 | 0.239 | 0.000806 | 0.142 | 0.0310 | 0.000440 | 0.0378 | 0.00219 | 160 | 0.00610 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-NSC-25-Apr-15 | Elk River | Ovary | 0.00182 | 0.355 | 0.000535 | 0.119 | 0.0273 | 0.000690 | 0.0364 | 0.00196 | 198 | 0.00480 |
| | ER-NSC-43-Apr-15 | Elk River | Ovary | 0.00297 | 0.301 | 0.00203 | 0.192 | 0.0787 | 0.00131 | 0.0824 | 0.00562 | 216 | 0.0184 |
| | GC-NSC-02-Apr-15 | Gold Creek | Muscle | 0.00126 | 1.47 | 0.00077 | 0.1565 | 0.0082 | 0.00039 | 0.00955 | 0.00076 | 23.2 | 0.0144 |
| | GC-NSC-04-Apr-15 | Gold Creek | Muscle | 0.00070 | 1.79 | <0.00037 | 0.0997 | 0.0097 | 0.00040 | 0.00456 | <0.00019 | 23.9 | 0.0059 |
| | GC-NSC-10-Apr-15 | Gold Creek | Muscle | 0.00190 | 1.06 | <0.00039 | 0.1030 | 0.0085 | 0.00041 | 0.00586 | 0.00027 | 33.1 | 0.0113 |
| | GC-NSC-13-Apr-15 | Gold Creek | Muscle | 0.00093 | 0.32 | <0.00035 | 0.1400 | 0.0058 | 0.00023 | 0.00879 | 0.00044 | 49.5 | 0.0116 |
| | GC-NSC-20-Apr-15 | Gold Creek | Muscle | 0.00061 | 1.48 | <0.000044 | 0.0790 | 0.0126 | 0.00020 | 0.00277 | <0.00020 | 38.7 | 0.0070 |
| | GC-NSC-31-Apr-15 | Gold Creek | Muscle | <0.00060 | 1.02 | <0.000046 | 0.0790 | 0.0202 | 0.00025 | 0.00310 | <0.00021 | 21.5 | 0.0040 |
| | GC-NSC-33-Apr-15 | Gold Creek | Muscle | <0.00058 | 0.14 | 0.000056 | 0.0850 | 0.0081 | <0.00016 | 0.00207 | <0.00020 | 17.3 | 0.0037 |
| | GC-NSC-34-Apr-15 | Gold Creek | Muscle | 0.00122 | 0.22 | 0.000282 | 0.1060 | 0.0121 | <0.00015 | 0.00307 | 0.00047 | 26.9 | 0.0263 |
| | GC-NSC-37-Apr-15 | Gold Creek | Muscle | <0.00059 | 0.97 | 0.000061 | 0.0940 | 0.0146 | 0.00020 | 0.00263 | 0.00033 | 28.5 | 0.0043 |
| | GC-NSC-49-Apr-15 | Gold Creek | Muscle | 0.00075 | 0.27 | 0.000459 | 0.1050 | 0.0254 | <0.00015 | 0.00485 | 0.00066 | 19.1 | 0.0056 |
| | GC-NSC-01-Aug-15 | Gold Creek | Muscle | 0.00454 | 0.349 | <0.000091 | 0.0900 | 0.00566 | 0.000178 | 0.00330 | 0.000270 | 37.8 | 0.0240 |
| | GC-NSC-02-Aug-15 | Gold Creek | Muscle | 0.00258 | 0.211 | 0.000579 | 0.102 | 0.00391 | 0.000373 | 0.0152 | 0.000220 | 30.2 | 0.00647 |
| | GC-NSC-03-Aug-15 | Gold Creek | Muscle | 0.00779 | 0.492 | 0.000211 | 0.117 | 0.00437 | 0.000198 | 0.00640 | 0.000350 | 55.5 | 0.00609 |
| | GC-NSC-04-Aug-15 | Gold Creek | Muscle | 0.00584 | 1.72 | <0.000091 | 0.138 | 0.00335 | 0.000471 | 0.0114 | 0.000570 | 43.4 | 0.0416 |
| | GC-NSC-05-Aug-15 | Gold Creek | Muscle | 0.00326 | 3.07 | 0.000707 | 0.184 | 0.00350 | 0.000745 | 0.0112 | 0.00177 | 38.4 | 0.0604 |
| | GC-NSC-06-Aug-15 | Gold Creek | Muscle | 0.00159 | 2.29 | <0.000093 | 0.0988 | 0.00176 | 0.000404 | 0.00580 | 0.000970 | 23.8 | 0.0577 |
| | GC-NSC-07-Aug-15 | Gold Creek | Muscle | 0.00238 | 0.845 | <0.000088 | 0.100 | 0.00367 | 0.000255 | 0.00537 | 0.000470 | 46.2 | 0.0211 |
| | GC-NSC-08-Aug-15 | Gold Creek | Muscle | 0.00144 | 1.27 | 0.0000880 | 0.0981 | 0.00403 | 0.000286 | 0.00549 | 0.000270 | 49.7 | 0.0127 |
| | GC-NSC-09-Aug-15 | Gold Creek | Muscle | 0.00155 | 0.814 | 0.000932 | 0.153 | 0.00328 | 0.000629 | 0.00723 | 0.00256 | 73.5 | 0.0291 |
| | GC-NSC-10-Aug-15 | Gold Creek | Muscle | 0.000670 | 0.174 | 0.000271 | 0.111 | 0.00324 | 0.000137 | 0.00365 | 0.000730 | 39.0 | 0.0126 |
| | GC-NSC-13-Apr-15 | Gold Creek | Ovary | 0.00404 | 0.337 | 0.000758 | 0.128 | 0.0104 | 0.00097 | 0.0688 | 0.00273 | 196 | 0.00682 |
| | GC-NSC-31-Apr-15 | Gold Creek | Ovary | 0.00397 | 0.444 | 0.000708 | 0.0943 | 0.0374 | 0.000429 | 0.0118 | 0.00177 | 272 | 0.00676 |
| | GC-NSC-33-Apr-15 | Gold Creek | Ovary | 0.00273 | 0.379 | 0.00315 | 0.193 | 0.0253 | 0.000713 | 0.0225 | 0.00611 | 276 | 0.0108 |
| | GC-NSC-34-Apr-15 | Gold Creek | Ovary | 0.00358 | 0.178 | 0.00215 | 0.245 | 0.0241 | 0.000588 | 0.0174 | 0.00392 | 340 | 0.0137 |
| | GC-NSC-49-Apr-15 | Gold Creek | Ovary | <0.00063 | 0.301 | 0.000299 | 0.0866 | 0.0557 | 0.000257 | 0.0180 | 0.00223 | 134 | 0.00436 |
| 2016 | SC-NSC-03 O-Apr-16 | Sand Creek | Ovary | 0.00159 | 0.295 | 0.000231 | 0.0662 | 0.0257 | 0.00042 | 0.0122 | 0.00206 | 146 | 0.00227 |
| | SC-NSC-09 O-Apr-16 | Sand Creek | Ovary | 0.001645 | 0.2875 | 0.001635 | 0.157 | 0.0219 | 0.004205 | 0.06225 | 0.009435 | 177.5 | 0.008555 |
| | SC-NSC-21 O-Apr-16 | Sand Creek | Ovary | 0.00163 | 0.169 | 0.00108 | 0.067 | 0.0197 | 0.00033 | 0.0135 | 0.00189 | 128 | 0.0119 |
| | SC-NSC-25 O-Apr-16 | Sand Creek | Ovary | 0.00062 | 0.408 | 0.000566 | 0.058 | 0.0106 | 0.00619 | 0.0102 | 0.00281 | 137 | 0.00501 |
| | SC-NSC-29 O-Apr-16 | Sand Creek | Ovary | 0.00441 | 0.266 | 0.00217 | 0.196 | 0.0202 | 0.00086 | 0.0246 | 0.00608 | 116 | 0.0222 |
| | SC-NSC-32 O-Apr-16 | Sand Creek | Ovary | 0.0009 | 0.325 | 0.000141 | 0.079 | 0.0154 | 0.00092 | 0.0162 | 0.00208 | 141 | 0.00687 |
| | SC-NSC-33 O-Apr-16 | Sand Creek | Ovary | 0.00073 | 0.248 | 0.000327 | 0.061 | 0.00904 | 0.00166 | 0.0381 | 0.00218 | 158 | 0.00446 |
| | SC-NSC-34 O-Apr-16 | Sand Creek | Ovary | 0.00215 | 0.597 | 0.0067 | 0.223 | 0.0199 | 0.00139 | 0.0342 | 0.0219 | 139 | 0.0392 |
| | SC-NSC-35 O-Apr-16 | Sand Creek | Ovary | <0.00059 | 0.332 | 0.000645 | 0.109 | 0.018 | 0.00042 | 0.0208 | 0.00151 | 126 | 0.0144 |
| | SC-NSC-36 O-Apr-16 | Sand Creek | Ovary | 0.00199 | 0.342 | 0.00225 | 0.161 | 0.0195 | 0.00053 | 0.0253 | 0.00477 | 95.1 | 0.0201 |
| | SC-NSC-03 M-Apr-16 | Sand Creek | Muscle | 0.00096 | 0.133 | 0.00016 | 0.1 | 0.0136 | <0.00019 | 0.0038 | 0.00031 | 16.5 | 0.00526 |
| | SC-NSC-09 M-Apr-16 | Sand Creek | Muscle | <0.00065 | 2.77 | <0.00013 | 0.106 | 0.0131 | 0.00114 | 0.00789 | 0.0005 | 22.3 | 0.00206 |
| | SC-NSC-21 M-Apr-16 | Sand Creek | Muscle | <0.00066 | 0.692 | 0.00013 | 0.115 | 0.0138 | 0.00023 | 0.00219 | 0.00029 | 17.5 | 0.00319 |
| | SC-NSC-25 M-Apr-16 | Sand Creek | Muscle | 0.00061 | 1.56 | 0.00012 | 0.0775 | 0.01014 | 0.00069 | 0.002285 | <0.00012 | 16.55 | 0.00264 |
| | SC-NSC-29 M-Apr-16 | Sand Creek | Muscle | 0.00098 | 1.5 | <0.00013 | 0.089 | 0.0185 | 0.00021 | 0.00333 | 0.00022 | 14.2 | 0.00508 |
| | SC-NSC-32 M-Apr-16 | Sand Creek | Muscle | <0.00067 | 0.245 | 0.0006 | 0.142 | 0.0114 | 0.0002 | 0.00246 | 0.00052 | 15.8 | 0.00635 |
| | SC-NSC-33 M-Apr-16 | Sand Creek | Muscle | 0.00117 | 0.23 | 0.0244 | 0.191 | 0.00784 | 0.00039 | 0.0106 | 0.00334 | 13.8 | 0.0514 |
| | SC-NSC-34 M-Apr-16 | Sand Creek | Muscle | 0.00074 | 1.083 | 0.001085 | 0.136 | 0.01001 | 0.00037 | 0.006845 | 0.00164 | 13.7 | 0.00902 |
| | SC-NSC-35 M-Apr-16 | Sand Creek | Muscle | 0.00091 | 0.231 | 0.00061 | 0.141 | 0.013 | <0.0002 | 0.00481 | 0.00091 | 14.1 | 0.0198 |
| | SC-NSC-36 M-Apr-16 | Sand Creek | Muscle | <0.00058 | 5.12 | 0.00037 | 0.109 | 0.0212 | 0.00114 | 0.011 | 0.00097 | 19.8 | 0.0108 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-NSC-09 M-Apr-16 | Elk River | Muscle | 0.0738 | 0.192 | 0.00139 | 0.135 | 0.00928 | 0.00028 | 0.0105 | 0.0019 | 19.9 | 0.021 |
| | ER-NSC-15 M-Apr-16 | Elk River | Muscle | <0.0009 | 0.302 | 0.000551 | 0.096 | 0.00766 | <0.00022 | 0.00344 | 0.00048 | 13.6 | 0.0065 |
| | ER-NSC-16 M-Apr-16 | Elk River | Muscle | 0.00201 | 0.225 | 0.00216 | 0.157 | 0.00956 | <0.00022 | 0.00692 | 0.00111 | 16.4 | 0.0101 |
| | ER-NSC-17 M-Apr-16 | Elk River | Muscle | <0.00089 | 0.91 | 0.000133 | 0.085 | 0.0225 | <0.00022 | 0.00471 | 0.00039 | 19.3 | 0.0057 |
| | ER-NSC-19 M-Apr-16 | Elk River | Muscle | 0.00148 | 2.95 | 0.000258 | 0.088 | 0.0159 | 0.00072 | 0.00687 | 0.0004 | 18.9 | 0.0029 |
| | ER-NSC-21 M-Apr-16 | Elk River | Muscle | 0.0023 | 0.976 | 0.000916 | 0.213 | 0.0128 | 0.00071 | 0.0212 | 0.00269 | 17.2 | 0.01 |
| | ER-NSC-27 M-Apr-16 | Elk River | Muscle | 0.00237 | 0.137 | 0.000074 | 0.083 | 0.0178 | <0.00021 | 0.00236 | 0.00027 | 12.4 | 0.0061 |
| | ER-NSC-28 M-Apr-16 | Elk River | Muscle | 0.000895 | 1.1975 | 0.000229 | 0.108 | 0.00764 | 0.000305 | 0.00399 | 0.000365 | 13.4 | 0.0035 |
| | ER-NSC-29 M-Apr-16 | Elk River | Muscle | 0.00111 | 0.189 | 0.000162 | 0.077 | 0.0108 | <0.00022 | 0.00447 | 0.00037 | 15.2 | 0.0035 |
| | ER-NSC-38 M-Apr-16 | Elk River | Muscle | 0.00106 | 0.101 | <0.000068 | 0.062 | 0.017 | <0.0002 | 0.00293 | 0.00023 | 15.8 | 0.0038 |
| | ER-NSC-09 O-Apr-16 | Elk River | Ovary | 0.00457 | 0.335 | 0.000897 | 0.154 | 0.0171 | 0.00164 | 0.068 | 0.00401 | 147 | 0.00837 |
| | ER-NSC-15 O-Apr-16 | Elk River | Ovary | <0.00062 | 0.259 | 0.000277 | 0.0646 | 0.0114 | 0.00147 | 0.0345 | 0.00165 | 142 | 0.00378 |
| | ER-NSC-16 O-Apr-16 | Elk River | Ovary | 0.00082 | 0.333 | 0.000313 | 0.106 | 0.023 | 0.00033 | 0.0229 | 0.00216 | 162 | 0.00427 |
| | ER-NSC-17 O-Apr-16 | Elk River | Ovary | 0.00137 | 0.307 | 0.000319 | 0.0822 | 0.0516 | 0.00121 | 0.0304 | 0.00307 | 191 | 0.00288 |
| | ER-NSC-19 O-Apr-16 | Elk River | Ovary | 0.00634 | 0.426 | 0.00104 | 0.0886 | 0.0223 | 0.0011 | 0.0372 | 0.00295 | 144 | 0.00822 |
| | ER-NSC-21 O-Apr-16 | Elk River | Ovary | 0.00406 | 0.316 | 0.000832 | 0.15 | 0.012 | 0.00155 | 0.0941 | 0.00314 | 120 | 0.00694 |
| | ER-NSC-27 O -Apr-16 | Elk River | Ovary | 0.00129 | 0.5495 | 0.000283 | 0.0875 | 0.02165 | 0.000555 | 0.0158 | 0.001715 | 126.5 | 0.01125 |
| | ER-NSC-28 O-Apr-16 | Elk River | Ovary | 0.00074 | 0.255 | 0.000267 | 0.0737 | 0.00778 | 0.00097 | 0.022 | 0.00137 | 134 | 0.002 |
| | ER-NSC-29 O-Apr-16 | Elk River | Ovary | <0.00063 | 0.222 | 0.000112 | 0.057 | 0.0129 | 0.00104 | 0.0292 | 0.00103 | 151 | 0.00184 |
| | ER-NSC-38 O-Apr-16 | Elk River | Ovary | 0.00091 | 0.346 | 0.000184 | 0.0809 | 0.0271 | 0.00049 | 0.0191 | 0.00153 | 132 | 0.00451 |
| | GC-NSC-01 M-Apr-16 | Gold Creek | Muscle | 0.00091 | 2.422 | 0.0001285 | 0.09805 | 0.0117 | 0.00098 | 0.006865 | 0.00044 | 19.45 | 0.00406 |
| | GC-NSC-05 M-Apr-16 | Gold Creek | Muscle | 0.00146 | 0.164 | 0.000332 | 0.122 | 0.00784 | <0.00063 | 0.00391 | 0.00051 | 15.6 | 0.0106 |
| | GC-NSC-06 M-Apr-16 | Gold Creek | Muscle | 0.00173 | 0.24 | 0.000078 | 0.0766 | 0.00516 | <0.00061 | 0.00381 | 0.00019 | 14.4 | 0.006 |
| | GC-NSC-08 M-Apr-16 | Gold Creek | Muscle | 0.0008 | 1.14 | 0.000607 | 0.134 | 0.00635 | <0.00061 | 0.0076 | 0.00287 | 14.4 | 0.00609 |
| | GC-NSC-12 M-Apr-16 | Gold Creek | Muscle | 0.00075 | 0.604 | 0.000131 | 0.0624 | 0.0146 | <0.00061 | 0.00701 | 0.00052 | 20.8 | 0.00415 |
| | GC-NSC-13 M-Apr-16 | Gold Creek | Muscle | 0.00078 | 6.46 | <0.000062 | 0.0639 | 0.0117 | 0.00148 | 0.0184 | 0.00026 | 22 | 0.00621 |
| | GC-NSC-14 M-Apr-16 | Gold Creek | Muscle | 0.002 | 1.4 | 0.000314 | 0.122 | 0.0172 | <0.00063 | 0.00681 | 0.00092 | 17.6 | 0.00544 |
| | GC-NSC-16 M-Apr-16 | Gold Creek | Muscle | 0.00099 | 1.36 | <0.000064 | 0.0763 | 0.0119 | <0.00062 | 0.00276 | <0.00019 | 16.1 | 0.00221 |
| | GC-NSC-17 M-Apr-16 | Gold Creek | Muscle | 0.00126 | 0.395 | 0.000257 | 0.088 | 0.00776 | <0.00063 | 0.00527 | 0.00039 | 16.3 | 0.0142 |
| | GC-NSC-24 M-Apr-16 | Gold Creek | Muscle | 0.00224 | 0.871 | 0.000125 | 0.106 | 0.00943 | <0.00058 | 0.0385 | 0.00024 | 13.9 | 0.00258 |
| | GC-NSC-26 M -Apr-16 | Gold Creek | Muscle | 0.000705 | 0.2555 | 0.000707 | 0.0943 | 0.0151 | 0.000575 | 0.002875 | 0.0004 | 14.5 | 0.007855 |
| | GC-NSC-01 O-Apr-16 | Gold Creek | Ovary | 0.0045 | 0.347 | 0.00158 | 0.216 | 0.0197 | 0.00067 | 0.0332 | 0.00519 | 189 | 0.0136 |
| | GC-NSC-05 O-Apr-16 | Gold Creek | Ovary | 0.00114 | 0.227 | 0.000175 | 0.078 | 0.00945 | 0.00172 | 0.0505 | 0.00127 | 130 | 0.0145 |
| | GC-NSC-06 O-Apr-16 | Gold Creek | Ovary | 0.00193 | 0.28 | 0.000432 | 0.128 | 0.013 | <0.00035 | 0.0401 | 0.00119 | 169 | 0.00713 |
| | GC-NSC-08 O-Apr-16 | Gold Creek | Ovary | 0.00069 | 0.264 | 0.00351 | 0.122 | 0.0108 | 0.00054 | 0.0372 | 0.00235 | 122 | 0.00416 |
| | GC-NSC-12 O-Apr-16 | Gold Creek | Ovary | 0.00099 | 0.253 | 0.000559 | 0.096 | 0.021 | 0.00066 | 0.0396 | 0.00219 | 120 | 0.0045 |
| | GC-NSC-13 O -Apr-16 | Gold Creek | Ovary | 0.001355 | 0.2185 | 0.0005395 | 0.0885 | 0.007745 | 0.002585 | 0.04795 | 0.002295 | 155 | 0.005475 |
| | GC-NSC-14 O-Apr-16 | Gold Creek | Ovary | 0.00588 | 0.36 | 0.0048 | 0.202 | 0.0275 | 0.00163 | 0.0279 | 0.0053 | 130 | 0.0108 |
| | GC-NSC-16 O-Apr-16 | Gold Creek | Ovary | 0.00333 | 0.271 | 0.000756 | 0.065 | 0.0197 | 0.00037 | 0.0137 | 0.00162 | 194 | 0.00489 |
| | GC-NSC-17 O-Apr-16 | Gold Creek | Ovary | 0.00431 | 0.249 | 0.00178 | 0.234 | 0.0241 | 0.00084 | 0.0667 | 0.00473 | 273 | 0.0642 |
| | GC-NSC-24 O-Apr-16 | Gold Creek | Ovary | <0.00065 | 0.179 | 0.000146 | 0.054 | 0.00911 | 0.00039 | 0.0135 | 0.00119 | 111 | 0.00237 |
| | GC-NSC-26 O-Apr-16 | Gold Creek | Ovary | <0.00063 | 0.205 | 0.000301 | 0.063 | 0.0164 | 0.00082 | 0.0202 | 0.00088 | 166 | 0.00236 |

**Table G.7: Metal Concentrations (µg/g Dry Weight) in Northern Pikeminnow Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | SC-NSC-01A avg | Sand Creek | Muscle | 0.0072 | 1.67 | 0.00077 | 0.35 | 0.0052 | 0.0011 | 0.019 | 0.00042 | 28.85 | 0.027 |
| | SC-NSC-02A | Sand Creek | Muscle | 0.0023 | 1.72 | 0.00023 | 0.121 | 0.00587 | 0.000435 | 0.0063 | 0.00051 | 24.5 | 0.0108 |
| | SC-NSC-03A | Sand Creek | Muscle | 0.0019 | 0.472 | 0.00014 | 0.104 | 0.00777 | 0.000291 | 0.00492 | 0.0005 | 21.3 | 0.0106 |
| | SC-NSC-04A | Sand Creek | Muscle | 0.00077 | 1.52 | <0.00011 | 0.091 | 0.00412 | 0.00054 | 0.00275 | <0.00036 | 16.9 | 0.00483 |
| | SC-NSC-05A | Sand Creek | Muscle | 0.0018 | 0.276 | 0.00043 | 0.106 | 0.00796 | 0.000387 | 0.00701 | 0.00042 | 34.4 | 0.0128 |
| | SC-NSC-06A | Sand Creek | Muscle | 0.0027 | 0.495 | 0.00028 | 0.181 | 0.00557 | 0.000432 | 0.00781 | 0.00124 | 27.1 | 0.0122 |
| | SC-NSC-07A | Sand Creek | Muscle | 0.0013 | 0.252 | 0.00023 | 0.126 | 0.00818 | 0.000284 | 0.00443 | 0.00058 | 17.6 | 0.0229 |
| | SC-NSC-08A | Sand Creek | Muscle | 0.0021 | 0.204 | 0.00049 | 0.142 | 0.00722 | 0.000518 | 0.00637 | 0.00132 | 19.4 | 0.0104 |
| | SC-NSC-09A | Sand Creek | Muscle | 0.0029 | 1.16 | 0.00031 | 0.15 | 0.00741 | 0.000518 | 0.0054 | 0.00066 | 16.9 | 0.00572 |
| | SC-NSC-10A | Sand Creek | Muscle | 0.011 | 1.71 | 0.00048 | 0.183 | 0.00396 | 0.000617 | 0.00799 | 0.00089 | 26.3 | 0.00963 |
| | GC-NSC-01A avg | Gold Creek | Muscle | 0.022 | 0.8415 | 0.004915 | 0.496 | 0.003015 | 0.002075 | 0.0199 | 0.00134 | 25.7 | 0.0476 |
| | GC-NSC-02A | Gold Creek | Muscle | 0.00086 | 1.05 | 0.00016 | 0.091 | 0.00314 | 0.000407 | 0.00392 | <0.00038 | 16.3 | 0.00249 |
| | GC-NSC-03A | Gold Creek | Muscle | 0.00105 | 0.315 | <0.00011 | 0.072 | 0.00606 | 0.000169 | 0.00395 | <0.00036 | 26.7 | 0.00232 |
| | GC-NSC-04A | Gold Creek | Muscle | 0.00091 | 1.54 | 0.00013 | 0.094 | 0.00353 | 0.000548 | 0.00511 | <0.00037 | 18.9 | 0.00271 |
| | GC-NSC-05A | Gold Creek | Muscle | 0.00099 | 1.91 | <0.00012 | 0.1 | 0.00295 | 0.000572 | 0.00459 | <0.00038 | 21.8 | 0.00276 |
| | GC-NSC-06A | Gold Creek | Muscle | 0.00078 | 0.216 | <0.00011 | 0.083 | 0.00353 | 0.000109 | 0.00244 | <0.00034 | 23.6 | 0.00225 |
| | GC-NSC-07A | Gold Creek | Muscle | 0.00092 | 0.858 | 0.00041 | 0.119 | 0.00302 | 0.00024 | 0.00388 | 0.00078 | 21.6 | 0.0271 |
| | GC-NSC-08A | Gold Creek | Muscle | 0.00086 | 0.583 | 0.0002 | 0.098 | 0.00229 | 0.000297 | 0.0047 | <0.00038 | 22.3 | 0.0132 |
| | GC-NSC-09A | Gold Creek | Muscle | 0.00133 | 1.34 | 0.00014 | 0.125 | 0.00228 | 0.000443 | 0.0055 | <0.00038 | 20.6 | 0.00894 |
| | GC-NSC-10A | Gold Creek | Muscle | 0.00114 | 2.2 | <0.00012 | 0.13 | 0.00476 | 0.000727 | 0.00713 | 0.00071 | 32 | 0.00815 |
| | ER-NSC-01A avg | Elk River | Muscle | 0.00239 | 0.1675 | 0.000415 | 0.1 | 0.01001 | 0.000359 | 0.004495 | 0.00134 | 14.1 | 0.007455 |
| | ER-NSC-02A avg | Elk River | Muscle | 0.001585 | 0.285 | 0.000151 | 0.0845 | 0.00694 | 0.000198 | 0.005055 | 0.00134 | 14.35 | 0.00995 |
| | ER-NSC-03A | Elk River | Muscle | 0.00163 | 0.177 | 0.00019 | 0.118 | 0.00594 | 0.000336 | 0.00774 | 0.0005 | 20.3 | 0.00687 |
| | ER-NSC-04A avg | Elk River | Muscle | 0.001355 | 0.443 | 0.000165 | 0.12 | 0.00914 | 0.0002285 | 0.00581 | 0.00134 | 15.5 | 0.00457 |
| | ER-NSC-05A | Elk River | Muscle | 0.00302 | 1.07 | 0.00018 | 0.088 | 0.00322 | 0.00069 | 0.0134 | <0.00037 | 25.5 | 0.00555 |
| | ER-NSC-06A | Elk River | Muscle | 0.0032 | 0.969 | 0.00023 | 0.184 | 0.00515 | 0.000523 | 0.00736 | 0.0006 | 27.7 | 0.00442 |
| | ER-NSC-07A | Elk River | Muscle | 0.00331 | 3.14 | 0.00036 | 0.226 | 0.00305 | 0.00143 | 0.0204 | 0.00127 | 30.2 | 0.00654 |
| | ER-NSC-08A | Elk River | Muscle | 0.00398 | 0.381 | 0.00056 | 0.19 | 0.00599 | 0.000388 | 0.00776 | 0.00121 | 15.2 | 0.01 |
| | ER-NSC-09A | Elk River | Muscle | 0.00183 | 0.106 | 0.00054 | 0.107 | 0.00808 | 0.000187 | 0.00478 | 0.00042 | 13.9 | 0.00415 |
| | ER-NSC-10A | Elk River | Muscle | 0.00302 | 1.79 | 0.00056 | 0.166 | 0.00839 | 0.000789 | 0.00801 | 0.00108 | 18.1 | 0.00901 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag | Al | As | B | Ba | Be | Bi | Ca | Cd | Co | Cr | Cs | Cu | Fe |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw | µg/g dw |
| 2014 | SC-PC-02M-Apr-14 | Sand Creek | Muscle | 79.2 | <0.00065 | 16.3 | 0.13 | 0.128 | 1.84 | <0.0026 | 0.00698 | 4,540 | 0.0068 | 0.0167 | 0.159 | 0.0611 | 0.803 | 22.1 |
| | SC-PC-03M-Apr-14 | Sand Creek | Muscle | 79.1 | <0.00062 | 15.3 | 0.195 | 0.061 | 2.11 | <0.0025 | 0.0133 | 3,900 | 0.0036 | 0.0173 | 0.0939 | 0.0714 | 0.829 | 25.6 |
| | SC-PC-04M-Apr-14 | Sand Creek | Muscle | 79.1 | <0.00051 | 25.4 | 0.174 | 0.117 | 1.47 | <0.0025 | 0.00771 | 3,290 | 0.00329 | 0.0161 | 0.118 | 0.0863 | 0.576 | 23.6 |
| | SC-PC-06M-Apr-14 | Sand Creek | Muscle | 80.7 | <0.00067 | 24.9 | 0.142 | 0.141 | 2.82 | <0.0027 | 0.0244 | 4,720 | 0.0037 | 0.0218 | 0.124 | 0.0557 | 0.987 | 32.5 |
| | SC-PC-07M-Apr-14 | Sand Creek | Muscle | 77.2 | <0.00068 | 58.5 | 0.107 | 0.217 | 1.73 | <0.0027 | 0.00273 | 1,560 | 0.0047 | 0.0318 | 0.213 | 0.0649 | 1.73 | 62.2 |
| | SC-PC-10M-Apr-14 | Sand Creek | Muscle | 78.1 | <0.00067 | 11.8 | 0.0514 | 0.127 | 1.48 | <0.0027 | 0.00173 | 3,420 | 0.0028 | 0.0122 | 0.0834 | 0.046 | 1.06 | 19.2 |
| | SC-PC-11M-Apr-14 | Sand Creek | Muscle | 79.5 | <0.00067 | 17.7 | 0.0801 | 0.073 | 1.23 | <0.0026 | 0.00229 | 4,250 | 0.0021 | 0.0145 | 0.0902 | 0.0565 | 0.57 | 26 |
| | SC-PC-12M-Apr-14 | Sand Creek | Muscle | 79.0 | <0.00063 | 10.5 | 0.0973 | 0.058 | 2.16 | <0.0025 | 0.00846 | 6,080 | 0.0055 | 0.012 | 0.111 | 0.115 | 0.596 | 15.4 |
| | SC-PC-14M-Apr-14 | Sand Creek | Muscle | 78.7 | <0.00067 | 47.7 | 0.154 | 0.256 | 1.35 | <0.0027 | 0.0145 | 2,820 | 0.0061 | 0.0357 | 0.248 | 0.055 | 1.02 | 49.8 |
| | SC-PC-15M-Apr-14 | Sand Creek | Muscle | 78.4 | <0.00070 | 15.8 | 0.136 | 0.09 | 1.62 | <0.0028 | 0.018 | 3,850 | 0.0027 | 0.0142 | 0.151 | 0.0484 | 0.542 | 15.8 |
| | SC-PC-01M-Aug-14 | Sand Creek | Muscle | 80.1 | <0.00082 | 6.88 | 0.118 | <0.13 | 2.15 | <0.0041 | 0.00306 | 5,260 | 0.0111 | 0.0113 | 0.111 | 0.103 | 0.748 | 15.7 |
| | SC-PC-02M-Aug-14 | Sand Creek | Muscle | 79.5 | <0.00075 | 3.07 | 0.0505 | <0.11 | 1.45 | <0.0037 | 0.0105 | 3,890 | 0.00444 | 0.0101 | 0.101 | 0.0567 | 0.533 | 12.4 |
| | SC-PC-02G-Apr | Sand Creek | Ovary | 66.5 | 0.0141 | 36.8 | 0.139 | <0.12 | 1.58 | <0.0026 | 0.00203 | 434 | 0.0259 | 0.0841 | 0.12 | 0.0198 | 3.66 | 79 |
| | SC-PC-02G-Apr | Sand Creek | Ovary | 66.5 | 0.014 | 87.4 | 0.197 | <0.13 | 2.3 | <0.0027 | 0.00277 | 688 | 0.0254 | 0.116 | 0.228 | 0.0257 | 3.7 | 160 |
| | SC-PC-02G-Apr-14 | Sand Creek | Ovary | 66.5 | 0.0141 | 62.1 | 0.168 | <0.13 | 1.94 | <0.0027 | 0.00240 | 561 | 0.0257 | 0.100 | 0.174 | 0.0228 | 3.68 | 120 |
| | SC-PC-03G-Apr-14 | Sand Creek | Ovary | 65.6 | 0.0118 | 148 | 0.235 | 0.14 | 3.08 | 0.0035 | 0.00367 | 715 | 0.0186 | 0.118 | 0.237 | 0.0342 | 3.76 | 232 |
| | SC-PC-04G-Apr-14 | Sand Creek | Ovary | 67.1 | 0.0125 | 12.7 | 0.116 | <0.12 | 1.74 | <0.0026 | 0.000619 | 415 | 0.0152 | 0.0845 | 0.136 | 0.0297 | 4.58 | 73.6 |
| | SC-PC-06G-Apr-14 | Sand Creek | Ovary | 70.8 | 0.00818 | 112 | 0.209 | 0.14 | 3.05 | 0.0053 | 0.00701 | 783 | 0.0141 | 0.118 | 0.206 | 0.0293 | 2.26 | 158 |
| | SC-PC-07G-Apr-14 | Sand Creek | Ovary | 79.5 | 0.0163 | 21 | 0.0901 | <0.15 | 0.612 | <0.0032 | 0.000698 | 724 | 0.0166 | 0.0784 | 0.139 | 0.0641 | 5.15 | 91.1 |
| | SC-PC-10G-Apr-14 | Sand Creek | Ovary | 69.7 | 0.0138 | 2.24 | 0.0688 | <0.12 | 0.57 | <0.0026 | 0.000498 | 460 | 0.0109 | 0.0719 | 0.0778 | 0.0209 | 4.36 | 85.9 |
| | SC-PC-11G-Apr-14 | Sand Creek | Ovary | 67.8 | 0.0083 | 21.3 | 0.177 | <0.12 | 1.73 | <0.0027 | 0.000652 | 564 | 0.0109 | 0.0613 | 0.122 | 0.0224 | 3.16 | 106 |
| | SC-PC-12G-Apr-14 | Sand Creek | Ovary | 68.6 | 0.0162 | 4.81 | 0.153 | <0.13 | 2.57 | <0.0027 | 0.00149 | 425 | 0.0182 | 0.0802 | 0.0854 | 0.031 | 4.17 | 111 |
| | SC-PC-14G-Apr-14 | Sand Creek | Ovary | 69.2 | 0.0121 | 54.7 | 0.156 | <0.12 | 1.68 | <0.0026 | 0.00334 | 675 | 0.0087 | 0.136 | 0.161 | 0.0226 | 2.93 | 128 |
| | SC-PC-15G-Apr-14 | Sand Creek | Ovary | 65.3 | 0.018 | 19.5 | 0.134 | <0.12 | 1.14 | <0.0027 | 0.00367 | 349 | 0.0066 | 0.0887 | 0.103 | 0.0163 | 3.46 | 75 |
| | SC-PC-01WB-Apr-14 | Sand Creek | Whole Body | 75.0 | <0.00490 | 33.9 | 0.214 | 0.26 | 10.6 | <0.0026 | 0.00201 | 53,550 | 0.0960 | 0.148 | 0.102 | 0.0615 | 2.31 | 71.1 |
| | SC-PC-05WB-Apr-14 | Sand Creek | Whole Body | 77.1 | <0.00210 | 59.6 | 0.286 | 0.24 | 6.1 | <0.0025 | 0.00365 | 25,100 | 0.0739 | 0.0902 | 0.172 | 0.0794 | 2.02 | 91.7 |
| | SC-PC-08WB-Apr-14 | Sand Creek | Whole Body | 76.1 | <0.00379 | 459 | 0.232 | 0.31 | 11.2 | <0.0143 | 0.00547 | 29,300 | 0.0908 | 0.194 | 0.526 | 0.0858 | 2.26 | 317 |
| | SC-PC-13WB-Apr-14 | Sand Creek | Whole Body | 78.4 | <0.00146 | 26 | 0.2 | 0.25 | 9.8 | <0.0026 | 0.0032 | 52,000 | 0.0686 | 0.0671 | 0.1 | 0.0484 | 1.66 | 63 |
| | SC-PC-16WB-Apr-14 | Sand Creek | Whole Body | 78.3 | <0.00320 | 466 | 0.285 | 0.36 | 17.1 | <0.0107 | 0.00636 | 68,500 | 0.077 | 0.25 | 0.518 | 0.0794 | 2.01 | 296 |
| | ER-PC-01M-Apr-14 | Elk River | Muscle | 81.0 | <0.00068 | 56.3 | 0.0958 | 0.15 | 1.96 | 0.0037 | 0.00629 | 4,860 | 0.0068 | 0.026 | 0.165 | 0.0335 | 0.71 | 61.7 |
| | ER-PC-02M-Apr-14 | Elk River | Muscle | 79.7 | <0.00075 | 104 | 0.117 | 0.195 | 3.21 | <0.0030 | 0.00372 | 2,780 | 0.0209 | 0.0353 | 0.217 | 0.025 | 0.845 | 86.4 |
| | ER-PC-04M-Apr-14 | Elk River | Muscle | 78.9 | <0.00062 | 11.1 | 0.139 | 0.077 | 1.44 | <0.0025 | 0.00756 | 4,490 | 0.0048 | 0.0673 | 0.106 | 0.121 | 0.746 | 39.7 |
| | ER-PC-05M-Apr-14 | Elk River | Muscle | 79.4 | <0.00072 | 38.2 | 0.0971 | 0.169 | 1.36 | <0.0028 | 0.00448 | 3,940 | 0.0096 | 0.0197 | 0.127 | 0.0405 | 0.646 | 35.3 |
| | ER-PC-06M-Apr-14 | Elk River | Muscle | 78.7 | <0.00066 | 39.4 | 0.197 | 0.169 | 1.71 | <0.0026 | 0.00409 | 1,450 | 0.0416 | 0.0318 | 0.193 | 0.0682 | 1.21 | 53 |
| | ER-PC-07M-Apr-14 | Elk River | Muscle | 79.4 | <0.00070 | 8.38 | 0.136 | 0.06 | 1.42 | <0.0028 | 0.00136 | 5,430 | 0.0114 | 0.0121 | 0.101 | 0.056 | 0.712 | 16.6 |
| | ER-PC-08M-Apr-14 | Elk River | Muscle | 79.4 | <0.00064 | 9.9 | 0.0688 | 0.164 | 2.17 | <0.0026 | 0.00782 | 4,060 | 0.0049 | 0.00932 | 0.0874 | 0.0751 | 0.594 | 12.5 |
| | ER-PC-09M-Apr-14 | Elk River | Muscle | 79.3 | <0.00078 | 18.3 | 0.142 | 0.131 | 0.943 | <0.0031 | 0.00588 | 2,110 | 0.0074 | 0.015 | 0.158 | 0.0998 | 0.779 | 26.7 |
| | ER-PC-10M-Apr-14 | Elk River | Muscle | 79.1 | <0.00061 | 24.6 | 0.125 | 0.092 | 0.783 | <0.0024 | 0.00648 | 720 | 0.0253 | 0.017 | 0.129 | 0.0541 | 1.01 | 41.9 |
| | ER-PC-11M-Apr-14 | Elk River | Muscle | 79.7 | <0.00062 | 6.24 | 0.131 | 0.116 | 2.62 | <0.0024 | 0.00649 | 7,400 | 0.0076 | 0.0146 | 0.0868 | 0.06 | 0.531 | 13.7 |
| | ER-PC-01M-Aug-14 | Elk River | Muscle | 80.6 | <0.00080 | 4.33 | 0.142 | <0.086 | 1.99 | <0.0024 | 0.00755 | 1,130 | 0.0159 | 0.0173 | 0.0935 | 0.036 | 1.68 | 35 |
| | ER-PC-02M-Aug-14 | Elk River | Muscle | 79.7 | <0.00080 | 1.81 | 0.122 | <0.085 | 1.72 | <0.0024 | 0.00692 | 4,590 | 0.00684 | 0.00706 | 0.0715 | 0.0287 | 0.548 | 9.43 |
| | ER-PC-03M-Aug-14 | Elk River | Muscle | 80.5 | <0.00080 | 5.8 | 0.107 | <0.085 | 1.58 | <0.0024 | 0.00442 | 2,160 | 0.0107 | 0.00897 | 0.0759 | 0.0348 | 0.709 | 17.9 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | ER-PC-04M-Aug-14 | Elk River | Muscle | 79.9 | <0.00079 | 2.9 | 0.177 | <0.084 | 1.04 | <0.0023 | 0.00534 | 986 | 0.0166 | 0.0128 | 0.0777 | 0.0531 | 0.968 | 19.5 |
| | ER-PC-01G-Apr-14 | Elk River | Ovary | 69.4 | 0.0181 | 70.4 | 0.173 | <0.11 | 1.99 | <0.0024 | 0.00186 | 846 | 0.0251 | 0.0924 | 0.171 | 0.0154 | 3.12 | 149 |
| | ER-PC-02G-Apr-14 | Elk River | Ovary | 68.3 | 0.0173 | 22.7 | 0.186 | <0.12 | 4.94 | <0.0027 | 0.00108 | 614 | 0.0576 | 0.0742 | 0.0999 | 0.00659 | 3.73 | 101 |
| | ER-PC-04G-Apr-14 | Elk River | Ovary | 64.2 | 0.0139 | 10.7 | 0.269 | <0.11 | 1.85 | <0.0024 | 0.00105 | 345 | 0.0107 | 0.0592 | 0.0979 | 0.0305 | 3.57 | 68.9 |
| | ER-PC-05G-Apr-14 | Elk River | Ovary | 65.5 | 0.0114 | 43.5 | 0.201 | <0.12 | 1.42 | <0.0025 | 0.00121 | 453 | 0.0242 | 0.0625 | 0.133 | 0.013 | 3.06 | 101 |
| | ER-PC-06G-Apr-14 | Elk River | Ovary | 65.8 | 0.0144 | 7.22 | 0.195 | <0.12 | 0.56 | <0.0025 | 0.000453 | 366 | 0.0255 | 0.0599 | 0.0904 | 0.0219 | 3.91 | 65.5 |
| | ER-PC-07G-Apr-14 | Elk River | Ovary | 67.5 | 0.0133 | 37.7 | 0.419 | <0.12 | 2.58 | <0.0026 | 0.000906 | 521 | 0.0717 | 0.0948 | 0.158 | 0.0173 | 3.86 | 166 |
| | ER-PC-08G-Apr-14 | Elk River | Ovary | 66.4 | 0.00919 | 13.2 | 0.129 | <0.12 | 1.95 | <0.0026 | 0.00142 | 367 | 0.0216 | 0.0629 | 0.0996 | 0.0229 | 3.54 | 66.4 |
| | ER-PC-09G-Apr-14 | Elk River | Ovary | 68.6 | 0.0133 | 7.49 | 0.163 | <0.12 | 1.49 | <0.0025 | 0.000983 | 482 | 0.0133 | 0.0577 | 0.0669 | 0.0369 | 4 | 72.2 |
| | ER-PC-10G-Apr-14 | Elk River | Ovary | 68.4 | 0.00954 | 3.97 | 0.0586 | <0.13 | 0.567 | <0.0027 | 0.00139 | 486 | 0.0206 | 0.0463 | 0.0784 | 0.0172 | 3.49 | 110 |
| | ER-PC-11G-Apr-14 | Elk River | Ovary | 67.9 | 0.0142 | 29 | 0.152 | <0.12 | 1.45 | <0.0025 | 0.00156 | 481 | 0.0324 | 0.0894 | 0.132 | 0.0198 | 4.04 | 118 |
| | ER-PC-03WB-Apr-14 | Elk River | Whole Body | 77.0 | <0.00715 | 308 | 0.359 | 0.77 | 20.3 | <0.0126 | 0.00639 | 60,800 | 0.185 | 0.22 | 0.55 | 0.111 | 2.26 | 313 |
| | ER-PC-15WB-Apr-14 | Elk River | Whole Body | 77.1 | <0.00556 | 90.9 | 0.273 | 0.24 | 7.12 | <0.0031 | 0.00413 | 31,300 | 0.124 | 0.0841 | 0.252 | 0.0532 | 2.46 | 104 |
| | ER-PC-23WB-Apr-14 | Elk River | Whole Body | 77.7 | <0.00285 | 20.6 | 0.118 | 0.235 | 11.9 | <0.0024 | 0.00626 | 60,650 | 0.0999 | 0.0785 | 0.102 | 0.0418 | 1.78 | 74.4 |
| | ER-PC-24WB-Apr-14 | Elk River | Whole Body | 75.5 | <0.01490 | 713 | 0.458 | 1.49 | 14 | <0.0284 | 0.00679 | 32,900 | 0.173 | 0.371 | 1.13 | 0.128 | 3.28 | 570 |
| | ER-PC-26WB-Apr-14 | Elk River | Whole Body | 76.5 | <0.00592 | 20.8 | 0.0941 | 0.22 | 13.8 | <0.0022 | 0.000865 | 95,700 | 0.0755 | 0.0701 | 0.081 | 0.0237 | 1.66 | 47.7 |
| | GC-PC-01M-Apr-14 | Gold Creek | Muscle | 78.5 | <0.00063 | 10.3 | 0.0889 | 0.083 | 0.638 | <0.0025 | 0.00222 | 1,310 | 0.0053 | 0.0113 | 0.186 | 0.0402 | 0.656 | 18.3 |
| | GC-PC-02M-Apr-14 | Gold Creek | Muscle | 78.4 | <0.00069 | 2.33 | 0.0562 | 0.073 | 1.02 | <0.0027 | 0.00257 | 3,450 | 0.0023 | 0.00852 | 0.0898 | 0.0706 | 0.569 | 6.9 |
| | GC-PC-05M-Apr-14 | Gold Creek | Muscle | 78.3 | <0.00057 | 16.3 | 0.221 | 0.146 | 0.99 | <0.0023 | 0.0077 | 874 | 0.0063 | 0.0169 | 0.0985 | 0.0527 | 0.829 | 18.6 |
| | GC-PC-06M-Apr-14 | Gold Creek | Muscle | 80.5 | <0.00064 | 14.7 | 0.0783 | 0.104 | 1.12 | <0.0025 | 0.00622 | 2,740 | 0.009 | 0.0174 | 0.301 | 0.0222 | 0.846 | 23.9 |
| | GC-PC-07M-Apr-14 | Gold Creek | Muscle | 78.7 | <0.00062 | 6.51 | 0.0564 | 0.098 | 1.12 | <0.0025 | 0.00118 | 4,310 | 0.0039 | 0.00992 | 0.0848 | 0.0409 | 0.49 | 9.73 |
| | GC-PC-11M-Apr-14 | Gold Creek | Muscle | 78.6 | <0.00064 | 6.76 | 0.12 | 0.407 | 0.62 | <0.0025 | 0.00186 | 1,470 | 0.006 | 0.00874 | 0.087 | 0.092 | 0.702 | 12.6 |
| | GC-PC-13M-Apr-14 | Gold Creek | Muscle | 79.1 | <0.00061 | 3.9 | 0.118 | 0.073 | 1.22 | <0.0024 | 0.00303 | 4,240 | 0.0083 | 0.0133 | 0.0648 | 0.0576 | 0.652 | 10.3 |
| | GC-PC-15M-Apr-14 | Gold Creek | Muscle | 79.1 | <0.00063 | 7.47 | 0.0709 | 0.231 | 1.6 | <0.0025 | 0.00419 | 2,730 | 0.006 | 0.0124 | 0.235 | 0.0302 | 0.625 | 13.7 |
| | GC-PC-18M-Apr-14 | Gold Creek | Muscle | 79.5 | <0.00061 | 12 | 0.0622 | 0.078 | 1.63 | <0.0024 | 0.00392 | 3,590 | 0.0022 | 0.00816 | 0.078 | 0.0336 | 0.573 | 17.2 |
| | GC-PC-19M-Apr-14 | Gold Creek | Muscle | 80.5 | <0.00062 | 22.3 | 0.0878 | 0.143 | 1.61 | <0.0025 | 0.00384 | 1,260 | 0.0037 | 0.0139 | 0.12 | 0.0898 | 0.713 | 20.9 |
| | GC-PC-01M-Aug-14 | Gold Creek | Muscle | 83.3 | <0.00049 | 11.5 | 0.0821 | <0.12 | 1.32 | <0.0026 | 0.00266 | 3,050 | 0.00505 | 0.0093 | 0.101 | 0.0577 | 0.759 | 15.2 |
| | GC-PC-01G-Apr-14 | Gold Creek | Ovary | 78.7 | 0.014 | 4.93 | 0.115 | <0.12 | 2 | <0.0027 | 0.000908 | 804 | 0.0478 | 0.0822 | 0.274 | 0.0251 | 4.87 | 128 |
| | GC-PC-02G-Apr-14 | Gold Creek | Ovary | 66.6 | 0.0172 | 10.4 | 0.144 | <0.13 | 1.02 | <0.0027 | 0.000642 | 342 | 0.0128 | 0.0859 | 0.0884 | 0.0221 | 4.15 | 59.6 |
| | GC-PC-05G-Apr-14 | Gold Creek | Ovary | 62.8 | 0.0178 | 1.22 | 0.28 | <0.12 | 1.02 | <0.0027 | 0.00152 | 268 | 0.0134 | 0.0782 | 0.0999 | 0.0149 | 3.4 | 95.8 |
| | GC-PC-06G-Apr-14 | Gold Creek | Ovary | 72.8 | 0.0135 | 4.05 | 0.0437 | <0.12 | 0.535 | <0.0027 | 0.00144 | 652 | 0.0327 | 0.0777 | 0.0752 | 0.00888 | 4.2 | 134 |
| | GC-PC-07G-Apr-14 | Gold Creek | Ovary | 77.7 | 0.0128 | 25.6 | 0.263 | <0.12 | 3.46 | <0.0026 | 0.000753 | 823 | 0.0311 | 0.13 | 0.105 | 0.0301 | 5.17 | 120 |
| | GC-PC-11G-Apr-14 | Gold Creek | Ovary | 62.1 | 0.00953 | 6.27 | 0.341 | 0.18 | 1.78 | <0.0027 | 0.000611 | 313 | 0.0191 | 0.0536 | 0.12 | 0.0254 | 3.24 | 56.7 |
| | GC-PC-13G-Apr-14 | Gold Creek | Ovary | 62.6 | 0.0126 | 3.4 | 0.227 | <0.12 | 0.729 | <0.0025 | 0.000551 | 297 | 0.0147 | 0.0614 | 0.0871 | 0.0113 | 3 | 48.9 |
| | GC-PC-15G-Apr-14 | Gold Creek | Ovary | 72.7 | 0.0134 | 2.31 | 0.141 | <0.14 | 1.28 | <0.0027 | 0.00147 | 691 | 0.0247 | 0.122 | 0.0865 | 0.0104 | 3.54 | 107 |
| | GC-PC-18G-Apr-14 | Gold Creek | Ovary | 74.7 | 0.0102 | 20.3 | 0.109 | <0.12 | 3.37 | <0.0027 | 0.00172 | 767 | 0.0232 | 0.0897 | 0.11 | 0.0183 | 3.74 | 121 |
| | GC-PC-19G-Apr-14 | Gold Creek | Ovary | 67.0 | 0.0155 | 4.79 | 0.231 | <0.11 | 1.08 | <0.0025 | 0.000704 | 298 | 0.0064 | 0.0476 | 0.0687 | 0.0257 | 3.13 | 65.2 |
| | GC-PC-04WB-Apr-14 | Gold Creek | Whole Body | 74.5 | <0.00556 | 27 | 0.295 | 0.24 | 7.05 | <0.0024 | 0.00302 | 34,300 | 0.0702 | 0.117 | 0.106 | 0.0643 | 2.19 | 61.5 |
| | GC-PC-08WB-Apr-14 | Gold Creek | Whole Body | 73.5 | <0.00163 | 34.8 | 0.266 | 0.23 | 7.35 | <0.0023 | 0.00118 | 32,800 | 0.122 | 0.114 | 0.121 | 0.0397 | 1.81 | 75.4 |
| | GC-PC-12WB-Apr-14 | Gold Creek | Whole Body | 73.9 | <0.00300 | 23.7 | 0.26 | 0.24 | 5.37 | <0.0024 | 0.00218 | 27,700 | 0.0778 | 0.11 | 0.11 | 0.0571 | 1.97 | 63.4 |
| | GC-PC-14WB-Apr-14 | Gold Creek | Whole Body | 75.5 | <0.00324 | 30.1 | 0.243 | 0.25 | 10.5 | <0.0025 | 0.00374 | 38,600 | 0.161 | 0.154 | 0.0972 | 0.0314 | 2.41 | 71.2 |
| | GC-PC-16WB-Apr-14 | Gold Creek | Whole Body | 74.2 | <0.00568 | 16.8 | 0.209 | 0.24 | 7.10 | <0.0025 | 0.00180 | 37,800 | 0.0900 | 0.112 | 0.0986 | 0.0202 | 2.00 | 47.2 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | SC-PCC-01-Apr-15 | Sand Creek | Muscle | 79.8 | <0.00049 | 3.500 | 0.1320 | 0.106 | 2.030 | <0.0025 | 0.00632 | 2,530 | 0.0031 | 0.01620 | 0.0716 | 0.0511 | 1.470 | 18.6 |
| | SC-PCC-02-Apr-15 | Sand Creek | Muscle | 79.0 | <0.00049 | 0.532 | 0.0808 | <0.079 | 1.550 | <0.0025 | 0.00209 | 3,910 | 0.0038 | 0.00856 | 0.0666 | 0.0528 | 0.804 | 11.0 |
| | SC-PCC-04-Apr-15 | Sand Creek | Muscle | 80.4 | <0.00047 | 3.920 | 0.1660 | 0.098 | 3.080 | <0.0024 | 0.00497 | 806 | 0.0130 | 0.02260 | 0.0679 | 0.0878 | 1.700 | 35.0 |
| | SC-PCC-05-Apr-15 | Sand Creek | Muscle | 79.2 | <0.000475 | 2.250 | 0.1610 | 0.141 | 1.870 | <0.00245 | 0.00499 | 3,325 | 0.0045 | 0.02105 | 0.0637 | 0.0686 | 1.220 | 17.9 |
| | SC-PCC-06-Apr-15 | Sand Creek | Muscle | 80.4 | <0.00046 | 1.110 | 0.2120 | <0.075 | 2.140 | <0.0024 | 0.00444 | 3,630 | 0.0113 | 0.01530 | 0.0638 | 0.0900 | 1.370 | 25.7 |
| | SC-PCC-08-Apr-15 | Sand Creek | Muscle | 78.9 | <0.00047 | 1.440 | 0.1280 | 0.155 | 1.550 | <0.0024 | 0.01070 | 961 | 0.0112 | 0.02040 | 0.0647 | 0.0467 | 1.930 | 29.9 |
| | SC-PCC-10-Apr-15 | Sand Creek | Muscle | 78.8 | <0.00047 | 3.770 | 0.2240 | 0.150 | 1.700 | <0.0024 | 0.00347 | 3,070 | 0.0064 | 0.01170 | 0.0663 | 0.0899 | 0.843 | 11.3 |
| | SC-PCC-13-Apr-15 | Sand Creek | Muscle | 78.4 | <0.00045 | 1.450 | 0.2120 | 0.466 | 1.270 | <0.0023 | 0.00285 | 3,910 | 0.0028 | 0.00851 | 0.0570 | 0.0692 | 0.654 | 7.4 |
| | SC-PCC-14-Apr-15 | Sand Creek | Muscle | 79.7 | <0.00049 | 3.130 | 0.1390 | 0.593 | 5.400 | <0.0025 | 0.01720 | 6,750 | 0.0033 | 0.01650 | 0.0597 | 0.0353 | 0.585 | 10.9 |
| | SC-PCC-15-Apr-15 | Sand Creek | Muscle | 78.2 | <0.00048 | 4.550 | 0.1550 | 0.459 | 0.866 | <0.0025 | 0.00731 | 1,020 | 0.0063 | 0.01140 | 0.0695 | 0.0637 | 0.955 | 13.8 |
| | SC-PCC-01-Apr-15 | Sand Creek | Ovary | 64.0 | 0.0178 | 21.1 | 0.136 | <0.14 | 2.72 | <0.0025 | 0.00122 | 338 | 0.00670 | 0.0742 | 0.0809 | 0.0159 | 3.55 | 53.4 |
| | SC-PCC-02-Apr-15 | Sand Creek | Ovary | 77.0 | 0.0150 | 1.04 | 0.251 | <0.14 | 2.64 | <0.0026 | 0.000790 | 740 | 0.0224 | 0.0657 | 0.0669 | 0.0224 | 3.76 | 128 |
| | SC-PCC-04-Apr-15 | Sand Creek | Ovary | 76.1 | 0.0126 | 2.22 | 0.144 | <0.14 | 2.95 | <0.0026 | 0.00167 | 841 | 0.0316 | 0.0819 | 0.0696 | 0.0460 | 3.30 | 131 |
| | SC-PCC-05-Apr-15 | Sand Creek | Ovary | 65.7 | 0.0182 | 6.80 | 0.127 | <0.14 | 1.45 | <0.0025 | 0.000925 | 303 | 0.0112 | 0.0928 | 0.0656 | 0.0174 | 3.44 | 58.2 |
| | SC-PCC-06-Apr-15 | Sand Creek | Ovary | 70.9 | 0.0275 | 2.82 | 0.225 | <0.14 | 1.97 | <0.0026 | 0.00122 | 547 | 0.0482 | 0.0722 | 0.0728 | 0.0338 | 4.24 | 105 |
| | SC-PCC-08-Apr-15 | Sand Creek | Ovary | 67.1 | 0.0155 | 2.91 | 0.103 | <0.12 | 1.52 | <0.0026 | 0.00207 | 409 | 0.0190 | 0.0687 | 0.0924 | 0.0161 | 3.19 | 82.7 |
| | SC-PCC-10-Apr-15 | Sand Creek | Ovary | 69.4 | 0.0235 | 3.60 | 0.162 | 0.23 | 2.15 | <0.0026 | 0.000980 | 490 | 0.0521 | 0.0796 | 0.0683 | 0.0318 | 4.53 | 84.9 |
| | SC-PCC-13-Apr-15 | Sand Creek | Ovary | 67.4 | 0.0167 | 3.92 | 0.179 | 0.39 | 2.66 | <0.0025 | 0.00129 | 493 | 0.0124 | 0.0629 | 0.0628 | 0.0232 | 3.81 | 62.4 |
| | SC-PCC-14-Apr-15 | Sand Creek | Ovary | 69.5 | 0.0235 | 11.8 | 0.0937 | 0.20 | 1.20 | <0.0025 | 0.00345 | 523 | 0.0210 | 0.110 | 0.0737 | 0.0106 | 3.53 | 132 |
| | SC-PCC-15-Apr-15 | Sand Creek | Ovary | 69.8 | 0.0103 | 3.36 | 0.0853 | 0.34 | 1.97 | <0.0025 | 0.00123 | 551 | 0.0239 | 0.0604 | 0.0785 | 0.0211 | 3.98 | 85.3 |
| | SC-PCC-03-Apr-15 | Sand Creek | Whole Body | 75.3 | 0.00151 | 29.1 | 0.206 | <0.23 | 8.5 | <0.0025 | 0.00256 | 27,800 | 0.0854 | 0.0565 | 0.0946 | 0.083 | 1.82 | 67.7 |
| | SC-PCC-07-Apr-15 | Sand Creek | Whole Body | 76.6 | 0.00364 | 48.2 | 0.276 | 0.32 | 8.79 | <0.0025 | 0.00345 | 31,300 | 0.123 | 0.115 | 0.126 | 0.0743 | 1.88 | 88.7 |
| | SC-PCC-09-Apr-15 | Sand Creek | Whole Body | 76.2 | 0.00314 | 9.13 | 0.191 | 0.67 | 7.15 | <0.0026 | 0.0028 | 33,400 | 0.0935 | 0.0651 | 0.116 | 0.044 | 1.71 | 48.3 |
| | SC-PCC-11-Apr-15 | Sand Creek | Whole Body | 74.9 | 0.00314 | 233 | 0.276 | 0.47 | 11.3 | 0.0062 | 0.00266 | 35,300 | 0.0799 | 0.101 | 0.307 | 0.0614 | 1.84 | 176 |
| | SC-PCC-12-Apr-15 | Sand Creek | Whole Body | 77.6 | 0.00222 | 191 | 0.15 | 0.94 | 14.4 | 0.00455 | 0.00385 | 52,550 | 0.179 | 0.135 | 0.322 | 0.0454 | 1.65 | 172 |
| | ER-PCC-01-Apr-15 | Elk River | Muscle | 77.2 | 0.00147 | 10.800 | 0.1760 | <0.11 | 1.940 | <0.0027 | 0.00996 | 3,740 | 0.0113 | 0.03180 | 0.0776 | 0.0285 | 1.630 | 26.2 |
| | ER-PCC-02-Apr-15 | Elk River | Muscle | 79.5 | 0.00071 | 3.190 | 0.1080 | <0.10 | 2.660 | <0.0025 | 0.01150 | 4,170 | 0.0082 | 0.02200 | 0.1010 | 0.0357 | 1.290 | 31.1 |
| | ER-PCC-04-Apr-15 | Elk River | Muscle | 79.7 | 0.00040 | 3.380 | 0.1360 | <0.11 | 1.410 | <0.0026 | 0.00613 | 2,740 | 0.0037 | 0.01250 | 0.0561 | 0.0639 | 0.696 | 13.7 |
| | ER-PCC-05-Apr-15 | Elk River | Muscle | 79.2 | 0.00202 | 18.900 | 0.1310 | <0.10 | 3.040 | <0.0025 | 0.01150 | 4,680 | 0.0137 | 0.03150 | 0.0934 | 0.0317 | 1.280 | 35.3 |
| | ER-PCC-06-Apr-15 | Elk River | Muscle | 79.4 | 0.00073 | 4.930 | 0.1880 | 0.101 | 1.920 | <0.0024 | 0.01540 | 3,930 | 0.0030 | 0.01740 | 0.0641 | 0.0691 | 0.753 | 17.3 |
| | ER-PCC-07-Apr-15 | Elk River | Muscle | 78.7 | 0.00115 | 10.100 | 0.0635 | 0.120 | 1.050 | <0.0027 | 0.00138 | 8,900 | 0.0071 | 0.01730 | 0.0689 | 0.0921 | 0.806 | 16.7 |
| | ER-PCC-08-Apr-15 | Elk River | Muscle | 78.7 | 0.00036 | 5.110 | 0.1900 | <0.10 | 2.260 | <0.0026 | 0.01100 | 5,810 | 0.0053 | 0.01230 | 0.2020 | 0.0672 | 0.651 | 10.7 |
| | ER-PCC-10-Apr-15 | Elk River | Muscle | 81.1 | 0.00087 | 4.675 | 0.1465 | 0.130 | 2.360 | <0.0026 | 0.00731 | 4,775 | 0.0080 | 0.01785 | 0.0631 | 0.0323 | 0.895 | 17.7 |
| | ER-PCC-11-Apr-15 | Elk River | Muscle | 80.9 | 0.00119 | 5.280 | 0.1050 | 0.370 | 3.040 | <0.0024 | 0.00932 | 5,700 | 0.0126 | 0.03310 | 0.0606 | 0.0292 | 0.772 | 23.0 |
| | ER-PCC-12-Apr-15 | Elk River | Muscle | 79.9 | 0.00042 | 1.950 | 0.0437 | 0.360 | 5.520 | <0.0027 | 0.00334 | 7,460 | 0.0083 | 0.01330 | 0.0573 | 0.0316 | 0.720 | 13.7 |
| | ER-PCC-01-Apr-15 | Elk River | Ovary | 66.3 | 0.0297 | 16.0 | 0.124 | 0.19 | 0.952 | <0.0025 | 0.00209 | 407 | 0.0182 | 0.0914 | 0.106 | 0.00953 | 3.53 | 81.4 |
| | ER-PCC-02-Apr-15 | Elk River | Ovary | 74.4 | 0.00877 | 4.79 | 0.0659 | 0.23 | 1.78 | <0.0024 | 0.00388 | 668 | 0.0393 | 0.0861 | 0.0829 | 0.0174 | 2.41 | 229 |
| | ER-PCC-04-Apr-15 | Elk River | Ovary | 67.7 | 0.0174 | 3.58 | 0.130 | 0.18 | 1.61 | <0.0023 | 0.00117 | 389 | 0.0110 | 0.0610 | 0.0726 | 0.0202 | 3.39 | 96.1 |
| | ER-PCC-05-Apr-15 | Elk River | Ovary | 65.8 | 0.0243 | 46.4 | 0.0834 | 0.21 | 1.39 | <0.0023 | 0.00233 | 448 | 0.0179 | 0.111 | 0.118 | 0.0128 | 3.12 | 106 |
| | ER-PCC-06-Apr-15 | Elk River | Ovary | 66.7 | 0.0165 | 261 | 0.186 | 0.48 | 4.54 | 0.0065 | 0.00393 | 1,010 | 0.0189 | 0.123 | 0.414 | 0.0519 | 3.39 | 253 |
| | ER-PCC-07-Apr-15 | Elk River | Ovary | 65.4 | 0.0194 | 30.9 | 0.233 | <0.12 | 1.68 | <0.0023 | 0.000540 | 365 | 0.0215 | 0.0836 | 0.124 | 0.0360 | 3.55 | 69.7 |
| | ER-PCC-08-Apr-15 | Elk River | Ovary | 70.7 | 0.0171 | 54.9 | 0.230 | 0.14 | 4.18 | <0.0023 | 0.00266 | 636 | 0.0296 | 0.127 | 0.137 | 0.0283 | 3.99 | 107 |
| | ER-PCC-10-Apr-15 | Elk River | Ovary | 75.5 | 0.0222 | 22.8 | 0.183 | 0.22 | 4.32 | <0.0021 | 0.00309 | 850 | 0.0672 | 0.112 | 0.119 | 0.0184 | 4.92 | 169 |

**Table G.8: Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-PCC-11-Apr-15 | Elk River | Ovary | 71.6 | 0.0240 | 7.85 | 0.106 | 0.20 | 1.91 | <0.0024 | 0.00315 | 451 | 0.0518 | 0.139 | 0.0910 | 0.0115 | 4.02 | 195 |
| | ER-PCC-12-Apr-15 | Elk River | Ovary | 67.6 | 0.0106 | 3.83 | 0.0717 | 0.17 | 4.55 | <0.0021 | 0.000720 | 410 | 0.0201 | 0.0500 | 0.0724 | 0.0102 | 1.48 | 98.1 |
| | ER-PCC-24-Apr-15 | Elk River | Whole Body | 72.9 | 0.00608 | 141 | 0.212 | <0.18 | 12.2 | <0.0029 | 0.00318 | 39,100 | 0.115 | 0.107 | 0.22 | 0.0351 | 2.15 | 122 |
| | ER-PCC-25-Apr-15 | Elk River | Whole Body | 76.0 | 0.00564 | 4.24 | 0.299 | <0.15 | 16.7 | <0.0025 | 0.00731 | 41,400 | 0.167 | 0.135 | 0.144 | 0.0181 | 2.21 | 66.3 |
| | ER-PCC-26-Apr-15 | Elk River | Whole Body | 75.2 | 0.00241 | 10.3 | 0.169 | <0.16 | 11.9 | <0.0027 | 0.00566 | 51,600 | 0.106 | 0.133 | 0.195 | 0.0284 | 1.71 | 72.3 |
| | ER-PCC-27-Apr-15 | Elk River | Whole Body | 78.1 | 0.00234 | 5.62 | 0.331 | 0.17 | 7.77 | <0.0027 | 0.00141 | 27,650 | 0.161 | 0.0649 | 0.184 | 0.0509 | 2.04 | 73.5 |
| | ER-PCC-28-Apr-15 | Elk River | Whole Body | 75.2 | 0.00391 | 200 | 0.248 | 0.5 | 13.5 | 0.0064 | 0.00447 | 51,500 | 0.135 | 0.188 | 0.317 | 0.0446 | 1.83 | 177 |
| | GC-PCC-01-Apr-15 | Gold Creek | Muscle | 78.9 | 0.00081 | 3.430 | 0.1540 | <0.10 | 2.510 | <0.0026 | 0.01770 | 3,600 | 0.0073 | 0.02860 | 0.0560 | 0.0337 | 1.290 | 20.7 |
| | GC-PCC-02-Apr-15 | Gold Creek | Muscle | 79.9 | 0.00167 | 13.300 | 0.1750 | <0.11 | 2.330 | <0.0026 | 0.00673 | 3,940 | 0.0143 | 0.02150 | 0.0754 | 0.0477 | 1.440 | 36.4 |
| | GC-PCC-03-Apr-15 | Gold Creek | Muscle | 79.7 | 0.00098 | 2.160 | 0.1260 | <0.10 | 3.020 | <0.0025 | 0.00584 | 8,810 | 0.0124 | 0.01320 | 0.0614 | 0.0410 | 0.767 | 15.0 |
| | GC-PCC-04-Apr-15 | Gold Creek | Muscle | 80.2 | 0.00171 | 36.200 | 0.1350 | 0.160 | 2.730 | <0.0027 | 0.01010 | 3,880 | 0.0102 | 0.03470 | 0.0915 | 0.0321 | 1.020 | 41.6 |
| | GC-PCC-05-Apr-15 | Gold Creek | Muscle | 78.6 | 0.00048 | 3.130 | 0.0810 | <0.0965 | 1.630 | <0.00245 | 0.00363 | 3,385 | 0.0042 | 0.01155 | 0.0595 | 0.0683 | 0.963 | 16.0 |
| | GC-PCC-06-Apr-15 | Gold Creek | Muscle | 79.7 | 0.00057 | 0.628 | 0.0592 | 1.220 | 2.070 | <0.0027 | 0.00399 | 6,250 | 0.0058 | 0.00971 | 0.0531 | 0.0490 | 0.633 | 9.7 |
| | GC-PCC-07-Apr-15 | Gold Creek | Muscle | 78.3 | 0.00119 | 1.080 | 0.1720 | <0.10 | 1.830 | <0.0026 | 0.00788 | 2,110 | 0.0095 | 0.02500 | 0.0626 | 0.0438 | 2.060 | 23.0 |
| | GC-PCC-08-Apr-15 | Gold Creek | Muscle | 78.1 | 0.00127 | 0.800 | 0.0555 | <0.099 | 1.290 | <0.0025 | 0.00029 | 3,600 | 0.0028 | 0.00661 | 0.0599 | 0.0439 | 0.843 | 6.6 |
| | GC-PCC-09-Apr-15 | Gold Creek | Muscle | 79.5 | 0.00067 | 2.880 | 0.1470 | <0.11 | 1.920 | <0.0026 | 0.00318 | 7,660 | 0.0091 | 0.01450 | 0.0606 | 0.0938 | 1.010 | 19.1 |
| | GC-PCC-10-Apr-15 | Gold Creek | Muscle | 79.4 | 0.00129 | 4.180 | 0.1450 | <0.11 | 2.270 | <0.0027 | 0.01290 | 4,500 | 0.0057 | 0.01320 | 0.0697 | 0.0274 | 0.698 | 17.8 |
| | GC-PCC-01-Apr-15 | Gold Creek | Ovary | 68.1 | 0.0220 | 11.5 | 0.115 | 0.14 | 1.76 | <0.0026 | 0.00349 | 458 | 0.0178 | 0.107 | 0.0747 | 0.0128 | 3.66 | 107 |
| | GC-PCC-02-Apr-15 | Gold Creek | Ovary | 71.0 | 0.0165 | 12.3 | 0.183 | <0.12 | 1.86 | <0.0027 | 0.00215 | 672 | 0.0410 | 0.0991 | 0.0971 | 0.0182 | 4.08 | 116 |
| | GC-PCC-03-Apr-15 | Gold Creek | Ovary | 73.5 | 0.0229 | 19.7 | 0.298 | <0.11 | 4.54 | <0.0025 | 0.00316 | 840 | 0.0757 | 0.105 | 0.0814 | 0.0202 | 3.59 | 162 |
| | GC-PCC-04-Apr-15 | Gold Creek | Ovary | 72.3 | 0.0272 | 906 | 0.618 | 0.44 | 18.4 | 0.0206 | 0.0130 | 2,230 | 0.0597 | 0.446 | 0.918 | 0.106 | 4.29 | 895 |
| | GC-PCC-05-Apr-15 | Gold Creek | Ovary | 62.7 | 0.0139 | 3.35 | 0.0553 | <0.11 | 1.26 | <0.0024 | 0.000690 | 221 | 0.00730 | 0.0400 | 0.0785 | 0.0160 | 4.71 | 49.4 |
| | GC-PCC-06-Apr-15 | Gold Creek | Ovary | 69.8 | 0.0192 | 3.45 | 0.0831 | 0.53 | 1.47 | <0.0024 | 0.00115 | 388 | 0.0228 | 0.0593 | 0.0840 | 0.0151 | 3.87 | 92.2 |
| | GC-PCC-07-Apr-15 | Gold Creek | Ovary | 65.6 | 0.0207 | 2.20 | 0.226 | <0.12 | 3.81 | <0.0027 | 0.00149 | 332 | 0.0171 | 0.0778 | 0.0794 | 0.0125 | 3.21 | 53.0 |
| | GC-PCC-08-Apr-15 | Gold Creek | Ovary | 66.5 | 0.0246 | 0.900 | 0.272 | 0.13 | 1.59 | <0.0027 | <0.00016 | 404 | 0.00915 | 0.0649 | 0.0727 | 0.0156 | 4.56 | 50.8 |
| | GC-PCC-09-Apr-15 | Gold Creek | Ovary | 66.7 | 0.0203 | 3.35 | 0.275 | <0.12 | 3.40 | <0.0027 | 0.00182 | 372 | 0.0265 | 0.0767 | 0.0768 | 0.0274 | 3.99 | 66.6 |
| | GC-PCC-10-Apr-15 | Gold Creek | Ovary | 71.7 | 0.0156 | 72.0 | 0.142 | <0.12 | 2.88 | <0.0026 | 0.00341 | 726 | 0.0306 | 0.131 | 0.139 | 0.0186 | 3.61 | 165 |
| | GC-PCC-12-Apr-15 | Gold Creek | Whole Body | 76.1 | 0.00237 | 7.1 | 0.217 | <0.18 | 5.32 | <0.0029 | 0.00077 | 23,300 | 0.0559 | 0.0654 | 0.194 | 0.0364 | 2.46 | 58.3 |
| | GC-PCC-16-Apr-15 | Gold Creek | Whole Body | 75.1 | 0.0301 | 16.5 | 0.224 | <0.17 | 10.7 | <0.0028 | 0.00318 | 39,800 | 0.221 | 0.101 | 0.0837 | 0.0539 | 2.36 | 67.4 |
| | GC-PCC-17-Apr-15 | Gold Creek | Whole Body | 73.4 | 0.00597 | 54.8 | 0.202 | 0.27 | 8.33 | 0.0037 | 0.00461 | 31,400 | 0.0823 | 0.157 | 0.154 | 0.0257 | 2.47 | 123 |
| | GC-PCC-18-Apr-15 | Gold Creek | Whole Body | 76.8 | 0.00284 | 12.1 | 0.188 | <0.16 | 13.6 | <0.0026 | 0.00407 | 45,200 | 0.162 | 0.0996 | 0.0907 | 0.0322 | 1.94 | 66.7 |
| | GC-PCC-21-Apr-15 | Gold Creek | Whole Body | 73.9 | 0.00181 | 13.9 | 0.227 | <0.16 | 8.4 | <0.0027 | 0.00157 | 36,100 | 0.102 | 0.0753 | 0.0921 | 0.047 | 2.36 | 68 |
| 2016 | SC-PCC-06 M-Apr-16 | Sand Creek | Muscle | 78.5 | 0.000505 | 2.65 | 0.186 | 0.1075 | 1.1525 | 0.00545 | 0.01075 | 2,420 | 0.00385 | 0.02125 | 0.5375 | 0.07245 | 1.555 | 26.25 |
| | SC-PCC-11 M-Apr-16 | Sand Creek | Muscle | 78.2 | <0.00047 | 4.74 | 0.116 | 0.099 | 1.48 | <0.0051 | 0.00414 | 2,500 | 0.0083 | 0.019 | 0.0593 | 0.0667 | 2 | 25.9 |
| | SC-PCC-12 M-Apr-16 | Sand Creek | Muscle | 80.7 | <0.00046 | 1.27 | 0.184 | 0.158 | 1.42 | <0.0049 | 0.00775 | 2,180 | 0.0031 | 0.0152 | 0.0526 | 0.0522 | 1.46 | 20.7 |
| | SC-PCC-16 M-Apr-16 | Sand Creek | Muscle | 79.6 | <0.00051 | 2.12 | 0.133 | 0.159 | 1.83 | <0.0055 | 0.0144 | 2,300 | 0.0085 | 0.021 | 0.0549 | 0.0529 | 1.97 | 33.6 |
| | SC-PCC-17 M-Apr-16 | Sand Creek | Muscle | 79.7 | <0.00049 | 2.88 | 0.0878 | <0.083 | 1.86 | <0.0052 | 0.00916 | 4,450 | 0.0026 | 0.0113 | 0.0547 | 0.065 | 0.761 | 13.7 |
| | SC-PCC-18 M-Apr-16 | Sand Creek | Muscle | 81.2 | <0.0005 | 0.522 | 0.16 | <0.085 | 2.14 | <0.0054 | 0.017 | 4,380 | 0.011 | 0.0205 | 0.0465 | 0.0647 | 1.78 | 25 |
| | SC-PCC-19 M-Apr-16 | Sand Creek | Muscle | 80.7 | <0.00049 | 1.68 | 0.236 | <0.083 | 3.38 | <0.0053 | 0.0137 | 6,940 | 0.0052 | 0.0162 | 0.0434 | 0.0826 | 0.673 | 14.1 |
| | SC-PCC-20 M-Apr-16 | Sand Creek | Muscle | 80.7 | <0.00049 | 0.534 | 0.202 | <0.083 | 2.29 | <0.0053 | 0.0102 | 8,830 | 0.0042 | 0.0147 | 0.0512 | 0.0611 | 0.92 | 16 |
| | SC-PCC-21 M-Apr-16 | Sand Creek | Muscle | 78.9 | <0.0005 | 3.83 | 0.18 | <0.084 | 1.06 | <0.0053 | 0.00364 | 1,700 | 0.0071 | 0.0151 | 0.0617 | 0.0721 | 1.29 | 18.3 |
| | SC-PCC-22 M-Apr-16 | Sand Creek | Muscle | 79.9 | <0.00051 | 1.77 | 0.167 | 0.105 | 2.09 | <0.0055 | 0.0104 | 2,500 | 0.0067 | 0.0241 | 0.0505 | 0.0379 | 2.11 | 31.9 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | SC-PCC-06 O-Apr-16 | Sand Creek | Ovary | 62.7 | 0.00888 | 6.16 | 0.117 | <0.087 | 0.719 | <0.003 | 0.00321 | 243 | 0.0047 | 0.049 | 0.102 | 0.0167 | 2.55 | 58.9 |
|  | SC-PCC-11 O-Apr-16 | Sand Creek | Ovary | 70.6 | 0.0178 | 4.5 | 0.103 | <0.091 | 1.06 | <0.0031 | 0.00192 | 564 | 0.0432 | 0.0862 | 0.086 | 0.0303 | 4.82 | 142 |
|  | SC-PCC-12 O-Apr-16 | Sand Creek | Ovary | 66.2 | 0.0169 | 3.21 | 0.1275 | 0.1505 | 1.64 | 0.003 | 0.00188 | 393 | 0.01045 | 0.0691 | 0.0768 | 0.0151 | 3.75 | 72.9 |
|  | SC-PCC-16 O-Apr-16 | Sand Creek | Ovary | 65.6 | 0.0145 | 1.52 | 0.0961 | 0.231 | 1.14 | <0.0028 | 0.00259 | 341 | 0.0107 | 0.0498 | 0.0805 | 0.0173 | 2.4 | 45.3 |
|  | SC-PCC-17 O-Apr-16 | Sand Creek | Ovary | 64.5 | 0.0102 | 3.42 | 0.107 | 0.105 | 0.694 | <0.0027 | 0.00194 | 231 | 0.013 | 0.0672 | 0.0902 | 0.0155 | 2.16 | 70.8 |
|  | SC-PCC-18 O-Apr-16 | Sand Creek | Ovary | 64.4 | 0.0215 | 1.33 | 0.12 | 0.151 | 0.891 | <0.0032 | 0.00287 | 315 | 0.0119 | 0.0708 | 0.0766 | 0.0178 | 4.32 | 66.2 |
|  | SC-PCC-19 O-Apr-16 | Sand Creek | Ovary | 66.6 | 0.0322 | 4.07 | 0.16 | 0.135 | 1.45 | <0.0031 | 0.00321 | 311 | 0.0327 | 0.0915 | 0.0812 | 0.0237 | 5.04 | 53.4 |
|  | SC-PCC-20 O-Apr-16 | Sand Creek | Ovary | 62.9 | 0.0199 | 0.904 | 0.0963 | 0.112 | 1.02 | <0.003 | 0.00138 | 242 | 0.0062 | 0.0469 | 0.0774 | 0.0136 | 2.07 | 64.8 |
|  | SC-PCC-21 O-Apr-16 | Sand Creek | Ovary | 65.4 | 0.0297 | 1.81 | 0.115 | 0.149 | 1.05 | <0.003 | 0.000465 | 282 | 0.0102 | 0.0458 | 0.0749 | 0.0201 | 4.24 | 52.3 |
|  | SC-PCC-22 O-Apr-16 | Sand Creek | Ovary | 64.6 | 0.0351 | 1.5 | 0.143 | 0.207 | 1.95 | <0.0032 | 0.00231 | 277 | 0.0137 | 0.0755 | 0.0882 | 0.0101 | 3.03 | 70.6 |
|  | SC-PCC-07 WB-Apr-16 | Sand Creek | Whole Body | 77.9 | 0.00254 | 8.42 | 0.215 | <0.092 | 16.1 | <0.0031 | 0.00105 | 32,300 | 0.0828 | 0.0682 | 0.0792 | 0.0726 | 1.77 | 62 |
|  | SC-PCC-09 WB-Apr-16 | Sand Creek | Whole Body | 76.8 | 0.00349 | 19.9 | 0.15 | <0.079 | 8.51 | <0.0027 | 0.00568 | 28,100 | 0.146 | 0.105 | 0.0937 | 0.0293 | 2.04 | 66.8 |
|  | SC-PCC-14 WB-Apr-16 | Sand Creek | Whole Body | 75.2 | 0.00297 | 9.42 | 0.192 | 0.085 | 6.09 | <0.0027 | 0.0015 | 30,600 | 0.047 | 0.0639 | 0.102 | 0.0672 | 1.89 | 60.7 |
|  | SC-PCC-23 WB-Apr-16 | Sand Creek | Whole Body | 76.9 | 0.00426 | 27.5 | 0.246 | <0.089 | 7.87 | <0.003 | 0.00595 | 31,500 | 0.0699 | 0.155 | 0.12 | 0.0416 | 2.12 | 81.6 |
|  | SC-PCC-24 WB-Apr-16 | Sand Creek | Whole Body | 75.0 | 0.00187 | 43.2 | 0.164 | 0.132 | 23.7 | <0.0032 | 0.00219 | 103,000 | 0.0305 | 0.0678 | 0.102 | 0.0303 | 1.29 | 63.3 |
|  | GC-PCC-13 WB-Apr-16 | Gold Creek | Whole Body | 75.2 | 0.00343 | 11.1 | 0.191 | 0.295 | 14.2 | <0.0029 | 0.00146 | 39,400 | 0.108 | 0.0881 | 0.113 | 0.0339 | 1.9 | 53.1 |
|  | GC-PCC-16 WB-Apr-16 | Gold Creek | Whole Body | 77.5 | 0.00345 | 10.3 | 0.232 | 0.136 | 10.6 | <0.0027 | 0.00395 | 38,600 | 0.0919 | 0.0819 | 0.0939 | 0.048 | 2.08 | 57.6 |
|  | GC-PCC-27 WB-Apr-16 | Gold Creek | Whole Body | 73.9 | 0.004905 | 14.05 | 0.3435 | 0.2305 | 8.465 | 0.00285 | 0.002555 | 31,800 | 0.0733 | 0.0923 | 0.142 | 0.03655 | 1.94 | 57.95 |
|  | GC-PCC-31 WB-Apr-16 | Gold Creek | Whole Body | 76.6 | 0.00436 | 15.2 | 0.335 | 0.231 | 7.08 | <0.0031 | 0.0027 | 31,800 | 0.0491 | 0.0737 | 0.0976 | 0.0366 | 1.88 | 47.8 |
|  | GC-PCC-36 WB-Apr-16 | Gold Creek | Whole Body | 73.4 | 0.00339 | 4.84 | 0.336 | 0.432 | 9.01 | <0.0031 | 0.00116 | 41,000 | 0.049 | 0.0536 | 0.0668 | 0.0285 | 1.77 | 38.7 |
|  | ER-PCC-01 M-Apr-16 | Elk River | Muscle | 79.1 | 0.000495 | 0.885 | 0.1325 | 0.085 | 1.96 | 0.00535 | 0.005675 | 2,885 | 0.00515 | 0.01755 | 0.0593 | 0.02915 | 1.705 | 26.7 |
|  | ER-PCC-02 M-Apr-16 | Elk River | Muscle | 78.0 | <0.00051 | 8.64 | 0.0595 | 0.208 | 1.47 | <0.0055 | 0.00408 | 3,270 | 0.0045 | 0.00941 | 0.0651 | 0.0549 | 0.758 | 15.2 |
|  | ER-PCC-03 M-Apr-16 | Elk River | Muscle | 78.7 | 0.0009 | 30.7 | 0.132 | 0.368 | 1.49 | <0.0052 | 0.00777 | 2,130 | 0.0062 | 0.0259 | 0.124 | 0.0353 | 1.7 | 28.1 |
|  | ER-PCC-05 M-Apr-16 | Elk River | Muscle | 77.6 | 0.00167 | 11.9 | 0.128 | 0.16 | 2.29 | <0.0054 | 0.00204 | 4,070 | 0.0047 | 0.0177 | 0.129 | 0.089 | 1.8 | 21.4 |
|  | ER-PCC-06 M-Apr-16 | Elk River | Muscle | 77.2 | <0.00049 | 5.49 | 0.0414 | 0.098 | 1.4 | <0.0053 | 0.00166 | 4,280 | 0.0026 | 0.00786 | 0.0564 | 0.0722 | 0.729 | 9.85 |
|  | ER-PCC-07 M-Apr-16 | Elk River | Muscle | 78.3 | 0.00051 | 6.23 | 0.0894 | 0.099 | 2.76 | <0.0052 | 0.006 | 4,550 | 0.0045 | 0.0227 | 0.0622 | 0.0508 | 1.69 | 22.1 |
|  | ER-PCC-08 M-Apr-16 | Elk River | Muscle | 78.7 | <0.00048 | 2.27 | 0.084 | 0.082 | 1.74 | <0.0051 | 0.00838 | 4,730 | 0.0039 | 0.0122 | 0.0599 | 0.0393 | 0.68 | 7.32 |
|  | ER-PCC-10 M-Apr-16 | Elk River | Muscle | 79.3 | <0.00051 | 3.07 | 0.191 | 0.104 | 3.3 | <0.0055 | 0.0052 | 6,170 | 0.003 | 0.0151 | 0.0842 | 0.0229 | 0.698 | 12.7 |
|  | ER-PCC-14 M-Apr-16 | Elk River | Muscle | 77.9 | <0.00047 | 1.07 | 0.0752 | 0.095 | 1.53 | <0.0051 | 0.00244 | 3,790 | <0.0023 | 0.0102 | 0.0501 | 0.0763 | 1.36 | 9.43 |
|  | ER-PCC-15 M-Apr-16 | Elk River | Muscle | 78.6 | <0.00051 | 11.1 | 0.239 | 0.263 | 1.2 | <0.0055 | 0.00497 | 3,280 | 0.005 | 0.0166 | 0.075 | 0.0693 | 2.89 | 16.5 |
|  | ER-PCC-01 O-Apr-16 | Elk River | Ovary | 63.9 | 0.0297 | 0.72 | 0.0789 | 0.181 | 1.35 | <0.0024 | 0.00071 | 222 | 0.0066 | 0.0517 | 0.0741 | 0.00672 | 1.93 | 46.5 |
|  | ER-PCC-02 O-Apr-16 | Elk River | Ovary | 62.5 | 0.0209 | 3.91 | 0.0669 | 0.138 | 0.907 | <0.0026 | 0.0009 | 213 | 0.0047 | 0.0493 | 0.0775 | 0.0123 | 2.93 | 35.4 |
|  | ER-PCC-03 O-Apr-16 | Elk River | Ovary | 71.7 | 0.0365 | 403 | 0.222 | 0.86 | 6.63 | 0.0077 | 0.00482 | 1,630 | 0.0299 | 0.19 | 0.587 | 0.0583 | 2.8 | 362 |
|  | ER-PCC-05 O-Apr-16 | Elk River | Ovary | 61.6 | 0.032 | 19.2 | 0.188 | 0.203 | 1.55 | <0.0026 | 0.00054 | 195 | 0.0047 | 0.0682 | 0.101 | 0.0203 | 4.32 | 51.4 |
|  | ER-PCC-06 O -Apr-16 | Elk River | Ovary | 62.5 | 0.03035 | 4.45 | 0.193 | 0.141 | 0.834 | 0.00315 | 0.0004285 | 180 | 0.00675 | 0.0497 | 0.08915 | 0.01745 | 3.68 | 41.85 |
|  | ER-PCC-07 O-Apr-16 | Elk River | Ovary | 64.3 | 0.0297 | 26.3 | 0.0825 | 0.187 | 2.19 | <0.0031 | 0.00133 | 326 | 0.0103 | 0.0718 | 0.122 | 0.0136 | 4.1 | 83.8 |
|  | ER-PCC-08 O-Apr-16 | Elk River | Ovary | 64.2 | 0.0426 | 7.66 | 0.123 | 0.305 | 1.65 | <0.0031 | 0.00153 | 287 | 0.0158 | 0.0896 | 0.0957 | 0.0101 | 3.78 | 58.3 |
|  | ER-PCC-10 O-Apr-16 | Elk River | Ovary | 70.1 | 0.0344 | 20.9 | 0.169 | 0.238 | 2.25 | <0.0031 | 0.00141 | 502 | 0.0139 | 0.132 | 0.112 | 0.00993 | 3.07 | 146 |
|  | ER-PCC-14 O-Apr-16 | Elk River | Ovary | 61.4 | 0.0286 | 1.51 | 0.268 | 0.12 | 1.03 | <0.0031 | 0.000471 | 195 | 0.0063 | 0.0511 | 0.0915 | 0.0183 | 3.51 | 39.7 |
|  | ER-PCC-15 O-Apr-16 | Elk River | Ovary | 62.0 | 0.0292 | 38.8 | 0.182 | 0.156 | 1.28 | <0.0031 | 0.00136 | 294 | 0.007 | 0.0887 | 0.139 | 0.0204 | 4.47 | 73.6 |
|  | ER-PCC-12 WB-Apr-16 | Elk River | Whole Body | 73.7 | 0.00633 | 20.2 | 0.205 | 0.462 | 10 | <0.0028 | 0.00147 | 39,100 | 0.0659 | 0.0558 | 0.11 | 0.0268 | 2.2 | 43.6 |
|  | ER-PCC-13 WB-Apr-16 | Elk River | Whole Body | 76.4 | 0.005565 | 22.65 | 0.174 | 0.4205 | 11.55 | 0.00315 | 0.00131 | 57,750 | 0.04675 | 0.0636 | 0.2185 | 0.0639 | 2.215 | 58.3 |
|  | ER-PCC-21 WB-Apr-16 | Elk River | Whole Body | 74.7 | 0.00895 | 370 | 0.456 | 0.632 | 13.8 | 0.0174 | 0.0144 | 21,900 | 0.12 | 0.295 | 0.629 | 0.086 | 2.64 | 344 |

**Table G.8: Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-PCC-26 WB-Apr-16 | Elk River | Whole Body | 74.8 | 0.00253 | 6.18 | 0.244 | 0.162 | 4.22 | <0.003 | 0.00147 | 20,000 | 0.0788 | 0.096 | 0.164 | 0.0674 | 1.92 | 57.2 |
| | ER-PCC-27 WB-Apr-16 | Elk River | Whole Body | 75.8 | 0.00573 | 16.5 | 0.293 | 0.215 | 9 | <0.0029 | 0.00242 | 23,600 | 0.273 | 0.138 | 0.119 | 0.0422 | 2.27 | 105 |
| | GC-PCC-25 M-Apr-16 | Gold Creek | Muscle | 81.9 | <0.0005 | 4.86 | 0.0488 | <0.086 | 0.909 | <0.0054 | 0.000641 | 3,050 | 0.0068 | 0.00792 | 0.0603 | 0.0868 | 0.943 | 13.3 |
| | GC-PCC-26 M-Apr-16 | Gold Creek | Muscle | 79.0 | <0.00051 | 1.7 | 0.143 | 0.128 | 2 | <0.0055 | 0.0086 | 4,100 | 0.0028 | 0.0128 | 0.0918 | 0.0331 | 0.83 | 9.91 |
| | GC-PCC-34 M-Apr-16 | Gold Creek | Muscle | 80.4 | <0.00049 | 2.65 | 0.0663 | 0.123 | 2.19 | <0.0053 | 0.0084 | 4,280 | 0.0052 | 0.0118 | 0.172 | 0.0365 | 1.09 | 13.4 |
| | GC-PCC-44 M-Apr-16 | Gold Creek | Muscle | 78.6 | <0.00042 | 4.96 | 0.101 | <0.1 | 3.48 | <0.0027 | 0.0131 | 4,130 | 0.0076 | 0.0291 | 0.0796 | 0.0192 | 1.95 | 34.2 |
| | GC-PCC-45 M-Apr-16 | Gold Creek | Muscle | 78.6 | <0.0004 | 10.7 | 0.172 | 0.18 | 2.73 | <0.0025 | 0.00819 | 5,600 | 0.0062 | 0.0135 | 0.0878 | 0.0455 | 0.624 | 19 |
| | GC-PCC-81 M-Apr-16 | Gold Creek | Muscle | 80.0 | <0.00041 | 2.71 | 0.151 | <0.1 | 0.895 | <0.0026 | 0.0106 | 1,400 | 0.0051 | 0.0301 | 0.113 | 0.0329 | 0.998 | 17.7 |
| | GC-PCC-82 M-Apr-16 | Gold Creek | Muscle | 79.6 | <0.0004 | 2.82 | 0.177 | <0.098 | 1.61 | <0.0026 | 0.00675 | 3,270 | 0.0047 | 0.0114 | 0.112 | 0.0325 | 0.726 | 16 |
| | GC-PCC-86 M-Apr-16 | Gold Creek | Muscle | 79.7 | <0.0004 | 5.58 | 0.122 | <0.097 | 1.72 | <0.0025 | 0.0123 | 5,380 | 0.005 | 0.0152 | 0.0801 | 0.0918 | 0.908 | 16.5 |
| | GC-PCC-90 M-Apr-16 | Gold Creek | Muscle | 79.4 | <0.00039 | 4.39 | 0.174 | <0.096 | 1.9 | <0.0025 | 0.0153 | 3,840 | 0.0068 | 0.0193 | 0.0756 | 0.031 | 1.14 | 19.4 |
| | GC-PCC-92 M-Apr-16 | Gold Creek | Muscle | 78.2 | <0.00042 | 5.78 | 0.156 | <0.1 | 1.82 | <0.0027 | 0.00698 | 2,000 | 0.0089 | 0.0264 | 0.0906 | 0.0353 | 1.7 | 27.3 |
| | GC-PCC-25 O-Apr-16 | Gold Creek | Ovary | 60.9 | 0.0335 | 8.64 | 0.19 | <0.095 | 0.997 | <0.0025 | 0.0002 | 173 | 0.0101 | 0.0409 | 0.0804 | 0.0203 | 3.64 | 43.8 |
| | GC-PCC-26 O-Apr-16 | Gold Creek | Ovary | 64.5 | 0.0218 | 1.08 | 0.0829 | 0.196 | 1.48 | <0.0024 | 0.00174 | 293 | 0.0053 | 0.076 | 0.0664 | 0.00886 | 2.83 | 50.4 |
| | GC-PCC-34 O-Apr-16 | Gold Creek | Ovary | 64.8 | 0.0167 | 3.57 | 0.161 | 0.21 | 1.27 | <0.0027 | 0.00115 | 265 | 0.0053 | 0.0641 | 0.0696 | 0.0112 | 4.77 | 51.6 |
| | GC-PCC-44 O-Apr-16 | Gold Creek | Ovary | 66.6 | 0.0287 | 6.87 | 0.0999 | <0.098 | 1.91 | <0.0026 | 0.00201 | 372 | 0.0119 | 0.0993 | 0.0718 | 0.00714 | 2.94 | 62.1 |
| | GC-PCC-45 O-Apr-16 | Gold Creek | Ovary | 64.7 | 0.0452 | 9.1 | 0.169 | 0.16 | 2.93 | <0.0026 | 0.00272 | 323 | 0.045 | 0.107 | 0.0932 | 0.0108 | 3.98 | 79 |
| | GC-PCC-81 O-Apr-16 | Gold Creek | Ovary | 62.0 | 0.0418 | 6 | 0.0935 | <0.099 | 1.54 | <0.0026 | 0.00153 | 237 | 0.0092 | 0.0914 | 0.0811 | 0.00801 | 3.55 | 56.9 |
| | GC-PCC-82 O-Apr-16 | Gold Creek | Ovary | 62.6 | 0.0213 | 0.907 | 0.115 | <0.099 | 1.36 | <0.0026 | 0.00101 | 190 | 0.0065 | 0.0517 | 0.0881 | 0.0062 | 2.64 | 65.5 |
| | GC-PCC-86 O-Apr-16 | Gold Creek | Ovary | 63.2 | 0.0194 | 7.58 | 0.0965 | 0.11 | 1.01 | <0.0026 | 0.00264 | 236 | 0.0109 | 0.0663 | 0.0787 | 0.0184 | 3.15 | 74.9 |
| | GC-PCC-90 O-Apr-16 | Gold Creek | Ovary | 63.4 | 0.03575 | 8.745 | 0.1065 | 0.15 | 1.2 | 0.00265 | 0.00179 | 258 | 0.0117 | 0.07385 | 0.07745 | 0.00839 | 3.225 | 77.1 |
| | GC-PCC-92 O-Apr-16 | Gold Creek | Ovary | 67.6 | 0.0376 | 6.03 | 0.146 | 0.2 | 1.79 | <0.0027 | 0.00156 | 383 | 0.0163 | 0.102 | 0.0866 | 0.0108 | 3.59 | 77.4 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw | Sn µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-PC-02M-Apr-14 | Sand Creek | Muscle | 0.015 | 0.799 | 20,500 | 0.0237 | 1,370 | 1.47 | 0.00714 | 1,160 | 0.0978 | 11,400 | 0.124 | 11.3 | <0.000054 | 0.00211 | 1.5 | 0.0342 |
| | SC-PC-03M-Apr-14 | Sand Creek | Muscle | 0.0138 | 0.919 | 20,700 | 0.0204 | 1,250 | 1.28 | 0.0049 | 1,120 | 0.0619 | 11,000 | 0.0548 | 10.1 | <0.000051 | 0.00161 | 1.62 | 0.0104 |
| | SC-PC-04M-Apr-14 | Sand Creek | Muscle | 0.0186 | 0.813 | 20,550 | 0.0211 | 1,300 | 1.44 | 0.00456 | 1,034 | 0.0616 | 10,650 | 0.0389 | 17.2 | <0.000054 | 0.00188 | 1.23 | 0.0196 |
| | SC-PC-06M-Apr-14 | Sand Creek | Muscle | 0.0192 | 0.601 | 22,500 | 0.027 | 1,310 | 1.37 | 0.00606 | 1,130 | 2.21 | 12,100 | 0.0712 | 9.48 | <0.000055 | 0.0022 | 2.58 | 0.0152 |
| | SC-PC-07M-Apr-14 | Sand Creek | Muscle | 0.0276 | 0.376 | 18,200 | 0.0574 | 1,220 | 1.58 | 0.00944 | 1,180 | 0.128 | 9,270 | 0.174 | 16.4 | <0.000056 | 0.00283 | 1.77 | 0.0614 |
| | SC-PC-10M-Apr-14 | Sand Creek | Muscle | 0.0125 | 0.29 | 19,400 | 0.0124 | 1,180 | 1.42 | 0.00459 | 941 | 0.0474 | 10,500 | 0.048 | 15.4 | <0.000055 | 0.00096 | 1.31 | 0.0148 |
| | SC-PC-11M-Apr-14 | Sand Creek | Muscle | 0.0203 | 0.356 | 20,400 | 0.0539 | 1,340 | 1.73 | 0.004 | 885 | 0.286 | 11,200 | 0.0329 | 17 | <0.000055 | 0.00144 | 1.59 | 0.0143 |
| | SC-PC-12M-Apr-14 | Sand Creek | Muscle | 0.0136 | 0.946 | 22,500 | 0.0148 | 1,360 | 1.69 | 0.00291 | 981 | 0.0498 | 12,900 | 0.0313 | 14.3 | <0.000051 | 0.00136 | 1.97 | 0.00649 |
| | SC-PC-14M-Apr-14 | Sand Creek | Muscle | 0.023 | 0.62 | 21,500 | 0.0456 | 1,280 | 1.52 | 0.00709 | 1,370 | 0.238 | 10,500 | 0.205 | 8.57 | <0.000055 | 0.00696 | 2.07 | 0.0509 |
| | SC-PC-15M-Apr-14 | Sand Creek | Muscle | 0.0145 | 0.542 | 21,700 | 0.0142 | 1,350 | 1.26 | 0.0031 | 895 | 0.0544 | 11,400 | 0.0509 | 8.39 | <0.000058 | 0.00171 | 1.78 | 0.0079 |
| | SC-PC-01M-Aug-14 | Sand Creek | Muscle | 0.0123 | 1.41 | 22,400 | 0.0241 | 1,410 | 1.74 | 0.0065 | 1,490 | 0.0678 | 12,600 | 0.257 | 14.1 | <0.00012 | 0.0115 | 1.96 | 0.0135 |
| | SC-PC-02M-Aug-14 | Sand Creek | Muscle | 0.00992 | 1.01 | 21,300 | 0.0135 | 1,360 | 1.14 | 0.0039 | 1,400 | 0.0684 | 11,500 | 0.174 | 9.01 | <0.00011 | 0.00195 | 1.86 | 0.00361 |
| | SC-PC-02G-Apr | Sand Creek | Ovary | 0.0236 | 0.0218 | 7,860 | 0.0304 | 820 | 9.69 | 0.109 | 1,640 | 0.0943 | 11,400 | 0.0447 | 5.87 | 0.000074 | 0.00218 | 4.49 | 0.0229 |
| | SC-PC-02G-Apr | Sand Creek | Ovary | 0.0453 | 0.024 | 7,810 | 0.101 | 881 | 11.0 | 0.114 | 1,540 | 0.165 | 11,300 | 0.0871 | 5.81 | 0.000114 | 0.00296 | 4.56 | 0.0224 |
| | SC-PC-02G-Apr-14 | Sand Creek | Ovary | 0.0345 | 0.0229 | 7,835 | 0.066 | 851 | 10.3 | 0.112 | 1,590 | 0.130 | 11,350 | 0.0659 | 5.84 | 0.000094 | 0.00257 | 4.53 | 0.0227 |
| | SC-PC-03G-Apr-14 | Sand Creek | Ovary | 0.0643 | 0.0379 | 7,940 | 0.119 | 1,060 | 9.82 | 0.156 | 1,640 | 0.349 | 11,300 | 0.114 | 5.53 | <0.000038 | 0.00334 | 4.65 | 0.0249 |
| | SC-PC-04G-Apr-14 | Sand Creek | Ovary | 0.0152 | 0.0294 | 8,750 | 0.0096 | 880 | 8.73 | 0.13 | 1,560 | 1.17 | 11,400 | 0.0212 | 8.89 | 0.000106 | 0.00101 | 4.8 | 0.0133 |
| | SC-PC-06G-Apr-14 | Sand Creek | Ovary | 0.0494 | 0.0289 | 9,790 | 0.090 | 1,170 | 5.41 | 0.182 | 2,100 | 1.1 | 11,500 | 0.0879 | 5.59 | 0.000049 | 0.00422 | 10.6 | 0.0409 |
| | SC-PC-07G-Apr-14 | Sand Creek | Ovary | 0.02 | 0.0236 | 19,700 | 0.0177 | 1,450 | 22.3 | 0.227 | 2,570 | 5.86 | 15,500 | 0.0294 | 23.3 | 0.000078 | 0.00128 | 12.8 | 0.0153 |
| | SC-PC-10G-Apr-14 | Sand Creek | Ovary | 0.0118 | 0.0148 | 9,600 | <0.0050 | 1,110 | 13.1 | 0.168 | 1,990 | 0.03 | 10,700 | 0.00669 | 10.3 | <0.000039 | 0.00032 | 4.96 | 0.00275 |
| | SC-PC-11G-Apr-14 | Sand Creek | Ovary | 0.0139 | 0.0175 | 9,330 | 0.0207 | 1,040 | 12.3 | 0.173 | 1,940 | 0.874 | 7,760 | 0.0204 | 10.1 | <0.000040 | 0.00129 | 4.09 | 0.0156 |
| | SC-PC-12G-Apr-14 | Sand Creek | Ovary | 0.012 | 0.0326 | 8,990 | 0.0053 | 1,000 | 10.8 | 0.109 | 1,980 | 0.122 | 11,300 | 0.0104 | 7.74 | <0.000041 | 0.00167 | 6.39 | 0.0108 |
| | SC-PC-14G-Apr-14 | Sand Creek | Ovary | 0.0284 | 0.0289 | 8,640 | 0.0486 | 1,110 | 9.66 | 0.177 | 2,020 | 0.0905 | 10,800 | 0.0554 | 4.68 | <0.000039 | 0.00239 | 6.15 | 0.0105 |
| | SC-PC-15G-Apr-14 | Sand Creek | Ovary | 0.0164 | 0.0140 | 7,340 | 0.016 | 867 | 5.99 | 0.11 | 1,370 | 0.07 | 11,300 | 0.027 | 4.05 | <0.000040 | 0.00173 | 5.34 | 0.00548 |
| | SC-PC-01WB-Apr-14 | Sand Creek | Whole Body | 0.0409 | 0.469 | 12,100 | 0.0835 | 2,165 | 8.52 | 0.0381 | 3,480 | 0.271 | 35,300 | 0.143 | 9.96 | <0.000057 | 0.00429 | 1.44 | 0.051 |
| | SC-PC-05WB-Apr-14 | Sand Creek | Whole Body | 0.0371 | 0.454 | 13,800 | 0.092 | 1,320 | 4.43 | 0.0411 | 2,380 | 0.233 | 21,700 | 0.104 | 11.1 | <0.000053 | 0.00343 | 2.12 | 0.0361 |
| | SC-PC-08WB-Apr-14 | Sand Creek | Whole Body | 0.165 | 0.233 | 13,100 | 0.415 | 1,420 | 11.2 | 0.0408 | 2,590 | 0.376 | 22,500 | 0.26 | 11.8 | <0.000053 | 0.0057 | 1.55 | 0.0255 |
| | SC-PC-13WB-Apr-14 | Sand Creek | Whole Body | 0.0388 | 0.294 | 13,700 | 0.083 | 1,560 | 8.13 | 0.0346 | 3,240 | 0.242 | 35,100 | 0.122 | 11.7 | <0.000055 | 0.00201 | 1.35 | 0.011 |
| | SC-PC-16WB-Apr-14 | Sand Creek | Whole Body | 0.176 | 0.266 | 12,200 | 0.524 | 1,820 | 13 | 0.052 | 2,960 | 0.532 | 42,500 | 0.27 | 9.62 | <0.000060 | 0.00595 | 1.53 | 0.0203 |
| | ER-PC-01M-Apr-14 | Elk River | Muscle | 0.0278 | 0.669 | 20,200 | 0.0678 | 1,330 | 2.15 | 0.00568 | 859 | 0.119 | 11,100 | 0.066 | 6.82 | <0.000056 | 0.00216 | 3.3 | 0.0211 |
| | ER-PC-02M-Apr-14 | Elk River | Muscle | 0.0422 | 0.786 | 18,600 | 0.107 | 1,190 | 2.4 | 0.00729 | 1,600 | 0.122 | 9,500 | 0.0698 | 5.59 | 0.000062 | 0.00302 | 3.61 | 0.0155 |
| | ER-PC-04M-Apr-14 | Elk River | Muscle | 0.014 | 1.24 | 21,900 | 0.02 | 1,360 | 1.39 | 0.00392 | 1,110 | 0.0838 | 12,000 | 0.0394 | 14.2 | <0.000051 | 0.0022 | 1.74 | 0.0102 |
| | ER-PC-05M-Apr-14 | Elk River | Muscle | 0.0184 | 0.724 | 19,300 | 0.0384 | 1,270 | 1.88 | 0.00616 | 723 | 0.0663 | 10,100 | 0.037 | 12 | <0.000059 | 0.00158 | 3.19 | 0.00918 |
| | ER-PC-06M-Apr-14 | Elk River | Muscle | 0.0208 | 1.17 | 18,800 | 0.0441 | 1,160 | 1.23 | 0.00887 | 943 | 0.103 | 9,000 | 0.0617 | 10.8 | <0.000054 | 0.00367 | 2.89 | 0.0221 |
| | ER-PC-07M-Apr-14 | Elk River | Muscle | 0.0135 | 1.23 | 22,000 | 0.0266 | 1,340 | 1.23 | 0.00337 | 1,020 | 0.105 | 12,300 | 0.0197 | 12 | <0.000058 | 0.00113 | 2.58 | 0.0132 |
| | ER-PC-08M-Apr-14 | Elk River | Muscle | 0.0130 | 1.52 | 22,700 | 0.0194 | 1,295 | 1.64 | 0.00357 | 1,004 | 0.0405 | 11,700 | 0.0393 | 13.4 | <0.000053 | 0.00138 | 2.55 | 0.00531 |
| | ER-PC-09M-Apr-14 | Elk River | Muscle | 0.0131 | 1.07 | 18,400 | 0.0236 | 1,100 | 1.15 | 0.0043 | 802 | 0.075 | 8,890 | 0.0604 | 13.2 | <0.000064 | 0.00265 | 1.37 | 0.00909 |
| | ER-PC-10M-Apr-14 | Elk River | Muscle | 0.0145 | 0.999 | 20,600 | 0.0319 | 1,160 | 0.897 | 0.00931 | 1,370 | 0.0595 | 9,200 | 0.0327 | 11.6 | <0.000050 | 0.0021 | 2.63 | 0.00802 |
| | ER-PC-11M-Apr-14 | Elk River | Muscle | 0.0133 | 1.19 | 21,400 | 0.0204 | 1,290 | 1.79 | 0.00402 | 998 | 0.0479 | 12,900 | 0.052 | 10.7 | <0.000051 | 0.00088 | 1.59 | 0.00131 |
| | ER-PC-01M-Aug-14 | Elk River | Muscle | 0.00809 | 1.07 | 21,600 | 0.0756 | 1,320 | 0.603 | 0.0105 | 1,900 | 0.0552 | 10,600 | 0.0441 | 8.27 | <0.000049 | 0.00203 | 5.09 | 0.00984 |
| | ER-PC-02M-Aug-14 | Elk River | Muscle | 0.00887 | 0.580 | 24,700 | 0.0414 | 1,590 | 1.57 | 0.00407 | 1,430 | 0.0431 | 13,800 | 0.0224 | 8.34 | <0.000049 | 0.0018 | 5.13 | 0.00743 |
| | ER-PC-03M-Aug-14 | Elk River | Muscle | 0.0103 | 1.39 | 24,200 | 0.0353 | 1,400 | 0.903 | 0.00385 | 1,650 | 0.119 | 12,000 | 0.138 | 7.75 | <0.000048 | 0.00395 | 4.78 | 0.0209 |

**Table G.8: Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw | Sn µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | ER-PC-04M-Aug-14 | Elk River | Muscle | 0.00643 | 1.00 | 22,000 | 0.027 | 1,380 | 0.623 | 0.00494 | 1,990 | 0.0447 | 10,800 | 0.0406 | 13.2 | <0.000048 | 0.00187 | 3.08 | 0.00457 |
|  | ER-PC-01G-Apr-14 | Elk River | Ovary | 0.0363 | 0.0256 | 8,810 | 0.0679 | 1,020 | 11.8 | 0.15 | 1,240 | 0.138 | 10,800 | 0.0564 | 3.64 | 0.000057 | 0.00376 | 7.87 | 0.00649 |
|  | ER-PC-02G-Apr-14 | Elk River | Ovary | 0.0181 | 0.0296 | 7,980 | 0.0275 | 999 | 15 | 0.14 | 1,620 | 0.0727 | 10,300 | 0.0293 | 3.18 | <0.000040 | 0.00288 | 9.37 | 0.00576 |
|  | ER-PC-04G-Apr-14 | Elk River | Ovary | 0.0129 | 0.038 | 7,990 | 0.0176 | 720 | 6.34 | 0.0976 | 1,240 | 0.0458 | 11,300 | 0.015 | 6.21 | <0.000036 | 0.00062 | 5.14 | 0.00374 |
|  | ER-PC-05G-Apr-14 | Elk River | Ovary | 0.024 | 0.0177 | 6,420 | 0.0378 | 752 | 8.47 | 0.109 | 960 | 0.1 | 9,670 | 0.033 | 5.35 | 0.000057 | 0.00173 | 5.62 | 0.00657 |
|  | ER-PC-06G-Apr-14 | Elk River | Ovary | 0.0124 | 0.03 | 7,710 | 0.0104 | 826 | 8.32 | 0.104 | 1,150 | 0.0253 | 11,100 | 0.00932 | 5.46 | <0.000038 | 0.00085 | 6.57 | 0.00275 |
|  | ER-PC-07G-Apr-14 | Elk River | Ovary | 0.0232 | 0.057 | 8,420 | 0.037 | 898 | 9.6 | 0.152 | 1,510 | 0.115 | 10,700 | 0.0365 | 6.09 | <0.000039 | 0.00239 | 10.8 | 0.0142 |
|  | ER-PC-08G-Apr-14 | Elk River | Ovary | 0.0151 | 0.0481 | 8,120 | 0.0199 | 871 | 9.13 | 0.125 | 1,610 | 0.0492 | 11,200 | 0.0202 | 6.23 | 0.000047 | 0.00184 | 10.3 | 0.00602 |
|  | ER-PC-09G-Apr-14 | Elk River | Ovary | 0.012 | 0.0449 | 8,460 | 0.0116 | 924 | 8.9 | 0.122 | 1,630 | 0.0314 | 10,600 | 0.008 | 8.32 | 0.000046 | 0.00077 | 4.98 | 0.00244 |
|  | ER-PC-10G-Apr-14 | Elk River | Ovary | 0.0121 | 0.0368 | 9,260 | 0.0142 | 998 | 7.62 | 0.134 | 1,870 | 0.0346 | 11,700 | 0.0155 | 6.15 | <0.000040 | 0.0011 | 6.92 | 0.00235 |
|  | ER-PC-11G-Apr-14 | Elk River | Ovary | 0.0204 | 0.0433 | 8,630 | 0.0323 | 949 | 9.96 | 0.125 | 1,580 | 0.0697 | 11,300 | 0.024 | 5.32 | 0.000046 | 0.00191 | 5.05 | 0.00364 |
|  | ER-PC-03WB-Apr-14 | Elk River | Whole Body | 0.127 | 0.48 | 14,400 | 0.406 | 1,850 | 18.1 | 0.0812 | 3,760 | 0.597 | 38,700 | 0.476 | 8.39 | <0.000093 | 0.00965 | 2.51 | 0.0178 |
|  | ER-PC-15WB-Apr-14 | Elk River | Whole Body | 0.0513 | 0.334 | 13,600 | 0.161 | 1,360 | 5.83 | 0.0409 | 2,600 | 0.299 | 24,900 | 0.0956 | 9.97 | <0.000063 | 0.00467 | 1.9 | 0.0112 |
|  | ER-PC-23WB-Apr-14 | Elk River | Whole Body | 0.0433 | 0.341 | 14,450 | 0.112 | 1,655 | 9.79 | 0.0429 | 4,095 | 0.323 | 39,900 | 0.104 | 11.0 | <0.000113 | 0.00346 | 1.47 | 0.00696 |
|  | ER-PC-24WB-Apr-14 | Elk River | Whole Body | 0.245 | 0.226 | 12,500 | 0.726 | 2,440 | 20.1 | 0.0879 | 2,900 | 0.841 | 23,800 | 0.358 | 10.5 | <0.000208 | 0.0142 | 2.12 | 0.025 |
|  | ER-PC-26WB-Apr-14 | Elk River | Whole Body | 0.0538 | 0.141 | 11,000 | 0.203 | 2,040 | 10 | 0.0385 | 3,520 | 0.397 | 55,000 | 0.047 | 10.5 | <0.000047 | 0.00299 | 1.17 | 0.00573 |
|  | GC-PC-01M-Apr-14 | Gold Creek | Muscle | 0.0118 | 0.567 | 20,400 | 0.0107 | 1,200 | 0.717 | 0.00385 | 968 | 0.0716 | 9,280 | 0.0186 | 15.8 | <0.000052 | 0.00089 | 1.87 | 0.00673 |
|  | GC-PC-02M-Apr-14 | Gold Creek | Muscle | 0.00803 | 0.405 | 21,200 | <0.0061 | 1,350 | 1.48 | 0.00234 | 727 | 0.0356 | 10,900 | 0.0183 | 15.5 | <0.000056 | 0.00189 | 1.77 | 0.00277 |
|  | GC-PC-05M-Apr-14 | Gold Creek | Muscle | 0.012 | 0.604 | 19,400 | 0.0131 | 1,210 | 0.716 | 0.00544 | 752 | 0.0711 | 9,290 | 0.0304 | 12.3 | 0.000049 | 0.00174 | 1.69 | 0.00855 |
|  | GC-PC-06M-Apr-14 | Gold Creek | Muscle | 0.0153 | 0.877 | 22,600 | 0.0208 | 1,220 | 1.35 | 0.0142 | 1,240 | 0.0565 | 10,900 | 0.0172 | 10.1 | <0.000053 | 0.00087 | 7.02 | 0.00514 |
|  | GC-PC-07M-Apr-14 | Gold Creek | Muscle | 0.0111 | 0.322 | 20,600 | 0.0129 | 1,270 | 1.17 | 0.00389 | 754 | 0.0365 | 11,000 | 0.013 | 15.1 | <0.000051 | 0.00093 | 1.46 | 0.00315 |
|  | GC-PC-11M-Apr-14 | Gold Creek | Muscle | 0.0103 | 0.839 | 20,300 | 0.0096 | 1,220 | 0.687 | 0.00292 | 1,010 | 0.0319 | 9,710 | 0.0389 | 13.2 | <0.000052 | 0.00202 | 4.51 | 0.00297 |
|  | GC-PC-13M-Apr-14 | Gold Creek | Muscle | 0.0111 | 0.465 | 21,400 | 0.0089 | 1,280 | 1.11 | 0.00326 | 815 | 0.0363 | 11,900 | 0.00765 | 13.2 | <0.000051 | <0.00053 | 1.7 | 0.00393 |
|  | GC-PC-15M-Apr-14 | Gold Creek | Muscle | 0.0102 | 0.705 | 20,400 | 0.0105 | 1,230 | 1.18 | 0.00278 | 1,040 | 0.0502 | 10,500 | 0.0264 | 13.2 | <0.000052 | 0.00123 | 2.31 | 0.005 |
|  | GC-PC-18M-Apr-14 | Gold Creek | Muscle | 0.0135 | 0.377 | 20,800 | 0.0153 | 1,290 | 1.43 | 0.00248 | 820 | 0.0358 | 11,000 | 0.0223 | 12.7 | <0.000050 | 0.00156 | 3.69 | 0.00553 |
|  | GC-PC-19M-Apr-14 | Gold Creek | Muscle | 0.0143 | 0.468 | 18,500 | 0.0234 | 1,280 | 0.97 | 0.00467 | 789 | 0.0773 | 9,060 | 0.0405 | 12.2 | <0.000051 | 0.00226 | 1.93 | 0.00777 |
|  | GC-PC-01M-Aug-14 | Gold Creek | Muscle | 0.0114 | 0.566 | 21,300 | 0.0529 | 1,500 | 1.06 | 0.00491 | 837 | 0.0667 | 11,500 | 0.0364 | 14.9 | <0.00015 | 0.00143 | 2.24 | 0.00869 |
|  | GC-PC-01G-Apr-14 | Gold Creek | Ovary | 0.0152 | 0.0502 | 16,100 | 0.0103 | 1,320 | 27.6 | 0.259 | 2,650 | 0.0412 | 13,900 | 0.0127 | 15.1 | 0.000048 | 0.00089 | 10.7 | 0.00409 |
|  | GC-PC-02G-Apr-14 | Gold Creek | Ovary | 0.0125 | 0.0108 | 7,910 | 0.0092 | 938 | 6.84 | 0.146 | 1,430 | 0.0426 | 11,500 | 0.0139 | 7.76 | <0.000040 | 0.0009 | 8.75 | 0.00297 |
|  | GC-PC-05G-Apr-14 | Gold Creek | Ovary | 0.0101 | 0.0152 | 7,640 | <0.0051 | 854 | 7.67 | 0.107 | 1,170 | 0.0155 | 12,700 | 0.00994 | 6.77 | <0.000040 | 0.00065 | 3.99 | 0.00253 |
|  | GC-PC-06G-Apr-14 | Gold Creek | Ovary | 0.0121 | 0.0336 | 11,100 | 0.0102 | 1,300 | 14.5 | 0.179 | 2,240 | 0.0434 | 11,200 | 0.0068 | 6.25 | 0.00007 | 0.00059 | 12.8 | 0.00201 |
|  | GC-PC-07G-Apr-14 | Gold Creek | Ovary | 0.0216 | 0.0294 | 15,700 | 0.0274 | 1,140 | 18.7 | 0.239 | 2,600 | 0.0734 | 13,300 | 0.0203 | 14.1 | <0.000039 | 0.00178 | 4.79 | 0.00925 |
|  | GC-PC-11G-Apr-14 | Gold Creek | Ovary | 0.0106 | 0.0237 | 6,920 | 0.0075 | 697 | 4.82 | 0.0894 | 1,070 | 0.0182 | 11,000 | 0.00922 | 5.72 | <0.000041 | 0.00071 | 4.99 | 0.00361 |
|  | GC-PC-13G-Apr-14 | Gold Creek | Ovary | 0.012 | 0.0165 | 6,640 | 0.0059 | 745 | 6.79 | 0.0946 | 1,090 | 0.0153 | 10,800 | 0.00341 | 5.77 | <0.000038 | 0.00035 | 4.24 | 0.00121 |
|  | GC-PC-15G-Apr-14 | Gold Creek | Ovary | 0.0116 | 0.0505 | 10,450 | 0.0058 | 1,215 | 27.5 | 0.195 | 2,635 | 0.0372 | 10,350 | 0.0126 | 8.90 | <0.000040 | 0.00082 | 15.8 | 0.00286 |
|  | GC-PC-18G-Apr-14 | Gold Creek | Ovary | 0.0191 | 0.0299 | 11,200 | 0.018 | 1,360 | 20.1 | 0.274 | 2,460 | 0.0812 | 11,400 | 0.0277 | 8.88 | <0.000040 | 0.00271 | 12 | 0.0201 |
|  | GC-PC-19G-Apr-14 | Gold Creek | Ovary | 0.0106 | 0.0135 | 6,670 | 0.007 | 753 | 7.16 | 0.108 | 1,020 | 0.0154 | 9,950 | 0.00678 | 6.26 | <0.000037 | 0.00053 | 4.96 | 0.00807 |
|  | GC-PC-04WB-Apr-14 | Gold Creek | Whole Body | 0.0326 | 0.354 | 12,700 | 0.0776 | 2,090 | 5.73 | 0.0353 | 3,240 | 0.167 | 26,200 | 0.0415 | 10.9 | <0.000052 | 0.00204 | 2.27 | 0.00568 |
|  | GC-PC-08WB-Apr-14 | Gold Creek | Whole Body | 0.0335 | 0.404 | 12,200 | 0.11 | 1,220 | 5.3 | 0.0356 | 2,920 | 0.171 | 25,200 | 0.0442 | 8.07 | <0.000050 | 0.00152 | 3.09 | 0.00438 |
|  | GC-PC-12WB-Apr-14 | Gold Creek | Whole Body | 0.0288 | 0.352 | 13,100 | 0.0743 | 1,210 | 4.73 | 0.0322 | 2,970 | 0.138 | 22,800 | 0.033 | 13.2 | <0.000052 | 0.00141 | 1.78 | 0.00562 |
|  | GC-PC-14WB-Apr-14 | Gold Creek | Whole Body | 0.0367 | 0.355 | 13,500 | 0.103 | 1,400 | 6.71 | 0.0416 | 3,250 | 0.22 | 28,800 | 0.0487 | 9.83 | <0.000054 | 0.00161 | 2.52 | 0.00543 |
|  | GC-PC-16WB-Apr-14 | Gold Creek | Whole Body | 0.0303 | 0.179 | 12,950 | 0.0651 | 1,835 | 6.65 | 0.0302 | 2,895 | 0.194 | 28,000 | 0.0295 | 11.2 | <0.000053 | 0.00196 | 1.81 | 0.00399 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw | Sn µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | SC-PCC-01-Apr-15 | Sand Creek | Muscle | 0.00782 | 0.412 | 21,900 | <0.0070 | 1,300 | 1.060 | 0.0085 | 758 | 0.0275 | 10,600 | 0.01850 | 13.0 | <0.000029 | <0.0012 | 3.32 | 0.00151 |
| | SC-PCC-02-Apr-15 | Sand Creek | Muscle | 0.00643 | 0.435 | 21,900 | 0.0071 | 1,440 | 1.150 | 0.0087 | 1,150 | 0.0214 | 11,400 | 0.00908 | 17.4 | <0.000029 | <0.0012 | 2.43 | <0.00071 |
| | SC-PCC-04-Apr-15 | Sand Creek | Muscle | 0.00647 | 1.270 | 20,600 | 0.0088 | 1,160 | 0.722 | 0.0113 | 1,880 | 0.0233 | 9,610 | 0.01110 | 13.2 | <0.000028 | 0.0019 | 1.89 | 0.00165 |
| | SC-PCC-05-Apr-15 | Sand Creek | Muscle | 0.00682 | 0.840 | 22,100 | 0.0074 | 1,345 | 1.290 | 0.0062 | 918 | 0.0234 | 11,150 | 0.02265 | 12.7 | <0.000028 | 0.0013 | 2.545 | 0.00081 |
| | SC-PCC-06-Apr-15 | Sand Creek | Muscle | 0.00647 | 1.470 | 22,100 | 0.0100 | 1,290 | 1.100 | 0.0107 | 1,560 | 0.0234 | 11,500 | 0.01990 | 16.2 | <0.000027 | 0.0033 | 1.76 | <0.00067 |
| | SC-PCC-08-Apr-15 | Sand Creek | Muscle | 0.00653 | 0.855 | 21,100 | <0.0068 | 1,170 | 0.597 | 0.0113 | 1,170 | 0.0209 | 10,200 | 0.00793 | 9.3 | <0.000028 | 0.0017 | 3.63 | 0.00073 |
| | SC-PCC-10-Apr-15 | Sand Creek | Muscle | 0.00814 | 1.460 | 22,700 | 0.0068 | 1,300 | 1.210 | 0.0068 | 1,110 | 0.0218 | 10,900 | 0.09650 | 12.6 | <0.000028 | <0.0011 | 1.89 | 0.00137 |
| | SC-PCC-13-Apr-15 | Sand Creek | Muscle | 0.00632 | 0.789 | 22,400 | 0.0074 | 1,340 | 1.280 | 0.0068 | 897 | 0.0184 | 11,300 | 0.03240 | 16.0 | <0.000027 | <0.0011 | 2.31 | 0.00068 |
| | SC-PCC-14-Apr-15 | Sand Creek | Muscle | 0.00786 | 0.886 | 20,400 | 0.0138 | 1,200 | 1.740 | 0.0068 | 1,140 | 0.0372 | 11,700 | 0.09070 | 6.8 | <0.000029 | 0.0050 | 3.68 | 0.00235 |
| | SC-PCC-15-Apr-15 | Sand Creek | Muscle | 0.00638 | 0.950 | 22,000 | <0.0069 | 1,360 | 0.583 | 0.0076 | 1,150 | 0.0291 | 10,200 | 0.02690 | 9.1 | <0.000028 | 0.0013 | 2.23 | 0.00211 |
| | SC-PCC-01-Apr-15 | Sand Creek | Ovary | 0.0111 | 0.0139 | 6,630 | 0.0141 | 776 | 7.15 | 0.111 | 1,010 | 0.0338 | 10,100 | 0.0173 | 5.85 | <0.0000039 | 0.00140 | 11.9 | <0.0011 |
| | SC-PCC-02-Apr-15 | Sand Creek | Ovary | 0.00560 | 0.0410 | 8,890 | 0.0100 | 1,340 | 9.92 | 0.224 | 5,380 | 0.0389 | 9,050 | 0.00972 | 9.79 | 0.0000176 | 0.00180 | 12.2 | 0.00150 |
| | SC-PCC-04-Apr-15 | Sand Creek | Ovary | 0.00730 | 0.146 | 14,000 | 0.00680 | 1,310 | 10.6 | 0.280 | 2,610 | 0.0375 | 10,600 | 0.0110 | 11.5 | <0.0000040 | <0.0012 | 10.1 | <0.0012 |
| | SC-PCC-05-Apr-15 | Sand Creek | Ovary | 0.00881 | 0.0363 | 7,385 | 0.00730 | 832 | 9.64 | 0.108 | 1,315 | 0.0355 | 10,350 | 0.0124 | 6.02 | <0.0000039 | 0.00140 | 17.1 | <0.0012 |
| | SC-PCC-06-Apr-15 | Sand Creek | Ovary | 0.00780 | 0.112 | 9,380 | 0.00550 | 972 | 7.73 | 0.182 | 2,050 | 0.0367 | 10,600 | 0.0178 | 9.58 | <0.0000040 | 0.00160 | 10.7 | <0.0012 |
| | SC-PCC-08-Apr-15 | Sand Creek | Ovary | 0.0103 | 0.0500 | 8,785 | 0.00510 | 956 | 6.98 | 0.131 | 1,505 | 0.0450 | 11,550 | 0.0142 | 5.06 | <0.000037 | 0.00184 | 22.6 | <0.00062 |
| | SC-PCC-10-Apr-15 | Sand Creek | Ovary | 0.00834 | 0.0704 | 8,760 | 0.00620 | 978 | 10.7 | 0.123 | 2,230 | 0.0278 | 10,400 | 0.0591 | 6.20 | 0.000067 | 0.00121 | 6.21 | 0.000650 |
| | SC-PCC-13-Apr-15 | Sand Creek | Ovary | 0.00668 | 0.0309 | 7,870 | 0.00510 | 874 | 8.27 | 0.125 | 1,980 | 0.0258 | 10,700 | 0.0332 | 7.56 | <0.000035 | 0.00143 | 13.3 | 0.000640 |
| | SC-PCC-14-Apr-15 | Sand Creek | Ovary | 0.00750 | 0.0593 | 8,370 | 0.0114 | 968 | 6.39 | 0.151 | 2,280 | 0.0890 | 10,800 | 0.0879 | 3.61 | <0.000036 | 0.00310 | 16.0 | 0.00102 |
| | SC-PCC-15-Apr-15 | Sand Creek | Ovary | 0.00650 | 0.0629 | 8,780 | 0.00610 | 997 | 12.5 | 0.156 | 2,250 | 0.0347 | 10,700 | 0.0207 | 5.10 | <0.000035 | 0.00191 | 9.18 | 0.00192 |
| | SC-PCC-03-Apr-15 | Sand Creek | Whole Body | 0.0198 | 0.72 | 15,100 | 0.0482 | 1,290 | 3.71 | 0.0342 | 2,840 | 0.109 | 22,300 | 0.0526 | 10.7 | <0.0000030 | 0.00231 | 2.75 | 0.00194 |
| | SC-PCC-07-Apr-15 | Sand Creek | Whole Body | 0.0264 | 0.69 | 15,500 | 0.0677 | 1,390 | 5.92 | 0.0441 | 3,440 | 0.139 | 23,900 | 0.0857 | 13.6 | 0.0000818 | 0.00274 | 2.48 | 0.00324 |
| | SC-PCC-09-Apr-15 | Sand Creek | Whole Body | 0.0152 | 0.483 | 15,700 | 0.0489 | 1,360 | 4.43 | 0.0394 | 2,860 | 0.159 | 25,200 | 0.0634 | 12.9 | 0.000012 | 0.00236 | 3.42 | 0.00557 |
| | SC-PCC-11-Apr-15 | Sand Creek | Whole Body | 0.0825 | 0.292 | 13,800 | 0.209 | 1,400 | 9.12 | 0.0451 | 3,000 | 0.225 | 25,100 | 0.193 | 20.9 | <0.0000027 | 0.00706 | 2.66 | 0.00977 |
| | SC-PCC-12-Apr-15 | Sand Creek | Whole Body | 0.0698 | 0.691 | 13,500 | 0.290 | 1,645 | 9.26 | 0.0432 | 4,335 | 0.290 | 34,700 | 0.242 | 11.8 | 0.000053 | 0.00420 | 3.20 | 0.00882 |
| | ER-PCC-01-Apr-15 | Elk River | Muscle | 0.01090 | 0.502 | 19,500 | 0.0179 | 1,280 | 1.280 | 0.0081 | 1,020 | 0.0692 | 11,000 | 0.09430 | 6.2 | <0.000034 | 0.0032 | 4.49 | 0.00868 |
| | ER-PCC-02-Apr-15 | Elk River | Muscle | 0.00621 | 1.210 | 20,900 | 0.0127 | 1,230 | 1.440 | 0.0103 | 1,470 | 0.0480 | 11,300 | 0.08350 | 6.5 | <0.000032 | 0.0042 | 4.12 | 0.00587 |
| | ER-PCC-04-Apr-15 | Elk River | Muscle | 0.00597 | 0.762 | 20,300 | 0.0093 | 1,200 | 0.908 | 0.0064 | 1,060 | 0.0433 | 10,300 | 0.03670 | 9.4 | <0.000033 | 0.0018 | 1.8 | 0.00285 |
| | ER-PCC-05-Apr-15 | Elk River | Muscle | 0.01230 | 0.431 | 21,600 | 0.0209 | 1,320 | 1.990 | 0.0124 | 1,150 | 0.0937 | 12,200 | 0.06570 | 6.3 | <0.000032 | 0.0082 | 4.29 | 0.00331 |
| | ER-PCC-06-Apr-15 | Elk River | Muscle | 0.00720 | 0.858 | 21,000 | 0.0132 | 1,260 | 1.120 | 0.0079 | 1,340 | 0.0540 | 11,500 | 0.06540 | 8.3 | <0.000030 | 0.0031 | 2.08 | 0.00386 |
| | ER-PCC-07-Apr-15 | Elk River | Muscle | 0.00941 | 0.393 | 20,800 | 0.0142 | 1,410 | 1.010 | 0.0086 | 1,180 | 0.0723 | 11,000 | 0.01740 | 14.3 | <0.000034 | 0.0010 | 2.21 | 0.00282 |
| | ER-PCC-08-Apr-15 | Elk River | Muscle | 0.00732 | 0.674 | 22,000 | 0.0161 | 1,410 | 1.790 | 0.0065 | 966 | 0.0353 | 12,700 | 0.03670 | 8.8 | <0.000033 | 0.0014 | 2.22 | 0.00139 |
| | ER-PCC-10-Apr-15 | Elk River | Muscle | 0.00717 | 0.835 | 24,250 | 0.0167 | 1,255 | 1.235 | 0.0097 | 1,380 | 0.0486 | 12,800 | 0.02470 | 9.1 | <0.0000325 | 0.0028 | 9.23 | 0.00291 |
| | ER-PCC-11-Apr-15 | Elk River | Muscle | 0.00737 | 0.882 | 22,700 | 0.0180 | 1,320 | 1.680 | 0.0082 | 1,570 | 0.0663 | 12,600 | 0.05700 | 6.2 | <0.000030 | 0.0020 | 4.54 | 0.00176 |
| | ER-PCC-12-Apr-15 | Elk River | Muscle | 0.00768 | 2.690 | 20,800 | 0.0227 | 1,250 | 2.220 | 0.0068 | 1,210 | 0.0368 | 13,200 | 0.05600 | 7.0 | <0.000034 | 0.0014 | 5.93 | 0.00265 |
| | ER-PCC-01-Apr-15 | Elk River | Ovary | 0.0115 | 0.0192 | 7,570 | 0.0178 | 1,020 | 7.04 | 0.136 | 1,450 | 0.0947 | 11,200 | 0.0841 | 3.04 | 0.000050 | 0.00281 | 10.9 | 0.00663 |
| | ER-PCC-02-Apr-15 | Elk River | Ovary | 0.00962 | 0.140 | 10,950 | 0.0127 | 1,240 | 9.29 | 0.227 | 2,515 | 0.128 | 11,350 | 0.0965 | 4.36 | <0.000036 | 0.00594 | 13.4 | 0.00802 |
| | ER-PCC-04-Apr-15 | Elk River | Ovary | 0.00796 | 0.0363 | 7,760 | 0.0115 | 937 | 8.79 | 0.134 | 1,640 | 0.0485 | 11,000 | 0.0348 | 4.42 | <0.000035 | 0.00173 | 10.1 | 0.00316 |
| | ER-PCC-05-Apr-15 | Elk River | Ovary | 0.0227 | 0.0152 | 7,590 | 0.0328 | 934 | 6.25 | 0.129 | 1,420 | 0.0954 | 11,500 | 0.0366 | 2.89 | 0.000085 | 0.00190 | 12.1 | 0.00280 |
| | ER-PCC-06-Apr-15 | Elk River | Ovary | 0.0997 | 0.0344 | 7,490 | 0.208 | 1,100 | 9.43 | 0.143 | 1,380 | 0.209 | 11,400 | 0.156 | 4.07 | 0.000137 | 0.00829 | 14.2 | 0.0102 |
| | ER-PCC-07-Apr-15 | Elk River | Ovary | 0.0161 | 0.0197 | 7,820 | 0.0303 | 842 | 7.68 | 0.143 | 1,230 | 0.109 | 11,300 | 0.0251 | 6.88 | <0.000035 | 0.00112 | 13.6 | 0.00216 |
| | ER-PCC-08-Apr-15 | Elk River | Ovary | 0.0244 | 0.0365 | 9,620 | 0.0472 | 1,140 | 5.81 | 0.196 | 1,790 | 0.109 | 11,000 | 0.0609 | 4.91 | <0.000035 | 0.00414 | 17.3 | 0.00445 |
| | ER-PCC-10-Apr-15 | Elk River | Ovary | 0.0145 | 0.105 | 11,900 | 0.0262 | 1,320 | 14.9 | 0.224 | 2,570 | 0.122 | 10,400 | 0.103 | 5.47 | 0.000045 | 0.00345 | 18.9 | 0.00695 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw | Sn µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-PCC-11-Apr-15 | Elk River | Ovary | 0.00920 | 0.0523 | 9,100 | 0.0137 | 1,130 | 4.76 | 0.192 | 1,930 | 0.101 | 10,500 | 0.0357 | 3.24 | 0.000048 | 0.00283 | 14.6 | 0.00181 |
|  | ER-PCC-12-Apr-15 | Elk River | Ovary | 0.00764 | 0.289 | 7,940 | 0.00890 | 949 | 17.3 | 0.127 | 1,470 | 0.0426 | 10,900 | 0.0220 | 3.53 | <0.000031 | 0.00151 | 7.21 | 0.00166 |
|  | ER-PCC-24-Apr-15 | Elk River | Whole Body | 0.0542 | 0.173 | 13,200 | 0.201 | 1,520 | 8.69 | 0.0328 | 3,440 | 0.192 | 29,000 | 0.108 | 10.5 | <0.000053 | 0.00424 | 3.08 | 0.00584 |
|  | ER-PCC-25-Apr-15 | Elk River | Whole Body | 0.0134 | 0.425 | 13,500 | 0.0673 | 1,470 | 9.47 | 0.0408 | 3,990 | 0.209 | 30,300 | 0.092 | 7.08 | <0.000045 | 0.0034 | 3.74 | 0.00166 |
|  | ER-PCC-26-Apr-15 | Elk River | Whole Body | 0.017 | 0.489 | 14,000 | 0.127 | 1,640 | 6.57 | 0.0329 | 3,890 | 0.315 | 35,400 | 0.114 | 4.98 | <0.000048 | 0.00398 | 4.02 | 0.00278 |
|  | ER-PCC-27-Apr-15 | Elk River | Whole Body | 0.0121 | 0.793 | 16,250 | 0.0961 | 1,340 | 6.37 | 0.0549 | 4,040 | 0.142 | 23,850 | 0.187 | 11.5 | <0.000049 | 0.00268 | 2.81 | 0.00419 |
|  | ER-PCC-28-Apr-15 | Elk River | Whole Body | 0.0715 | 0.276 | 13,500 | 0.27 | 1,750 | 8.83 | 0.0396 | 3,730 | 0.367 | 34,400 | 0.197 | 5.24 | <0.000051 | 0.00689 | 3.12 | 0.00881 |
|  | GC-PCC-01-Apr-15 | Gold Creek | Muscle | 0.00800 | 0.598 | 20,900 | 0.0104 | 1,250 | 1.220 | 0.0072 | 1,160 | 0.0283 | 11,600 | 0.02970 | 8.2 | <0.000033 | 0.0022 | 2.75 | 0.01420 |
|  | GC-PCC-02-Apr-15 | Gold Creek | Muscle | 0.01020 | 1.340 | 22,100 | 0.0148 | 1,250 | 1.330 | 0.0129 | 1,520 | 0.0346 | 12,000 | 0.02160 | 12.7 | <0.000033 | 0.0014 | 2.19 | 0.00294 |
|  | GC-PCC-03-Apr-15 | Gold Creek | Muscle | 0.00818 | 0.959 | 22,900 | 0.0168 | 1,340 | 1.390 | 0.0087 | 1,080 | 0.0398 | 14,600 | 0.01940 | 8.3 | <0.000032 | 0.0011 | 2.84 | 0.00178 |
|  | GC-PCC-04-Apr-15 | Gold Creek | Muscle | 0.01760 | 0.609 | 22,300 | 0.0375 | 1,340 | 1.850 | 0.0117 | 1,780 | 0.0611 | 11,900 | 0.03480 | 9.4 | 0.000035 | 0.0025 | 3.71 | 0.00237 |
|  | GC-PCC-05-Apr-15 | Gold Creek | Muscle | 0.00784 | 0.758 | 21,700 | 0.0074 | 1,360 | 1.620 | 0.0077 | 1,005 | 0.0215 | 11,500 | 0.01990 | 19.1 | <0.0000305 | 0.0014 | 1.84 | 0.00410 |
|  | GC-PCC-06-Apr-15 | Gold Creek | Muscle | 0.00725 | 1.800 | 23,100 | 0.0102 | 1,260 | 2.070 | 0.0082 | 1,450 | 0.0279 | 13,500 | 0.06190 | 10.3 | <0.000034 | 0.0024 | 1.75 | <0.00060 |
|  | GC-PCC-07-Apr-15 | Gold Creek | Muscle | 0.00596 | 0.686 | 20,600 | <0.0065 | 1,270 | 0.762 | 0.0108 | 1,030 | 0.0294 | 11,100 | 0.00839 | 10.1 | <0.000032 | 0.0017 | 2.6 | 0.00077 |
|  | GC-PCC-08-Apr-15 | Gold Creek | Muscle | 0.00674 | 0.251 | 21,100 | 0.0069 | 1,440 | 1.200 | 0.0076 | 786 | 0.0163 | 11,800 | 0.01150 | 20.1 | <0.000031 | 0.0022 | 1.88 | 0.00102 |
|  | GC-PCC-09-Apr-15 | Gold Creek | Muscle | 0.00626 | 1.430 | 22,400 | 0.0129 | 1,340 | 1.330 | 0.0100 | 1,120 | 0.0323 | 12,600 | 0.01110 | 14.9 | <0.000033 | 0.0009 | 2.21 | 0.00101 |
|  | GC-PCC-10-Apr-15 | Gold Creek | Muscle | 0.00769 | 1.490 | 22,200 | 0.0112 | 1,310 | 1.270 | 0.0079 | 1,050 | 0.0315 | 12,000 | 0.02880 | 10.1 | <0.000034 | 0.0017 | 3.11 | 0.00128 |
|  | GC-PCC-01-Apr-15 | Gold Creek | Ovary | 0.0111 | 0.0310 | 9,300 | 0.00880 | 970 | 8.61 | 0.135 | 1,440 | 0.0436 | 11,500 | 0.0252 | 4.93 | <0.000037 | 0.00198 | 13.0 | 0.00381 |
|  | GC-PCC-02-Apr-15 | Gold Creek | Ovary | 0.00935 | 0.135 | 9,870 | 0.00950 | 1,160 | 15.5 | 0.163 | 1,500 | 0.0527 | 10,400 | 0.0182 | 7.10 | <0.000038 | 0.00177 | 6.01 | 0.00301 |
|  | GC-PCC-03-Apr-15 | Gold Creek | Ovary | 0.0131 | 0.0910 | 11,700 | 0.0162 | 1,240 | 8.16 | 0.224 | 1,980 | 0.0892 | 11,300 | 0.0245 | 5.37 | 0.000038 | 0.00210 | 19.4 | 0.00463 |
|  | GC-PCC-04-Apr-15 | Gold Creek | Ovary | 0.343 | 0.0477 | 10,300 | 0.689 | 1,700 | 26.6 | 0.220 | 2,020 | 0.679 | 9,940 | 0.442 | 6.89 | 0.000049 | 0.0115 | 14.6 | 0.0293 |
|  | GC-PCC-05-Apr-15 | Gold Creek | Ovary | 0.00789 | 0.0179 | 7,630 | 0.00480 | 745 | 7.57 | 0.0880 | 992 | 0.0157 | 12,000 | 0.00679 | 8.55 | <0.000034 | 0.00102 | 6.33 | 0.00141 |
|  | GC-PCC-06-Apr-15 | Gold Creek | Ovary | 0.00743 | 0.137 | 9,170 | 0.00570 | 933 | 4.98 | 0.148 | 2,160 | 0.0413 | 11,100 | 0.0221 | 5.50 | 0.000038 | 0.00212 | 9.67 | 0.000840 |
|  | GC-PCC-07-Apr-15 | Gold Creek | Ovary | 0.00571 | 0.0265 | 7,890 | <0.0042 | 872 | 4.21 | 0.117 | 1,440 | 0.0416 | 11,200 | 0.0110 | 5.12 | 0.000057 | 0.00122 | 8.84 | <0.00064 |
|  | GC-PCC-08-Apr-15 | Gold Creek | Ovary | 0.00586 | 0.0114 | 8,145 | 0.00560 | 899 | 9.75 | 0.134 | 1,650 | 0.0173 | 9,595 | 0.00531 | 10.6 | <0.000038 | 0.00106 | 8.48 | 0.000910 |
|  | GC-PCC-09-Apr-15 | Gold Creek | Ovary | 0.00674 | 0.0625 | 8,510 | 0.00580 | 958 | 3.31 | 0.134 | 1,470 | 0.0277 | 11,200 | 0.00774 | 6.96 | <0.000038 | 0.00169 | 9.37 | <0.00064 |
|  | GC-PCC-10-Apr-15 | Gold Creek | Ovary | 0.0374 | 0.0873 | 10,600 | 0.0509 | 1,150 | 9.36 | 0.171 | 1,880 | 0.106 | 11,100 | 0.0577 | 6.76 | <0.000037 | 0.00359 | 10.9 | 0.00389 |
|  | GC-PCC-12-Apr-15 | Gold Creek | Whole Body | 0.0105 | 0.33 | 14,400 | 0.0533 | 1,220 | 4 | 0.039 | 2,790 | 0.135 | 20,400 | 0.0213 | 13.7 | <0.000053 | 0.00158 | 2.28 | 0.00163 |
|  | GC-PCC-16-Apr-15 | Gold Creek | Whole Body | 0.0173 | 0.506 | 13,400 | 0.0963 | 1,490 | 5.9 | 0.0425 | 3,690 | 0.136 | 29,300 | 0.0694 | 10.6 | <0.000051 | 0.00213 | 3.64 | 0.00168 |
|  | GC-PCC-17-Apr-15 | Gold Creek | Whole Body | 0.0301 | 0.249 | 12,500 | 0.102 | 1,300 | 6.62 | 0.0514 | 3,400 | 0.193 | 24,700 | 0.112 | 8.29 | <0.000053 | 0.00553 | 2.92 | 0.00284 |
|  | GC-PCC-18-Apr-15 | Gold Creek | Whole Body | 0.0158 | 0.486 | 13,500 | 0.101 | 1,540 | 8.44 | 0.0436 | 4,390 | 0.148 | 31,900 | 0.0956 | 10.3 | <0.000046 | 0.0017 | 2.31 | 0.00267 |
|  | GC-PCC-21-Apr-15 | Gold Creek | Whole Body | 0.0155 | 0.734 | 12,400 | 0.0534 | 1,340 | 5.22 | 0.0388 | 4,140 | 0.125 | 26,600 | 0.0505 | 8.97 | <0.000048 | 0.00159 | 1.87 | 0.0015 |
| 2016 | SC-PCC-06 M-Apr-16 | Sand Creek | Muscle | 0.00425 | 1.003 | 20,200 | 0.00785 | 1,310 | 1.14 | 0.0065 | 819 | 0.03615 | 11,300 | 0.02215 | 8.325 | 0.0000425 | 0.00145 | 3.07 | 0.0043 |
|  | SC-PCC-11 M-Apr-16 | Sand Creek | Muscle | 0.0054 | 0.662 | 20,000 | 0.0083 | 1,280 | 1.08 | 0.0043 | 859 | 0.029 | 11,500 | 0.0166 | 16.4 | <0.00004 | <0.0011 | 3.37 | <0.00099 |
|  | SC-PCC-12 M-Apr-16 | Sand Creek | Muscle | 0.0032 | 0.597 | 20,800 | 0.0109 | 1,300 | 1.02 | 0.0034 | 748 | 0.0249 | 11,600 | 0.021 | 8.65 | <0.000039 | 0.0013 | 2.86 | <0.00096 |
|  | SC-PCC-16 M-Apr-16 | Sand Creek | Muscle | 0.0041 | 0.783 | 20,500 | 0.0096 | 1,220 | 0.976 | 0.0278 | 1,470 | 0.0263 | 11,700 | 0.0147 | 8.98 | 0.000121 | 0.002 | 2.33 | 0.0027 |
|  | SC-PCC-17 M-Apr-16 | Sand Creek | Muscle | 0.0062 | 0.811 | 23,000 | 0.0096 | 1,420 | 1.55 | 0.0031 | 873 | 0.0307 | 13,600 | 0.0425 | 10.1 | <0.000041 | 0.0011 | 2.18 | <0.001 |
|  | SC-PCC-18 M-Apr-16 | Sand Creek | Muscle | 0.0041 | 0.754 | 22,200 | 0.0059 | 1,290 | 1.59 | 0.0042 | 1,380 | 0.0343 | 13,500 | 0.0343 | 12.1 | <0.000042 | <0.0011 | 2.44 | <0.0011 |
|  | SC-PCC-19 M-Apr-16 | Sand Creek | Muscle | 0.0055 | 0.843 | 22,200 | 0.0098 | 1,380 | 2.58 | 0.003 | 1,170 | 0.0328 | 14,300 | 0.557 | 12.1 | <0.000042 | 0.002 | 2.6 | 0.0075 |
|  | SC-PCC-20 M-Apr-16 | Sand Creek | Muscle | 0.0058 | 0.817 | 22,200 | 0.0077 | 1,360 | 1.59 | <0.0029 | 1,150 | 0.0323 | 15,500 | 0.0431 | 6.75 | <0.000042 | 0.0019 | 1.83 | <0.001 |
|  | SC-PCC-21 M-Apr-16 | Sand Creek | Muscle | 0.0048 | 1.44 | 19,500 | 0.0092 | 1,360 | 0.978 | 0.0043 | 1,370 | 0.0359 | 11,000 | 0.0133 | 12.4 | <0.000042 | 0.0014 | 1.7 | 0.0014 |
|  | SC-PCC-22 M-Apr-16 | Sand Creek | Muscle | 0.0036 | 0.49 | 20,800 | 0.007 | 1,260 | 1.16 | 0.0054 | 1,150 | 0.0443 | 11,900 | 0.0188 | 6.48 | <0.000043 | 0.0023 | 4.89 | 0.0013 |

**Table G.8: Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw | Sn µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | SC-PCC-06 O-Apr-16 | Sand Creek | Ovary | 0.00855 | 0.0439 | 6,840 | 0.0093 | 769 | 4.12 | 0.0857 | 1,190 | 0.0336 | 11,600 | 0.0132 | 3.78 | <0.000048 | <0.00093 | 17.9 | <0.0012 |
| | SC-PCC-11 O-Apr-16 | Sand Creek | Ovary | 0.00923 | 0.0564 | 9,170 | 0.0073 | 1,160 | 9.7 | 0.176 | 1,650 | 0.0446 | 11,400 | 0.0169 | 9.91 | <0.00005 | 0.00118 | 30.1 | <0.0012 |
| | SC-PCC-12 O-Apr-16 | Sand Creek | Ovary | 0.007795 | 0.02685 | 7,260 | 0.0103 | 889 | 11.7 | 0.1225 | 1,290 | 0.0347 | 11,000 | 0.01185 | 3.895 | 0.000048 | 0.00177 | 14.15 | 0.0012 |
| | SC-PCC-16 O-Apr-16 | Sand Creek | Ovary | 0.00793 | 0.036 | 7,700 | 0.0049 | 891 | 7.21 | 0.125 | 1,420 | 0.0286 | 11,600 | 0.011 | 4.78 | <0.000046 | 0.00099 | 9.5 | <0.0011 |
| | SC-PCC-17 O-Apr-16 | Sand Creek | Ovary | 0.00898 | 0.0369 | 6,730 | 0.0105 | 772 | 6.19 | 0.0961 | 1,300 | 0.0412 | 11,600 | 0.0112 | 3.9 | <0.000044 | <0.00085 | 13.5 | <0.0011 |
| | SC-PCC-18 O-Apr-16 | Sand Creek | Ovary | 0.00646 | 0.0323 | 6,940 | 0.0042 | 825 | 8.64 | 0.104 | 1,440 | 0.0416 | 11,500 | 0.0139 | 5.27 | <0.000051 | 0.00147 | 12.7 | <0.0013 |
| | SC-PCC-19 O-Apr-16 | Sand Creek | Ovary | 0.00989 | 0.0452 | 7,390 | 0.0048 | 931 | 9.95 | 0.126 | 1,620 | 0.0456 | 11,700 | 0.0176 | 5.47 | <0.00005 | 0.00185 | 15.3 | <0.0012 |
| | SC-PCC-20 O-Apr-16 | Sand Creek | Ovary | 0.00591 | 0.0241 | 5,930 | <0.0039 | 649 | 3.99 | 0.0781 | 1,230 | 0.0204 | 10,100 | 0.0103 | 2.47 | <0.000049 | 0.00104 | 7.32 | 0.0064 |
| | SC-PCC-21 O-Apr-16 | Sand Creek | Ovary | 0.00741 | 0.0503 | 6,720 | 0.007 | 907 | 6.53 | 0.115 | 1,420 | 0.0187 | 11,400 | 0.00904 | 5.92 | <0.000048 | 0.00133 | 6.9 | <0.0012 |
| | SC-PCC-22 O-Apr-16 | Sand Creek | Ovary | 0.00861 | 0.0205 | 7,550 | 0.0042 | 872 | 5.7 | 0.102 | 1,560 | 0.06 | 12,400 | 0.0166 | 3.17 | <0.000051 | 0.00353 | 18.1 | <0.0013 |
| | SC-PCC-07 WB-Apr-16 | Sand Creek | Whole Body | 0.0169 | 0.52 | 12,700 | 0.0527 | 1,490 | 4.97 | 0.0275 | 2,600 | 0.13 | 26,100 | 0.0742 | 10.3 | <0.000051 | 0.00125 | 1.8 | 0.0056 |
| | SC-PCC-09 WB-Apr-16 | Sand Creek | Whole Body | 0.0196 | 0.338 | 12,400 | 0.0709 | 1,370 | 4.91 | 0.0354 | 2,940 | 0.186 | 23,800 | 0.0985 | 4.96 | <0.000043 | 0.00275 | 3.82 | 0.0024 |
| | SC-PCC-14 WB-Apr-16 | Sand Creek | Whole Body | 0.0145 | 0.398 | 12,600 | 0.0468 | 1,330 | 4.95 | 0.0388 | 2,850 | 0.121 | 23,800 | 0.0475 | 14.4 | <0.000044 | 0.00098 | 2.16 | 0.0048 |
| | SC-PCC-23 WB-Apr-16 | Sand Creek | Whole Body | 0.0218 | 0.306 | 12,800 | 0.0674 | 1,440 | 6.07 | 0.0336 | 3,520 | 0.194 | 25,800 | 0.106 | 7.82 | <0.000049 | 0.00266 | 3.43 | 0.0028 |
| | SC-PCC-24 WB-Apr-16 | Sand Creek | Whole Body | 0.0443 | 0.114 | 9,020 | 0.119 | 2,040 | 17.2 | 0.0323 | 2,980 | 0.352 | 59,700 | 0.184 | 6.88 | <0.000051 | 0.00201 | 1.33 | 0.0024 |
| | GC-PCC-13 WB-Apr-16 | Gold Creek | Whole Body | 0.0202 | 0.201 | 12,100 | 0.0611 | 1,550 | 9.79 | 0.0326 | 3,420 | 0.182 | 29,900 | 0.103 | 8.5 | <0.000047 | 0.00213 | 4.35 | 0.003 |
| | GC-PCC-16 WB-Apr-16 | Gold Creek | Whole Body | 0.0205 | 0.477 | 14,600 | 0.0589 | 1,550 | 5.82 | 0.0335 | 3,760 | 0.149 | 29,700 | 0.0539 | 10.9 | <0.000043 | 0.00215 | 2.4 | 0.0033 |
| | GC-PCC-27 WB-Apr-16 | Gold Creek | Whole Body | 0.0171 | 0.1745 | 11,350 | 0.0644 | 1,340 | 4.21 | 0.0321 | 2,625 | 0.214 | 24,850 | 0.0547 | 8.145 | 0.0000465 | 0.00176 | 3.69 | 0.00245 |
| | GC-PCC-31 WB-Apr-16 | Gold Creek | Whole Body | 0.0163 | 0.249 | 11,900 | 0.0484 | 1,390 | 5.02 | 0.0363 | 2,620 | 0.161 | 25,500 | 0.0614 | 9.61 | <0.00005 | 0.00174 | 2.83 | 0.0029 |
| | GC-PCC-36 WB-Apr-16 | Gold Creek | Whole Body | 0.0179 | 0.13 | 10,800 | 0.0476 | 1,330 | 5.39 | 0.0317 | 2,630 | 0.15 | 29,600 | 0.0251 | 9.9 | <0.00005 | <0.00096 | 2.41 | 0.0014 |
| | ER-PCC-01 M-Apr-16 | Elk River | Muscle | 0.0044 | 0.4575 | 21,950 | 0.00935 | 1,345 | 0.9095 | 0.003 | 993 | 0.04765 | 13,000 | 0.01505 | 4.995 | 0.0000425 | 0.00235 | 5.025 | 0.00105 |
| | ER-PCC-02 M-Apr-16 | Elk River | Muscle | 0.0075 | 0.261 | 19,100 | 0.018 | 1,530 | 1.43 | <0.003 | 1,010 | 0.0499 | 12,000 | 0.0212 | 10 | <0.000043 | <0.0011 | 3.75 | 0.0032 |
| | ER-PCC-03 M-Apr-16 | Elk River | Muscle | 0.0111 | 0.335 | 20,200 | 0.0226 | 1,320 | 1.05 | 0.0057 | 1,150 | 0.0741 | 12,000 | 0.0328 | 6.1 | 0.000043 | 0.0022 | 5.36 | 0.0045 |
| | ER-PCC-05 M-Apr-16 | Elk River | Muscle | 0.009 | 0.281 | 19,900 | 0.0191 | 1,410 | 1.77 | 0.005 | 1,070 | 0.0647 | 13,200 | 0.0318 | 22.4 | <0.000042 | 0.0022 | 2.31 | 0.0032 |
| | ER-PCC-06 M-Apr-16 | Elk River | Muscle | 0.0058 | 0.333 | 20,000 | 0.0111 | 1,520 | 1.58 | <0.0029 | 902 | 0.0387 | 13,000 | 0.019 | 16.3 | <0.000041 | <0.0011 | 2.32 | 0.0039 |
| | ER-PCC-07 M-Apr-16 | Elk River | Muscle | 0.0066 | 0.318 | 20,400 | 0.0226 | 1,350 | 1.81 | 0.0043 | 1,110 | 0.0492 | 13,300 | 0.0298 | 10.1 | <0.000041 | 0.0014 | 3.59 | 0.0015 |
| | ER-PCC-08 M-Apr-16 | Elk River | Muscle | 0.0044 | 0.609 | 21,100 | 0.0137 | 1,440 | 1.44 | <0.0028 | 838 | 0.0394 | 13,100 | 0.0307 | 6.55 | <0.00004 | 0.0017 | 5.06 | <0.001 |
| | ER-PCC-10 M-Apr-16 | Elk River | Muscle | 0.0076 | 0.368 | 21,100 | 0.0207 | 1,390 | 1.64 | 0.0033 | 1,120 | 0.0682 | 13,900 | 0.0382 | 5.67 | <0.000043 | 0.0028 | 6.85 | 0.0027 |
| | ER-PCC-14 M-Apr-16 | Elk River | Muscle | 0.004 | 0.279 | 20,700 | 0.0121 | 1,400 | 1.03 | <0.0028 | 864 | 0.0348 | 13,100 | 0.00464 | 16.2 | <0.00004 | <0.0011 | 2.8 | <0.00099 |
| | ER-PCC-15 M-Apr-16 | Elk River | Muscle | 0.009 | 0.34 | 21,500 | 0.0144 | 1,550 | 1.38 | <0.003 | 963 | 0.0731 | 12,800 | 0.0293 | 9.12 | <0.000043 | 0.0017 | 3.23 | 0.0022 |
| | ER-PCC-01 O-Apr-16 | Elk River | Ovary | 0.00793 | 0.0165 | 7,340 | 0.0056 | 739 | 4.23 | 0.0942 | 1,190 | 0.0628 | 10,500 | 0.00774 | 2.18 | 0.000039 | 0.00171 | 16.3 | 0.00098 |
| | ER-PCC-02 O-Apr-16 | Elk River | Ovary | 0.00764 | 0.00724 | 6,810 | 0.0085 | 612 | 6.62 | 0.08 | 1,010 | 0.0412 | 10,500 | 0.00824 | 4.37 | <0.00003 | 0.00149 | 12.6 | 0.00178 |
| | ER-PCC-03 O-Apr-16 | Elk River | Ovary | 0.137 | 0.0199 | 9,110 | 0.335 | 1,410 | 19.9 | 0.222 | 2,420 | 0.369 | 9,240 | 0.199 | 3.91 | 0.000047 | 0.00684 | 18.9 | 0.017 |
| | ER-PCC-05 O-Apr-16 | Elk River | Ovary | 0.0117 | 0.00674 | 6,530 | 0.0206 | 668 | 4.73 | 0.0777 | 1,050 | 0.0593 | 10,100 | 0.0328 | 9.49 | <0.00003 | 0.0015 | 8.9 | 0.00225 |
| | ER-PCC-06 O -Apr-16 | Elk River | Ovary | 0.008355 | 0.01029 | 6,415 | 0.0066 | 726 | 6.795 | 0.09105 | 1,150 | 0.02375 | 10,850 | 0.00886 | 7.075 | 0.000051 | 0.000985 | 8.15 | 0.0027 |
| | ER-PCC-07 O-Apr-16 | Elk River | Ovary | 0.0154 | 0.0112 | 6,630 | 0.0286 | 778 | 5.51 | 0.0886 | 1,360 | 0.369 | 11,000 | 0.0334 | 4.31 | <0.00005 | 0.00181 | 11 | 0.0031 |
| | ER-PCC-08 O-Apr-16 | Elk River | Ovary | 0.00911 | 0.0269 | 7,480 | 0.0165 | 846 | 7.46 | 0.0893 | 1,490 | 0.155 | 11,900 | 0.0164 | 3 | <0.000049 | 0.00115 | 25.4 | 0.0017 |
| | ER-PCC-10 O-Apr-16 | Elk River | Ovary | 0.0103 | 0.0165 | 7,730 | 0.0306 | 862 | 5.38 | 0.141 | 2,440 | 0.168 | 10,600 | 0.0266 | 2.9 | <0.00005 | 0.0021 | 18.4 | 0.0029 |
| | ER-PCC-14 O-Apr-16 | Elk River | Ovary | 0.00602 | 0.0106 | 6,380 | 0.0079 | 703 | 7.68 | 0.0915 | 1,150 | 0.026 | 10,600 | 0.00348 | 6.71 | <0.00005 | <0.00097 | 7.25 | <0.0012 |
| | ER-PCC-15 O-Apr-16 | Elk River | Ovary | 0.0224 | 0.0102 | 6,970 | 0.035 | 725 | 6.52 | 0.0854 | 1,260 | 0.0876 | 11,800 | 0.0288 | 3.72 | 0.000068 | 0.00151 | 10.3 | 0.0021 |
| | ER-PCC-12 WB-Apr-16 | Elk River | Whole Body | 0.0241 | 0.153 | 11,800 | 0.0803 | 1,470 | 8.49 | 0.0273 | 2,790 | 0.21 | 29,200 | 0.842 | 8.96 | <0.000045 | 0.00546 | 3.54 | 0.0042 |
| | ER-PCC-13 WB-Apr-16 | Elk River | Whole Body | 0.02805 | 0.1935 | 12,900 | 0.0869 | 1,775 | 7.51 | 0.0377 | 3,685 | 0.3695 | 39,600 | 0.10215 | 12 | 0.000048 | 0.0021 | 3.08 | 0.00345 |
| | ER-PCC-21 WB-Apr-16 | Elk River | Whole Body | 0.142 | 0.342 | 12,800 | 0.335 | 1,580 | 12.6 | 0.058 | 3,280 | 0.46 | 19,700 | 0.346 | 7.32 | 0.000117 | 0.00916 | 4 | 0.0141 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw | Sn µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-PCC-26 WB-Apr-16 | Elk River | Whole Body | 0.0129 | 0.291 | 12,400 | 0.0321 | 1,280 | 2.85 | 0.028 | 2,580 | 0.0862 | 18,800 | 0.0382 | 11.9 | <0.000048 | 0.00133 | 2.42 | 0.0024 |
| | ER-PCC-27 WB-Apr-16 | Elk River | Whole Body | 0.018 | 0.57 | 13,300 | 0.0731 | 1,370 | 3.59 | 0.041 | 3,290 | 0.16 | 22,400 | 0.0604 | 10.3 | <0.000047 | 0.00131 | 3.02 | 0.0027 |
| | GC-PCC-25 M-Apr-16 | Gold Creek | Muscle | 0.0051 | 0.277 | 21,300 | 0.0098 | 1,510 | 1.06 | <0.003 | 960 | 0.0462 | 12,300 | 0.00802 | 18 | <0.000043 | <0.0011 | 2.65 | 0.0014 |
| | GC-PCC-26 M-Apr-16 | Gold Creek | Muscle | 0.0052 | 0.692 | 21,800 | 0.0087 | 1,420 | 1.26 | <0.0031 | 916 | 0.0337 | 12,800 | 0.0222 | 7.81 | <0.000044 | 0.0019 | 4.64 | <0.0011 |
| | GC-PCC-34 M-Apr-16 | Gold Creek | Muscle | 0.0056 | 0.415 | 21,200 | 0.0109 | 1,400 | 1.73 | <0.0029 | 1,040 | 0.0609 | 13,100 | 0.0135 | 14.3 | <0.000041 | <0.0011 | 4.64 | 0.0018 |
| | GC-PCC-44 M-Apr-16 | Gold Creek | Muscle | 0.00846 | 0.964 | 20,500 | 0.0109 | 1,390 | 1.49 | 0.0073 | 1,170 | 0.0389 | 12,500 | 0.0214 | 6.16 | <0.000031 | 0.00136 | 3.97 | 0.00204 |
| | GC-PCC-45 M-Apr-16 | Gold Creek | Muscle | 0.0106 | 0.972 | 19,400 | 0.0244 | 1,380 | 1.58 | 0.0056 | 1,080 | 0.0563 | 12,000 | 0.0229 | 10.4 | 0.000042 | 0.00213 | 2.6 | 0.00215 |
| | GC-PCC-81 M-Apr-16 | Gold Creek | Muscle | 0.00765 | 0.371 | 21,700 | 0.0049 | 1,520 | 0.695 | 0.0046 | 965 | 0.0444 | 11,300 | 0.00814 | 7.75 | 0.000038 | 0.00392 | 5.29 | <0.00076 |
| | GC-PCC-82 M-Apr-16 | Gold Creek | Muscle | 0.00812 | 0.461 | 20,800 | 0.0113 | 1,420 | 1.06 | 0.0064 | 896 | 0.0311 | 11,500 | 0.0151 | 6.46 | <0.00003 | 0.00085 | 4.61 | <0.00074 |
| | GC-PCC-86 M-Apr-16 | Gold Creek | Muscle | 0.00998 | 1.05 | 23,600 | 0.0097 | 1,510 | 1.64 | 0.0071 | 1,040 | 0.0375 | 13,800 | 0.0251 | 9.7 | <0.00003 | 0.00115 | 1.74 | 0.00223 |
| | GC-PCC-90 M-Apr-16 | Gold Creek | Muscle | 0.00862 | 0.864 | 21,500 | 0.0083 | 1,440 | 1.23 | 0.0047 | 962 | 0.0386 | 12,300 | 0.0209 | 6.57 | <0.000029 | 0.00128 | 4.67 | <0.00072 |
| | GC-PCC-92 M-Apr-16 | Gold Creek | Muscle | 0.00792 | 0.511 | 19,200 | 0.0096 | 1,340 | 1.05 | 0.0077 | 1,050 | 0.0412 | 10,700 | 0.0151 | 5.84 | <0.000031 | 0.00135 | 4.12 | 0.00105 |
| | GC-PCC-25 O-Apr-16 | Gold Creek | Ovary | 0.00883 | 0.00917 | 6,630 | 0.0093 | 594 | 3.35 | 0.0737 | 968 | 0.0239 | 10,200 | 0.00545 | 6.94 | <0.000029 | 0.00246 | 6.27 | <0.00072 |
| | GC-PCC-26 O-Apr-16 | Gold Creek | Ovary | 0.00743 | 0.0244 | 7,520 | <0.0032 | 689 | 8.17 | 0.0971 | 1,240 | 0.0433 | 10,600 | 0.00922 | 3.34 | <0.000028 | 0.00218 | 11.4 | <0.00069 |
| | GC-PCC-34 O-Apr-16 | Gold Creek | Ovary | 0.00785 | 0.0141 | 8,070 | 0.004 | 832 | 12.5 | 0.11 | 1,120 | 0.0262 | 10,500 | 0.0192 | 6.88 | <0.000031 | 0.00184 | 12.1 | <0.00077 |
| | GC-PCC-44 O-Apr-16 | Gold Creek | Ovary | 0.00854 | 0.049 | 8,680 | 0.0079 | 872 | 10.4 | 0.111 | 1,560 | 0.0404 | 10,700 | 0.00811 | 3.26 | 0.000037 | 0.0024 | 14 | <0.00074 |
| | GC-PCC-45 O-Apr-16 | Gold Creek | Ovary | 0.00881 | 0.0285 | 7,030 | 0.0071 | 729 | 6.88 | 0.0985 | 1,410 | 0.0604 | 10,500 | 0.0159 | 4.96 | 0.000053 | 0.00311 | 8.29 | 0.00212 |
| | GC-PCC-81 O-Apr-16 | Gold Creek | Ovary | 0.00802 | 0.0109 | 6,610 | 0.0058 | 665 | 6.58 | 0.0822 | 1,120 | 0.06 | 10,400 | 0.0105 | 2.88 | <0.00003 | 0.00374 | 13.7 | <0.00074 |
| | GC-PCC-82 O-Apr-16 | Gold Creek | Ovary | 0.00708 | 0.0161 | 7,080 | 0.004 | 669 | 5.51 | 0.0706 | 1,190 | 0.0316 | 10,600 | 0.00781 | 2.58 | <0.00003 | 0.00219 | 14 | <0.00075 |
| | GC-PCC-86 O-Apr-16 | Gold Creek | Ovary | 0.0131 | 0.0331 | 6,890 | 0.0089 | 747 | 5.8 | 0.0949 | 1,210 | 0.037 | 10,600 | 0.0161 | 3.93 | 0.00007 | 0.00312 | 6.65 | <0.00075 |
| | GC-PCC-90 O-Apr-16 | Gold Creek | Ovary | 0.009665 | 0.025 | 6,670 | 0.00705 | 741 | 4.76 | 0.1025 | 1,200 | 0.0488 | 10,200 | 0.01375 | 2.915 | 0.0000315 | 0.001215 | 15.05 | 0.000775 |
| | GC-PCC-92 O-Apr-16 | Gold Creek | Ovary | 0.00836 | 0.0224 | 8,080 | 0.0062 | 892 | 7.05 | 0.141 | 1,690 | 0.0458 | 10,300 | 0.0148 | 3.11 | <0.000031 | 0.00094 | 14.4 | <0.00077 |

**Table G.8: Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-PC-02M-Apr-14 | Sand Creek | Muscle | 5.62 | 0.0047 | 0.377 | 0.00968 | 0.003 | 0.0327 | 0.00625 | 30.4 | 0.0235 |
| | SC-PC-03M-Apr-14 | Sand Creek | Muscle | 5.09 | 0.00329 | 0.347 | 0.00738 | 0.00329 | 0.0332 | 0.00492 | 40.5 | 0.0205 |
| | SC-PC-04M-Apr-14 | Sand Creek | Muscle | 4.56 | 0.00409 | 0.453 | 0.0101 | 0.00206 | 0.0353 | 0.00804 | 19.3 | 0.0192 |
| | SC-PC-06M-Apr-14 | Sand Creek | Muscle | 5.74 | 0.00473 | 0.481 | 0.00387 | 0.00489 | 0.0418 | 0.00652 | 24.1 | 0.0247 |
| | SC-PC-07M-Apr-14 | Sand Creek | Muscle | 1.96 | 0.0127 | 0.983 | 0.016 | 0.00252 | 0.0817 | 0.0177 | 37.8 | 0.205 |
| | SC-PC-10M-Apr-14 | Sand Creek | Muscle | 4.54 | 0.00225 | 0.227 | 0.00561 | 0.00143 | 0.0213 | 0.00306 | 26.8 | 0.0279 |
| | SC-PC-11M-Apr-14 | Sand Creek | Muscle | 4.93 | 0.00261 | 1.13 | 0.00504 | 0.00162 | 0.0404 | 0.00396 | 16 | 0.0142 |
| | SC-PC-12M-Apr-14 | Sand Creek | Muscle | 7.72 | 0.00223 | 0.268 | 0.0124 | 0.00266 | 0.0227 | 0.00342 | 19.5 | 0.0172 |
| | SC-PC-14M-Apr-14 | Sand Creek | Muscle | 3.05 | 0.0095 | 1.2 | 0.0045 | 0.00424 | 0.0757 | 0.0143 | 25.7 | 0.0586 |
| | SC-PC-15M-Apr-14 | Sand Creek | Muscle | 5.1 | 0.00307 | 0.429 | 0.00391 | 0.00247 | 0.0288 | 0.00551 | 15 | 0.0168 |
| | SC-PC-01M-Aug-14 | Sand Creek | Muscle | 7.01 | 0.00164 | 0.294 | 0.00339 | 0.00259 | 0.0181 | 0.00266 | 28.5 | 0.0145 |
| | SC-PC-02M-Aug-14 | Sand Creek | Muscle | 4.85 | 0.000492 | 0.168 | 0.00301 | 0.00152 | 0.0119 | 0.00168 | 20.3 | 0.00795 |
| | SC-PC-02G-Apr | Sand Creek | Ovary | 0.529 | 0.00626 | 0.654 | 0.0095 | 0.00476 | 0.0622 | 0.0119 | 126 | 0.0669 |
| | SC-PC-02G-Apr | Sand Creek | Ovary | 1.04 | 0.0308 | 1.32 | 0.0108 | 0.00955 | 0.136 | 0.0357 | 135 | 0.11 |
| | SC-PC-02G-Apr-14 | Sand Creek | Ovary | 0.785 | 0.0185 | 0.987 | 0.0102 | 0.00716 | 0.0991 | 0.0238 | 131 | 0.0885 |
| | SC-PC-03G-Apr-14 | Sand Creek | Ovary | 1.06 | 0.0302 | 1.93 | 0.01 | 0.0103 | 0.247 | 0.0472 | 117 | 0.143 |
| | SC-PC-04G-Apr-14 | Sand Creek | Ovary | 0.456 | 0.00243 | 0.301 | 0.00808 | 0.00377 | 0.0366 | 0.00704 | 124 | 0.022 |
| | SC-PC-06G-Apr-14 | Sand Creek | Ovary | 0.972 | 0.0231 | 1.55 | 0.00697 | 0.0137 | 0.174 | 0.0368 | 141 | 0.123 |
| | SC-PC-07G-Apr-14 | Sand Creek | Ovary | 0.486 | 0.00418 | 0.52 | 0.0322 | 0.00095 | 0.0358 | 0.00532 | 289 | 0.0293 |
| | SC-PC-10G-Apr-14 | Sand Creek | Ovary | 0.348 | 0.000831 | 0.109 | 0.00491 | 0.00424 | 0.0169 | 0.00698 | 128 | 0.00871 |
| | SC-PC-11G-Apr-14 | Sand Creek | Ovary | 0.438 | 0.00397 | 0.395 | 0.00609 | 0.0056 | 0.0349 | 0.0107 | 127 | 0.0171 |
| | SC-PC-12G-Apr-14 | Sand Creek | Ovary | 0.406 | 0.000965 | 0.169 | 0.0125 | 0.00356 | 0.0284 | 0.00318 | 126 | 0.0115 |
| | SC-PC-14G-Apr-14 | Sand Creek | Ovary | 0.708 | 0.0128 | 0.764 | 0.00562 | 0.0075 | 0.105 | 0.0178 | 117 | 0.0602 |
| | SC-PC-15G-Apr-14 | Sand Creek | Ovary | 0.39 | 0.00393 | 0.357 | 0.0054 | 0.00449 | 0.0465 | 0.00644 | 98 | 0.0266 |
| | SC-PC-01WB-Apr-14 | Sand Creek | Whole Body | 74.4 | 0.00663 | 0.618 | 0.0201 | 0.0133 | 0.0791 | 0.0128 | 100 | 0.0817 |
| | SC-PC-05WB-Apr-14 | Sand Creek | Whole Body | 32.4 | 0.0135 | 1.1 | 0.0212 | 0.00939 | 0.0915 | 0.0196 | 99.2 | 0.108 |
| | SC-PC-08WB-Apr-14 | Sand Creek | Whole Body | 38 | 0.102 | 5.97 | 0.0177 | 0.0222 | 0.574 | 0.116 | 78.7 | 0.2 |
| | SC-PC-13WB-Apr-14 | Sand Creek | Whole Body | 71.9 | 0.00542 | 0.513 | 0.0106 | 0.0138 | 0.0651 | 0.0126 | 95 | 0.112 |
| | SC-PC-16WB-Apr-14 | Sand Creek | Whole Body | 89.1 | 0.0975 | 4.99 | 0.0212 | 0.0271 | 0.595 | 0.119 | 84.5 | 0.359 |
| | ER-PC-01M-Apr-14 | Elk River | Muscle | 5.46 | 0.0212 | 1.14 | 0.0143 | 0.00419 | 0.104 | 0.0251 | 21.3 | 0.0619 |
| | ER-PC-02M-Apr-14 | Elk River | Muscle | 3.17 | 0.0229 | 1.74 | 0.00679 | 0.00497 | 0.16 | 0.0414 | 30.9 | 0.132 |
| | ER-PC-04M-Apr-14 | Elk River | Muscle | 5.41 | 0.00256 | 0.348 | 0.0131 | 0.0024 | 0.0238 | 0.00584 | 18 | 0.0161 |
| | ER-PC-05M-Apr-14 | Elk River | Muscle | 4.65 | 0.0068 | 0.906 | 0.00758 | 0.00312 | 0.0916 | 0.0153 | 17.9 | 0.0407 |
| | ER-PC-06M-Apr-14 | Elk River | Muscle | 1.59 | 0.0082 | 0.926 | 0.0132 | 0.00198 | 0.074 | 0.016 | 31.9 | 0.0796 |
| | ER-PC-07M-Apr-14 | Elk River | Muscle | 6.38 | 0.00195 | 0.275 | 0.00847 | 0.00147 | 0.0212 | 0.00496 | 23.3 | 0.0134 |
| | ER-PC-08M-Apr-14 | Elk River | Muscle | 4.99 | 0.00161 | 0.250 | 0.00737 | 0.00399 | 0.0177 | 0.00311 | 17.8 | 0.0152 |
| | ER-PC-09M-Apr-14 | Elk River | Muscle | 2.66 | 0.00384 | 0.421 | 0.00795 | 0.00232 | 0.0356 | 0.00729 | 23.7 | 0.0267 |
| | ER-PC-10M-Apr-14 | Elk River | Muscle | 0.716 | 0.00641 | 0.42 | 0.0124 | 0.00157 | 0.0438 | 0.00805 | 31 | 0.0571 |
| | ER-PC-11M-Apr-14 | Elk River | Muscle | 9.37 | 0.00101 | 0.219 | 0.00746 | 0.00461 | 0.0169 | 0.00206 | 20.5 | 0.0125 |
| | ER-PC-01M-Aug-14 | Elk River | Muscle | 0.953 | 0.000839 | 0.257 | 0.0112 | 0.0005 | 0.0107 | 0.00163 | 69.6 | 0.0129 |
| | ER-PC-02M-Aug-14 | Elk River | Muscle | 5.21 | 0.000344 | 0.14 | 0.00915 | 0.00154 | 0.00851 | 0.0007 | 19.6 | 0.00651 |
| | ER-PC-03M-Aug-14 | Elk River | Muscle | 2.2 | 0.00122 | 0.228 | 0.00539 | 0.00106 | 0.0147 | 0.00221 | 22.7 | 0.00769 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | ER-PC-04M-Aug-14 | Elk River | Muscle | 0.89 | 0.000482 | 0.159 | 0.0104 | 0.00048 | 0.00724 | 0.00109 | 40.7 | 0.00702 |
| | ER-PC-01G-Apr-14 | Elk River | Ovary | 0.809 | 0.0167 | 1.27 | 0.0174 | 0.00676 | 0.187 | 0.0444 | 105 | 0.0992 |
| | ER-PC-02G-Apr-14 | Elk River | Ovary | 0.569 | 0.00518 | 0.638 | 0.00642 | 0.00453 | 0.0783 | 0.0127 | 142 | 0.0463 |
| | ER-PC-04G-Apr-14 | Elk River | Ovary | 0.314 | 0.00165 | 0.283 | 0.0126 | 0.00281 | 0.0324 | 0.00453 | 114 | 0.0166 |
| | ER-PC-05G-Apr-14 | Elk River | Ovary | 0.483 | 0.00803 | 0.811 | 0.00695 | 0.00445 | 0.11 | 0.0178 | 109 | 0.0434 |
| | ER-PC-06G-Apr-14 | Elk River | Ovary | 0.351 | 0.000951 | 0.279 | 0.00932 | 0.00185 | 0.0255 | 0.00402 | 93.7 | 0.00713 |
| | ER-PC-07G-Apr-14 | Elk River | Ovary | 0.489 | 0.0105 | 0.772 | 0.0126 | 0.0113 | 0.0971 | 0.0221 | 164 | 0.0402 |
| | ER-PC-08G-Apr-14 | Elk River | Ovary | 0.365 | 0.00275 | 0.311 | 0.00681 | 0.00639 | 0.0594 | 0.0078 | 93.9 | 0.0389 |
| | ER-PC-09G-Apr-14 | Elk River | Ovary | 0.446 | 0.000502 | 0.119 | 0.011 | 0.0028 | 0.0204 | 0.00376 | 142 | 0.0153 |
| | ER-PC-10G-Apr-14 | Elk River | Ovary | 0.413 | 0.00134 | 0.151 | 0.00936 | 0.013 | 0.0542 | 0.00864 | 117 | 0.0366 |
| | ER-PC-11G-Apr-14 | Elk River | Ovary | 0.427 | 0.00521 | 0.627 | 0.00818 | 0.00583 | 0.107 | 0.01 | 111 | 0.0441 |
| | ER-PC-03WB-Apr-14 | Elk River | Whole Body | 87.9 | 0.0588 | 3.32 | 0.0161 | 0.063 | 0.891 | 0.157 | 107 | 0.197 |
| | ER-PC-15WB-Apr-14 | Elk River | Whole Body | 39.6 | 0.0166 | 1.25 | 0.019 | 0.0082 | 0.247 | 0.049 | 98 | 0.148 |
| | ER-PC-23WB-Apr-14 | Elk River | Whole Body | 85.2 | 0.00386 | 0.46 | 0.00846 | 0.0175 | 0.0795 | 0.0149 | 111 | 0.0627 |
| | ER-PC-24WB-Apr-14 | Elk River | Whole Body | 38.3 | 0.129 | 5.99 | 0.0351 | 0.0364 | 2.08 | 0.379 | 84.7 | 0.358 |
| | ER-PC-26WB-Apr-14 | Elk River | Whole Body | 114 | 0.00407 | 0.463 | 0.0147 | 0.0075 | 0.108 | 0.0122 | 62 | 0.0331 |
| | GC-PC-01M-Apr-14 | Gold Creek | Muscle | 1.3 | 0.00207 | 0.339 | 0.00432 | 0.00064 | 0.0211 | 0.00402 | 17 | 0.025 |
| | GC-PC-02M-Apr-14 | Gold Creek | Muscle | 4.35 | 0.000447 | 0.14 | 0.0115 | 0.00101 | 0.0078 | 0.00108 | 18 | 0.0062 |
| | GC-PC-05M-Apr-14 | Gold Creek | Muscle | 0.94 | 0.00423 | 0.386 | 0.0152 | 0.00081 | 0.0227 | 0.00562 | 40.6 | 0.0216 |
| | GC-PC-06M-Apr-14 | Gold Creek | Muscle | 3.06 | 0.00952 | 0.363 | 0.00343 | 0.00284 | 0.0305 | 0.00878 | 22 | 0.0283 |
| | GC-PC-07M-Apr-14 | Gold Creek | Muscle | 5.12 | 0.00126 | 0.266 | 0.00835 | 0.00082 | 0.0321 | 0.00218 | 15.9 | 0.0113 |
| | GC-PC-11M-Apr-14 | Gold Creek | Muscle | 1.56 | 0.00156 | 0.271 | 0.0103 | 0.00064 | 0.0103 | 0.00192 | 20.5 | 0.0112 |
| | GC-PC-13M-Apr-14 | Gold Creek | Muscle | 5.29 | 0.000686 | 0.205 | 0.00964 | 0.00089 | 0.0116 | 0.00168 | 14 | 0.00857 |
| | GC-PC-15M-Apr-14 | Gold Creek | Muscle | 3.05 | 0.00126 | 0.312 | 0.00795 | 0.00142 | 0.0176 | 0.00251 | 18.5 | 0.0138 |
| | GC-PC-18M-Apr-14 | Gold Creek | Muscle | 4.33 | 0.00177 | 0.482 | 0.00837 | 0.00214 | 0.0234 | 0.00437 | 15.7 | 0.013 |
| | GC-PC-19M-Apr-14 | Gold Creek | Muscle | 1.49 | 0.00418 | 0.823 | 0.0169 | 0.00133 | 0.0347 | 0.00695 | 22.7 | 0.0264 |
| | GC-PC-01M-Aug-14 | Gold Creek | Muscle | 3.45 | 0.00181 | 0.403 | 0.00865 | 0.00107 | 0.0252 | 0.00414 | 30.6 | 0.0293 |
| | GC-PC-01G-Apr-14 | Gold Creek | Ovary | 0.53 | 0.000989 | 0.2 | 0.0156 | 0.0008 | 0.0451 | 0.00238 | 227 | 0.0136 |
| | GC-PC-02G-Apr-14 | Gold Creek | Ovary | 0.294 | 0.00288 | 0.316 | 0.0114 | 0.00293 | 0.0217 | 0.00621 | 112 | 0.0163 |
| | GC-PC-05G-Apr-14 | Gold Creek | Ovary | 0.286 | 0.000183 | 0.106 | 0.012 | 0.00164 | 0.0109 | 0.00135 | 97.1 | 0.00284 |
| | GC-PC-06G-Apr-14 | Gold Creek | Ovary | 0.506 | 0.00118 | 0.162 | 0.00511 | 0.0037 | 0.0393 | 0.00536 | 120 | 0.0193 |
| | GC-PC-07G-Apr-14 | Gold Creek | Ovary | 0.619 | 0.0314 | 0.675 | 0.0246 | 0.00186 | 0.046 | 0.0111 | 237 | 0.0568 |
| | GC-PC-11G-Apr-14 | Gold Creek | Ovary | 0.363 | 0.00127 | 0.157 | 0.014 | 0.00177 | 0.0178 | 0.00246 | 120 | 0.00977 |
| | GC-PC-13G-Apr-14 | Gold Creek | Ovary | 0.296 | 0.000713 | 0.122 | 0.00741 | 0.00168 | 0.0208 | 0.00331 | 82.3 | 0.00701 |
| | GC-PC-15G-Apr-14 | Gold Creek | Ovary | 0.451 | 0.0006655 | 0.128 | 0.0129 | 0.00404 | 0.0261 | 0.00720 | 115 | 0.0167 |
| | GC-PC-18G-Apr-14 | Gold Creek | Ovary | 0.569 | 0.00491 | 0.456 | 0.0135 | 0.011 | 0.0713 | 0.0196 | 176 | 0.0441 |
| | GC-PC-19G-Apr-14 | Gold Creek | Ovary | 0.274 | 0.000634 | 0.252 | 0.0146 | 0.00147 | 0.0149 | 0.00306 | 96.6 | 0.00742 |
| | GC-PC-04WB-Apr-14 | Gold Creek | Whole Body | 40.1 | 0.00679 | 0.822 | 0.0285 | 0.00497 | 0.0615 | 0.0143 | 80.7 | 0.0448 |
| | GC-PC-08WB-Apr-14 | Gold Creek | Whole Body | 38.7 | 0.00887 | 0.884 | 0.0101 | 0.00654 | 0.0705 | 0.0206 | 82.7 | 0.0652 |
| | GC-PC-12WB-Apr-14 | Gold Creek | Whole Body | 33.4 | 0 | 0.603 | 0.0197 | 0.00415 | 0.0508 | 0.0151 | 79.4 | 0.0466 |
| | GC-PC-14WB-Apr-14 | Gold Creek | Whole Body | 48.7 | 0.00706 | 0.806 | 0.0117 | 0.00853 | 0.0894 | 0.0177 | 86.5 | 0.0565 |
| | GC-PC-16WB-Apr-14 | Gold Creek | Whole Body | 46.9 | 0.00544 | 0.472 | 0.0175 | 0.00487 | 0.0597 | 0.0186 | 64.4 | 0.105 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sr<br>µg/g dw | Th<br>µg/g dw | Ti<br>µg/g dw | Tl<br>µg/g dw | U<br>µg/g dw | V<br>µg/g dw | Y<br>µg/g dw | Zn<br>µg/g dw | Zr<br>µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | SC-PCC-01-Apr-15 | Sand Creek | Muscle | 2.94 | 0.00073 | 0.1310 | 0.0136 | 0.00115 | 0.00888 | 0.00122 | 54.7 | 0.0127 |
| | SC-PCC-02-Apr-15 | Sand Creek | Muscle | 4.89 | <0.00040 | 0.1010 | 0.0133 | 0.00069 | 0.00404 | <0.00021 | 36.8 | 0.0076 |
| | SC-PCC-04-Apr-15 | Sand Creek | Muscle | 1.05 | 0.00073 | 0.1270 | 0.0128 | 0.00107 | 0.01120 | 0.00154 | 92.1 | 0.0193 |
| | SC-PCC-05-Apr-15 | Sand Creek | Muscle | 4.74 | 0.00053 | 0.1155 | 0.0099 | 0.00226 | 0.00832 | 0.00084 | 42.5 | 0.0160 |
| | SC-PCC-06-Apr-15 | Sand Creek | Muscle | 4.74 | 0.00079 | 0.1040 | 0.0098 | 0.00130 | 0.00770 | 0.00071 | 66.3 | 0.0094 |
| | SC-PCC-08-Apr-15 | Sand Creek | Muscle | 0.87 | 0.00049 | 0.1040 | 0.0069 | 0.00064 | 0.00636 | 0.00064 | 29.5 | 0.0152 |
| | SC-PCC-10-Apr-15 | Sand Creek | Muscle | 4.65 | 0.00094 | 0.1870 | 0.0170 | 0.00197 | 0.01300 | 0.00148 | 37.4 | 0.0288 |
| | SC-PCC-13-Apr-15 | Sand Creek | Muscle | 5.86 | 0.00055 | 0.1060 | 0.0075 | 0.00243 | 0.00943 | 0.00109 | 25.1 | 0.0090 |
| | SC-PCC-14-Apr-15 | Sand Creek | Muscle | 7.23 | 0.00069 | 0.1330 | 0.0036 | 0.00552 | 0.01710 | 0.00106 | 25.6 | 0.0336 |
| | SC-PCC-15-Apr-15 | Sand Creek | Muscle | 1.10 | 0.00094 | 0.1450 | 0.0058 | 0.00071 | 0.01000 | 0.00158 | 35.8 | 0.0202 |
| | SC-PCC-01-Apr-15 | Sand Creek | Ovary | 0.416 | 0.00484 | 0.326 | 0.00659 | 0.00470 | 0.0343 | 0.00901 | 105 | 0.0194 |
| | SC-PCC-02-Apr-15 | Sand Creek | Ovary | 0.803 | 0.000299 | 0.118 | 0.0198 | 0.00196 | 0.0165 | 0.00333 | 170 | 0.00765 |
| | SC-PCC-04-Apr-15 | Sand Creek | Ovary | 0.846 | 0.00113 | 0.111 | 0.0148 | 0.00494 | 0.0527 | 0.00496 | 176 | 0.0108 |
| | SC-PCC-05-Apr-15 | Sand Creek | Ovary | 0.364 | 0.00365 | 0.140 | 0.00647 | 0.00582 | 0.0191 | 0.00348 | 90.8 | 0.00968 |
| | SC-PCC-06-Apr-15 | Sand Creek | Ovary | 0.457 | 0.00147 | 0.0921 | 0.0126 | 0.00765 | 0.0348 | 0.00758 | 149 | 0.0132 |
| | SC-PCC-08-Apr-15 | Sand Creek | Ovary | 0.271 | 0.00106 | 0.133 | 0.00457 | 0.0121 | 0.0286 | 0.00472 | 107 | 0.0180 |
| | SC-PCC-10-Apr-15 | Sand Creek | Ovary | 0.561 | 0.000828 | 0.193 | 0.0190 | 0.00400 | 0.0356 | 0.00340 | 122 | 0.0177 |
| | SC-PCC-13-Apr-15 | Sand Creek | Ovary | 0.645 | 0.000858 | 0.126 | 0.00739 | 0.00367 | 0.0298 | 0.00208 | 116 | 0.0118 |
| | SC-PCC-14-Apr-15 | Sand Creek | Ovary | 0.424 | 0.00219 | 0.207 | 0.00470 | 0.00786 | 0.0656 | 0.00660 | 92.0 | 0.0236 |
| | SC-PCC-15-Apr-15 | Sand Creek | Ovary | 0.397 | 0.00105 | 0.105 | 0.00593 | 0.00682 | 0.0297 | 0.00458 | 128 | 0.0146 |
| | SC-PCC-03-Apr-15 | Sand Creek | Whole Body | 35.7 | 0.00763 | 0.56 | 0.0127 | 0.00669 | 0.0538 | 0.0292 | 104 | 0.244 |
| | SC-PCC-07-Apr-15 | Sand Creek | Whole Body | 39.7 | 0.00986 | 0.847 | 0.0143 | 0.00846 | 0.0914 | 0.0379 | 137 | 0.321 |
| | SC-PCC-09-Apr-15 | Sand Creek | Whole Body | 37.2 | 0.00238 | 0.314 | 0.011 | 0.00564 | 0.0462 | 0.0198 | 87.9 | 0.207 |
| | SC-PCC-11-Apr-15 | Sand Creek | Whole Body | 42.2 | 0.052 | 2.97 | 0.0156 | 0.0134 | 0.295 | 0.0932 | 86.7 | 0.411 |
| | SC-PCC-12-Apr-15 | Sand Creek | Whole Body | 66.4 | 0.0358 | 3.14 | 0.0142 | 0.0188 | 0.282 | 0.0706 | 115 | 0.266 |
| | ER-PCC-01-Apr-15 | Elk River | Muscle | 4.25 | 0.00207 | 0.3570 | 0.0240 | 0.00266 | 0.03050 | 0.00467 | 21.2 | 0.0815 |
| | ER-PCC-02-Apr-15 | Elk River | Muscle | 4.99 | 0.00052 | 0.1790 | 0.0043 | 0.00326 | 0.01830 | 0.00145 | 26.0 | 0.0299 |
| | ER-PCC-04-Apr-15 | Elk River | Muscle | 3.97 | 0.000698 | 0.1500 | 0.0062 | 0.00154 | 0.01110 | 0.00137 | 26.4 | 0.0097 |
| | ER-PCC-05-Apr-15 | Elk River | Muscle | 5.38 | 0.00546 | 0.3320 | 0.0116 | 0.00586 | 0.06300 | 0.01000 | 18.8 | 0.0705 |
| | ER-PCC-06-Apr-15 | Elk River | Muscle | 4.78 | 0.000995 | 0.1870 | 0.0063 | 0.00346 | 0.01850 | 0.00249 | 22.2 | 0.0094 |
| | ER-PCC-07-Apr-15 | Elk River | Muscle | 3.35 | 0.00224 | 0.2650 | 0.0145 | 0.00098 | 0.02660 | 0.00435 | 21.7 | 0.0105 |
| | ER-PCC-08-Apr-15 | Elk River | Muscle | 7.43 | 0.000776 | 0.1940 | 0.0037 | 0.00310 | 0.01940 | 0.00296 | 18.2 | 0.0116 |
| | ER-PCC-10-Apr-15 | Elk River | Muscle | 5.94 | 0.0011465 | 0.1895 | 0.0082 | 0.00194 | 0.01800 | 0.00208 | 23.4 | 0.0070 |
| | ER-PCC-11-Apr-15 | Elk River | Muscle | 6.99 | 0.000941 | 0.2110 | 0.0047 | 0.00470 | 0.02700 | 0.00241 | 21.1 | 0.0088 |
| | ER-PCC-12-Apr-15 | Elk River | Muscle | 9.85 | 0.000426 | 0.1280 | 0.0051 | 0.01030 | 0.03250 | 0.00100 | 22.3 | 0.0116 |
| | ER-PCC-01-Apr-15 | Elk River | Ovary | 0.306 | 0.00340 | 0.326 | 0.0165 | 0.00461 | 0.0536 | 0.00813 | 105 | 0.0139 |
| | ER-PCC-02-Apr-15 | Elk River | Ovary | 0.394 | 0.00183 | 0.185 | 0.00538 | 0.00888 | 0.0958 | 0.00952 | 153 | 0.0352 |
| | ER-PCC-04-Apr-15 | Elk River | Ovary | 0.396 | 0.000817 | 0.110 | 0.00782 | 0.00738 | 0.0517 | 0.00412 | 111 | 0.0219 |
| | ER-PCC-05-Apr-15 | Elk River | Ovary | 0.395 | 0.00944 | 0.797 | 0.0111 | 0.00595 | 0.118 | 0.0227 | 93.5 | 0.0307 |
| | ER-PCC-06-Apr-15 | Elk River | Ovary | 1.20 | 0.0661 | 2.93 | 0.0105 | 0.0231 | 0.662 | 0.132 | 94.5 | 0.124 |
| | ER-PCC-07-Apr-15 | Elk River | Ovary | 0.351 | 0.00615 | 0.475 | 0.0160 | 0.00316 | 0.0719 | 0.0158 | 125 | 0.0212 |
| | ER-PCC-08-Apr-15 | Elk River | Ovary | 0.513 | 0.0123 | 0.776 | 0.00728 | 0.00621 | 0.137 | 0.0301 | 147 | 0.0344 |
| | ER-PCC-10-Apr-15 | Elk River | Ovary | 0.545 | 0.00597 | 0.429 | 0.0193 | 0.00371 | 0.106 | 0.0135 | 153 | 0.103 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-PCC-11-Apr-15 | Elk River | Ovary | 0.297 | 0.00260 | 0.163 | 0.00569 | 0.00954 | 0.125 | 0.0104 | 121 | 0.0312 |
| | ER-PCC-12-Apr-15 | Elk River | Ovary | 0.305 | 0.000830 | 0.155 | 0.00649 | 0.0139 | 0.128 | 0.00379 | 97.0 | 0.0255 |
| | ER-PCC-24-Apr-15 | Elk River | Whole Body | 48.3 | 0.0264 | 1.95 | 0.033 | 0.0101 | 0.287 | 0.0538 | 66.4 | 0.131 |
| | ER-PCC-25-Apr-15 | Elk River | Whole Body | 51.2 | 0.00152 | 0.184 | 0.0111 | 0.0136 | 0.105 | 0.011 | 98.9 | 0.169 |
| | ER-PCC-26-Apr-15 | Elk River | Whole Body | 68.2 | 0.0021 | 0.308 | 0.0103 | 0.0101 | 0.0774 | 0.0236 | 99.6 | 0.204 |
| | ER-PCC-27-Apr-15 | Elk River | Whole Body | 34.8 | 0.0008545 | 0.190 | 0.0117 | 0.00533 | 0.0410 | 0.0276 | 116 | 0.304 |
| | ER-PCC-28-Apr-15 | Elk River | Whole Body | 63.3 | 0.0394 | 3.24 | 0.0154 | 0.0143 | 0.488 | 0.0993 | 95.1 | 0.2 |
| | GC-PCC-01-Apr-15 | Gold Creek | Muscle | 4.05 | 0.000654 | 0.1660 | 0.0084 | 0.00197 | 0.01230 | 0.00203 | 27.9 | 0.0047 |
| | GC-PCC-02-Apr-15 | Gold Creek | Muscle | 4.39 | 0.00356 | 0.3800 | 0.0093 | 0.00150 | 0.02440 | 0.00562 | 33.8 | 0.0108 |
| | GC-PCC-03-Apr-15 | Gold Creek | Muscle | 11.40 | 0.00065 | 0.1090 | 0.0126 | 0.00218 | 0.01250 | 0.00184 | 31.7 | 0.0050 |
| | GC-PCC-04-Apr-15 | Gold Creek | Muscle | 4.55 | 0.00944 | 0.7850 | 0.0047 | 0.00430 | 0.05700 | 0.01940 | 28.5 | 0.0873 |
| | GC-PCC-05-Apr-15 | Gold Creek | Muscle | 4.60 | 0.0004815 | 0.1810 | 0.0053 | 0.00203 | 0.00910 | 0.00160 | 30.4 | 0.0078 |
| | GC-PCC-06-Apr-15 | Gold Creek | Muscle | 7.56 | 0.000144 | 0.0980 | 0.0056 | 0.00747 | 0.01410 | 0.00072 | 20.2 | 0.0295 |
| | GC-PCC-07-Apr-15 | Gold Creek | Muscle | 2.39 | 0.000342 | 0.0910 | 0.0271 | 0.00083 | 0.00695 | 0.00060 | 34.9 | 0.0225 |
| | GC-PCC-08-Apr-15 | Gold Creek | Muscle | 4.11 | 0.000125 | 0.1050 | 0.0240 | 0.00040 | 0.00605 | 0.00056 | 24.1 | 0.0137 |
| | GC-PCC-09-Apr-15 | Gold Creek | Muscle | 6.83 | 0.000454 | 0.1340 | 0.0098 | 0.00159 | 0.01120 | 0.00132 | 38.6 | 0.0110 |
| | GC-PCC-10-Apr-15 | Gold Creek | Muscle | 5.12 | 0.00116 | 0.1550 | 0.0050 | 0.00289 | 0.01320 | 0.00177 | 32.8 | 0.0278 |
| | GC-PCC-01-Apr-15 | Gold Creek | Ovary | 0.292 | 0.00276 | 0.267 | 0.00920 | 0.00331 | 0.0387 | 0.00686 | 108 | 0.0133 |
| | GC-PCC-02-Apr-15 | Gold Creek | Ovary | 0.421 | 0.00315 | 0.274 | 0.0103 | 0.00275 | 0.0430 | 0.00862 | 139 | 0.0551 |
| | GC-PCC-03-Apr-15 | Gold Creek | Ovary | 0.496 | 0.00485 | 0.533 | 0.0250 | 0.00332 | 0.0641 | 0.0119 | 198 | 0.0407 |
| | GC-PCC-04-Apr-15 | Gold Creek | Ovary | 3.37 | 0.318 | 15.3 | 0.0168 | 0.0391 | 1.19 | 0.475 | 162 | 0.598 |
| | GC-PCC-05-Apr-15 | Gold Creek | Ovary | 0.216 | 0.00140 | 0.108 | 0.00373 | 0.00426 | 0.0170 | 0.00229 | 84.0 | 0.00580 |
| | GC-PCC-06-Apr-15 | Gold Creek | Ovary | 0.362 | 0.00187 | 0.117 | 0.00779 | 0.00960 | 0.0732 | 0.00520 | 106 | 0.0404 |
| | GC-PCC-07-Apr-15 | Gold Creek | Ovary | 0.240 | 0.000539 | 0.110 | 0.0145 | 0.00428 | 0.0189 | 0.00293 | 129 | 0.00945 |
| | GC-PCC-08-Apr-15 | Gold Creek | Ovary | 0.402 | 0.0002025 | 0.0547 | 0.0217 | 0.000849 | 0.0166 | 0.00182 | 116 | 0.00739 |
| | GC-PCC-09-Apr-15 | Gold Creek | Ovary | 0.333 | 0.000880 | 0.105 | 0.00899 | 0.00291 | 0.0305 | 0.00417 | 144 | 0.0127 |
| | GC-PCC-10-Apr-15 | Gold Creek | Ovary | 0.473 | 0.0214 | 1.68 | 0.00737 | 0.00727 | 0.131 | 0.0478 | 137 | 0.0694 |
| | GC-PCC-12-Apr-15 | Gold Creek | Whole Body | 25.3 | 0.00181 | 0.224 | 0.00806 | 0.00285 | 0.0459 | 0.0136 | 94.1 | 0.146 |
| | GC-PCC-16-Apr-15 | Gold Creek | Whole Body | 52.5 | 0.00369 | 0.42 | 0.018 | 0.00987 | 0.0517 | 0.0195 | 106 | 0.162 |
| | GC-PCC-17-Apr-15 | Gold Creek | Whole Body | 38.6 | 0.0141 | 1.46 | 0.0132 | 0.0122 | 0.122 | 0.0693 | 87.7 | 0.243 |
| | GC-PCC-18-Apr-15 | Gold Creek | Whole Body | 54.2 | 0.00269 | 0.515 | 0.0189 | 0.0109 | 0.0909 | 0.0414 | 94.8 | 0.392 |
| | GC-PCC-21-Apr-15 | Gold Creek | Whole Body | 43.8 | 0.00332 | 0.414 | 0.00751 | 0.00948 | 0.0627 | 0.0158 | 101 | 0.111 |
| 2016 | SC-PCC-06 M-Apr-16 | Sand Creek | Muscle | 2.48 | 0.0006715 | 0.1339 | 0.00719 | 0.002915 | 0.0128 | 0.00065 | 38.55 | 0.00828 |
| | SC-PCC-11 M-Apr-16 | Sand Creek | Muscle | 3.15 | 0.00206 | 0.189 | 0.017 | 0.00158 | 0.00948 | 0.0015 | 66 | 0.00703 |
| | SC-PCC-12 M-Apr-16 | Sand Creek | Muscle | 2.58 | 0.000252 | 0.0961 | 0.00735 | 0.00164 | 0.00535 | 0.00051 | 31.8 | 0.0058 |
| | SC-PCC-16 M-Apr-16 | Sand Creek | Muscle | 2.59 | 0.000323 | 0.177 | 0.0108 | 0.0017 | 0.012 | 0.0009 | 51.4 | 0.0112 |
| | SC-PCC-17 M-Apr-16 | Sand Creek | Muscle | 5.93 | 0.00064 | 0.114 | 0.00713 | 0.00382 | 0.0106 | 0.00133 | 22.1 | 0.009 |
| | SC-PCC-18 M-Apr-16 | Sand Creek | Muscle | 5.71 | 0.000133 | 0.0647 | 0.0106 | 0.00265 | 0.0118 | 0.00025 | 27.9 | 0.00668 |
| | SC-PCC-19 M-Apr-16 | Sand Creek | Muscle | 8.96 | 0.000598 | 0.0918 | 0.00577 | 0.00643 | 0.0124 | 0.00108 | 30.7 | 0.0167 |
| | SC-PCC-20 M-Apr-16 | Sand Creek | Muscle | 11.5 | 0.000101 | 0.0739 | 0.00336 | 0.00579 | 0.0101 | 0.00059 | 29.5 | 0.00848 |
| | SC-PCC-21 M-Apr-16 | Sand Creek | Muscle | 1.97 | 0.000778 | 0.166 | 0.00457 | 0.00176 | 0.0134 | 0.00185 | 30.9 | 0.0149 |
| | SC-PCC-22 M-Apr-16 | Sand Creek | Muscle | 2.82 | 0.000323 | 0.125 | 0.0117 | 0.00142 | 0.00838 | 0.00071 | 34.3 | 0.00537 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | SC-PCC-06 O-Apr-16 | Sand Creek | Ovary | 0.252 | 0.0015 | 0.131 | 0.00461 | 0.00647 | 0.0231 | 0.00395 | 80.7 | 0.0117 |
| | SC-PCC-11 O-Apr-16 | Sand Creek | Ovary | 0.445 | 0.00199 | 0.165 | 0.0196 | 0.00721 | 0.0367 | 0.00811 | 171 | 0.0109 |
| | SC-PCC-12 O-Apr-16 | Sand Creek | Ovary | 0.3105 | 0.001032 | 0.122 | 0.006495 | 0.026285 | 0.0208 | 0.003 | 106 | 0.00796 |
| | SC-PCC-16 O-Apr-16 | Sand Creek | Ovary | 0.278 | 0.00151 | 0.092 | 0.00614 | 0.00801 | 0.0263 | 0.0023 | 99.1 | 0.0122 |
| | SC-PCC-17 O-Apr-16 | Sand Creek | Ovary | 0.222 | 0.00145 | 0.124 | 0.00587 | 0.00846 | 0.0204 | 0.00421 | 87.9 | 0.0411 |
| | SC-PCC-18 O-Apr-16 | Sand Creek | Ovary | 0.294 | 0.00056 | 0.0835 | 0.00602 | 0.00463 | 0.0287 | 0.00244 | 88.2 | 0.0168 |
| | SC-PCC-19 O-Apr-16 | Sand Creek | Ovary | 0.34 | 0.00128 | 0.107 | 0.0048 | 0.00654 | 0.0444 | 0.00396 | 100 | 0.0208 |
| | SC-PCC-20 O-Apr-16 | Sand Creek | Ovary | 0.205 | 0.000677 | 0.0647 | 0.00142 | 0.00591 | 0.0132 | 0.00157 | 81.8 | 0.0098 |
| | SC-PCC-21 O-Apr-16 | Sand Creek | Ovary | 0.314 | 0.000618 | 0.0908 | 0.00313 | 0.00518 | 0.0367 | 0.00193 | 95.3 | 0.0124 |
| | SC-PCC-22 O-Apr-16 | Sand Creek | Ovary | 0.283 | 0.000591 | 0.108 | 0.00642 | 0.00734 | 0.0205 | 0.00411 | 100 | 0.011 |
| | SC-PCC-07 WB-Apr-16 | Sand Creek | Whole Body | 46.2 | 0.00306 | 0.386 | 0.0121 | 0.00688 | 0.0348 | 0.0258 | 101 | 0.326 |
| | SC-PCC-09 WB-Apr-16 | Sand Creek | Whole Body | 33.4 | 0.00577 | 0.398 | 0.0267 | 0.00942 | 0.0614 | 0.0129 | 75 | 0.0683 |
| | SC-PCC-14 WB-Apr-16 | Sand Creek | Whole Body | 35.6 | 0.00388 | 0.282 | 0.011 | 0.00477 | 0.0366 | 0.0291 | 81.8 | 0.33 |
| | SC-PCC-23 WB-Apr-16 | Sand Creek | Whole Body | 39.2 | 0.00794 | 0.502 | 0.0144 | 0.0111 | 0.0602 | 0.0165 | 83.3 | 0.0835 |
| | SC-PCC-24 WB-Apr-16 | Sand Creek | Whole Body | 128 | 0.00882 | 0.813 | 0.0155 | 0.0186 | 0.131 | 0.0193 | 80.1 | 0.112 |
| | GC-PCC-13 WB-Apr-16 | Gold Creek | Whole Body | 49.5 | 0.00214 | 0.397 | 0.0265 | 0.0122 | 0.0906 | 0.0433 | 83 | 0.365 |
| | GC-PCC-16 WB-Apr-16 | Gold Creek | Whole Body | 44.2 | 0.00265 | 0.344 | 0.0183 | 0.00572 | 0.0375 | 0.0258 | 103 | 0.275 |
| | GC-PCC-27 WB-Apr-16 | Gold Creek | Whole Body | 38.45 | 0.00292 | 0.3375 | 0.0275 | 0.00554 | 0.0517 | 0.01135 | 76.7 | 0.0996 |
| | GC-PCC-31 WB-Apr-16 | Gold Creek | Whole Body | 36.1 | 0.00296 | 0.356 | 0.0259 | 0.00618 | 0.0462 | 0.0104 | 74.1 | 0.121 |
| | GC-PCC-36 WB-Apr-16 | Gold Creek | Whole Body | 48.1 | 0.000991 | 0.195 | 0.0328 | 0.0065 | 0.0314 | 0.00758 | 98.7 | 0.0922 |
| | ER-PCC-01 M-Apr-16 | Elk River | Muscle | 3.59 | 0.0001285 | 0.1115 | 0.03315 | 0.00145 | 0.010575 | 0.00042 | 34.9 | 0.00657 |
| | ER-PCC-02 M-Apr-16 | Elk River | Muscle | 3.89 | 0.00154 | 0.264 | 0.0194 | 0.0013 | 0.0262 | 0.00397 | 20.8 | 0.015 |
| | ER-PCC-03 M-Apr-16 | Elk River | Muscle | 2.45 | 0.00215 | 0.45 | 0.018 | 0.00115 | 0.0444 | 0.00604 | 39.1 | 0.0164 |
| | ER-PCC-05 M-Apr-16 | Elk River | Muscle | 4.84 | 0.00185 | 0.326 | 0.0435 | 0.00188 | 0.0302 | 0.00487 | 33.5 | 0.0191 |
| | ER-PCC-06 M-Apr-16 | Elk River | Muscle | 5.34 | 0.000891 | 0.177 | 0.021 | 0.000971 | 0.017 | 0.00203 | 18.8 | 0.0126 |
| | ER-PCC-07 M-Apr-16 | Elk River | Muscle | 5.36 | 0.00106 | 0.191 | 0.0125 | 0.00215 | 0.0232 | 0.00402 | 27.5 | 0.0112 |
| | ER-PCC-08 M-Apr-16 | Elk River | Muscle | 5.74 | 0.000381 | 0.125 | 0.0171 | 0.00203 | 0.0113 | 0.00119 | 18.8 | 0.00783 |
| | ER-PCC-10 M-Apr-16 | Elk River | Muscle | 7.59 | 0.00202 | 0.16 | 0.00816 | 0.00296 | 0.0176 | 0.00254 | 32.9 | 0.0206 |
| | ER-PCC-14 M-Apr-16 | Elk River | Muscle | 4.6 | 0.000088 | 0.0783 | 0.0279 | 0.000562 | 0.00613 | 0.00029 | 26.9 | 0.16 |
| | ER-PCC-15 M-Apr-16 | Elk River | Muscle | 3.56 | 0.0027 | 0.286 | 0.00966 | 0.00156 | 0.0325 | 0.00583 | 40.9 | 0.012 |
| | ER-PCC-01 O-Apr-16 | Elk River | Ovary | 0.205 | 0.000478 | 0.0817 | 0.0073 | 0.00512 | 0.021 | 0.0022 | 93.8 | 0.00593 |
| | ER-PCC-02 O-Apr-16 | Elk River | Ovary | 0.221 | 0.000711 | 0.151 | 0.0147 | 0.0027 | 0.0153 | 0.00269 | 72.4 | 0.00537 |
| | ER-PCC-03 O-Apr-16 | Elk River | Ovary | 2.25 | 0.0777 | 4.94 | 0.021 | 0.0201 | 0.943 | 0.189 | 110 | 0.185 |
| | ER-PCC-05 O-Apr-16 | Elk River | Ovary | 0.247 | 0.00365 | 0.439 | 0.0197 | 0.00355 | 0.0473 | 0.0105 | 83.9 | 0.0126 |
| | ER-PCC-06 O -Apr-16 | Elk River | Ovary | 0.228 | 0.000914 | 0.159 | 0.0207 | 0.00225 | 0.0192 | 0.00261 | 90.85 | 0.00631 |
| | ER-PCC-07 O-Apr-16 | Elk River | Ovary | 0.384 | 0.00488 | 0.513 | 0.00778 | 0.00516 | 0.0852 | 0.0142 | 83.8 | 0.0194 |
| | ER-PCC-08 O-Apr-16 | Elk River | Ovary | 0.228 | 0.00143 | 0.244 | 0.014 | 0.00396 | 0.0288 | 0.00531 | 107 | 0.00865 |
| | ER-PCC-10 O-Apr-16 | Elk River | Ovary | 0.477 | 0.00398 | 0.419 | 0.0107 | 0.00522 | 0.0762 | 0.0133 | 115 | 0.018 |
| | ER-PCC-14 O-Apr-16 | Elk River | Ovary | 0.241 | 0.000259 | 0.088 | 0.0154 | 0.0016 | 0.0103 | 0.00114 | 87.9 | 0.00455 |
| | ER-PCC-15 O-Apr-16 | Elk River | Ovary | 0.431 | 0.00779 | 0.664 | 0.00772 | 0.0041 | 0.0785 | 0.0162 | 88.7 | 0.0184 |
| | ER-PCC-12 WB-Apr-16 | Elk River | Whole Body | 49.9 | 0.00466 | 0.671 | 0.0275 | 0.00971 | 0.109 | 0.0141 | 65.8 | 0.0822 |
| | ER-PCC-13 WB-Apr-16 | Elk River | Whole Body | 72.35 | 0.004135 | 0.608 | 0.03195 | 0.007015 | 0.08305 | 0.0221 | 123 | 0.117 |
| | ER-PCC-21 WB-Apr-16 | Elk River | Whole Body | 26.6 | 0.0845 | 4.26 | 0.0369 | 0.0272 | 1 | 0.191 | 89.3 | 0.25 |

**Table G.8:** **Metal Concentrations (µg/g Dry Weight) in Peamouth Chub Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-PCC-26 WB-Apr-16 | Elk River | Whole Body | 23.3 | 0.00165 | 0.23 | 0.0216 | 0.00242 | 0.0274 | 0.00661 | 87.3 | 0.0585 |
| | ER-PCC-27 WB-Apr-16 | Elk River | Whole Body | 30.9 | 0.00327 | 0.431 | 0.023 | 0.0068 | 0.0684 | 0.0161 | 129 | 0.0861 |
| | GC-PCC-25 M-Apr-16 | Gold Creek | Muscle | 3.52 | 0.00113 | 0.209 | 0.0166 | 0.000673 | 0.0114 | 0.002 | 24.8 | 0.00753 |
| | GC-PCC-26 M-Apr-16 | Gold Creek | Muscle | 4.53 | 0.000229 | 0.105 | 0.00989 | 0.00246 | 0.01 | 0.00095 | 23.6 | 0.0292 |
| | GC-PCC-34 M-Apr-16 | Gold Creek | Muscle | 5.24 | 0.000401 | 0.103 | 0.0184 | 0.00113 | 0.0131 | 0.00132 | 26.6 | 0.00598 |
| | GC-PCC-44 M-Apr-16 | Gold Creek | Muscle | 4.41 | 0.00131 | 0.16 | 0.0244 | 0.00217 | 0.015 | 0.00442 | 31.9 | 0.0149 |
| | GC-PCC-45 M-Apr-16 | Gold Creek | Muscle | 6.93 | 0.00109 | 0.291 | 0.0149 | 0.00268 | 0.0223 | 0.00349 | 40.8 | 0.0112 |
| | GC-PCC-81 M-Apr-16 | Gold Creek | Muscle | 1.29 | 0.00323 | 0.114 | 0.0216 | 0.00094 | 0.00984 | 0.00924 | 19.1 | 0.00675 |
| | GC-PCC-82 M-Apr-16 | Gold Creek | Muscle | 3.91 | 0.000532 | 0.187 | 0.0112 | 0.00204 | 0.0163 | 0.00174 | 17.6 | 0.00867 |
| | GC-PCC-86 M-Apr-16 | Gold Creek | Muscle | 6.73 | 0.00113 | 0.205 | 0.00893 | 0.00274 | 0.0115 | 0.00286 | 21.7 | 0.00934 |
| | GC-PCC-90 M-Apr-16 | Gold Creek | Muscle | 4.02 | 0.00101 | 0.166 | 0.0096 | 0.00199 | 0.0121 | 0.00231 | 19.2 | 0.00791 |
| | GC-PCC-92 M-Apr-16 | Gold Creek | Muscle | 2.01 | 0.00101 | 0.179 | 0.0226 | 0.000799 | 0.0133 | 0.00253 | 48.9 | 0.0117 |
| | GC-PCC-25 O-Apr-16 | Gold Creek | Ovary | 0.224 | 0.0016 | 0.19 | 0.0103 | 0.00121 | 0.0149 | 0.00361 | 79.6 | 0.0055 |
| | GC-PCC-26 O-Apr-16 | Gold Creek | Ovary | 0.221 | 0.000257 | 0.0807 | 0.00619 | 0.00352 | 0.0232 | 0.00263 | 87.4 | 0.00645 |
| | GC-PCC-34 O-Apr-16 | Gold Creek | Ovary | 0.209 | 0.00129 | 0.143 | 0.018 | 0.00209 | 0.0154 | 0.00444 | 107 | 0.0322 |
| | GC-PCC-44 O-Apr-16 | Gold Creek | Ovary | 0.263 | 0.00161 | 0.228 | 0.0125 | 0.00371 | 0.0204 | 0.0059 | 96.5 | 0.0198 |
| | GC-PCC-45 O-Apr-16 | Gold Creek | Ovary | 0.326 | 0.0018 | 0.23 | 0.0118 | 0.00623 | 0.0407 | 0.00711 | 88 | 0.0233 |
| | GC-PCC-81 O-Apr-16 | Gold Creek | Ovary | 0.209 | 0.00165 | 0.174 | 0.0172 | 0.00329 | 0.0274 | 0.00665 | 75.9 | 0.0133 |
| | GC-PCC-82 O-Apr-16 | Gold Creek | Ovary | 0.158 | 0.000164 | 0.0757 | 0.00691 | 0.00411 | 0.022 | 0.00134 | 71.1 | 0.0149 |
| | GC-PCC-86 O-Apr-16 | Gold Creek | Ovary | 0.254 | 0.0123 | 0.234 | 0.00565 | 0.00549 | 0.0225 | 0.0081 | 77.5 | 0.012 |
| | GC-PCC-90 O-Apr-16 | Gold Creek | Ovary | 0.1995 | 0.002385 | 0.203 | 0.00479 | 0.003015 | 0.024 | 0.00685 | 71.85 | 0.01009 |
| | GC-PCC-92 O-Apr-16 | Gold Creek | Ovary | 0.254 | 0.00112 | 0.155 | 0.0164 | 0.00222 | 0.0272 | 0.004 | 114 | 0.00962 |

## Table G.9: Metal Concentrations (µg/g Dry Weight) in Rainbow Trout Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw | Fe µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-RT-01M-FEB-14 | Sand Creek | Muscle | 76 | <0.00041 | 2.27 | 0.0628 | <0.056 | 0.0226 | <0.0026 | 0.00158 | 457 | <0.0010 | 0.0166 | 0.0790 | 0.211 | 1.09 | 9.93 |
| | SC-RT-01M-APR-14 | Sand Creek | Muscle | 77 | <0.00068 | 5.85 | 0.0901 | <0.055 | 0.0642 | <0.0027 | 0.000184 | 217 | 0.0019 | 0.0113 | 0.078 | 0.127 | 1.79 | 31 |
| | SC-RT-02M-APR-14 | Sand Creek | Muscle | 78 | <0.00065 | 7.87 | 0.0247 | 0.099 | 0.152 | <0.0026 | 0.000445 | 1,050 | 0.0013 | 0.0148 | 0.0744 | 0.16 | 1.38 | 25.4 |
| | SC-RT-03M-APR-14 | Sand Creek | Muscle | 76 | <0.00063 | 5.84 | 0.109 | <0.051 | 0.0705 | <0.0025 | 0.000132 | 237 | <0.0012 | 0.0126 | 0.087 | 0.265 | 1.82 | 23 |
| | SC-RT-01G-FEB-14 | Sand Creek | Ovary | 82 | 0.0369 | 2.49 | 0.101 | <0.052 | 0.154 | <0.0025 | 0.000554 | 4,880 | 0.008 | 0.437 | 0.0741 | 0.206 | 23.7 | 220 |
| | SC-RT-01G-APR-14 | Sand Creek | Ovary | 59 | 0.0611 | 2.54 | 0.083 | <0.093 | 0.244 | <0.0027 | 0.00097 | 1,350 | <0.0011 | 0.0788 | 0.0801 | 0.0281 | 11.6 | 62.3 |
| | SC-RT-02G-APR-14 | Sand Creek | Ovary | 59 | 0.0314 | 0.89 | 0.0348 | <0.13 | 0.257 | <0.0028 | 0.000083 | 1,250 | <0.0012 | 0.109 | 0.0755 | 0.0272 | 12.7 | 71.3 |
| | SC-RT-03G-APR-14 | Sand Creek | Ovary | 59 | 0.0117 | 4.01 | 0.0777 | <0.13 | 0.376 | <0.0028 | 0.00011 | 1,250 | <0.0012 | 0.0633 | 0.0902 | 0.053 | 12 | 51.9 |
| | ER-RT-01M-FEB-14 | Elk River | Muscle | 77 | <0.00044 | 3.13 | 0.0615 | <0.061 | 0.108 | <0.0028 | 0.00307 | 559 | 0.0026 | 0.0145 | 0.0917 | 0.157 | 1.19 | 10.5 |
| | GC-RT-01M-FEB-14 | Gold Creek | Muscle | 77 | <0.00043 | 1.88 | 0.0642 | 0.071 | 0.0585 | <0.0027 | 0.00091 | 569 | 0.0025 | 0.00934 | 0.0709 | 0.122 | 0.959 | 9.34 |
| | GC-RT-02M-FEB-14 | Gold Creek | Muscle | 77 | <0.00042 | 0.907 | 0.0146 | <0.057 | 0.282 | <0.0026 | 0.000312 | 3,860 | 0.0014 | 0.0114 | 0.0776 | 0.0397 | 0.946 | 9.68 |
| | GC-RT-01M-AUG-14 | Gold Creek | Muscle | 69 | <0.0089 | 38.2 | 0.09 | <1.2 | 2.74 | <0.026 | 0.00076 | 336 | 0.0117 | 0.0398 | 0.372 | 0.128 | 2.35 | 82.9 |
| | GC-RT-01G-FEB-14 | Gold Creek | Ovary | 78 | 0.0228 | 1.74 | 0.131 | <0.052 | 0.267 | <0.0025 | 0.000818 | 5,990 | 0.0085 | 0.461 | 0.0846 | 0.121 | 17.1 | 433 |
| | GC-RT-02G-FEB-14 | Gold Creek | Ovary | 85 | 0.0214 | 2.27 | 0.0643 | <0.14 | 0.129 | <0.0070 | 0.00024 | 417 | 0.02 | 0.416 | 0.088 | 0.0493 | 15.5 | 355 |
| 2015 | GC-RB-01-APR-15 | Gold Creek | Muscle | 77 | 0.00042 | 12.6 | 0.18 | <0.11 | 1.12 | <0.0056 | 0.0011 | 8,660 | 0.008 | 0.026 | 0.082 | 0.024 | 1.13 | 26.2 |
| 2016 | SC-RT-01 M-Apr-16 | Sand Creek | Muscle | 79 | 0.00051 | 0.72 | 0.08475 | 0.125 | 0.19015 | 0.0055 | 0.000303 | 2,604 | 0.00245 | 0.01215 | 0.0463 | 0.03605 | 1.06 | 13.95 |
| | SC-RT-02 M-Apr-16 | Sand Creek | Muscle | 78 | <0.00045 | 1.36 | 0.037 | 0.154 | 0.164 | <0.0048 | 0.000606 | 1,770 | <0.0022 | 0.0134 | 0.0455 | 0.0248 | 0.911 | 11.5 |
| | SC-RT-04 M-Apr-16 | Sand Creek | Muscle | 77 | <0.00049 | 5.31 | 0.385 | 0.097 | 0.0939 | <0.0053 | 0.0002 | 438 | <0.0024 | 0.0148 | 0.0645 | 0.185 | 2.63 | 24.4 |
| | GC-RT-01 M-Apr-16 | Gold Creek | Muscle | 78 | <0.00042 | 7.16 | 0.0597 | <0.1 | 0.225 | <0.0026 | 0.00041 | 689 | 0.004 | 0.0166 | 0.0765 | 0.0522 | 0.991 | 21.9 |
| | GC-RT-02 M-Apr-16 | Gold Creek | Muscle | 79 | <0.00037 | 1.31 | 0.0407 | 0.142 | 0.0626 | <0.0024 | 0.00064 | 752 | 0.0023 | 0.0153 | 0.375 | 0.0349 | 1.02 | 12 |
| | GC-RT-03 M-Apr-16 | Gold Creek | Muscle | 78 | <0.0004 | 1.06 | 0.0511 | <0.098 | 0.204 | <0.0026 | 0.00033 | 2,350 | <0.0012 | 0.0278 | 0.0641 | 0.0426 | 1.53 | 19.7 |
| | SC-RT-04 O-Apr-16 | Sand Creek | Ovary | 60 | 0.0556 | 0.661 | 0.205 | 0.099 | 0.2555 | 0.00265 | 0.000125 | 1,215 | 0.00175 | 0.0807 | 0.0797 | 0.0415 | 17.15 | 60.8 |
| | GC-RT-01 O-Apr-16 | Gold Creek | Ovary | 83 | 0.0184 | 6.06 | 0.163 | 0.753 | 0.186 | <0.0023 | <0.00011 | 628 | 0.0119 | 0.287 | 0.0767 | 0.0524 | 10.8 | 378 |
| | GC-RT-03 O-Apr-16 | Gold Creek | Ovary | 74 | 0.0651 | 4.19 | 0.148 | 0.18 | 0.0881 | <0.0026 | 0.00049 | 711 | 0.0097 | 0.875 | 0.0708 | 0.0428 | 27.5 | 423 |

**Table G.9: Metal Concentrations (µg/g Dry Weight) in Rainbow Trout Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw | Se µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-RT-01M-FEB-14 | Sand Creek | Muscle | 0.0119 | 0.716 | 19,450 | <0.0062 | 1,125 | 0.554 | 0.00504 | 951 | 0.0151 | 9,800 | 0.0282 | 22.5 | 0.000204 | 0.00190 | 1.32 |
| | SC-RT-01M-APR-14 | Sand Creek | Muscle | 0.0105 | 0.557 | 21,500 | <0.0060 | 1,070 | 0.289 | 0.00667 | 960 | 0.0147 | 11,100 | 0.0044 | 27.8 | 0.000402 | 0.00076 | 1.7 |
| | SC-RT-02M-APR-14 | Sand Creek | Muscle | 0.0114 | 0.596 | 21,300 | 0.0079 | 1,140 | 0.47 | 0.00617 | 1,070 | 0.025 | 11,300 | 0.0691 | 28.1 | 0.000359 | <0.00056 | 1.97 |
| | SC-RT-03M-APR-14 | Sand Creek | Muscle | 0.0108 | 0.918 | 19,900 | 0.0063 | 1,050 | 0.325 | 0.0066 | 952 | 0.044 | 10,100 | 0.0109 | 36.7 | 0.000368 | 0.00103 | 1.96 |
| | SC-RT-01G-FEB-14 | Sand Creek | Ovary | 0.0107 | 0.112 | 13,900 | 0.0189 | 541 | 6.37 | 0.0549 | 9,180 | 0.0429 | 10,900 | 0.093 | 19 | 0.00188 | 0.00612 | 8.45 |
| | SC-RT-01G-APR-14 | Sand Creek | Ovary | 0.0101 | 0.0215 | 5,030 | 0.0059 | 1,445 | 3.04 | 0.0145 | 1,660 | 0.0107 | 10,550 | 0.00176 | 8.60 | 0.00739 | 0.00042 | 5.65 |
| | SC-RT-02G-APR-14 | Sand Creek | Ovary | 0.0107 | 0.0246 | 4,750 | <0.0053 | 1,430 | 2.26 | 0.0128 | 1,340 | 0.0133 | 10,700 | 0.00903 | 8.9 | 0.00562 | 0.00026 | 6.38 |
| | SC-RT-03G-APR-14 | Sand Creek | Ovary | 0.0114 | 0.0423 | 5,300 | 0.0068 | 1,630 | 0.922 | 0.0106 | 1,520 | 0.0164 | 11,100 | 0.00642 | 12.3 | 0.00639 | 0.00034 | 7.06 |
| | ER-RT-01M-FEB-14 | Elk River | Muscle | 0.0127 | 0.577 | 21,000 | <0.0067 | 1,280 | 0.616 | 0.00646 | 1,020 | 0.0204 | 10,900 | 0.0431 | 28.7 | 0.000272 | 0.00216 | 2.44 |
| | GC-RT-01M-FEB-14 | Gold Creek | Muscle | 0.0105 | 0.648 | 18,900 | <0.0065 | 1,180 | 0.667 | 0.00542 | 957 | 0.0206 | 9,440 | 0.0187 | 23.2 | 0.000419 | 0.00185 | 1.64 |
| | GC-RT-02M-FEB-14 | Gold Creek | Muscle | 0.0145 | 0.29 | 22,400 | 0.0077 | 1,320 | 0.893 | 0.00762 | 995 | 0.0309 | 13,300 | 0.0251 | 11.7 | 0.000199 | 0.00138 | 1.47 |
| | GC-RT-01M-AUG-14 | Gold Creek | Muscle | <0.019 | 0.544 | 17,600 | <0.084 | 1,260 | 0.81 | 0.0113 | 1,290 | 0.28 | 10,700 | 0.264 | 21.2 | <0.0018 | 0.0089 | 2.31 |
| | GC-RT-01G-FEB-14 | Gold Creek | Ovary | 0.01 | 0.12 | 12,300 | 0.0172 | 559 | 6.31 | 0.0465 | 8,530 | 0.0366 | 11,000 | 0.0285 | 18.4 | 0.00256 | 0.00377 | 7.39 |
| | GC-RT-02G-FEB-14 | Gold Creek | Ovary | 0.0149 | 0.113 | 27,100 | <0.016 | 1,030 | 8.46 | 0.0562 | 4,700 | 0.0587 | 17,400 | 0.241 | 19.4 | 0.00223 | 0.0217 | 6.37 |
| 2015 | GC-RB-01-APR-15 | Gold Creek | Muscle | 0.0129 | 0.309 | 18,700 | <0.0047 | 1,250 | 2.37 | 0.0105 | 1,660 | 0.050 | 14,700 | 0.073 | 8.5 | <0.00020 | 0.0018 | 1.40 |
| 2016 | SC-RT-01 M-Apr-16 | Sand Creek | Muscle | 0.005 | 0.163 | 24,150 | 0.0118 | 1,340 | 0.6695 | 0.00305 | 1,265 | 0.01905 | 14,350 | 0.00357 | 9.965 | 0.0000555 | 0.00115 | 1.525 |
| | SC-RT-02 M-Apr-16 | Sand Creek | Muscle | 0.0052 | 0.146 | 23,600 | 0.0073 | 1,290 | 0.472 | 0.0046 | 1,060 | 0.0223 | 13,900 | 0.00284 | 9.82 | 0.000094 | <0.001 | 1.16 |
| | SC-RT-04 M-Apr-16 | Sand Creek | Muscle | 0.0059 | 0.416 | 20,100 | 0.0066 | 1,100 | 0.338 | 0.0038 | 838 | 0.0188 | 11,800 | 0.0137 | 37.1 | 0.000299 | <0.0011 | 2.58 |
| | GC-RT-01 M-Apr-16 | Gold Creek | Muscle | 0.0082 | 0.261 | 22,900 | 0.0138 | 1,320 | 0.488 | 0.0071 | 1,240 | 0.0165 | 11,800 | 0.00861 | 13.9 | 0.000153 | 0.001 | 1.29 |
| | GC-RT-02 M-Apr-16 | Gold Creek | Muscle | 0.0092 | 0.203 | 24,200 | 0.0034 | 1,330 | 0.387 | 0.0211 | 885 | 0.0203 | 12,500 | 0.00534 | 14.6 | 0.000092 | 0.00095 | 2.18 |
| | GC-RT-03 M-Apr-16 | Gold Creek | Muscle | 0.00736 | 0.305 | 20,000 | 0.0067 | 1,200 | 0.66 | 0.0093 | 759 | 0.02 | 11,900 | 0.00569 | 10.8 | 0.000191 | 0.00053 | 1.68 |
| | SC-RT-04 O-Apr-16 | Sand Creek | Ovary | 0.00591 | 0.02395 | 5,240 | 0.0034 | 1,470 | 1.575 | 0.0191 | 1,700 | 0.0093 | 10,200 | 0.00227 | 11.35 | 0.00545 | 0.00127 | 10.7 |
| | GC-RT-01 O-Apr-16 | Gold Creek | Ovary | 0.00935 | 0.0635 | 22,300 | 0.0481 | 767 | 13.7 | 0.106 | 5,250 | 0.0995 | 13,300 | 0.0111 | 18.1 | 0.00123 | 0.00083 | 8.23 |
| | GC-RT-03 O-Apr-16 | Gold Creek | Ovary | 0.0082 | 0.0775 | 16,900 | 0.044 | 721 | 19.3 | 0.0511 | 5,540 | 0.0854 | 10,300 | 0.0129 | 12 | 0.00109 | 0.00311 | 19.8 |

**Table G.9:** **Metal Concentrations (μg/g Dry Weight) in Rainbow Trout Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Sn<br>μg/g dw | Sr<br>μg/g dw | Th<br>μg/g dw | Ti<br>μg/g dw | Tl<br>μg/g dw | U<br>μg/g dw | V<br>μg/g dw | Y<br>μg/g dw | Zn<br>μg/g dw | Zr<br>μg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-RT-01M-FEB-14 | Sand Creek | Muscle | 0.00195 | 0.119 | 0.0001955 | 0.120 | 0.0318 | <0.00012 | 0.00312 | 0.00061 | 11.5 | 0.00279 |
| | SC-RT-01M-APR-14 | Sand Creek | Muscle | 0.00155 | 0.105 | 0.00269 | 0.211 | 0.118 | <0.00038 | 0.00983 | 0.00224 | 14.4 | 0.00566 |
| | SC-RT-02M-APR-14 | Sand Creek | Muscle | 0.00232 | 0.521 | 0.00200 | 0.21 | 0.093 | 0.00042 | 0.0108 | 0.00378 | 11.7 | 0.0408 |
| | SC-RT-03M-APR-14 | Sand Creek | Muscle | 0.0032 | 0.1 | 0.000885 | 0.193 | 0.152 | <0.00035 | 0.00827 | 0.00212 | 10.7 | 0.0793 |
| | SC-RT-01G-FEB-14 | Sand Creek | Ovary | 0.00535 | 2.84 | 0.000674 | 0.126 | 0.0799 | 0.00052 | 0.0129 | 0.00199 | 382 | 0.00968 |
| | SC-RT-01G-APR-14 | Sand Creek | Ovary | 0.0015 | 1.07 | 0.000318 | 0.104 | 0.00497 | 0.00027 | 0.00657 | 0.00159 | 75.5 | 0.00210 |
| | SC-RT-02G-APR-14 | Sand Creek | Ovary | <0.00098 | 1.12 | 0.000216 | 0.098 | 0.02 | 0.00032 | 0.00481 | 0.00089 | 63.1 | 0.00284 |
| | SC-RT-03G-APR-14 | Sand Creek | Ovary | 0.0012 | 1.16 | 0.00103 | 0.168 | 0.0115 | 0.00041 | 0.00871 | 0.00165 | 52.0 | 0.00768 |
| | ER-RT-01M-FEB-14 | Elk River | Muscle | 0.00863 | 0.271 | 0.000489 | 0.193 | 0.0584 | 0.00014 | 0.00601 | 0.00101 | 14.3 | 0.00654 |
| | GC-RT-01M-FEB-14 | Gold Creek | Muscle | 0.00592 | 0.162 | 0.000201 | 0.156 | 0.0538 | 0.00016 | 0.00404 | 0.00091 | 11.4 | 0.00855 |
| | GC-RT-02M-FEB-14 | Gold Creek | Muscle | 0.00354 | 2.11 | 0.000075 | 0.126 | 0.0298 | 0.00024 | 0.0044 | 0.0004 | 16.6 | 0.00254 |
| | GC-RT-01M-AUG-14 | Gold Creek | Muscle | 0.0149 | 0.473 | 0.00376 | 0.916 | 0.0937 | <0.0014 | 0.0507 | 0.0101 | 21.9 | 0.0829 |
| | GC-RT-01G-FEB-14 | Gold Creek | Ovary | 0.00374 | 2.95 | 0.000522 | 0.124 | 0.115 | <0.00035 | 0.0135 | 0.00593 | 272 | 0.00721 |
| | GC-RT-02G-FEB-14 | Gold Creek | Ovary | 0.0149 | 0.418 | 0.00036 | 0.205 | 0.0319 | 0.00118 | 0.018 | 0.00093 | 262 | 0.110 |
| 2015 | GC-RB-01-APR-15 | Gold Creek | Muscle | 0.0025 | 5.020 | 0.00356 | 0.269 | 0.0162 | 0.0010 | 0.0286 | 0.005 | 25.2 | 0.014 |
| 2016 | SC-RT-01 M-Apr-16 | Sand Creek | Muscle | 0.0013 | 1.8095 | 0.000065 | 0.0722 | 0.0111 | 0.0002465 | 0.00255 | <0.00023 | 19.3 | 0.0053 |
| | SC-RT-02 M-Apr-16 | Sand Creek | Muscle | <0.00094 | 1.33 | 0.00022 | 0.103 | 0.0201 | 0.000143 | 0.00472 | 0.00043 | 16 | 0.00417 |
| | SC-RT-04 M-Apr-16 | Sand Creek | Muscle | 0.0017 | 0.184 | 0.00099 | 0.141 | 0.136 | 0.000299 | 0.00964 | 0.00222 | 15.5 | 0.0049 |
| | GC-RT-01 M-Apr-16 | Gold Creek | Muscle | 0.00194 | 0.397 | 0.00144 | 0.228 | 0.0287 | 0.00051 | 0.0109 | 0.00296 | 15.1 | 0.00849 |
| | GC-RT-02 M-Apr-16 | Gold Creek | Muscle | <0.00068 | 0.388 | 0.000341 | 0.13 | 0.0253 | 0.000149 | 0.00617 | 0.00063 | 13.7 | 0.0068 |
| | GC-RT-03 M-Apr-16 | Gold Creek | Muscle | <0.00074 | 1.56 | 0.000248 | 0.111 | 0.0286 | 0.000287 | 0.00317 | 0.00038 | 17.2 | 0.00877 |
| | SC-RT-04 O-Apr-16 | Sand Creek | Ovary | 0.000765 | 1.005 | 0.000093 | 0.06805 | 0.01645 | 0.0003115 | 0.003965 | 0.000705 | 87.2 | 0.00595 |
| | GC-RT-01 O-Apr-16 | Gold Creek | Ovary | 0.00166 | 0.506 | 0.00118 | 0.208 | 0.0321 | 0.000815 | 0.0206 | 0.00246 | 157 | 0.0107 |
| | GC-RT-03 O-Apr-16 | Gold Creek | Ovary | 0.0024 | 0.488 | 0.00079 | 0.17 | 0.0418 | 0.00127 | 0.0205 | 0.00375 | 141 | 0.0114 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Moisture<br>% | Ag<br>µg/g dry wt | Al<br>µg/g dry wt | As<br>µg/g dry wt | B<br>µg/g dry wt | Ba<br>µg/g dry wt | Be<br>µg/g dry wt | Bi<br>µg/g dry wt | Ca<br>µg/g dry wt | Cd<br>µg/g dry wt | Co<br>µg/g dry wt | Cr<br>µg/g dry wt | Cs<br>µg/g dry wt | Cu<br>µg/g dry wt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | SC-RSC-03-Apr-15 | Sand Creek | Muscle | 78 | <0.00055 | 1.160 | 0.0601 | <0.089 | 1.330 | <0.0028 | 0.00092 | 1,650 | 0.0021 | 0.01000 | 0.0630 | 0.0973 | 2.450 |
| | SC-RSC-04-Apr-15 | Sand Creek | Muscle | 78 | <0.00047 | 2.680 | 0.0837 | 0.092 | 1.700 | <0.0024 | 0.00068 | 2,050 | 0.0033 | 0.01260 | 0.0720 | 0.0665 | 2.360 |
| | SC-RSC-06-Apr-15 | Sand Creek | Muscle | 78 | <0.0011 | 2.370 | 0.0282 | <0.18 | 0.820 | <0.0058 | 0.00082 | 2,270 | 0.0211 | 0.00693 | 0.0924 | 0.1580 | 1.440 |
| | SC-RSC-07-Apr-15 | Sand Creek | Muscle | 79 | <0.00059 | 8.460 | 0.0562 | 0.190 | 1.370 | <0.0030 | 0.00120 | 2,000 | 0.0062 | 0.01100 | 0.0833 | 0.0729 | 1.900 |
| | SC-RSC-08-Apr-15 | Sand Creek | Muscle | 80 | <0.0025 | 19.200 | 0.1220 | 0.570 | 2.380 | <0.013 | 0.00156 | 1,030 | 0.0146 | 0.02700 | 0.1060 | 0.0410 | 2.590 |
| | SC-RSC-09-Apr-15 | Sand Creek | Muscle | 16 | <0.00047 | 5.260 | 0.0645 | 0.183 | 1.170 | <0.0024 | 0.00102 | 4,030 | 0.0067 | 0.01180 | 0.1650 | 0.0687 | 1.810 |
| | SC-RSC-03-Apr-15 | Sand Creek | Ovary | 77 | 0.0204 | 2.29 | 0.142 | <0.35 | 1.61 | <0.0064 | 0.000310 | 1,690 | 0.0138 | 0.0651 | 0.0854 | 0.0696 | 6.13 |
| | SC-RSC-04-Apr-15 | Sand Creek | Ovary | 75 | 0.0252 | 3.56 | 0.276 | <0.22 | 1.29 | <0.0041 | 0.000780 | 1,560 | 0.0088 | 0.0779 | 0.0841 | 0.0412 | 5.72 |
| | SC-RSC-06-Apr-15 | Sand Creek | Ovary | 74 | 0.0161 | 1.57 | 0.0603 | 0.34 | 0.761 | <0.0045 | 0.000370 | 3,090 | 0.0116 | 0.0611 | 0.0712 | 0.0967 | 5.15 |
| | SC-RSC-07-Apr-15 | Sand Creek | Ovary | 75 | 0.0196 | 3.66 | 0.104 | <0.20 | 1.39 | <0.0037 | 0.000370 | 1,130 | 0.0250 | 0.0852 | 0.0637 | 0.0465 | 4.77 |
| | SC-RSC-08-Apr-15 | Sand Creek | Ovary | 78 | 0.0369 | 39.7 | 0.151 | 2.5 | 2.37 | <0.022 | <0.00096 | 1,400 | 0.0700 | 0.0706 | 0.122 | 0.0271 | 7.83 |
| | SC-RSC-09-Apr-15 | Sand Creek | Ovary | 73 | 0.0207 | 2.92 | 0.122 | 0.26 | 0.767 | <0.0028 | 0.000380 | 965 | 0.0103 | 0.0607 | 0.0662 | 0.0353 | 4.66 |
| | SC-RSC-01-Apr-15 | Sand Creek | Whole Body | 74 | 0.0036 | 107 | 0.288 | 0.32 | 8.19 | <0.0027 | 0.00883 | 40,100 | 0.065 | 0.0951 | 0.355 | 0.0716 | 2.16 |
| | SC-RSC-05-Apr-15 | Sand Creek | Whole Body | 72 | 0.00146 | 3.31 | 0.213 | <0.24 | 6.84 | <0.0026 | 0.00068 | 44,900 | 0.0396 | 0.0336 | 0.106 | 0.0647 | 1.63 |
| | ER-RSC-02-Apr-15 | Elk River | Muscle | 80 | 0.00103 | 10.500 | 0.0512 | 0.330 | 1.370 | <0.0035 | 0.00092 | 1,740 | 0.0280 | 0.01950 | 0.0755 | 0.0579 | 2.090 |
| | ER-RSC-04-Apr-15 | Elk River | Muscle | 77 | 0.00058 | 7.750 | 0.0734 | 0.190 | 1.370 | <0.0027 | 0.00296 | 2,610 | 0.0073 | 0.01190 | 0.0783 | 0.0444 | 2.210 |
| | ER-RSC-07-Apr-15 | Elk River | Muscle | 80 | 0.00090 | 21.600 | 0.0808 | 0.180 | 2.360 | <0.0027 | 0.00135 | 3,100 | 0.0071 | 0.01550 | 0.2900 | 0.0722 | 2.100 |
| | ER-RSC-08-Apr-15 | Elk River | Muscle | 80 | 0.00061 | 11.400 | 0.0734 | 0.108 | 3.860 | <0.0024 | 0.00084 | 3,240 | 0.0043 | 0.01270 | 0.0669 | 0.0449 | 2.660 |
| | ER-RSC-09-Apr-15 | Elk River | Muscle | 79 | 0.00083 | 18.600 | 0.0411 | <0.15 | 1.450 | <0.0027 | 0.00095 | 4,660 | 0.0038 | 0.01070 | 0.0846 | 0.1460 | 1.120 |
| | ER-RSC-10-Apr-15 | Elk River | Muscle | 80 | 0.00058 | 7.320 | 0.0218 | <0.15 | 1.250 | <0.0027 | 0.00275 | 4,580 | 0.0037 | 0.00918 | 0.0673 | 0.0534 | 1.630 |
| | ER-RSC-11-Apr-15 | Elk River | Muscle | 78 | <0.0020 | 6.960 | 0.0330 | 0.780 | 1.460 | <0.014 | 0.00110 | 1,930 | 0.0118 | 0.00920 | 0.0740 | 0.0279 | 1.540 |
| | ER-RSC-13-Apr-15 | Elk River | Muscle | 80 | 0.00055 | 3.390 | 0.0464 | <0.14 | 1.190 | <0.0027 | 0.00045 | 2,310 | 0.0071 | 0.00768 | 0.0674 | 0.1290 | 1.430 |
| | ER-RSC-15-Apr-15 | Elk River | Muscle | 78 | 0.00083 | 6.960 | 0.0521 | <0.16 | 0.651 | <0.0030 | 0.00124 | 2,040 | 0.0264 | 0.00800 | 0.3100 | 0.0547 | 1.260 |
| | ER-RSC-16-Apr-15 | Elk River | Muscle | 80 | 0.00089 | 2.870 | 0.0807 | <0.19 | 1.680 | <0.0035 | 0.00097 | 2,640 | 0.0093 | 0.00866 | 0.1000 | 0.0886 | 1.880 |
| | ER-RSC-02-Apr-15 | Elk River | Ovary | 75 | 0.0256 | 21.4 | 0.108 | 0.27 | 1.90 | <0.0039 | 0.000820 | 2,040 | 0.0828 | 0.0869 | 0.0960 | 0.0395 | 6.82 |
| | ER-RSC-04-Apr-15 | Elk River | Ovary | 74 | 0.0204 | 15.3 | 0.172 | 0.43 | 1.62 | <0.0053 | 0.00157 | 1,630 | 0.0881 | 0.0772 | 0.0767 | 0.0319 | 4.89 |
| | ER-RSC-07-Apr-15 | Elk River | Ovary | 79 | 0.0268 | 11.0 | 0.252 | 0.40 | 2.42 | <0.0034 | 0.000700 | 1,490 | 0.0510 | 0.0742 | 0.0856 | 0.0586 | 5.97 |
| | ER-RSC-08-Apr-15 | Elk River | Ovary | 79 | 0.0254 | 50.9 | 0.118 | 0.32 | 4.37 | <0.0043 | 0.00165 | 1,310 | 0.0606 | 0.0743 | 0.134 | 0.0345 | 5.74 |
| | ER-RSC-09-Apr-15 | Elk River | Ovary | 77 | 0.0106 | 72.0 | 0.244 | 0.72 | 5.09 | <0.0060 | 0.00152 | 2,150 | 0.175 | 0.0716 | 0.169 | 0.103 | 5.12 |
| | ER-RSC-10-Apr-15 | Elk River | Ovary | 75 | 0.0203 | 6.45 | 0.0438 | <0.12 | 1.21 | <0.0024 | 0.00272 | 1,570 | 0.0498 | 0.0717 | 0.0613 | 0.0334 | 6.70 |
| | ER-RSC-11-Apr-15 | Elk River | Ovary | 80 | 0.0192 | 5.83 | 0.108 | 0.39 | 2.92 | <0.0053 | 0.00120 | 1,730 | 0.120 | 0.0827 | 0.0944 | 0.0287 | 5.33 |
| | ER-RSC-13-Apr-15 | Elk River | Ovary | 75 | 0.0190 | 3.23 | 0.111 | <0.12 | 1.57 | <0.0024 | 0.000190 | 1,660 | 0.0663 | 0.0672 | 0.0525 | 0.0906 | 6.73 |
| | ER-RSC-15-Apr-15 | Elk River | Ovary | 75 | 0.0313 | 49.9 | 0.158 | 0.27 | 1.50 | <0.0039 | 0.000670 | 1,490 | 0.0297 | 0.0886 | 0.136 | 0.0450 | 6.50 |
| | ER-RSC-16-Apr-15 | Elk River | Ovary | 85 | 0.0426 | 5.49 | 0.111 | 0.67 | 0.627 | <0.0061 | 0.000480 | 1,520 | 0.0572 | 0.0579 | 0.0848 | 0.0621 | 7.55 |
| | ER-RSC-05-Apr-15 | Elk River | Whole Body | 74 | 0.00235 | 7.82 | 0.0884 | 4.17 | 9.58 | <0.0029 | 0.00101 | 63,400 | 0.0698 | 0.0381 | 0.0647 | 0.0653 | 1.69 |
| | ER-RSC-12-Apr-15 | Elk River | Whole Body | 77 | 0.00307 | 15.4 | 0.126 | 0.26 | 6.74 | <0.0029 | 0.0009 | 44,300 | 0.138 | 0.0454 | 0.0878 | 0.0585 | 1.92 |
| | ER-RSC-14-Apr-15 | Elk River | Whole Body | 75 | 0.00248 | 6.63 | 0.235 | 0.29 | 11.8 | <0.0026 | 0.00059 | 73,400 | 0.107 | 0.0469 | 0.0556 | 0.0498 | 1.83 |
| | GC-RSC-01-Apr-15 | Gold Creek | Muscle | 80 | 0.00047 | 10.800 | 0.0836 | <0.12 | 1.380 | <0.0029 | 0.00074 | 1,340 | 0.0054 | 0.01630 | 0.0720 | 0.0760 | 1.950 |
| | GC-RSC-05-Apr-15 | Gold Creek | Muscle | 84 | 0.00115 | 9.150 | 0.1740 | 0.420 | 2.180 | <0.0060 | 0.00165 | 3,040 | 0.0116 | 0.01820 | 0.1470 | 0.1160 | 2.340 |
| | GC-RSC-07-Apr-15 | Gold Creek | Muscle | 78 | 0.00072 | 1.280 | 0.0348 | <0.13 | 0.714 | <0.0031 | 0.00114 | 4,250 | 0.0018 | 0.00401 | 0.0729 | 0.1250 | 0.967 |
| | GC-RSC-08-Apr-15 | Gold Creek | Muscle | 80 | <0.00035 | 2.360 | 0.0386 | 0.130 | 0.753 | <0.0027 | 0.00103 | 2,760 | 0.0037 | 0.07450 | 0.0614 | 0.0815 | 1.060 |
| | GC-RSC-10-Apr-15 | Gold Creek | Muscle | 80 | 0.00066 | 4.500 | 0.0830 | <0.11 | 2.170 | <0.0027 | 0.00110 | 3,390 | 0.0038 | 0.01890 | 0.0682 | 0.0960 | 2.800 |
| | GC-RSC-01-Apr-15 | Gold Creek | Ovary | 74 | 0.0289 | 17.4 | 0.171 | 0.33 | 1.84 | <0.0039 | 0.000750 | 1,600 | 0.0402 | 0.0807 | 0.0706 | 0.0554 | 6.74 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Moisture | Ag | Al | As | B | Ba | Be | Bi | Ca | Cd | Co | Cr | Cs | Cu |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | % | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | GC-RSC-05-Apr-15 | Gold Creek | Ovary | 79 | 0.0245 | 16.6 | 0.145 | 0.31 | 0.574 | <0.0068 | 0.00115 | 1,560 | 0.0373 | 0.0734 | 0.0954 | 0.0732 | 5.98 |
| | GC-RSC-07-Apr-15 | Gold Creek | Ovary | 78 | 0.0143 | 6.66 | 0.0900 | 1.03 | 0.371 | <0.011 | 0.00114 | 1,100 | 0.0390 | 0.0856 | 0.0770 | 0.0722 | 5.71 |
| | GC-RSC-08-Apr-15 | Gold Creek | Ovary | 77 | 0.0184 | 3.72 | 0.0914 | <0.12 | 1.20 | <0.0027 | 0.000500 | 1,450 | 0.0126 | 0.0430 | 0.0635 | 0.0507 | 6.34 |
| | GC-RSC-10-Apr-15 | Gold Creek | Ovary | 77 | 0.0330 | 33.1 | 0.666 | 0.43 | 1.91 | <0.0049 | 0.00210 | 1,410 | 0.600 | 0.156 | 0.122 | 0.0600 | 9.30 |
| 2016 | SC-RSC-07 M-Apr-16 | Sand Creek | Muscle | 79 | <0.0012 | 5.71 | 0.0903 | <0.15 | 1.99 | <0.0045 | 0.00085 | 13,200 | 0.0263 | 0.021 | 0.0875 | 0.0902 | 1.11 |
| | SC-RSC-22 M-Apr-16 | Sand Creek | Muscle | 80 | <0.0012 | 7.35 | 0.0508 | <0.15 | 0.631 | <0.0046 | 0.00089 | 2,510 | 0.01 | 0.0164 | 0.0563 | 0.105 | 1.16 |
| | SC-RSC-01 M-Apr-16 | Sand Creek | Muscle | 81 | 0.00079 | 10.2 | 0.0566 | <0.16 | 0.914 | <0.0028 | 0.000849 | 3,910 | 0.0031 | 0.0114 | 0.601 | 0.146 | 1.03 |
| | SC-RSC-06 M-Apr-16 | Sand Creek | Muscle | 79 | <0.0014 | 7.67 | 0.0218 | <0.31 | 0.716 | <0.0055 | 0.00064 | 2,430 | 0.0066 | 0.0128 | 0.161 | 0.0479 | 1 |
| | SC-RSC-09 M-Apr-16 | Sand Creek | Muscle | 79 | <0.0017 | 5.18 | 0.0285 | <0.36 | 0.293 | <0.0065 | 0.00093 | 1,580 | 0.0048 | 0.0115 | 0.127 | 0.0471 | 0.826 |
| | SC-RSC-10 M-Apr-16 | Sand Creek | Muscle | 78 | <0.0012 | 8.54 | 0.0646 | <0.27 | 2.26 | <0.0047 | 0.00141 | 12,300 | 0.0185 | 0.0327 | 0.109 | 0.0609 | 1.13 |
| | SC-RSC-12 M-Apr-16 | Sand Creek | Muscle | 78 | 0.00094 | 3.71 | 0.0826 | 0.42 | 0.507 | <0.0032 | 0.00113 | 1,210 | 0.0091 | 0.0126 | 0.0791 | 0.101 | 1.39 |
| | SC-RSC-15 M-Apr-16 | Sand Creek | Muscle | 79 | 0.00089 | 7.59 | 0.0573 | <0.18 | 1.68 | <0.0032 | 0.000808 | 5,970 | 0.009 | 0.0233 | 0.118 | 0.0841 | 2.31 |
| | SC-RSC-24 M-Apr-16 | Sand Creek | Muscle | 79 | <0.00061 | 2.28 | 0.054 | 0.2 | 1.35 | <0.0024 | 0.00125 | 8,340 | 0.0054 | 0.0131 | 0.0636 | 0.0795 | 1.22 |
| | SC-RSC-25 M-Apr-16 | Sand Creek | Muscle | 80 | <0.0012 | 4.55 | 0.0715 | 0.75 | 1.08 | <0.0047 | 0.00188 | 1,490 | 0.0031 | 0.0186 | 0.0682 | 0.104 | 1.94 |
| | SC-RSC-01 O-Apr-16 | Sand Creek | Ovary | 77 | 0.0139 | 6.25 | 0.167 | <0.23 | 1.87 | <0.0035 | 0.00113 | 1,160 | 0.0184 | 0.1 | 0.0749 | 0.0912 | 4.73 |
| | SC-RSC-06 O-Apr-16 | Sand Creek | Ovary | 75 | 0.0257 | 2.34 | 0.0676 | <0.25 | 1.33 | <0.0038 | 0.00044 | 1,120 | 0.0118 | 0.0593 | 0.0787 | 0.0339 | 6.95 |
| | SC-RSC-07 O-Apr-16 | Sand Creek | Ovary | 75 | 0.0186 | 4.81 | 0.129 | 0.3 | 1.2 | <0.0042 | 0.00073 | 1,250 | 0.0146 | 0.116 | 0.0929 | 0.0853 | 4.29 |
| | SC-RSC-09 O-Apr-16 | Sand Creek | Ovary | 75 | 0.0268 | 4.97 | 0.172 | <0.27 | 0.442 | <0.004 | 0.00107 | 983 | 0.0733 | 0.136 | 0.0886 | 0.0332 | 7.36 |
| | SC-RSC-10 O-Apr-16 | Sand Creek | Ovary | 73 | 0.0339 | 239 | 0.33 | 2.09 | 3.32 | <0.0072 | 0.00273 | 2,030 | 0.0866 | 0.269 | 0.369 | 0.0657 | 7.25 |
| | SC-RSC-12 O-Apr-16 | Sand Creek | Ovary | 72 | 0.0387 | 3.08 | 0.203 | 0.19 | 0.616 | <0.0026 | 0.000461 | 1,070 | 0.0715 | 0.0932 | 0.0701 | 0.0538 | 5.38 |
| | SC-RSC-15 O-Apr-16 | Sand Creek | Ovary | 75 | 0.0317 | 15.1 | 0.161 | 0.97 | 0.99 | <0.004 | 0.00087 | 1,550 | 0.031 | 0.178 | 0.101 | 0.0644 | 7.22 |
| | SC-RSC-22 O-Apr-16 | Sand Creek | Ovary | 77 | 0.0195 | 35.5 | 0.106 | 4.73 | 0.859 | <0.012 | 0.0016 | 1,470 | 0.0354 | 0.114 | 0.143 | 0.08 | 7.83 |
| | SC-RSC-24 O-Apr-16 | Sand Creek | Ovary | 75 | 0.0201 | 7.99 | 0.257 | 1.46 | 1.74 | <0.007 | 0.0015 | 1,190 | 0.0583 | 0.167 | 0.0817 | 0.0575 | 5 |
| | SC-RSC-25 O-Apr-16 | Sand Creek | Ovary | 74 | 0.0244 | 37.7 | 0.179 | 0.96 | 2.28 | <0.0048 | 0.00148 | 1,330 | 0.0226 | 0.159 | 0.432 | 0.0738 | 6.04 |
| | SC-RSC-04 WB-Apr-16 | Sand Creek | Whole Body | 30 | 0.00639 | 64.8 | 0.325 | 0.29 | 6.37 | <0.0035 | 0.00177 | 40,100 | 0.0797 | 0.249 | 0.154 | 0.0502 | 3.17 |
| | SC-RSC-05 WB-Apr-16 | Sand Creek | Whole Body | 28 | 0.00327 | 53.6 | 0.192 | 0.274 | 6.59 | <0.0034 | 0.00302 | 38,400 | 0.0849 | 0.152 | 0.139 | 0.0591 | 2.52 |
| | SC-RSC-14 WB-Apr-16 | Sand Creek | Whole Body | 30 | 0.00331 | 46.3 | 0.257 | 0.247 | 4.96 | <0.0035 | 0.00383 | 31,200 | 0.0659 | 0.152 | 0.165 | 0.038 | 2.77 |
| | SC-RSC-17 WB-Apr-16 | Sand Creek | Whole Body | 37 | 0.00303 | 19.8 | 0.575 | 0.303 | 5.22 | <0.0035 | 0.002 | 34,700 | 0.117 | 0.0897 | 0.0968 | 0.0615 | 2.35 |
| | SC-RSC-18 WB-Apr-16 | Sand Creek | Whole Body | 32 | 0.00353 | 69.3 | 0.422 | 0.1935 | 6.91 | 0.0034 | 0.00246 | 50,350 | 0.09875 | 0.2065 | 0.154 | 0.06435 | 2.565 |
| | ER-RSC-04 M-Apr-16 | Elk River | Muscle | 79 | <0.0012 | 6.88 | 0.148 | 0.54 | 1.42 | <0.0047 | 0.00085 | 1,280 | 0.0094 | 0.0109 | 0.0586 | 0.044 | 2.45 |
| | ER-RSC-05 M-Apr-16 | Elk River | Muscle | 78 | 0.0014 | 6.36 | 0.0515 | 0.25 | 1 | <0.0046 | 0.00156 | 1,680 | 0.0062 | 0.0108 | 0.36 | 0.0573 | 1.33 |
| | ER-RSC-06 M-Apr-16 | Elk River | Muscle | 79 | 0.00113 | 9.32 | 0.062 | 0.336 | 0.645 | <0.0034 | 0.000726 | 1,490 | 0.0124 | 0.0119 | 0.181 | 0.0306 | 1.42 |
| | ER-RSC-07 M-Apr-16 | Elk River | Muscle | 80 | <0.0013 | 3.09 | 0.0595 | 0.68 | 0.453 | <0.0046 | 0.00131 | 1,450 | 0.0039 | 0.01 | 0.0813 | 0.107 | 0.946 |
| | ER-RSC-09 M-Apr-16 | Elk River | Muscle | 79 | <0.0012 | 2.34 | 0.0542 | 0.87 | 1.38 | <0.0042 | 0.000802 | 1,830 | 0.0078 | 0.0104 | 0.296 | 0.065 | 1.47 |
| | ER-RSC-11 M-Apr-16 | Elk River | Muscle | 80 | <0.0012 | 3.89 | 0.0567 | 1.28 | 0.504 | <0.0046 | 0.00132 | 1,600 | 0.0055 | 0.0097 | 0.0698 | 0.0853 | 1.02 |
| | ER-RSC-13 M-Apr-16 | Elk River | Muscle | 82 | 0.00125 | 1.725 | 0.04405 | 0.34 | 1.0735 | 0.00475 | 0.00079 | 2,935 | 0.0134 | 0.01145 | 0.06525 | 0.04445 | 1.315 |
| | ER-RSC-14 M-Apr-16 | Elk River | Muscle | 80 | <0.0011 | 4.27 | 0.0473 | 0.38 | 0.709 | <0.0038 | 0.000858 | 3,490 | 0.0023 | 0.0083 | 0.0866 | 0.0907 | 1.22 |
| | ER-RSC-15 M-Apr-16 | Elk River | Muscle | 79 | <0.0014 | 8.14 | 0.0327 | 0.55 | 0.515 | <0.0048 | 0.00086 | 1,670 | 0.0179 | 0.0146 | 0.0905 | 0.063 | 0.941 |
| | ER-RSC-16 M-Apr-16 | Elk River | Muscle | 78 | <0.0012 | 4.41 | 0.0455 | 0.56 | 0.573 | <0.0042 | 0.00152 | 1,820 | 0.0138 | 0.0114 | 0.127 | 0.103 | 1.02 |
| | ER-RSC-04 O-Apr-16 | Elk River | Ovary | 75 | 0.0158 | 6.72 | 0.157 | <0.3 | 0.82 | <0.0087 | 0.00067 | 1,120 | 0.0374 | 0.0608 | 0.085 | 0.0388 | 6.28 |
| | ER-RSC-05 O-Apr-16 | Elk River | Ovary | 69 | 0.0249 | 6.75 | 0.216 | 0.24 | 1.46 | <0.0033 | 0.000665 | 876 | 0.0214 | 0.0492 | 0.117 | 0.0294 | 4.24 |
| | ER-RSC-06 O-Apr-16 | Elk River | Ovary | 74 | 0.0228 | 5.39 | 0.152 | 0.5 | 0.568 | <0.0035 | 0.000354 | 1,910 | 0.0172 | 0.0792 | 0.298 | 0.0208 | 4.36 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Moisture % | Ag µg/g dry wt | Al µg/g dry wt | As µg/g dry wt | B µg/g dry wt | Ba µg/g dry wt | Be µg/g dry wt | Bi µg/g dry wt | Ca µg/g dry wt | Cd µg/g dry wt | Co µg/g dry wt | Cr µg/g dry wt | Cs µg/g dry wt | Cu µg/g dry wt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-RSC-07 O-Apr-16 | Elk River | Ovary | 76 | 0.0359 | 5.63 | 0.097 | 0.81 | 0.803 | <0.0066 | 0.00073 | 1,710 | 0.0306 | 0.0777 | 0.119 | 0.0742 | 7.81 |
|  | ER-RSC-09 O-Apr-16 | Elk River | Ovary | 71 | 0.0204 | 2.46 | 0.124 | 0.39 | 0.847 | <0.0033 | 0.000275 | 876 | 0.0292 | 0.069 | 0.0791 | 0.0274 | 4.54 |
|  | ER-RSC-11 O-Apr-16 | Elk River | Ovary | 74 | 0.038 | 9.39 | 0.129 | 1.29 | 0.855 | <0.0043 | 0.000828 | 1,260 | 0.0213 | 0.0559 | 0.094 | 0.0568 | 6.11 |
|  | ER-RSC-13 O-Apr-16 | Elk River | Ovary | 74 | 0.036 | 1.63 | 0.0949 | 0.64 | 1.11 | <0.0048 | 0.00033 | 1,080 | 0.0477 | 0.0977 | 0.0663 | 0.0279 | 6.31 |
|  | ER-RSC-14 O-Apr-16 | Elk River | Ovary | 76 | 0.0265 | 5.39 | 0.0861 | 1.27 | 0.741 | <0.0068 | 0.00055 | 1,280 | 0.0086 | 0.0796 | 0.0857 | 0.0629 | 6.24 |
|  | ER-RSC-15 O-Apr-16 | Elk River | Ovary | 75 | 0.0468 | 7.2 | 0.124 | 0.75 | 0.973 | <0.005 | 0.00031 | 1,550 | 0.0341 | 0.0907 | 0.0845 | 0.0432 | 7.74 |
|  | ER-RSC-16 O-Apr-16 | Elk River | Ovary | 72 | 0.0253 | 5.18 | 0.221 | 0.55 | 1.03 | <0.0044 | 0.000436 | 1,100 | 0.0669 | 0.0813 | 0.091 | 0.0577 | 4.58 |
|  | ER-RSC-01 WB-Apr-16 | Elk River | Whole Body | 34 | 0.002085 | 63.35 | 0.223 | 0.7985 | 5.545 | 0.00335 | 0.000997 | 36,100 | 0.0551 | 0.0735 | 0.1685 | 0.07385 | 1.655 |
|  | ER-RSC-02 WB-Apr-16 | Elk River | Whole Body | 24 | 0.0129 | 146 | 0.269 | 1.88 | 9.58 | 0.0076 | 0.00194 | 33,300 | 0.346 | 0.226 | 0.275 | 0.0429 | 3.26 |
|  | ER-RSC-08 WB-Apr-16 | Elk River | Whole Body | 31 | 0.00666 | 27.3 | 0.268 | 2.41 | 5.31 | <0.0032 | 0.00109 | 35,400 | 0.167 | 0.0933 | 0.12 | 0.0528 | 2.38 |
|  | ER-RSC-10 WB-Apr-16 | Elk River | Whole Body | 30 | 0.00918 | 96.5 | 0.201 | 1.89 | 10.1 | 0.0068 | 0.00139 | 38,300 | 0.312 | 0.156 | 0.21 | 0.0325 | 2.74 |
|  | ER-RSC-12 WB-Apr-16 | Elk River | Whole Body | 32 | 0.0071 | 34.6 | 0.56 | 2.06 | 6.08 | <0.0032 | 0.00105 | 34,900 | 0.115 | 0.111 | 0.121 | 0.0691 | 2.66 |
|  | GC-RSC-08 M-Apr-16 | Gold Creek | Muscle | 77 | 0.0016 | 10 | 0.0701 | 0.8 | 1.05 | <0.0052 | 0.0009 | 1,400 | 0.0026 | 0.0138 | 0.08 | 0.0371 | 2.29 |
|  | GC-RSC-09 M-Apr-16 | Gold Creek | Muscle | 79 | <0.0017 | 17 | 0.0728 | 0.28 | 2.33 | <0.0065 | 0.00278 | 2,320 | 0.0049 | 0.0159 | 0.13 | 0.0303 | 2.15 |
|  | GC-RSC-10 M-Apr-16 | Gold Creek | Muscle | 81 | <0.0012 | 8.67 | 0.0686 | 0.26 | 0.826 | <0.0045 | 0.00139 | 1,590 | 0.002 | 0.0147 | 0.0961 | 0.0806 | 1.5 |
|  | GC-RSC-11 M-Apr-16 | Gold Creek | Muscle | 80 | <0.001 | 3.66 | 0.0533 | 0.2 | 2.14 | <0.0039 | 0.00309 | 8,230 | 0.0241 | 0.0336 | 0.064 | 0.0821 | 1.29 |
|  | GC-RSC-12 M-Apr-16 | Gold Creek | Muscle | 80 | <0.0012 | 12.7 | 0.0553 | <0.15 | 0.625 | <0.0046 | 0.00159 | 1,690 | 0.0058 | 0.0126 | 0.0609 | 0.065 | 1 |
|  | GC-RSC-13 M-Apr-16 | Gold Creek | Muscle | 83 | 0.0018 | 21 | 0.0593 | 0.44 | 1.88 | <0.006 | 0.00184 | 1,320 | 0.0084 | 0.0222 | 0.233 | 0.0366 | 2.35 |
|  | GC-RSC-14 M-Apr-16 | Gold Creek | Muscle | 78 | <0.0013 | 11 | 0.096 | <0.16 | 2.69 | <0.0048 | 0.00218 | 13,400 | 0.0098 | 0.0193 | 0.109 | 0.0306 | 1.9 |
|  | GC-RSC-16 M-Apr-16 | Gold Creek | Muscle | 78 | 0.00123 | 6.05 | 0.0977 | 0.265 | 2.47 | <0.0023 | 0.000956 | 11,700 | 0.0258 | 0.0351 | 0.0732 | 0.0439 | 1.9 |
|  | GC-RSC-03 M-Apr-16 | Gold Creek | Muscle | 80 | <0.0015 | 6.69 | 0.0362 | 0.42 | 0.586 | <0.0058 | 0.00223 | 2,490 | 0.0037 | 0.0104 | 0.0864 | 0.0915 | 1.08 |
|  | GC-RSC-07 M-Apr-16 | Gold Creek | Muscle | 81 | <0.00083 | 6.2 | 0.0405 | 0.27 | 1.61 | <0.0032 | 0.00692 | 3,390 | 0.0033 | 0.0136 | 0.0826 | 0.0616 | 1.49 |
|  | GC-RSC-03 O-Apr-16 | Gold Creek | Ovary | 77 | 0.0263 | 6.9 | 0.0724 | 1.31 | 1.26 | <0.015 | 0.00157 | 1,260 | 0.0441 | 0.0653 | 0.073 | 0.0611 | 6.29 |
|  | GC-RSC-07 O-Apr-16 | Gold Creek | Ovary | 77 | 0.0135 | 11.5 | 0.114 | 0.186 | 2.38 | <0.0086 | 0.00328 | 1,490 | 0.0161 | 0.0704 | 0.082 | 0.0457 | 5.49 |
|  | GC-RSC-08 O-Apr-16 | Gold Creek | Ovary | 73 | 0.0324 | 684 | 3.57 | 1.26 | 8.72 | <0.027 | 0.00932 | 3,390 | 2.02 | 0.264 | 0.69 | 0.0903 | 16.2 |
|  | GC-RSC-09 O-Apr-16 | Gold Creek | Ovary | 78 | 0.0096 | 16.1 | 0.095 | 0.72 | 2.11 | <0.023 | 0.00091 | 1,420 | 0.0215 | 0.0973 | 0.084 | 0.0288 | 4.59 |
|  | GC-RSC-10 O-Apr-16 | Gold Creek | Ovary | 75 | 0.0197 | 9.82 | 0.201 | 0.166 | 0.559 | <0.012 | 0.00067 | 1,400 | 0.0266 | 0.0891 | 0.122 | 0.0703 | 5.51 |
|  | GC-RSC-11 O-Apr-16 | Gold Creek | Ovary | 77 | 0.0166 | 5.52 | 0.16 | 0.41 | 1.25 | <0.013 | 0.00096 | 1,330 | 0.0278 | 0.0955 | 0.088 | 0.0567 | 4.93 |
|  | GC-RSC-12 O-Apr-16 | Gold Creek | Ovary | 75 | 0.0287 | 35.2 | 0.208 | 0.594 | 1.65 | <0.0061 | 0.000931 | 1,800 | 0.338 | 0.132 | 0.151 | 0.0475 | 7.79 |
|  | GC-RSC-13 O-Apr-16 | Gold Creek | Ovary | 70 | 0.0161 | 1.08 | 0.0944 | 0.154 | 0.407 | <0.0048 | 0.000302 | 630 | 0.0041 | 0.0505 | 0.074 | 0.0162 | 3.64 |
|  | GC-RSC-14 O-Apr-16 | Gold Creek | Ovary | 71 | 0.026 | 6.58 | 0.253 | 0.602 | 0.515 | <0.0048 | 0.00128 | 851 | 0.0596 | 0.0674 | 0.066 | 0.0194 | 5.03 |
|  | GC-RSC-16 O-Apr-16 | Gold Creek | Ovary | 75 | 0.0223 | 8.68 | 0.115 | 0.706 | 1.13 | <0.0089 | 0.00058 | 1,390 | 0.0179 | 0.088 | 0.067 | 0.0338 | 5.31 |
|  | GC-RSC-01 WB-Apr-16 | Gold Creek | Whole Body | 33 | 0.00369 | 17.8 | 0.248 | 0.154 | 4.93 | <0.0033 | 0.00101 | 35,900 | 0.146 | 0.049 | 0.105 | 0.0469 | 1.87 |
|  | GC-RSC-02 WB-Apr-16 | Gold Creek | Whole Body | 31 | 0.00274 | 42.2 | 0.438 | 0.363 | 6.29 | <0.0034 | 0.000997 | 34,500 | 0.0793 | 0.0752 | 0.149 | 0.0372 | 2.11 |
|  | GC-RSC-04 WB-Apr-16 | Gold Creek | Whole Body | 37 | 0.00407 | 33 | 0.203 | 0.472 | 5.73 | <0.0035 | 0.00175 | 36,500 | 0.152 | 0.109 | 0.116 | 0.0361 | 2.39 |
|  | GC-RSC-05 WB-Apr-16 | Gold Creek | Whole Body | 25 | 0.00271 | 30.5 | 0.395 | 0.224 | 5.44 | <0.0034 | 0.00102 | 43,900 | 0.0426 | 0.11 | 0.134 | 0.0728 | 2.31 |
|  | GC-RSC-15 WB-Apr-16 | Gold Creek | Whole Body | 33 | 0.00309 | 29 | 0.533 | 0.139 | 6.14 | <0.0035 | 0.0009 | 39,100 | 0.135 | 0.153 | 0.112 | 0.0614 | 2.23 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Fe | Ga | Hg | K | Li | Mg | Mn | Mo | Na | Ni | P | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | SC-RSC-03-Apr-15 | Sand Creek | Muscle | 20.9 | 0.00540 | 0.349 | 20,200 | <0.0078 | 1,310 | 1.11 | 0.01 | 719 | 0.0138 | 10,200 | 0.00442 |
| | SC-RSC-04-Apr-15 | Sand Creek | Muscle | 24.5 | 0.00683 | 0.376 | 19,100 | <0.0068 | 1,280 | 1.46 | 0.01 | 987 | 0.0194 | 9,740 | 0.13200 |
| | SC-RSC-06-Apr-15 | Sand Creek | Muscle | 16.7 | 0.00590 | 0.379 | 18,800 | <0.016 | 1,360 | 1.60 | 0.01 | 1,020 | 0.0214 | 9,710 | 0.04330 |
| | SC-RSC-07-Apr-15 | Sand Creek | Muscle | 27.3 | 0.00818 | 0.334 | 20,000 | 0.0129 | 1,410 | 1.57 | 0.01 | 1,080 | 0.0314 | 10,200 | 0.06830 |
| | SC-RSC-08-Apr-15 | Sand Creek | Muscle | 45.2 | 0.01190 | 0.622 | 17,700 | <0.035 | 1,170 | 1.69 | 0.01 | 1,730 | 0.0419 | 8,240 | 0.12500 |
| | SC-RSC-09-Apr-15 | Sand Creek | Muscle | 23.2 | 0.00833 | 0.341 | 20,600 | 0.0075 | 1,420 | 1.62 | 0.01 | 984 | 0.0453 | 11,500 | 0.06420 |
| | SC-RSC-03-Apr-15 | Sand Creek | Ovary | 149 | 0.00910 | 0.0499 | 13,700 | <0.013 | 1,200 | 11.10 | 0.22 | 1,830 | 0.357 | 11,300 | 0.00667 |
| | SC-RSC-04-Apr-15 | Sand Creek | Ovary | 110 | 0.00600 | 0.0272 | 11,700 | <0.0083 | 1,100 | 4.24 | 0.19 | 2,000 | 0.0176 | 9,200 | 0.0460 |
| | SC-RSC-06-Apr-15 | Sand Creek | Ovary | 96.8 | 0.00630 | 0.0289 | 11,000 | <0.0093 | 1,200 | 6.21 | 0.17 | 2,000 | 0.0225 | 9,770 | 0.0159 |
| | SC-RSC-07-Apr-15 | Sand Creek | Ovary | 112 | 0.00680 | 0.0326 | 12,400 | <0.0076 | 1,140 | 11.70 | 0.18 | 1,790 | 0.0196 | 9,850 | 0.0147 |
| | SC-RSC-08-Apr-15 | Sand Creek | Ovary | 136 | 0.0165 | 0.0653 | 14,100 | <0.045 | 1,400 | 11.60 | 0.20 | 1,980 | 0.0530 | 12,000 | 0.0913 |
| | SC-RSC-09-Apr-15 | Sand Creek | Ovary | 91.2 | 0.00770 | 0.0289 | 10,700 | <0.0058 | 1,060 | 8.74 | 0.12 | 1,830 | 0.0225 | 9,520 | 0.0119 |
| | SC-RSC-01-Apr-15 | Sand Creek | Whole Body | 115 | 0.0478 | 0.198 | 13,500 | 0.111 | 1,520 | 9.16 | 0.04 | 2,370 | 0.286 | 28,000 | 0.228 |
| | SC-RSC-05-Apr-15 | Sand Creek | Whole Body | 36.5 | 0.0172 | 0.198 | 12,600 | 0.0404 | 1,400 | 7.35 | 0.03 | 2,330 | 0.138 | 30,100 | 0.0341 |
| | ER-RSC-02-Apr-15 | Elk River | Muscle | 34.6 | 0.00930 | 0.577 | 20,700 | 0.0291 | 1,280 | 1.26 | 0.02 | 1,430 | 0.0324 | 9,930 | 0.01420 |
| | ER-RSC-04-Apr-15 | Elk River | Muscle | 26.2 | 0.00727 | 0.253 | 17,900 | 0.0188 | 1,230 | 1.61 | 0.01 | 962 | 0.0291 | 9,850 | 0.01590 |
| | ER-RSC-07-Apr-15 | Elk River | Muscle | 32.7 | 0.01090 | 0.419 | 17,100 | 0.0339 | 1,240 | 1.61 | 0.02 | 1,020 | 0.1540 | 9,560 | 0.12600 |
| | ER-RSC-08-Apr-15 | Elk River | Muscle | 32.2 | 0.00873 | 0.518 | 20,200 | 0.0276 | 1,240 | 1.750 | 0.0140 | 1,330 | 0.0202 | 11,200 | 0.02110 |
| | ER-RSC-09-Apr-15 | Elk River | Muscle | 24.8 | 0.01270 | 0.615 | 20,700 | 0.0202 | 1,310 | 2.130 | 0.0117 | 1,400 | 0.0288 | 11,900 | 0.02560 |
| | ER-RSC-10-Apr-15 | Elk River | Muscle | 30.1 | 0.00930 | 0.840 | 20,600 | 0.0165 | 1,320 | 1.480 | 0.0136 | 1,220 | 0.0238 | 11,600 | 0.02560 |
| | ER-RSC-11-Apr-15 | Elk River | Muscle | 19.5 | 0.00780 | 0.477 | 16,900 | <0.028 | 1,240 | 1.090 | 0.0208 | 1,360 | 0.0220 | 8,930 | 0.04880 |
| | ER-RSC-13-Apr-15 | Elk River | Muscle | 19.4 | 0.00720 | 0.693 | 21,400 | 0.0141 | 1,270 | 1.050 | 0.0126 | 1,030 | 0.0321 | 10,900 | 0.01100 |
| | ER-RSC-15-Apr-15 | Elk River | Muscle | 17.1 | 0.00940 | 0.453 | 19,300 | 0.0117 | 1,320 | 1.560 | 0.0136 | 901 | 0.0621 | 10,300 | 0.07780 |
| | ER-RSC-16-Apr-15 | Elk River | Muscle | 18.8 | 0.00740 | 0.343 | 20,800 | 0.0109 | 1,280 | 1.240 | 0.0176 | 1,190 | 0.0193 | 10,900 | 0.04700 |
| | ER-RSC-02-Apr-15 | Elk River | Ovary | 166 | 0.0117 | 0.0453 | 12,500 | 0.0352 | 1,210 | 9.71 | 0.160 | 1,770 | 0.0386 | 11,400 | 0.0289 |
| | ER-RSC-04-Apr-15 | Elk River | Ovary | 115 | 0.00930 | 0.0187 | 11,400 | 0.0235 | 1,290 | 16.8 | 0.158 | 1,720 | 0.0285 | 10,500 | 0.0914 |
| | ER-RSC-07-Apr-15 | Elk River | Ovary | 144 | 0.00720 | 0.0378 | 12,300 | 0.0208 | 1,100 | 4.63 | 0.188 | 1,300 | 0.0356 | 11,200 | 0.0360 |
| | ER-RSC-08-Apr-15 | Elk River | Ovary | 261 | 0.0212 | 0.0392 | 14,300 | 0.0599 | 1,240 | 7.60 | 0.188 | 2,900 | 0.0732 | 12,300 | 0.117 |
| | ER-RSC-09-Apr-15 | Elk River | Ovary | 190 | 0.0328 | 0.0701 | 13,500 | 0.0578 | 954 | 4.07 | 0.127 | 3,270 | 0.0710 | 13,500 | 0.0729 |
| | ER-RSC-10-Apr-15 | Elk River | Ovary | 106 | 0.00740 | 0.0564 | 11,900 | 0.0210 | 1,130 | 3.77 | 0.197 | 1,690 | 0.0236 | 10,400 | 0.0140 |
| | ER-RSC-11-Apr-15 | Elk River | Ovary | 233 | 0.00770 | 0.0355 | 13,900 | 0.0266 | 962 | 2.66 | 0.113 | 2,050 | 0.0432 | 12,600 | 0.0723 |
| | ER-RSC-13-Apr-15 | Elk River | Ovary | 122 | 0.00480 | 0.0510 | 12,700 | 0.0198 | 1,080 | 5.91 | 0.198 | 1,600 | 0.0348 | 11,100 | 0.0116 |
| | ER-RSC-15-Apr-15 | Elk River | Ovary | 166 | 0.0218 | 0.0362 | 12,900 | 0.0415 | 1,300 | 7.80 | 0.195 | 1,880 | 0.0635 | 10,500 | 0.0339 |
| | ER-RSC-16-Apr-15 | Elk River | Ovary | 140 | 0.00500 | 0.0325 | 12,200 | 0.0145 | 1,200 | 8.70 | 0.168 | 1,790 | 0.0204 | 9,900 | 0.0263 |
| | ER-RSC-05-Apr-15 | Elk River | Whole Body | 57.7 | 0.0217 | 0.387 | 12,900 | 0.0816 | 1,710 | 13 | 0.0295 | 3,680 | 0.151 | 41,300 | 0.0734 |
| | ER-RSC-12-Apr-15 | Elk River | Whole Body | 68.4 | 0.0183 | 0.338 | 14,100 | 0.118 | 1,460 | 6.96 | 0.0377 | 3,080 | 0.13 | 31,300 | 0.0555 |
| | ER-RSC-14-Apr-15 | Elk River | Whole Body | 54.7 | 0.022 | 0.292 | 11,800 | 0.127 | 1,680 | 14.9 | 0.0459 | 3,240 | 0.167 | 45,300 | 0.0365 |
| | GC-RSC-01-Apr-15 | Gold Creek | Muscle | 30.6 | 0.00771 | 0.451 | 18,800 | 0.0136 | 1,270 | 1.280 | 0.0076 | 1,580 | 0.0165 | 9,220 | 0.00933 |
| | GC-RSC-05-Apr-15 | Gold Creek | Muscle | 38.1 | 0.00880 | 0.604 | 17,600 | 0.0260 | 1,210 | 1.560 | 0.0148 | 1,140 | 0.0294 | 9,890 | 0.02530 |
| | GC-RSC-07-Apr-15 | Gold Creek | Muscle | 9.1 | 0.00600 | 0.416 | 21,300 | 0.0101 | 1,380 | 1.420 | 0.0054 | 1,140 | 0.0216 | 11,700 | 0.00637 |
| | GC-RSC-08-Apr-15 | Gold Creek | Muscle | 14.3 | 0.00648 | 0.558 | 20,600 | 0.0081 | 1,290 | 1.320 | 0.0043 | 1,220 | 0.0162 | 10,500 | 0.00714 |
| | GC-RSC-10-Apr-15 | Gold Creek | Muscle | 31.8 | 0.00702 | 0.535 | 21,600 | 0.0107 | 1,220 | 1.300 | 0.0105 | 1,560 | 0.0190 | 11,600 | 0.00735 |
| | GC-RSC-01-Apr-15 | Gold Creek | Ovary | 148 | 0.0107 | 0.0355 | 13,200 | 0.0167 | 1,330 | 8.84 | 0.203 | 1,480 | 0.0387 | 11,100 | 0.0153 |

**Table G.10:** **Metal Concentrations (μg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Fe | Ga | Hg | K | Li | Mg | Mn | Mo | Na | Ni | P | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt | μg/g dry wt |
| 2015 | GC-RSC-05-Apr-15 | Gold Creek | Ovary | 211 | 0.0144 | 0.0562 | 12,100 | 0.0250 | 1,260 | 8.14 | 0.148 | 1,670 | 0.0360 | 10,900 | 0.0225 |
| | GC-RSC-07-Apr-15 | Gold Creek | Ovary | 199 | 0.0130 | 0.0373 | 12,800 | <0.017 | 1,030 | 5.46 | 0.114 | 4,690 | 0.0265 | 12,100 | 0.0166 |
| | GC-RSC-08-Apr-15 | Gold Creek | Ovary | 124 | 0.00832 | 0.0501 | 13,800 | 0.0113 | 1,250 | 5.92 | 0.212 | 2,850 | 0.0159 | 10,500 | 0.00466 |
| | GC-RSC-10-Apr-15 | Gold Creek | Ovary | 289 | 0.0201 | 0.0832 | 12,700 | 0.0273 | 1,160 | 6.09 | 0.188 | 3,240 | 0.0740 | 11,500 | 0.0762 |
| 2016 | SC-RSC-07 M-Apr-16 | Sand Creek | Muscle | 20.8 | 0.008 | 0.311 | 15,300 | 0.0188 | 1,320 | 5.02 | 0.00709 | 1,670 | 0.079 | 16,100 | 0.0166 |
| | SC-RSC-22 M-Apr-16 | Sand Creek | Muscle | 20.5 | 0.0092 | 0.237 | 17,200 | 0.013 | 1,390 | 1.85 | 0.0104 | 1,620 | 0.0313 | 11,000 | 0.0127 |
| | SC-RSC-01 M-Apr-16 | Sand Creek | Muscle | 29.4 | 0.0101 | 0.533 | 20,100 | 0.0181 | 1,380 | 1.8 | 0.0073 | 1,190 | 0.0684 | 11,200 | 0.0259 |
| | SC-RSC-06 M-Apr-16 | Sand Creek | Muscle | 17.5 | 0.0109 | 0.235 | 19,700 | <0.014 | 1,520 | 1.79 | 0.0028 | 1,230 | 0.0451 | 10,600 | 0.0146 |
| | SC-RSC-09 M-Apr-16 | Sand Creek | Muscle | 14.3 | 0.0071 | 0.287 | 17,900 | <0.016 | 1,520 | 1.62 | <0.0031 | 1,280 | 0.0409 | 9,310 | 0.00858 |
| | SC-RSC-10 M-Apr-16 | Sand Creek | Muscle | 25.8 | 0.0114 | 0.296 | 16,400 | 0.025 | 1,480 | 3.96 | 0.0087 | 1,440 | 0.0471 | 14,400 | 0.014 |
| | SC-RSC-12 M-Apr-16 | Sand Creek | Muscle | 21.8 | 0.00824 | 0.331 | 18,900 | <0.0082 | 1,350 | 1.06 | 0.0056 | 1,370 | 0.0143 | 9,680 | 0.00496 |
| | SC-RSC-15 M-Apr-16 | Sand Creek | Muscle | 30.7 | 0.00791 | 0.276 | 17,700 | 0.0172 | 1,350 | 2.59 | 0.0085 | 1,310 | 0.0306 | 11,800 | 0.00942 |
| | SC-RSC-24 M-Apr-16 | Sand Creek | Muscle | 14 | 0.00855 | 0.273 | 19,800 | 0.0146 | 1,430 | 2.29 | 0.0054 | 1,310 | 0.0317 | 13,500 | 0.0119 |
| | SC-RSC-25 M-Apr-16 | Sand Creek | Muscle | 23.8 | 0.0067 | 0.304 | 18,100 | <0.012 | 1,360 | 1.53 | 0.0065 | 1,430 | 0.0244 | 9,720 | 0.0122 |
| | SC-RSC-01 O-Apr-16 | Sand Creek | Ovary | 142 | 0.008 | 0.0464 | 12,600 | <0.0095 | 1,210 | 6.58 | 0.128 | 1,950 | 0.0659 | 10,800 | 0.0206 |
| | SC-RSC-06 O-Apr-16 | Sand Creek | Ovary | 120 | 0.0072 | 0.0283 | 12,600 | <0.01 | 1,330 | 10.2 | 0.228 | 2,160 | 0.0496 | 10,200 | 0.00342 |
| | SC-RSC-07 O-Apr-16 | Sand Creek | Ovary | 148 | 0.006 | 0.0344 | 12,700 | <0.011 | 1,250 | 8.98 | 0.146 | 2,440 | 0.0463 | 10,200 | 0.0148 |
| | SC-RSC-09 O-Apr-16 | Sand Creek | Ovary | 130 | 0.0078 | 0.0331 | 13,000 | <0.011 | 1,400 | 11.3 | 0.236 | 2,020 | 0.0405 | 11,000 | 0.00902 |
| | SC-RSC-10 O-Apr-16 | Sand Creek | Ovary | 286 | 0.0984 | 0.0391 | 12,200 | 0.197 | 1,320 | 16.3 | 0.214 | 1,990 | 0.174 | 10,400 | 0.116 |
| | SC-RSC-12 O-Apr-16 | Sand Creek | Ovary | 101 | 0.00606 | 0.0198 | 11,000 | <0.007 | 980 | 10.3 | 0.153 | 1,750 | 0.0236 | 9,780 | 0.0172 |
| | SC-RSC-15 O-Apr-16 | Sand Creek | Ovary | 125 | 0.0112 | 0.0272 | 12,300 | 0.018 | 1,300 | 17.3 | 0.186 | 2,050 | 0.0507 | 10,200 | 0.0176 |
| | SC-RSC-22 O-Apr-16 | Sand Creek | Ovary | 141 | 0.0174 | 0.0267 | 14,600 | <0.033 | 1,390 | 9.41 | 0.277 | 2,090 | 0.061 | 11,100 | 0.0414 |
| | SC-RSC-24 O-Apr-16 | Sand Creek | Ovary | 145 | 0.0089 | 0.0261 | 13,400 | <0.019 | 1,130 | 10.8 | 0.117 | 1,750 | 0.056 | 10,600 | 0.0258 |
| | SC-RSC-25 O-Apr-16 | Sand Creek | Ovary | 149 | 0.0188 | 0.0305 | 11,800 | 0.042 | 1,430 | 14 | 0.238 | 1,900 | 0.0724 | 9,510 | 0.0338 |
| | SC-RSC-04 WB-Apr-16 | Sand Creek | Whole Body | 111 | 0.0341 | 0.162 | 12,400 | 0.102 | 1,440 | 14.1 | 0.0513 | 2,930 | 0.183 | 27,800 | 0.0616 |
| | SC-RSC-05 WB-Apr-16 | Sand Creek | Whole Body | 81.2 | 0.0304 | 0.15 | 12,300 | 0.101 | 1,400 | 10.4 | 0.0407 | 2,940 | 0.161 | 26,500 | 0.069 |
| | SC-RSC-14 WB-Apr-16 | Sand Creek | Whole Body | 85.8 | 0.0269 | 0.199 | 12,300 | 0.0688 | 1,350 | 9.7 | 0.0371 | 2,760 | 0.128 | 23,600 | 0.0532 |
| | SC-RSC-17 WB-Apr-16 | Sand Creek | Whole Body | 79.6 | 0.0188 | 0.233 | 13,000 | 0.0605 | 1,390 | 9.39 | 0.0507 | 3,160 | 0.108 | 25,600 | 0.0299 |
| | SC-RSC-18 WB-Apr-16 | Sand Creek | Whole Body | 93.8 | 0.0371 | 0.2025 | 11,550 | 0.1295 | 1,460 | 11.85 | 0.05155 | 2,885 | 0.192 | 32,300 | 0.0549 |
| | ER-RSC-04 M-Apr-16 | Elk River | Muscle | 27.8 | 0.0066 | 0.218 | 14,300 | 0.01 | 1,080 | 1.24 | 0.00805 | 1,050 | 0.0469 | 9,090 | 0.00894 |
| | ER-RSC-05 M-Apr-16 | Elk River | Muscle | 19.2 | 0.0087 | 0.361 | 17,600 | 0.0153 | 1,400 | 1.79 | 0.00621 | 977 | 0.058 | 10,600 | 0.0282 |
| | ER-RSC-06 M-Apr-16 | Elk River | Muscle | 22.5 | 0.0069 | 0.224 | 17,000 | 0.0136 | 1,330 | 1.49 | 0.0065 | 917 | 0.0444 | 9,400 | 0.0489 |
| | ER-RSC-07 M-Apr-16 | Elk River | Muscle | 18 | 0.0052 | 0.385 | 18,800 | <0.013 | 1,390 | 1.46 | 0.0051 | 1,060 | 0.052 | 9,660 | 0.0134 |
| | ER-RSC-09 M-Apr-16 | Elk River | Muscle | 20.3 | 0.0068 | 0.275 | 18,900 | <0.012 | 1,360 | 1.32 | 0.007 | 1,120 | 0.0473 | 10,400 | 0.00758 |
| | ER-RSC-11 M-Apr-16 | Elk River | Muscle | 17.6 | 0.0055 | 0.322 | 16,200 | 0.011 | 1,360 | 1.76 | 0.00415 | 1,320 | 0.0653 | 10,000 | 0.0262 |
| | ER-RSC-13 M-Apr-16 | Elk River | Muscle | 17.6 | 0.00685 | 0.309 | 17,850 | 0.014 | 1,365 | 2.285 | 0.006785 | 1,075 | 0.0484 | 11,700 | 0.009045 |
| | ER-RSC-14 M-Apr-16 | Elk River | Muscle | 23.8 | 0.0058 | 0.374 | 17,200 | 0.017 | 1,370 | 1.85 | 0.0033 | 1,210 | 0.0472 | 10,600 | 0.0112 |
| | ER-RSC-15 M-Apr-16 | Elk River | Muscle | 16 | 0.0093 | 0.327 | 18,100 | 0.023 | 1,370 | 1.59 | 0.0039 | 1,100 | 0.0464 | 9,700 | 0.0171 |
| | ER-RSC-16 M-Apr-16 | Elk River | Muscle | 16.7 | 0.0065 | 0.307 | 18,000 | 0.017 | 1,390 | 1.37 | 0.0072 | 994 | 0.0519 | 9,680 | 0.0219 |
| | ER-RSC-04 O-Apr-16 | Elk River | Ovary | 102 | 0.0042 | 0.0273 | 12,000 | <0.03 | 1,270 | 13.2 | 0.226 | 1,940 | 0.0483 | 9,580 | 0.0129 |
| | ER-RSC-05 O-Apr-16 | Elk River | Ovary | 84.8 | 0.00809 | 0.0267 | 8,990 | 0.015 | 798 | 10.3 | 0.0972 | 1,560 | 0.0307 | 10,700 | 0.0172 |
| | ER-RSC-06 O-Apr-16 | Elk River | Ovary | 103 | 0.0062 | 0.0207 | 11,300 | 0.02 | 912 | 8.5 | 0.159 | 2,280 | 0.0468 | 9,860 | 0.0133 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Fe | Ga | Hg | K | Li | Mg | Mn | Mo | Na | Ni | P | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2016 | ER-RSC-07 O-Apr-16 | Elk River | Ovary | 164 | 0.0089 | 0.035 | 13,100 | <0.023 | 1,100 | 7.03 | 0.138 | 2,820 | 0.133 | 10,900 | 0.0153 |
| | ER-RSC-09 O-Apr-16 | Elk River | Ovary | 89 | 0.00514 | 0.0232 | 9,260 | 0.013 | 978 | 8.3 | 0.139 | 1,730 | 0.0365 | 10,100 | 0.00687 |
| | ER-RSC-11 O-Apr-16 | Elk River | Ovary | 99.3 | 0.00952 | 0.0304 | 10,900 | 0.017 | 1,040 | 10 | 0.197 | 2,230 | 0.0542 | 9,530 | 0.0319 |
| | ER-RSC-13 O-Apr-16 | Elk River | Ovary | 110 | 0.00491 | 0.0251 | 10,900 | <0.016 | 1,110 | 7.52 | 0.133 | 2,040 | 0.0359 | 9,890 | 0.00516 |
| | ER-RSC-14 O-Apr-16 | Elk River | Ovary | 114 | 0.007 | 0.0283 | 13,600 | <0.023 | 1,320 | 6.36 | 0.202 | 2,350 | 0.0371 | 10,500 | 0.0204 |
| | ER-RSC-15 O-Apr-16 | Elk River | Ovary | 113 | 0.0086 | 0.0253 | 11,700 | 0.032 | 1,130 | 12.6 | 0.165 | 2,240 | 0.046 | 9,620 | 0.00717 |
| | ER-RSC-16 O-Apr-16 | Elk River | Ovary | 120 | 0.00657 | 0.0216 | 10,100 | 0.017 | 948 | 8.29 | 0.152 | 1,740 | 0.045 | 8,220 | 0.00717 |
| | ER-RSC-01 WB-Apr-16 | Elk River | Whole Body | 83.85 | 0.03195 | 0.196 | 12,600 | 0.1135 | 1,405 | 9.425 | 0.04465 | 3,055 | 0.15 | 25,350 | 0.09445 |
| | ER-RSC-02 WB-Apr-16 | Elk River | Whole Body | 144 | 0.0577 | 0.177 | 11,700 | 0.183 | 1,360 | 13.7 | 0.0713 | 2,900 | 0.284 | 23,900 | 0.272 |
| | ER-RSC-08 WB-Apr-16 | Elk River | Whole Body | 64 | 0.0203 | 0.179 | 10,500 | 0.0961 | 1,250 | 8.38 | 0.0434 | 2,840 | 0.153 | 24,900 | 0.0412 |
| | ER-RSC-10 WB-Apr-16 | Elk River | Whole Body | 123 | 0.0472 | 0.159 | 13,000 | 0.187 | 1,450 | 12.2 | 0.0838 | 3,570 | 0.23 | 27,300 | 0.0913 |
| | ER-RSC-12 WB-Apr-16 | Elk River | Whole Body | 70.2 | 0.0218 | 0.197 | 11,500 | 0.0942 | 1,350 | 7.64 | 0.0475 | 3,170 | 0.14 | 25,600 | 0.0801 |
| | GC-RSC-08 M-Apr-16 | Gold Creek | Muscle | 34.5 | 0.0091 | 0.278 | 16,200 | 0.012 | 1,300 | 1.65 | 0.0055 | 868 | 0.0251 | 9,160 | 0.0134 |
| | GC-RSC-09 M-Apr-16 | Gold Creek | Muscle | 32.4 | 0.0109 | 0.288 | 18,200 | 0.023 | 1,430 | 1.93 | 0.0075 | 928 | 0.037 | 10,200 | 0.0251 |
| | GC-RSC-10 M-Apr-16 | Gold Creek | Muscle | 20 | 0.0071 | 0.411 | 15,700 | 0.0136 | 1,350 | 1.36 | 0.00438 | 1,080 | 0.0289 | 8,840 | 0.0212 |
| | GC-RSC-11 M-Apr-16 | Gold Creek | Muscle | 20.2 | 0.01 | 0.565 | 18,700 | 0.0137 | 1,420 | 2.21 | 0.00708 | 1,310 | 0.0343 | 13,300 | 0.00635 |
| | GC-RSC-12 M-Apr-16 | Gold Creek | Muscle | 19.1 | 0.0109 | 0.357 | 16,700 | 0.014 | 1,190 | 1.61 | 0.00759 | 875 | 0.035 | 9,760 | 0.0989 |
| | GC-RSC-13 M-Apr-16 | Gold Creek | Muscle | 45.5 | 0.0125 | 0.364 | 16,700 | 0.02 | 1,260 | 1.85 | 0.0113 | 1,300 | 0.0693 | 10,200 | 0.0553 |
| | GC-RSC-14 M-Apr-16 | Gold Creek | Muscle | 36.1 | 0.0109 | 0.354 | 15,900 | 0.032 | 1,410 | 4.21 | 0.0072 | 1,240 | 0.0712 | 15,200 | 0.0193 |
| | GC-RSC-16 M-Apr-16 | Gold Creek | Muscle | 23.9 | 0.0119 | 0.341 | 16,400 | 0.019 | 1,320 | 3.48 | 0.00931 | 1,180 | 0.051 | 14,300 | 0.0102 |
| | GC-RSC-03 M-Apr-16 | Gold Creek | Muscle | 18 | 0.0138 | 0.37 | 19,100 | <0.015 | 1,450 | 1.55 | <0.0028 | 1,560 | 0.0314 | 9,900 | 0.0172 |
| | GC-RSC-07 M-Apr-16 | Gold Creek | Muscle | 41 | 0.00791 | 0.694 | 20,400 | 0.0137 | 1,400 | 1.46 | 0.0059 | 1,260 | 0.0304 | 11,200 | 0.011 |
| | GC-RSC-03 O-Apr-16 | Gold Creek | Ovary | 121 | 0.009 | 0.0311 | 12,800 | <0.02 | 1,390 | 8.79 | 0.132 | 1,800 | 0.0347 | 10,200 | 0.0415 |
| | GC-RSC-07 O-Apr-16 | Gold Creek | Ovary | 132 | 0.01 | 0.0557 | 13,200 | 0.018 | 1,100 | 4.93 | 0.159 | 2,140 | 0.0308 | 10,100 | 0.0135 |
| | GC-RSC-08 O-Apr-16 | Gold Creek | Ovary | 676 | 0.26 | 0.0945 | 7,140 | 0.547 | 1,220 | 20.4 | 0.351 | 5,270 | 0.398 | 8,220 | 0.234 |
| | GC-RSC-09 O-Apr-16 | Gold Creek | Ovary | 134 | 0.013 | 0.0272 | 17,100 | <0.031 | 1,190 | 9.68 | 0.148 | 2,620 | 0.0343 | 11,900 | 0.0146 |
| | GC-RSC-10 O-Apr-16 | Gold Creek | Ovary | 148 | 0.0097 | 0.0539 | 13,600 | 0.019 | 1,220 | 8.66 | 0.189 | 2,420 | 0.0275 | 11,000 | 0.0139 |
| | GC-RSC-11 O-Apr-16 | Gold Creek | Ovary | 180 | 0.0094 | 0.0442 | 13,900 | <0.018 | 1,210 | 5.64 | 0.149 | 2,280 | 0.0227 | 10,800 | 0.0092 |
| | GC-RSC-12 O-Apr-16 | Gold Creek | Ovary | 156 | 0.0154 | 0.0296 | 11,700 | 0.032 | 1,310 | 12.3 | 0.196 | 2,840 | 0.0534 | 9,640 | 0.0226 |
| | GC-RSC-13 O-Apr-16 | Gold Creek | Ovary | 77.1 | 0.00619 | 0.0229 | 9,450 | <0.0065 | 883 | 5.97 | 0.107 | 1,690 | 0.0138 | 10,200 | 0.00357 |
| | GC-RSC-14 O-Apr-16 | Gold Creek | Ovary | 85.3 | 0.00751 | 0.0321 | 9,210 | 0.0093 | 855 | 6.12 | 0.107 | 1,570 | 0.0239 | 9,270 | 0.00914 |
| | GC-RSC-16 O-Apr-16 | Gold Creek | Ovary | 126 | 0.0081 | 0.0338 | 13,000 | 0.013 | 1,210 | 10.7 | 0.14 | 2,170 | 0.0264 | 9,830 | 0.0082 |
| | GC-RSC-01 WB-Apr-16 | Gold Creek | Whole Body | 64.3 | 0.0191 | 0.145 | 12,200 | 0.0649 | 1,290 | 13.6 | 0.0406 | 2,670 | 0.119 | 25,200 | 0.0579 |
| | GC-RSC-02 WB-Apr-16 | Gold Creek | Whole Body | 77.3 | 0.0244 | 0.199 | 11,400 | 0.102 | 1,300 | 7.53 | 0.0435 | 2,320 | 0.12 | 24,600 | 0.059 |
| | GC-RSC-04 WB-Apr-16 | Gold Creek | Whole Body | 71.3 | 0.0234 | 0.232 | 12,300 | 0.116 | 1,510 | 6.31 | 0.0496 | 3,060 | 0.114 | 26,200 | 0.0401 |
| | GC-RSC-05 WB-Apr-16 | Gold Creek | Whole Body | 81.4 | 0.0247 | 0.186 | 12,700 | 0.0876 | 1,490 | 8.91 | 0.0495 | 3,080 | 0.143 | 29,500 | 0.134 |
| | GC-RSC-15 WB-Apr-16 | Gold Creek | Whole Body | 77.1 | 0.022 | 0.176 | 11,000 | 0.079 | 1,340 | 8.39 | 0.046 | 2,500 | 0.114 | 26,900 | 0.0423 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Rb | Re | Sb | Se | Sn | Sr | Th | Ti | Tl | U | V | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | SC-RSC-03-Apr-15 | Sand Creek | Muscle | 14.6 | <0.000032 | <0.0013 | 1.81 | <0.00079 | 1.74 | <0.00045 | 0.1270 | 0.0260 | <0.00025 | 0.00354 | 0.00055 | 54.3 | 0.0646 |
| | SC-RSC-04-Apr-15 | Sand Creek | Muscle | 15.0 | <0.000028 | <0.0011 | 1.96 | 0.00153 | 2.23 | 0.0005 | 0.1650 | 0.0276 | 0.00058 | 0.00719 | 0.00154 | 81.1 | 0.0593 |
| | SC-RSC-06-Apr-15 | Sand Creek | Muscle | 16.4 | <0.000067 | <0.0027 | 1.26 | <0.0016 | 2.35 | <0.00093 | 0.1610 | 0.0204 | <0.00053 | 0.00603 | 0.00073 | 35.8 | 0.0662 |
| | SC-RSC-07-Apr-15 | Sand Creek | Muscle | 14.8 | <0.000035 | <0.0014 | 2.24 | 0.00251 | 2.03 | 0.00196 | 0.2730 | 0.0175 | 0.00071 | 0.01220 | 0.00305 | 54.7 | 0.0355 |
| | SC-RSC-08-Apr-15 | Sand Creek | Muscle | 8.1 | <0.00015 | <0.0058 | 2.53 | <0.0036 | 1.15 | 0.0032 | 0.4390 | 0.0220 | 0.00190 | 0.03560 | 0.00670 | 177.0 | 0.1220 |
| | SC-RSC-09-Apr-15 | Sand Creek | Muscle | 13.1 | 0.00003 | <0.0011 | 1.49 | 0.00590 | 4.33 | 0.00116 | 0.2300 | 0.0155 | 0.00079 | 0.01150 | 0.00209 | 46.6 | 0.0199 |
| | SC-RSC-03-Apr-15 | Sand Creek | Ovary | 13.3 | <0.0000099 | <0.0028 | 27.9 | <0.0029 | 1.16 | 0.000700 | 0.133 | 0.0298 | <0.00021 | 0.00810 | 0.000920 | 223 | 0.0239 |
| | SC-RSC-04-Apr-15 | Sand Creek | Ovary | 12.6 | <0.0000063 | <0.0018 | 15.5 | <0.0018 | 0.777 | 0.000700 | 0.145 | 0.0247 | 0.000680 | 0.0119 | 0.00223 | 200 | 0.0279 |
| | SC-RSC-06-Apr-15 | Sand Creek | Ovary | 12.8 | <0.0000070 | <0.0020 | 10.7 | <0.0020 | 2.66 | 0.000580 | 0.135 | 0.0273 | 0.000180 | 0.00687 | 0.00129 | 158 | 0.00750 |
| | SC-RSC-07-Apr-15 | Sand Creek | Ovary | 12.5 | <0.0000057 | 0.00200 | 29.5 | <0.0017 | 0.526 | 0.000690 | 0.149 | 0.0277 | 0.000490 | 0.0112 | 0.00266 | 165 | 0.0116 |
| | SC-RSC-08-Apr-15 | Sand Creek | Ovary | 8.28 | <0.0000340 | <0.0096 | 26.7 | <0.0098 | 0.968 | 0.00550 | 0.457 | 0.0374 | 0.00509 | 0.0460 | 0.00860 | 342 | 0.0617 |
| | SC-RSC-09-Apr-15 | Sand Creek | Ovary | 9.44 | <0.0000044 | 0.00470 | 15.1 | 0.00240 | 0.465 | 0.000560 | 0.167 | 0.0252 | 0.000326 | 0.00737 | 0.00171 | 156 | 0.00614 |
| | SC-RSC-01-Apr-15 | Sand Creek | Whole Body | 11.4 | 0.0000286 | 0.00777 | 2.95 | 0.0156 | 45.5 | 0.026 | 1.88 | 0.0147 | 0.00784 | 0.159 | 0.036 | 139 | 0.0666 |
| | SC-RSC-05-Apr-15 | Sand Creek | Whole Body | 10.2 | <0.0000031 | 0.00234 | 2.81 | 0.00287 | 47.9 | 0.000992 | 0.139 | 0.02 | 0.00267 | 0.0128 | 0.00287 | 132 | 0.0243 |
| | ER-RSC-02-Apr-15 | Elk River | Muscle | 14.5 | <0.000045 | 0.0024 | 1.99 | 0.00305 | 1.53 | 0.00501 | 0.2980 | 0.0244 | 0.00084 | 0.02660 | 0.00672 | 81.1 | 0.0106 |
| | ER-RSC-04-Apr-15 | Elk River | Muscle | 12.5 | <0.000034 | 0.0018 | 2.92 | 0.00264 | 2.74 | 0.00169 | 0.2450 | 0.0220 | 0.00097 | 0.01800 | 0.00378 | 58.5 | 0.0085 |
| | ER-RSC-07-Apr-15 | Elk River | Muscle | 12.5 | <0.000035 | 0.0063 | 2.34 | 0.00797 | 3.64 | 0.00444 | 0.5220 | 0.0291 | 0.00164 | 0.04300 | 0.00744 | 42.1 | 0.0255 |
| | ER-RSC-08-Apr-15 | Elk River | Muscle | 7.1 | <0.000031 | 0.0011 | 6.23 | 0.00137 | 3.76 | 0.00242 | 0.3230 | 0.0151 | 0.00088 | 0.02050 | 0.00389 | 68.5 | 0.0074 |
| | ER-RSC-09-Apr-15 | Elk River | Muscle | 16.0 | 0.0000537 | 0.0023 | 1.56 | <0.0012 | 5.30 | 0.0037 | 0.4050 | 0.0177 | 0.00159 | 0.04940 | 0.00975 | 40.4 | 0.0282 |
| | ER-RSC-10-Apr-15 | Elk River | Muscle | 10.3 | 0.0000222 | 0.0018 | 2.07 | <0.0012 | 5.25 | 0.00146 | 0.3210 | 0.0080 | 0.00106 | 0.01930 | 0.00297 | 47.9 | 0.0125 |
| | ER-RSC-11-Apr-15 | Elk River | Muscle | 6.4 | 0.000315 | <0.0061 | 4.04 | <0.0062 | 1.86 | 0.00096 | 0.3060 | 0.0138 | 0.00066 | 0.01530 | 0.00440 | 55.2 | 0.0217 |
| | ER-RSC-13-Apr-15 | Elk River | Muscle | 19.4 | 0.0000288 | 0.0015 | 1.6 | 0.00130 | 2.22 | 0.000777 | 0.1590 | 0.0176 | 0.00035 | 0.00908 | 0.00185 | 40.3 | 0.0142 |
| | ER-RSC-15-Apr-15 | Elk River | Muscle | 15.2 | 0.0000052 | 0.0018 | 2.08 | 0.01570 | 1.78 | 0.00143 | 0.1810 | 0.0219 | 0.00068 | 0.01620 | 0.00253 | 42.1 | 0.0200 |
| | ER-RSC-16-Apr-15 | Elk River | Muscle | 16.0 | 0.0000251 | 0.0017 | 2.11 | 0.00230 | 2.62 | 0.00068 | 0.1080 | 0.0331 | 0.00048 | 0.00937 | 0.00128 | 43.6 | 0.0269 |
| | ER-RSC-02-Apr-15 | Elk River | Ovary | 10.5 | <0.000060 | 0.00151 | 9.78 | 0.00290 | 0.999 | 0.00375 | 0.548 | 0.0504 | 0.00171 | 0.0479 | 0.00972 | 224 | 0.0156 |
| | ER-RSC-04-Apr-15 | Elk River | Ovary | 10.3 | <0.000080 | 0.00610 | 15.2 | 0.00340 | 0.734 | 0.00239 | 0.385 | 0.0404 | 0.000860 | 0.0323 | 0.00718 | 202 | 0.0236 |
| | ER-RSC-07-Apr-15 | Elk River | Ovary | 11.0 | <0.000051 | 0.00169 | 17.7 | 0.00419 | 0.675 | 0.00194 | 0.338 | 0.0435 | 0.00174 | 0.0264 | 0.00499 | 227 | 0.0139 |
| | ER-RSC-08-Apr-15 | Elk River | Ovary | 6.27 | <0.000065 | 0.00271 | 77.9 | 0.00650 | 0.905 | 0.0102 | 1.21 | 0.0265 | 0.00473 | 0.111 | 0.0235 | 221 | 0.0353 |
| | ER-RSC-09-Apr-15 | Elk River | Ovary | 13.4 | <0.000090 | 0.00210 | 8.96 | 0.00680 | 2.24 | 0.0151 | 1.60 | 0.0350 | 0.00760 | 0.179 | 0.0386 | 278 | 0.0399 |
| | ER-RSC-10-Apr-15 | Elk River | Ovary | 7.90 | <0.000036 | 0.000870 | 15.1 | 0.00120 | 0.638 | 0.00120 | 0.187 | 0.0154 | 0.00123 | 0.0155 | 0.00361 | 210 | 0.00560 |
| | ER-RSC-11-Apr-15 | Elk River | Ovary | 6.66 | <0.000081 | 0.00260 | 34.2 | <0.0014 | 1.19 | 0.00145 | 0.202 | 0.0461 | 0.00396 | 0.0196 | 0.00874 | 264 | 0.0100 |
| | ER-RSC-13-Apr-15 | Elk River | Ovary | 14.9 | <0.000036 | 0.000730 | 7.95 | 0.000850 | 0.665 | 0.000616 | 0.131 | 0.0391 | 0.000450 | 0.0141 | 0.00136 | 231 | 0.00660 |
| | ER-RSC-15-Apr-15 | Elk River | Ovary | 12.6 | <0.000059 | 0.00251 | 13.7 | 0.00420 | 0.661 | 0.0118 | 1.18 | 0.0492 | 0.00289 | 0.122 | 0.0260 | 170 | 0.0274 |
| | ER-RSC-16-Apr-15 | Elk River | Ovary | 13.1 | <0.000092 | <0.0012 | 16.6 | 0.00240 | 0.737 | 0.00135 | 0.236 | 0.0520 | <0.00083 | 0.0150 | 0.00270 | 156 | 0.00600 |
| | ER-RSC-05-Apr-15 | Elk River | Whole Body | 9.96 | <0.000052 | 0.00284 | 3.85 | 0.00295 | 73.2 | 0.00183 | 0.288 | 0.0161 | 0.00505 | 0.0269 | 0.00706 | 177 | 0.023 |
| | ER-RSC-12-Apr-15 | Elk River | Whole Body | 10.1 | <0.000053 | 0.00253 | 4.28 | 0.00223 | 49.3 | 0.00231 | 0.463 | 0.0107 | 0.0046 | 0.0428 | 0.00792 | 146 | 0.0357 |
| | ER-RSC-14-Apr-15 | Elk River | Whole Body | 8.93 | <0.000047 | 0.00159 | 4.05 | 0.00168 | 79.6 | 0.00105 | 0.293 | 0.0207 | 0.00446 | 0.0408 | 0.00464 | 148 | 0.0204 |
| | GC-RSC-01-Apr-15 | Gold Creek | Muscle | 17.0 | <0.000037 | 0.0007 | 1.82 | 0.00365 | 1.10 | 0.00238 | 0.4530 | 0.0390 | 0.00047 | 0.01630 | 0.00535 | 70.1 | 0.0128 |
| | GC-RSC-05-Apr-15 | Gold Creek | Muscle | 21.1 | <0.000076 | 0.0032 | 1.92 | 0.00390 | 3.55 | 0.00164 | 0.3420 | 0.0266 | 0.00133 | 0.01310 | 0.00360 | 82.5 | 0.0143 |
| | GC-RSC-07-Apr-15 | Gold Creek | Muscle | 17.0 | <0.000039 | 0.0016 | 2.07 | 0.00127 | 4.39 | 0.000141 | 0.1500 | 0.0162 | 0.00037 | 0.00341 | 0.00076 | 24.4 | 0.0852 |
| | GC-RSC-08-Apr-15 | Gold Creek | Muscle | 11.8 | <0.000033 | 0.0018 | 1.41 | 0.00365 | 2.88 | 0.00105 | 0.1370 | 0.0092 | 0.00030 | 0.00485 | 0.00111 | 29.8 | 0.0076 |
| | GC-RSC-10-Apr-15 | Gold Creek | Muscle | 19.2 | <0.000033 | 0.0014 | 1.8 | 0.00155 | 3.56 | 0.00107 | 0.2280 | 0.0322 | 0.00040 | 0.00966 | 0.00169 | 59.9 | 0.0110 |
| | GC-RSC-01-Apr-15 | Gold Creek | Ovary | 15.8 | <0.000055 | 0.00178 | 8.42 | 0.00327 | 0.604 | 0.00419 | 0.569 | 0.0840 | 0.00127 | 0.0256 | 0.00951 | 219 | 0.0151 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Rb | Re | Sb | Se | Sn | Sr | Th | Ti | Tl | U | V | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | GC-RSC-05-Apr-15 | Gold Creek | Ovary | 16.1 | <0.000096 | 0.00180 | 7.52 | 0.00300 | 0.629 | 0.00445 | 0.462 | 0.0414 | 0.00128 | 0.0266 | 0.0108 | 171 | 0.0194 |
| | GC-RSC-07-Apr-15 | Gold Creek | Ovary | 13.9 | <0.00015 | <0.0025 | 11.6 | 0.00380 | 0.871 | 0.00457 | 0.395 | 0.0329 | 0.00121 | 0.0224 | 0.00575 | 208 | 0.0175 |
| | GC-RSC-08-Apr-15 | Gold Creek | Ovary | 10.1 | <0.000038 | 0.000840 | 12.5 | 0.000810 | 0.586 | 0.000839 | 0.149 | 0.0249 | 0.000832 | 0.00914 | 0.00304 | 185 | 0.00472 |
| | GC-RSC-10-Apr-15 | Gold Creek | Ovary | 13.9 | <0.000070 | 0.00340 | 8.54 | 0.00350 | 0.866 | 0.00892 | 0.918 | 0.0570 | 0.00486 | 0.0535 | 0.0181 | 162 | 0.0373 |
| 2016 | SC-RSC-07 M-Apr-16 | Sand Creek | Muscle | 12.7 | <0.00017 | <0.00097 | 1.72 | 0.0039 | 16.7 | 0.00107 | 0.189 | 0.0149 | 0.0013 | 0.0102 | 0.00237 | 61.5 | 0.0112 |
| | SC-RSC-22 M-Apr-16 | Sand Creek | Muscle | 12.1 | <0.00017 | 0.0036 | 1.61 | 0.003 | 2.86 | 0.00167 | 0.24 | 0.00799 | 0.00092 | 0.0106 | 0.00455 | 49.8 | 0.0113 |
| | SC-RSC-01 M-Apr-16 | Sand Creek | Muscle | 13.8 | 0.0000121 | 0.00067 | 1.08 | 0.0044 | 3.79 | 0.00186 | 0.274 | 0.015 | 0.00214 | 0.0188 | 0.00344 | 44.0 | 0.0142 |
| | SC-RSC-06 M-Apr-16 | Sand Creek | Muscle | 11.8 | 0.0000084 | <0.0011 | 1.37 | 0.0402 | 2.62 | 0.00163 | 0.312 | 0.00721 | 0.00065 | 0.0105 | 0.00247 | 22.7 | 0.0097 |
| | SC-RSC-09 M-Apr-16 | Sand Creek | Muscle | 9.7 | 0.0000287 | <0.0013 | 1.18 | <0.0016 | 1.53 | 0.00072 | 0.19 | 0.00949 | 0.0006 | 0.00927 | 0.0023 | 30.2 | 0.0078 |
| | SC-RSC-10 M-Apr-16 | Sand Creek | Muscle | 11.6 | 0.0000342 | <0.00096 | 2.51 | 0.0019 | 13.8 | 0.00198 | 0.3 | 0.0135 | 0.00109 | 0.014 | 0.0034 | 47.9 | 0.299 |
| | SC-RSC-12 M-Apr-16 | Sand Creek | Muscle | 11.7 | <0.0000049 | 0.00197 | 2.47 | 0.00121 | 1.05 | 0.00158 | 0.286 | 0.0218 | 0.00024 | 0.00478 | 0.00111 | 46.2 | 0.00575 |
| | SC-RSC-15 M-Apr-16 | Sand Creek | Muscle | 18.2 | <0.0000049 | <0.00066 | 1.59 | 0.00101 | 6.87 | 0.00098 | 0.254 | 0.0125 | 0.00067 | 0.0114 | 0.00317 | 62.2 | 0.0172 |
| | SC-RSC-24 M-Apr-16 | Sand Creek | Muscle | 13.3 | <0.0000036 | <0.00049 | 2.06 | 0.00155 | 8.62 | 0.00055 | 0.124 | 0.0156 | 0.00061 | 0.00469 | 0.00083 | 36.1 | 0.00365 |
| | SC-RSC-25 M-Apr-16 | Sand Creek | Muscle | 13.9 | <0.0000071 | <0.00095 | 1.45 | 0.0017 | 1.48 | 0.0013 | 0.248 | 0.0282 | 0.00048 | 0.00809 | 0.00201 | 71.1 | 0.0069 |
| | SC-RSC-01 O-Apr-16 | Sand Creek | Ovary | 11.3 | <0.00012 | 0.00146 | 25.5 | 0.00215 | 0.739 | 0.00183 | 0.225 | 0.0217 | 0.00239 | 0.0169 | 0.00339 | 255.0 | 0.0178 |
| | SC-RSC-06 O-Apr-16 | Sand Creek | Ovary | 10.0 | <0.00013 | 0.00091 | 46 | 0.00161 | 0.476 | 0.000455 | 0.131 | 0.0119 | <0.00033 | 0.00664 | 0.00199 | 196.0 | 0.0067 |
| | SC-RSC-07 O-Apr-16 | Sand Creek | Ovary | 13.5 | <0.00014 | 0.0017 | 22.2 | 0.0027 | 0.63 | 0.00131 | 0.157 | 0.035 | 0.00039 | 0.0109 | 0.00189 | 199.0 | 0.0194 |
| | SC-RSC-09 O-Apr-16 | Sand Creek | Ovary | 8.4 | <0.00014 | 0.0019 | 29.9 | 0.0024 | 0.475 | 0.00166 | 0.145 | 0.0161 | 0.00061 | 0.00796 | 0.00287 | 171.0 | 0.0071 |
| | SC-RSC-10 O-Apr-16 | Sand Creek | Ovary | 11.1 | <0.00024 | 0.0032 | 13.6 | 0.0099 | 2.62 | 0.0606 | 3.33 | 0.03 | 0.0125 | 0.288 | 0.11 | 185.0 | 0.105 |
| | SC-RSC-12 O-Apr-16 | Sand Creek | Ovary | 8.9 | <0.000087 | 0.00249 | 22 | 0.00091 | 0.443 | 0.0009 | 0.133 | 0.0238 | 0.00043 | 0.00548 | 0.00236 | 165.0 | 0.00815 |
| | SC-RSC-15 O-Apr-16 | Sand Creek | Ovary | 17.0 | <0.00013 | 0.00188 | 19.5 | 0.00226 | 0.855 | 0.00458 | 0.29 | 0.0172 | 0.00134 | 0.0229 | 0.00941 | 190.0 | 0.0209 |
| | SC-RSC-22 O-Apr-16 | Sand Creek | Ovary | 12.3 | <0.00041 | 0.0018 | 17.4 | 0.0054 | 1.06 | 0.00842 | 0.583 | 0.0152 | 0.0109 | 0.0832 | 0.0183 | 174.0 | 0.0256 |
| | SC-RSC-24 O-Apr-16 | Sand Creek | Ovary | 12.1 | <0.00023 | 0.0038 | 15.1 | 0.0032 | 0.562 | 0.00281 | 0.22 | 0.0298 | 0.00071 | 0.0142 | 0.0084 | 251.0 | 0.0106 |
| | SC-RSC-25 O-Apr-16 | Sand Creek | Ovary | 11.4 | <0.00016 | 0.00206 | 17.2 | 0.0046 | 1.03 | 0.00799 | 0.503 | 0.0313 | 0.00216 | 0.0518 | 0.0185 | 191.0 | 0.0227 |
| | SC-RSC-04 WB-Apr-16 | Sand Creek | Whole Body | 9.7 | <0.00017 | 0.00298 | 2.71 | 0.00389 | 48.2 | 0.0159 | 1.07 | 0.0133 | 0.00738 | 0.0862 | 0.0473 | 121.0 | 0.166 |
| | SC-RSC-05 WB-Apr-16 | Sand Creek | Whole Body | 9.8 | <0.00016 | 0.00244 | 4.33 | 0.00554 | 49.8 | 0.0124 | 0.845 | 0.00938 | 0.00505 | 0.0743 | 0.0329 | 137.0 | 0.109 |
| | SC-RSC-14 WB-Apr-16 | Sand Creek | Whole Body | 8.8 | <0.00017 | 0.00297 | 2.6 | 0.00362 | 36 | 0.0113 | 0.688 | 0.00855 | 0.00474 | 0.0619 | 0.0243 | 125.0 | 0.0465 |
| | SC-RSC-17 WB-Apr-16 | Sand Creek | Whole Body | 9.1 | <0.00017 | 0.00154 | 2.44 | 0.00276 | 42.5 | 0.00418 | 0.365 | 0.00945 | 0.00337 | 0.0318 | 0.022 | 107.0 | 0.149 |
| | SC-RSC-18 WB-Apr-16 | Sand Creek | Whole Body | 8.7 | 0.00016 | 0.00292 | 3.43 | 0.004825 | 59.95 | 0.01505 | 1.12 | 0.01765 | 0.006135 | 0.093 | 0.03855 | 125.5 | 0.1365 |
| | ER-RSC-04 M-Apr-16 | Elk River | Muscle | 8.0 | <0.00017 | 0.007 | 1.68 | 0.0025 | 1.45 | 0.00097 | 0.236 | 0.00767 | 0.0004 | 0.0142 | 0.00275 | 120.0 | 0.0137 |
| | ER-RSC-05 M-Apr-16 | Elk River | Muscle | 12.5 | <0.00017 | 0.00123 | 2.56 | 0.0103 | 1.63 | 0.00082 | 0.243 | 0.0227 | 0.00062 | 0.0116 | 0.0021 | 51.8 | 0.0365 |
| | ER-RSC-06 M-Apr-16 | Elk River | Muscle | 10.3 | <0.000066 | 0.00474 | 2.45 | 0.0092 | 1.32 | 0.00172 | 0.304 | 0.0171 | 0.00072 | 0.0153 | 0.00366 | 33.9 | 0.0298 |
| | ER-RSC-07 M-Apr-16 | Elk River | Muscle | 15.6 | <0.000088 | 0.0073 | 3.23 | 0.0042 | 1.44 | 0.00046 | 0.198 | 0.0166 | <0.00038 | 0.0066 | 0.00072 | 36.2 | 0.0153 |
| | ER-RSC-09 M-Apr-16 | Elk River | Muscle | 15.9 | <0.000081 | <0.00097 | 2.43 | 0.0018 | 1.82 | 0.00076 | 0.176 | 0.0152 | <0.00036 | 0.00725 | 0.00148 | 58.5 | 0.0071 |
| | ER-RSC-11 M-Apr-16 | Elk River | Muscle | 12.5 | <0.00017 | 0.0021 | 2.08 | 0.0072 | 1.59 | 0.00059 | 0.206 | 0.0181 | 0.00071 | 0.00963 | 0.00148 | 54.3 | 0.0101 |
| | ER-RSC-13 M-Apr-16 | Elk River | Muscle | 9.7 | 0.000175 | 0.001035 | 6.175 | 0.0025 | 3.25 | 0.00032 | 0.1245 | 0.0185 | 0.000505 | 0.005225 | 0.00058 | 49.2 | 0.0124 |
| | ER-RSC-14 M-Apr-16 | Elk River | Muscle | 15.4 | <0.000073 | 0.00099 | 1.75 | 0.0021 | 3.64 | 0.00177 | 0.223 | 0.0195 | 0.00044 | 0.0229 | 0.00507 | 37.2 | 0.0114 |
| | ER-RSC-15 M-Apr-16 | Elk River | Muscle | 13.1 | <0.000092 | 0.0012 | 4.18 | 0.0031 | 1.54 | 0.00154 | 0.526 | 0.0174 | 0.00052 | 0.0188 | 0.00532 | 35.1 | 0.0142 |
| | ER-RSC-16 M-Apr-16 | Elk River | Muscle | 14.4 | <0.000081 | <0.00096 | 3 | 0.0026 | 1.68 | 0.00065 | 0.251 | 0.0217 | 0.00038 | 0.0104 | 0.00225 | 30.8 | 0.0108 |
| | ER-RSC-04 O-Apr-16 | Elk River | Ovary | 8.7 | <0.0003 | 0.006 | 17.6 | <0.0016 | 0.552 | 0.00114 | 0.209 | 0.0108 | <0.00087 | 0.0164 | 0.00388 | 179.0 | 0.0148 |
| | ER-RSC-05 O-Apr-16 | Elk River | Ovary | 8.2 | <0.00011 | 0.00417 | 18.5 | 0.00409 | 0.622 | 0.00116 | 0.223 | 0.0235 | 0.00077 | 0.0135 | 0.00271 | 168.0 | 0.0121 |
| | ER-RSC-06 O-Apr-16 | Elk River | Ovary | 8.7 | <0.00012 | <0.00044 | 30.2 | 0.00367 | 0.931 | 0.000992 | 0.223 | 0.0259 | <0.00035 | 0.0131 | 0.00205 | 147.0 | 0.0107 |

**Table G.10: Metal Concentrations (µg/g Dry Weight) in Redside Shiner Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Rb | Re | Sb | Se | Sn | Sr | Th | Ti | Tl | U | V | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2016 | ER-RSC-07 O-Apr-16 | Elk River | Ovary | 14.1 | <0.00023 | 0.00176 | 21.7 | 0.0108 | 0.981 | 0.000976 | 0.222 | 0.0314 | <0.00066 | 0.013 | 0.00201 | 178.0 | 0.0138 |
| | ER-RSC-09 O-Apr-16 | Elk River | Ovary | 9.5 | <0.00011 | 0.00074 | 18.6 | 0.00108 | 0.525 | 0.000626 | 0.106 | 0.0207 | 0.00061 | 0.00655 | 0.00272 | 148.0 | 0.0433 |
| | ER-RSC-11 O-Apr-16 | Elk River | Ovary | 10.6 | <0.00015 | 0.0018 | 18.2 | 0.00262 | 0.617 | 0.00213 | 0.24 | 0.032 | 0.0006 | 0.0211 | 0.00387 | 161.0 | 0.0582 |
| | ER-RSC-13 O-Apr-16 | Elk River | Ovary | 7.8 | <0.00016 | 0.00062 | 25.3 | 0.00101 | 0.465 | 0.000491 | 0.093 | 0.0324 | <0.00047 | 0.00646 | 0.00124 | 169.0 | 0.00405 |
| | ER-RSC-14 O-Apr-16 | Elk River | Ovary | 14.7 | <0.00023 | 0.00286 | 11.8 | 0.0035 | 0.5 | 0.00103 | 0.259 | 0.0379 | <0.00067 | 0.0123 | 0.00234 | 213.0 | 0.0078 |
| | ER-RSC-15 O-Apr-16 | Elk River | Ovary | 10.9 | <0.00017 | 0.00172 | 18.8 | 0.0021 | 0.552 | 0.00231 | 0.284 | 0.0317 | 0.00061 | 0.0193 | 0.00479 | 175.0 | 0.0109 |
| | ER-RSC-16 O-Apr-16 | Elk River | Ovary | 10.0 | <0.00015 | 0.00078 | 25.2 | 0.00115 | 0.533 | 0.000915 | 0.2 | 0.0349 | 0.00123 | 0.0131 | 0.00254 | 161.0 | 0.00613 |
| | ER-RSC-01 WB-Apr-16 | Elk River | Whole Body | 11.2 | 0.000165 | 0.002895 | 2.11 | 0.00531 | 45.35 | 0.01145 | 1.105 | 0.0141 | 0.00481 | 0.128 | 0.0286 | 109.0 | 0.0813 |
| | ER-RSC-02 WB-Apr-16 | Elk River | Whole Body | 7.2 | <0.00017 | 0.00684 | 5.62 | 0.0102 | 39 | 0.0284 | 2.48 | 0.0255 | 0.00916 | 0.364 | 0.0741 | 137.0 | 0.106 |
| | ER-RSC-08 WB-Apr-16 | Elk River | Whole Body | 7.2 | <0.00016 | 0.00237 | 4.56 | 0.00412 | 45.6 | 0.00557 | 0.601 | 0.0173 | 0.00363 | 0.0674 | 0.0231 | 106.0 | 0.0672 |
| | ER-RSC-10 WB-Apr-16 | Elk River | Whole Body | 6.0 | <0.00017 | 0.0043 | 5.85 | 0.00697 | 47.6 | 0.0172 | 1.98 | 0.0182 | 0.00831 | 0.229 | 0.0463 | 140.0 | 0.132 |
| | ER-RSC-12 WB-Apr-16 | Elk River | Whole Body | 10.3 | <0.00016 | 0.00205 | 2.33 | 0.00313 | 45.3 | 0.0066 | 0.811 | 0.0247 | 0.00382 | 0.077 | 0.0154 | 114.0 | 0.0449 |
| | GC-RSC-08 M-Apr-16 | Gold Creek | Muscle | 7.2 | <0.00019 | <0.0011 | 2.15 | 0.0031 | 1.32 | 0.00204 | 0.318 | 0.0139 | 0.00051 | 0.0142 | 0.00377 | 56.6 | 0.0111 |
| | GC-RSC-09 M-Apr-16 | Gold Creek | Muscle | 11.8 | <0.00024 | <0.0014 | 2.85 | 0.0053 | 2.65 | 0.0029 | 0.429 | 0.0201 | 0.00104 | 0.0238 | 0.00926 | 49.9 | 0.032 |
| | GC-RSC-10 M-Apr-16 | Gold Creek | Muscle | 11.8 | <0.00017 | 0.00178 | 2 | 0.0047 | 1.61 | 0.00162 | 0.315 | 0.0248 | 0.00116 | 0.0124 | 0.00364 | 37.5 | 0.0504 |
| | GC-RSC-11 M-Apr-16 | Gold Creek | Muscle | 16.3 | <0.00015 | 0.00121 | 2.07 | 0.002 | 8.3 | 0.00078 | 0.153 | 0.0289 | 0.00063 | 0.00688 | 0.00167 | 40.5 | 0.0059 |
| | GC-RSC-12 M-Apr-16 | Gold Creek | Muscle | 11.5 | <0.00017 | 0.00593 | 1.96 | 0.0103 | 1.61 | 0.00232 | 0.31 | 0.0184 | 0.0008 | 0.0206 | 0.00451 | 41.1 | 0.0233 |
| | GC-RSC-13 M-Apr-16 | Gold Creek | Muscle | 11.7 | <0.00022 | 0.0032 | 2.45 | 0.01 | 1.36 | 0.00337 | 0.504 | 0.0156 | 0.00139 | 0.0269 | 0.00655 | 101.0 | 0.153 |
| | GC-RSC-14 M-Apr-16 | Gold Creek | Muscle | 9.6 | <0.00018 | 0.0029 | 2.65 | 0.0035 | 13.9 | 0.00192 | 0.35 | 0.0244 | 0.00102 | 0.0168 | 0.00399 | 68.0 | 0.0227 |
| | GC-RSC-16 M-Apr-16 | Gold Creek | Muscle | 11.5 | <0.000085 | 0.00098 | 2.18 | 0.00229 | 12.7 | 0.00152 | 0.291 | 0.0244 | 0.001 | 0.0126 | 0.00327 | 60.0 | 0.0155 |
| | GC-RSC-03 M-Apr-16 | Gold Creek | Muscle | 17.5 | 0.0000138 | 0.0023 | 1.88 | 0.0027 | 2.68 | 0.00561 | 0.342 | 0.0301 | 0.00067 | 0.0124 | 0.00479 | 32.4 | 0.0146 |
| | GC-RSC-07 M-Apr-16 | Gold Creek | Muscle | 13.5 | <0.0000049 | 0.0007 | 2.12 | 0.00422 | 3.11 | 0.00165 | 0.212 | 0.0242 | 0.00067 | 0.0168 | 0.00384 | 35.0 | 0.0101 |
| | GC-RSC-03 O-Apr-16 | Gold Creek | Ovary | 14.4 | <0.00031 | 0.004 | 12.3 | 0.0034 | 0.563 | 0.00107 | 0.357 | 0.0462 | <0.0018 | 0.0168 | 0.00365 | 211.0 | 0.0587 |
| | GC-RSC-07 O-Apr-16 | Gold Creek | Ovary | 12.3 | <0.00018 | 0.00239 | 22.4 | 0.00143 | 0.613 | 0.00222 | 0.22 | 0.0535 | <0.0011 | 0.0173 | 0.00472 | 212.0 | 0.0369 |
| | GC-RSC-08 O-Apr-16 | Gold Creek | Ovary | 6.2 | <0.00056 | 0.0106 | 5.93 | 0.0243 | 3.99 | 0.161 | 13.6 | 0.0301 | 0.0282 | 0.816 | 0.332 | 86.3 | 0.468 |
| | GC-RSC-09 O-Apr-16 | Gold Creek | Ovary | 14.4 | <0.00048 | 0.0046 | 34.9 | 0.005 | 0.802 | 0.00224 | 0.349 | 0.0287 | <0.0029 | 0.0257 | 0.00491 | 243.0 | 0.0276 |
| | GC-RSC-10 O-Apr-16 | Gold Creek | Ovary | 12.6 | <0.00024 | 0.0027 | 14.4 | 0.0031 | 0.597 | 0.00214 | 0.303 | 0.0573 | <0.0015 | 0.016 | 0.00624 | 185.0 | 0.0459 |
| | GC-RSC-11 O-Apr-16 | Gold Creek | Ovary | 16.0 | <0.00027 | 0.0053 | 23.3 | <0.0012 | 0.587 | 0.00069 | 0.223 | 0.0454 | <0.0016 | 0.0129 | 0.0031 | 200.0 | 0.0141 |
| | GC-RSC-12 O-Apr-16 | Gold Creek | Ovary | 10.7 | <0.00013 | 0.00171 | 11.4 | 0.00409 | 1.18 | 0.0065 | 0.739 | 0.0386 | 0.00254 | 0.0504 | 0.0135 | 175.0 | 0.0322 |
| | GC-RSC-13 O-Apr-16 | Gold Creek | Ovary | 8.0 | <0.0001 | 0.00072 | 8.38 | <0.00045 | 0.365 | 0.000211 | 0.0768 | 0.0149 | <0.0006 | 0.00328 | 0.00127 | 117.0 | 0.00879 |
| | GC-RSC-14 O-Apr-16 | Gold Creek | Ovary | 7.0 | <0.0001 | 0.00099 | 19.6 | 0.00107 | 0.439 | 0.000999 | 0.202 | 0.0263 | 0.00063 | 0.00982 | 0.00282 | 135.0 | 0.0121 |
| | GC-RSC-16 O-Apr-16 | Gold Creek | Ovary | 11.0 | <0.00019 | 0.00141 | 13.1 | 0.00215 | 0.543 | 0.00252 | 0.304 | 0.034 | <0.0011 | 0.0146 | 0.00486 | 181.0 | 0.0162 |
| | GC-RSC-01 WB-Apr-16 | Gold Creek | Whole Body | 9.5 | <0.00016 | 0.00265 | 3.05 | 0.00589 | 40.7 | 0.00325 | 0.439 | 0.0201 | 0.00248 | 0.0308 | 0.00796 | 115.0 | 0.0253 |
| | GC-RSC-02 WB-Apr-16 | Gold Creek | Whole Body | 7.1 | <0.00017 | 0.00182 | 2.8 | 0.00521 | 39.5 | 0.00808 | 0.645 | 0.0321 | 0.0027 | 0.056 | 0.0156 | 114.0 | 0.0541 |
| | GC-RSC-04 WB-Apr-16 | Gold Creek | Whole Body | 9.1 | <0.00017 | 0.00182 | 7.16 | 0.00649 | 38.6 | 0.00751 | 0.745 | 0.0181 | 0.004 | 0.0506 | 0.0255 | 125.0 | 0.131 |
| | GC-RSC-05 WB-Apr-16 | Gold Creek | Whole Body | 11.5 | <0.00016 | 0.00299 | 2.66 | 0.00764 | 49.1 | 0.0436 | 0.721 | 0.0387 | 0.00363 | 0.0476 | 0.0223 | 121.0 | 0.135 |
| | GC-RSC-15 WB-Apr-16 | Gold Creek | Whole Body | 9.9 | <0.00017 | 0.00195 | 2.85 | 0.00394 | 46.1 | 0.0074 | 0.664 | 0.0348 | 0.00429 | 0.0442 | 0.0209 | 122.0 | 0.0929 |

## Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-YP-1-Aug-14 | Sand Creek | Muscle | 78 | <0.00079 | 2.08 | 0.0339 | <0.12 | 0.165 | <0.0039 | 0.0134 | 365 | 0.00409 | 0.0217 | 0.0841 | 0.203 | 0.486 |
|  | SC-YP-2-Aug-14 | Sand Creek | Muscle | 78 | <0.00073 | 4.12 | 0.0441 | <0.11 | 0.199 | <0.0036 | 0.00425 | 1,840 | 0.00346 | 0.0557 | 0.102 | 0.0433 | 0.949 |
|  | SC-YP-3-Aug-14 | Sand Creek | Muscle | 78 | <0.00095 | 2.82 | 0.0379 | <0.15 | 0.160 | <0.0047 | 0.00332 | 1,400 | 0.0023 | 0.0487 | 0.0795 | 0.0442 | 0.800 |
|  | SC-YP-4-Aug-14 | Sand Creek | Muscle | 77 | <0.00076 | 3.76 | 0.0269 | <0.12 | 1.49 | <0.0038 | 0.00740 | 8,270 | 0.0037 | 0.0176 | 0.077 | 0.131 | 0.529 |
|  | GC-YP-1-Aug-14 | Gold Creek | Muscle | 77 | <0.00091 | 19.5 | 0.0403 | 0.144 | 0.740 | <0.0038 | 0.00558 | 4,910 | 0.00531 | 0.0188 | 0.237 | 0.0319 | 0.524 |
|  | GC-YP-2-Aug-14 | Gold Creek | Muscle | 77 | <0.00160 | 2.26 | 0.0920 | <0.17 | 0.0604 | <0.0067 | 0.00280 | 381 | 0.0021 | 0.0085 | 0.0869 | 0.0396 | 0.680 |
|  | GC-YP-3-Aug-14 | Gold Creek | Muscle | 78 | <0.00071 | 2.14 | 0.0206 | <0.076 | 0.0594 | <0.0030 | 0.00496 | 463 | 0.00496 | 0.00846 | 0.0807 | 0.0765 | 0.638 |
|  | GC-YP-4-Aug-14 | Gold Creek | Muscle | 80 | <0.00069 | 8.33 | 0.0201 | <0.074 | 0.273 | <0.0029 | 0.00677 | 1,450 | 0.00577 | 0.00975 | 0.0893 | 0.0726 | 0.433 |
|  | GC-YP-5-Aug-14 | Gold Creek | Muscle | 78 | <0.00068 | 0.952 | 0.0188 | <0.073 | 0.116 | <0.0028 | 0.00505 | 1,366 | 0.00086 | 0.00566 | 0.0660 | 0.0808 | 0.409 |
|  | GC-YP-6-Aug-14 | Gold Creek | Muscle | 77 | <0.00072 | 2.18 | 0.0218 | <0.077 | 0.0513 | <0.0030 | 0.00240 | 346 | 0.00183 | 0.00801 | 0.0854 | 0.0468 | 0.672 |
|  | GC-YP-7-Aug-14 | Gold Creek | Muscle | 78 | <0.00069 | 1.16 | 0.0196 | <0.074 | 0.106 | <0.0029 | 0.00442 | 1,190 | 0.00145 | 0.00475 | 0.068 | 0.0818 | 0.343 |
|  | GC-YP-8-Aug-14 | Gold Creek | Muscle | 78 | <0.00070 | 1.40 | 0.0227 | <0.075 | 0.157 | <0.0029 | 0.00424 | 1,880 | 0.00111 | 0.0137 | 0.113 | 0.0529 | 0.619 |
|  | GC-YP-9-Aug-14 | Gold Creek | Muscle | 78 | <0.00071 | 0.992 | 0.0208 | <0.076 | 0.0444 | <0.0030 | 0.00341 | 556 | 0.0009 | 0.00766 | 0.0687 | 0.0646 | 0.528 |
|  | GC-YP-10-Aug-14 | Gold Creek | Muscle | 78 | <0.00070 | 0.756 | 0.0211 | <0.075 | 0.0578 | <0.0029 | 0.00493 | 604 | 0.00112 | 0.00964 | 0.0675 | 0.0258 | 0.492 |
| 2015 | SC-YP-01-Apr-15 | Sand Creek | Muscle | 77 | <0.00059 | 3.430 | 0.0332 | <0.096 | 0.209 | <0.0030 | 0.00294 | 1,950 | 0.0025 | 0.02550 | 0.0639 | 0.1090 | 0.903 |
|  | SC-YP-10-Apr-15 | Sand Creek | Muscle | 82 | <0.00047 | 1.270 | 0.0271 | <0.076 | 0.211 | <0.0024 | 0.00464 | 3,470 | 0.0144 | 0.00927 | 0.0840 | 0.1070 | 0.592 |
|  | SC-YP-15-Apr-15 | Sand Creek | Muscle | 77 | <0.00060 | 32.400 | 0.0352 | 0.168 | 0.715 | <0.0031 | 0.00669 | 3,090 | 0.0034 | 0.04540 | 0.1120 | 0.0433 | 1.650 |
|  | SC-YP-17-Apr-15 | Sand Creek | Muscle | 80 | <0.00047 | 2.620 | 0.0231 | <0.076 | 0.072 | <0.0024 | 0.00401 | 887 | 0.0014 | 0.01060 | 0.0641 | 0.1580 | 0.647 |
|  | SC-YP-19-Apr-15 | Sand Creek | Muscle | 81 | <0.00050 | 0.944 | 0.0149 | <0.080 | 0.061 | <0.0025 | 0.00541 | 826 | 0.0015 | 0.01000 | 0.0723 | 0.1230 | 0.641 |
|  | SC-YP-25-Apr-15 | Sand Creek | Muscle | 80 | <0.00048 | 13.400 | 0.0392 | 0.091 | 0.276 | <0.0025 | 0.00653 | 1,650 | 0.0046 | 0.02240 | 0.0772 | 0.0376 | 1.110 |
|  | SC-YP-01-Apr-15 | Sand Creek | Ovary | 82 | 0.00259 | 1.36 | 0.0588 | <0.14 | 0.227 | <0.0026 | 0.000690 | 777 | 0.00480 | 0.134 | 0.0718 | 0.0389 | 2.34 |
|  | SC-YP-10-Apr-15 | Sand Creek | Ovary | 83 | 0.00208 | 5.30 | 0.0453 | <0.14 | 0.353 | <0.0026 | 0.000760 | 1,520 | 0.00580 | 0.0477 | 0.0712 | 0.0305 | 2.17 |
|  | SC-YP-17-Apr-15 | Sand Creek | Ovary | 69 | 0.00169 | 0.796 | 0.0760 | <0.14 | 0.158 | <0.0026 | 0.000930 | 1,010 | 0.00190 | 0.0443 | 0.0619 | 0.0434 | 2.10 |
|  | SC-YP-19-Apr-15 | Sand Creek | Ovary | 67 | 0.00178 | 0.710 | 0.0378 | <0.14 | 0.224 | <0.0024 | 0.000620 | 1,120 | 0.00225 | 0.0425 | 0.0599 | 0.0307 | 1.96 |
|  | ER-YP-01-Apr-15 | Elk River | Muscle | 81 | <0.00038 | 9.560 | 0.0504 | <0.14 | 0.482 | <0.0026 | 0.00432 | 2,790 | 0.0039 | 0.01500 | 0.0675 | 0.0739 | 1.020 |
|  | ER-YP-02-Apr-15 | Elk River | Muscle | 83 | <0.00039 | 2.710 | 0.0290 | <0.15 | 0.201 | <0.0027 | 0.00652 | 1,760 | 0.0031 | 0.01700 | 0.0607 | 0.0887 | 0.852 |
|  | ER-YP-04-Apr-15 | Elk River | Muscle | 82 | <0.00038 | 3.630 | 0.0282 | <0.14 | 0.203 | <0.0026 | 0.00409 | 2,880 | 0.0040 | 0.01150 | 0.0745 | 0.2000 | 0.870 |
|  | ER-YP-05-Apr-15 | Elk River | Muscle | 82 | <0.00046 | 11.900 | 0.0250 | 0.510 | 0.470 | <0.0032 | 0.00403 | 4,040 | 0.0051 | 0.01840 | 1.0300 | 0.1500 | 0.993 |
|  | ER-YP-07-Apr-15 | Elk River | Muscle | 83 | <0.00037 | 2.180 | 0.0091 | <0.14 | 0.102 | <0.0026 | 0.00483 | 1,390 | 0.0050 | 0.00657 | 0.0256 | 0.0755 | 0.351 |
|  | ER-YP-08-Apr-15 | Elk River | Muscle | 82 | 0.00079 | 1.450 | 0.0210 | <0.14 | 0.076 | <0.0025 | 0.00898 | 963 | 0.0050 | 0.01480 | 0.0879 | 0.3015 | 0.451 |
|  | ER-YP-09-Apr-15 | Elk River | Muscle | 81 | <0.00038 | 2.100 | 0.0271 | <0.14 | 0.293 | <0.0026 | 0.00351 | 2,970 | 0.0045 | 0.01970 | 0.0616 | 0.0978 | 0.798 |
|  | ER-YP-10-Apr-15 | Elk River | Muscle | 81 | <0.00037 | 1.480 | 0.0198 | <0.14 | 0.180 | <0.0026 | 0.00591 | 1,870 | 0.0045 | 0.03110 | 0.0575 | 0.0658 | 1.250 |
|  | ER-YP-11-Apr-15 | Elk River | Muscle | 80 | <0.00037 | 0.539 | 0.0167 | <0.14 | 0.150 | <0.0026 | 0.00494 | 2,240 | 0.0026 | 0.01240 | 0.0599 | 0.1050 | 0.545 |
|  | ER-YP-12-Apr-15 | Elk River | Muscle | 83 | <0.00037 | 1.380 | 0.0315 | <0.14 | 0.442 | <0.0026 | 0.01340 | 4,600 | 0.0054 | 0.02100 | 0.0998 | 0.2130 | 1.220 |
|  | ER-YP-01-Apr-15 | Elk River | Ovary | 83 | 0.00321 | 30.750 | 0.0892 | 0.140 | 0.807 | <0.0023 | 0.00091 | 1,525 | 0.0206 | 0.06145 | 0.1760 | 0.0242 | 2.080 |
|  | ER-YP-02-Apr-15 | Elk River | Ovary | 83 | 0.00407 | 3.20 | 0.0381 | <0.12 | 0.315 | <0.0024 | 0.00114 | 1,025 | 0.00330 | 0.0499 | 0.0684 | 0.0190 | 2.28 |
|  | ER-YP-04-Apr-15 | Elk River | Ovary | 70 | 0.00254 | 0.317 | 0.0412 | <0.12 | 0.248 | <0.0024 | 0.000390 | 1,150 | <0.0018 | 0.0341 | 0.0548 | 0.0453 | 2.08 |
|  | ER-YP-05-Apr-15 | Elk River | Ovary | 70 | 0.00234 | 0.611 | 0.0358 | 0.36 | 0.274 | <0.0024 | 0.000540 | 962 | <0.0018 | 0.0490 | 0.0636 | 0.0316 | 1.90 |
|  | ER-YP-07-Apr-15 | Elk River | Ovary | 67 | 0.00235 | 0.534 | 0.0304 | <0.11 | 0.271 | <0.0022 | 0.00104 | 1,020 | <0.0017 | 0.0371 | 0.0617 | 0.0465 | 1.96 |
|  | ER-YP-08-Apr-15 | Elk River | Ovary | 85 | 0.00095 | 1.28 | 0.0325 | <0.12 | 0.0515 | <0.0024 | 0.0112 | 490 | 0.0406 | 0.0900 | 0.0614 | 0.205 | 2.45 |
|  | ER-YP-09-Apr-15 | Elk River | Ovary | 83 | 0.00401 | 0.463 | 0.0509 | <0.12 | 0.258 | <0.0023 | 0.000550 | 1,040 | 0.00520 | 0.0805 | 0.0774 | 0.0270 | 2.09 |
|  | ER-YP-10-Apr-15 | Elk River | Ovary | 61 | 0.00223 | 0.684 | 0.0260 | <0.11 | 0.317 | <0.0022 | 0.000700 | 937 | 0.00430 | 0.116 | 0.0593 | 0.0185 | 1.86 |

**Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-YP-11-Apr-15 | Elk River | Ovary | 82 | 0.00370 | 0.698 | 0.0383 | <0.12 | 0.669 | <0.0024 | 0.000840 | 842 | 0.00375 | 0.0721 | 0.0639 | 0.0237 | 2.17 |
|  | ER-YP-12-Apr-15 | Elk River | Ovary | 76 | 0.00229 | 8.68 | 0.0436 | <0.11 | 0.331 | <0.0021 | 0.00225 | 1,070 | 0.00610 | 0.0402 | 0.0728 | 0.0504 | 2.23 |
|  | GC-YP-01-Apr-15 | Gold Creek | Muscle | 81 | 0.00180 | 10.100 | 0.0299 | 0.106 | 0.519 | <0.0024 | 0.00481 | 6,190 | 0.0058 | 0.01530 | 0.1620 | 0.1340 | 0.589 |
|  | GC-YP-02-Apr-15 | Gold Creek | Muscle | 79 | <0.00045 | 11.400 | 0.0274 | <0.074 | 0.456 | <0.0023 | 0.00319 | 4,830 | 0.0046 | 0.01750 | 0.0807 | 0.0826 | 0.822 |
|  | GC-YP-03-Apr-15 | Gold Creek | Muscle | 82 | <0.00049 | 2.670 | 0.0178 | <0.080 | 0.247 | <0.0025 | 0.00418 | 1,700 | 0.0054 | 0.01580 | 0.0824 | 0.0893 | 0.742 |
|  | GC-YP-04-Apr-15 | Gold Creek | Muscle | 81 | 0.00112 | 0.662 | 0.0149 | <0.079 | 0.079 | <0.0025 | 0.00575 | 1,550 | 0.0026 | 0.00618 | 0.1150 | 0.1730 | 0.527 |
|  | GC-YP-05-Apr-15 | Gold Creek | Muscle | 81 | <0.00047 | 1.500 | 0.0202 | <0.076 | 0.094 | <0.0024 | 0.00361 | 882 | 0.0035 | 0.00879 | 0.0650 | 0.1130 | 0.865 |
|  | GC-YP-06-Apr-15 | Gold Creek | Muscle | 82 | <0.000485 | 1.535 | 0.0187 | <0.0795 | 0.160 | <0.0025 | 0.00581 | 1,960 | 0.0049 | 0.02100 | 0.0991 | 0.1330 | 0.721 |
|  | GC-YP-07-Apr-15 | Gold Creek | Muscle | 80 | <0.00049 | 0.484 | 0.0134 | <0.079 | 0.524 | <0.0025 | 0.00551 | 9,290 | 0.0019 | 0.01060 | 0.0708 | 0.1600 | 0.761 |
|  | GC-YP-08-Apr-15 | Gold Creek | Muscle | 81 | <0.00048 | 0.599 | 0.0110 | 0.080 | 0.098 | <0.0025 | 0.00826 | 1,720 | <0.0015 | 0.00846 | 0.0588 | 0.1690 | 0.698 |
|  | GC-YP-09-Apr-15 | Gold Creek | Muscle | 80 | <0.00047 | 0.412 | 0.0095 | 0.113 | 0.025 | <0.0024 | 0.00918 | 471 | <0.0014 | 0.01110 | 0.0569 | 0.1740 | 0.788 |
|  | GC-YP-10-Apr-15 | Gold Creek | Muscle | 79 | 0.00073 | 0.580 | 0.0233 | <0.080 | 0.282 | <0.0025 | 0.00571 | 4,520 | 0.0016 | 0.01180 | 0.0764 | 0.1140 | 0.645 |
|  | GC-YP-01-Apr-15 | Gold Creek | Ovary | 72 | 0.00314 | 4.17 | 0.0419 | <0.12 | 0.329 | <0.0024 | 0.000690 | 909 | 0.00240 | 0.0520 | 0.0612 | 0.0347 | 1.96 |
|  | GC-YP-02-Apr-15 | Gold Creek | Ovary | 81 | 0.00217 | 5.16 | 0.0421 | <0.11 | 0.287 | <0.0026 | 0.000790 | 1,040 | 0.00360 | 0.0685 | 0.0742 | 0.0235 | 1.97 |
|  | GC-YP-03-Apr-15 | Gold Creek | Ovary | 82 | 0.00230 | 0.221 | 0.0463 | <0.11 | 0.216 | <0.0024 | 0.000430 | 1,070 | <0.0015 | 0.0656 | 0.0719 | 0.0223 | 1.70 |
|  | GC-YP-04-Apr-15 | Gold Creek | Ovary | 65 | 0.00253 | 0.982 | 0.0401 | <0.12 | 0.244 | <0.0026 | 0.00107 | 1,010 | 0.00260 | 0.0258 | 0.0643 | 0.0417 | 1.75 |
|  | GC-YP-05-Apr-15 | Gold Creek | Ovary | 83 | 0.00258 | 0.394 | 0.0658 | <0.11 | 0.223 | <0.0024 | 0.000760 | 1,100 | <0.0016 | 0.0382 | 0.0873 | 0.0274 | 1.69 |
|  | GC-YP-06-Apr-15 | Gold Creek | Ovary | 73 | 0.00228 | 0.346 | 0.0377 | 0.13 | 0.435 | <0.0025 | 0.000690 | 1,185 | 0.00410 | 0.0898 | 0.0534 | 0.0300 | 1.97 |
|  | GC-YP-07-Apr-15 | Gold Creek | Ovary | 65 | 0.00347 | 0.196 | 0.0364 | <0.12 | 0.216 | <0.0026 | 0.000850 | 1,100 | 0.00230 | 0.0440 | 0.0722 | 0.0402 | 2.29 |
|  | GC-YP-08-Apr-15 | Gold Creek | Ovary | 70 | 0.00190 | 0.138 | 0.0398 | <0.10 | 0.291 | <0.0022 | 0.000710 | 913 | <0.0015 | 0.0430 | 0.0644 | 0.0364 | 1.97 |
|  | GC-YP-09-Apr-15 | Gold Creek | Ovary | 67 | 0.00113 | 0.341 | 0.0286 | 0.12 | 0.341 | <0.0027 | 0.00136 | 1,170 | 0.00200 | 0.0377 | 0.0575 | 0.0380 | 1.71 |
|  | GC-YP-10-Apr-15 | Gold Creek | Ovary | 67 | 0.00209 | 0.179 | 0.0635 | 0.16 | 0.288 | <0.0026 | 0.000730 | 1,070 | <0.0017 | 0.0619 | 0.0550 | 0.0311 | 2.05 |
| 2016 | SC-YP-01 M-Apr-16 | Sand Creek | Muscle | 83 | <0.00075 | 16.6 | 0.0215 | 0.249 | 0.233 | <0.0026 | 0.00669 | 2,340 | 0.0025 | 0.0135 | 0.622 | 0.144 | 0.605 |
|  | SC-YP-03 M-Apr-16 | Sand Creek | Muscle | 82 | <0.00073 | 12.9 | 0.0185 | 0.471 | 0.4 | <0.0026 | 0.00307 | 3,670 | 0.002 | 0.0164 | 0.103 | 0.205 | 0.532 |
|  | SC-YP-05 M-Apr-16 | Sand Creek | Muscle | 82 | <0.00069 | 2.01 | 0.0336 | 0.159 | 0.623 | <0.0024 | 0.00411 | 6,780 | 0.0038 | 0.0176 | 0.0773 | 0.151 | 0.741 |
|  | SC-YP-06 M-Apr-16 | Sand Creek | Muscle | 82 | <0.00072 | 3.6 | 0.0136 | 0.24 | 0.341 | <0.0026 | 0.00707 | 6,700 | 0.0018 | 0.0081 | 0.161 | 0.218 | 0.599 |
|  | SC-YP-09 M-Apr-16 | Sand Creek | Muscle | 81 | <0.00074 | 7.03 | 0.0237 | 0.234 | 0.238 | <0.0026 | 0.00451 | 3,000 | 0.0026 | 0.0135 | 0.0569 | 0.172 | 0.679 |
|  | SC-YP-10 M-Apr-16 | Sand Creek | Muscle | 82 | <0.00073 | 3.58 | 0.0351 | 0.25 | 0.979 | <0.0026 | 0.00337 | 17,600 | 0.0033 | 0.0251 | 0.0586 | 0.185 | 0.636 |
|  | SC-YP-14 M-Apr-16 | Sand Creek | Muscle | 81 | <0.00069 | 11.2 | 0.014 | <0.15 | 0.184 | <0.0027 | 0.00601 | 1,600 | <0.0014 | 0.0104 | 0.161 | 0.179 | 0.665 |
|  | SC-YP-17 M-Apr-16 | Sand Creek | Muscle | 81 | <0.0007 | 3.87 | 0.0162 | 0.21 | 0.0497 | <0.0027 | 0.00591 | 427 | <0.0014 | 0.0116 | 0.427 | 0.172 | 0.615 |
|  | SC-YP-18 M-Apr-16 | Sand Creek | Muscle | 81 | <0.0007 | 11.3 | 0.0178 | 0.28 | 0.16 | <0.0027 | 0.00621 | 1,650 | <0.0014 | 0.00914 | 0.113 | 0.155 | 0.485 |
|  | SC-YP-19 M-Apr-16 | Sand Creek | Muscle | 80 | <0.00073 | 3.1 | 0.0155 | <0.16 | 0.102 | <0.0028 | 0.00345 | 1,580 | <0.0015 | 0.00959 | 0.101 | 0.212 | 0.567 |
|  | SC-YP-01 O-Apr-16 | Sand Creek | Ovary | 84 | 0.00319 | 0.553 | 0.0346 | 0.37 | 0.184 | <0.0026 | 0.000977 | 1,050 | <0.0016 | 0.0332 | 0.0624 | 0.0327 | 2.02 |
|  | SC-YP-03 O-Apr-16 | Sand Creek | Ovary | 84 | 0.00404 | 1.95 | 0.0371 | 0.22 | 0.219 | <0.0026 | 0.000465 | 995 | 0.002 | 0.073 | 0.0597 | 0.0453 | 2.38 |
|  | SC-YP-05 O-Apr-16 | Sand Creek | Ovary | 84 | 0.00234 | 8.82 | 0.0659 | 0.28 | 0.362 | <0.0026 | 0.00102 | 1,210 | 0.0039 | 0.0789 | 0.0689 | 0.0403 | 2.21 |
|  | SC-YP-06 O-Apr-16 | Sand Creek | Ovary | 83 | 0.00212 | 1.07 | 0.0468 | 0.3 | 0.229 | <0.0025 | 0.000961 | 950 | <0.0015 | 0.0265 | 0.0567 | 0.0549 | 1.98 |
|  | SC-YP-09 O-Apr-16 | Sand Creek | Ovary | 84 | 0.00231 | 1.26 | 0.0672 | 0.32 | 0.19 | <0.0026 | 0.000704 | 835 | <0.0016 | 0.046 | 0.0597 | 0.0444 | 2.15 |
|  | SC-YP-10 O-Apr-16 | Sand Creek | Ovary | 84 | 0.002965 | 1.3 | 0.05935 | 0.17 | 0.1935 | 0.00255 | 0.000599 | 1,377 | 0.00185 | 0.09925 | 0.0616 | 0.0465 | 2.67 |
|  | SC-YP-14 O-Apr-16 | Sand Creek | Ovary | 83 | 0.00241 | 4.48 | 0.0452 | <0.17 | 0.206 | <0.0026 | 0.00126 | 1,010 | 0.0027 | 0.0424 | 0.137 | 0.0442 | 2.13 |
|  | SC-YP-17 O-Apr-16 | Sand Creek | Ovary | 84 | 0.00256 | 0.36 | 0.0526 | 0.25 | 0.147 | <0.0026 | 0.000802 | 1,020 | 0.0018 | 0.0575 | 0.0632 | 0.0447 | 2.18 |
|  | SC-YP-18 O-Apr-16 | Sand Creek | Ovary | 86 | 0.00197 | 2.07 | 0.0434 | 0.3 | 0.185 | <0.0026 | 0.00113 | 1,130 | <0.0016 | 0.041 | 0.0745 | 0.0381 | 1.92 |
|  | SC-YP-19 O-Apr-16 | Sand Creek | Ovary | 83 | 0.00118 | 0.959 | 0.0591 | <0.16 | 0.149 | <0.0025 | 0.000824 | 924 | 0.0018 | 0.0485 | 0.0785 | 0.0568 | 2.05 |
|  | ER-YP-01 M-Apr-16 | Elk River | Muscle | 81 | <0.00066 | 5.84 | 0.0285 | 0.257 | 0.067 | <0.0023 | 0.00369 | 468 | 0.0025 | 0.0125 | 0.108 | 0.171 | 0.629 |
|  | ER-YP-02 M-Apr-16 | Elk River | Muscle | 82 | 0.00075 | 3.65 | 0.01055 | 0.1405 | 0.262 | 0.00265 | 0.004845 | 2,765 | 0.00475 | 0.0109 | 0.1145 | 0.2015 | 0.7135 |
|  | ER-YP-03 M-Apr-16 | Elk River | Muscle | 79 | <0.00075 | 5.99 | 0.0357 | 0.513 | 1.64 | <0.0026 | 0.00204 | 21,200 | 0.009 | 0.0225 | 0.0772 | 0.0565 | 1.02 |

**Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Moisture (%) | Ag µg/g dw | Al µg/g dw | As µg/g dw | B µg/g dw | Ba µg/g dw | Be µg/g dw | Bi µg/g dw | Ca µg/g dw | Cd µg/g dw | Co µg/g dw | Cr µg/g dw | Cs µg/g dw | Cu µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-YP-05 M-Apr-16 | Elk River | Muscle | 84 | <0.00076 | 5.36 | 0.0339 | 0.714 | 0.0948 | <0.0027 | 0.00227 | 407 | 0.0055 | 0.0254 | 0.0742 | 0.112 | 1.83 |
| | ER-YP-06 M-Apr-16 | Elk River | Muscle | 80 | <0.00072 | 11.4 | 0.0426 | 1.27 | 3.45 | <0.0025 | 0.00312 | 43,000 | 0.0088 | 0.0336 | 0.126 | 0.0551 | 1.05 |
| | ER-YP-07 M-Apr-16 | Elk River | Muscle | 81 | <0.00069 | 11.5 | 0.0308 | 0.434 | 0.147 | <0.0024 | 0.00355 | 466 | 0.0034 | 0.0171 | 0.101 | 0.139 | 0.974 |
| | ER-YP-09 M-Apr-16 | Elk River | Muscle | 81 | <0.00074 | 6.61 | 0.0273 | 0.47 | 0.235 | <0.0026 | 0.00357 | 1,340 | 0.0019 | 0.0159 | 0.0645 | 0.116 | 0.929 |
| | ER-YP-10 M-Apr-16 | Elk River | Muscle | 82 | <0.00074 | 2.94 | 0.0304 | 0.305 | 0.351 | <0.0026 | 0.00622 | 3,620 | 0.0035 | 0.0149 | 0.123 | 0.0818 | 0.729 |
| | ER-YP-11 M-Apr-16 | Elk River | Muscle | 82 | <0.00072 | 2.33 | 0.0435 | 0.166 | 0.765 | <0.0026 | 0.00364 | 10,400 | 0.0054 | 0.0284 | 0.323 | 0.118 | 0.75 |
| | ER-YP-16 M-Apr-16 | Elk River | Muscle | 82 | <0.00074 | 4.15 | 0.0152 | 0.263 | 0.29 | <0.0026 | 0.00543 | 4,440 | 0.0022 | 0.0096 | 0.0624 | 0.229 | 0.511 |
| | ER-YP-01 O-Apr-16 | Elk River | Ovary | 84 | 0.00275 | 1.62 | 0.0766 | 0.2 | 0.214 | <0.0035 | 0.0011 | 1,000 | 0.0023 | 0.0767 | 0.0676 | 0.047 | 1.95 |
| | ER-YP-02 O-Apr-16 | Elk River | Ovary | 83 | 0.00259 | 1.22 | 0.0275 | 0.24 | 0.274 | <0.0036 | 0.000467 | 905 | 0.0278 | 0.0347 | 0.0658 | 0.04 | 2.37 |
| | ER-YP-03 O-Apr-16 | Elk River | Ovary | 82 | 0.00366 | 5.56 | 0.0652 | 0.31 | 0.375 | <0.0035 | 0.000507 | 1,140 | 0.003 | 0.0685 | 0.0736 | 0.0173 | 1.89 |
| | ER-YP-05 O-Apr-16 | Elk River | Ovary | 84 | 0.00373 | 1.43 | 0.06165 | 0.165 | 0.3625 | 0.00345 | 0.000319 | 1,001 | 0.0042 | 0.07125 | 0.0638 | 0.0269 | 2.055 |
| | ER-YP-06 O-Apr-16 | Elk River | Ovary | 82 | 0.00339 | 2.07 | 0.0526 | 0.22 | 0.38 | <0.0033 | 0.000732 | 963 | 0.0035 | 0.0959 | 0.0723 | 0.018 | 2.37 |
| | ER-YP-07 O-Apr-16 | Elk River | Ovary | 82 | 0.00333 | 5.04 | 0.0577 | 0.47 | 0.245 | <0.0035 | 0.000559 | 1,050 | 0.0031 | 0.0617 | 0.079 | 0.0326 | 1.85 |
| | ER-YP-09 O-Apr-16 | Elk River | Ovary | 82 | 0.00228 | 2.83 | 0.0581 | 0.54 | 0.443 | <0.0035 | 0.000382 | 3,080 | 0.0052 | 0.0613 | 0.0699 | 0.0266 | 1.84 |
| | ER-YP-10 O-Apr-16 | Elk River | Ovary | 84 | 0.00281 | 0.979 | 0.0807 | 0.28 | 0.402 | <0.0034 | 0.000651 | 919 | 0.0041 | 0.0734 | 0.07 | 0.0171 | 2.08 |
| | ER-YP-11 O-Apr-16 | Elk River | Ovary | 83 | 0.00301 | 19.3 | 0.0915 | 0.13 | 0.426 | <0.0035 | 0.00159 | 964 | 0.0047 | 0.093 | 0.153 | 0.0277 | 2.12 |
| | ER-YP-16 O-Apr-16 | Elk River | Ovary | 83 | 0.00235 | 1.42 | 0.0394 | 0.16 | 0.241 | <0.0032 | 0.00115 | 964 | 0.0025 | 0.0498 | 0.062 | 0.0489 | 2.15 |
| | GC-YP-06 M-Apr-16 | Gold Creek | Muscle | 82 | <0.00068 | 8.41 | 0.0193 | <0.15 | 0.211 | <0.0027 | 0.0182 | 1,610 | 0.0017 | 0.0206 | 0.0838 | 0.14 | 2.05 |
| | GC-YP-09 M-Apr-16 | Gold Creek | Muscle | 81 | <0.0008 | 9.08 | 0.0604 | <0.17 | 0.225 | <0.0031 | 0.00509 | 1,060 | 0.0032 | 0.0133 | 0.108 | 0.0729 | 0.676 |
| | GC-YP-21 M-Apr-16 | Gold Creek | Muscle | 81 | <0.00069 | 6.19 | 0.0225 | <0.15 | 0.0896 | <0.0027 | 0.0102 | 611 | 0.004 | 0.0133 | 0.0823 | 0.0589 | 0.592 |
| | GC-YP-23 M-Apr-16 | Gold Creek | Muscle | 81 | <0.0007 | 2.56 | 0.0112 | 0.25 | 0.0947 | <0.0027 | 0.00416 | 1,100 | 0.0021 | 0.00622 | 0.0852 | 0.198 | 0.511 |
| | GC-YP-24 M-Apr-16 | Gold Creek | Muscle | 81 | <0.00071 | 4.13 | 0.0264 | <0.15 | 0.289 | <0.0028 | 0.00389 | 3,390 | <0.0014 | 0.0142 | 0.112 | 0.101 | 0.938 |
| | GC-YP-31 M -Apr-16 | Gold Creek | Muscle | 81 | 0.000715 | 1.39 | 0.0089 | 0.215 | 0.0642 | 0.00275 | 0.00852 | 405 | 0.00145 | 0.0077 | 0.07065 | 0.201 | 0.8465 |
| | GC-YP-32 M-Apr-16 | Gold Creek | Muscle | 81 | <0.00078 | 5.14 | 0.0234 | 0.29 | 0.449 | <0.003 | 0.00339 | 3,340 | 0.0042 | 0.116 | 4.68 | 0.0941 | 1.1 |
| | GC-YP-33 M-Apr-16 | Gold Creek | Muscle | 81 | <0.00067 | 2.29 | 0.0362 | 0.34 | 0.61 | <0.0026 | 0.00562 | 7,610 | 0.0056 | 0.016 | 0.104 | 0.08 | 0.737 |
| | GC-YP-35 M-Apr-16 | Gold Creek | Muscle | 82 | <0.00072 | 6.74 | 0.0245 | 0.21 | 0.528 | <0.0028 | 0.00373 | 7,060 | 0.0039 | 0.0226 | 0.0724 | 0.112 | 0.745 |
| | GC-YP-37 M-Apr-16 | Gold Creek | Muscle | 80 | <0.00071 | 3.76 | 0.0126 | 0.26 | 0.0801 | <0.0028 | 0.018 | 935 | <0.0014 | 0.00795 | 0.0827 | 0.123 | 0.545 |
| | GC-YP-06 O-Apr-16 | Gold Creek | Ovary | 83 | 0.00281 | 1.7 | 0.0354 | 0.275 | 0.23 | <0.0049 | 0.00232 | 927 | 0.0018 | 0.0339 | 0.067 | 0.0307 | 1.97 |
| | GC-YP-09 O-Apr-16 | Gold Creek | Ovary | 83 | 0.00662 | 2.69 | 0.158 | 0.44 | 0.486 | <0.0049 | 0.000498 | 950 | 0.0045 | 0.0481 | 0.069 | 0.0219 | 1.89 |
| | GC-YP-21 O-Apr-16 | Gold Creek | Ovary | 83 | 0.0022 | 8.82 | 0.0709 | 0.242 | 0.568 | <0.0049 | 0.00186 | 1,120 | 0.003 | 0.0678 | 0.072 | 0.015 | 1.81 |
| | GC-YP-23 O-Apr-16 | Gold Creek | Ovary | 83 | 0.00136 | 6 | 0.0512 | 0.216 | 0.31 | <0.0048 | 0.000908 | 928 | 0.0023 | 0.0333 | 0.068 | 0.0453 | 1.92 |
| | GC-YP-24 O-Apr-16 | Gold Creek | Ovary | 83 | 0.00224 | 2.09 | 0.074 | 0.176 | 0.305 | <0.0045 | 0.000705 | 964 | 0.0014 | 0.0505 | 0.062 | 0.0231 | 1.99 |
| | GC-YP-31 O-Apr-16 | Gold Creek | Ovary | 83 | 0.00162 | 0.63 | 0.0273 | 0.173 | 0.192 | <0.0044 | 0.00184 | 927 | <0.0011 | 0.0228 | 0.066 | 0.0472 | 1.64 |
| | GC-YP-32 O-Apr-16 | Gold Creek | Ovary | 83 | 0.00273 | 0.664 | 0.0475 | 0.268 | 0.304 | <0.0047 | 0.000485 | 1,160 | 0.0029 | 0.0895 | 0.065 | 0.0234 | 1.76 |
| | GC-YP-33 O-Apr-16 | Gold Creek | Ovary | 83 | 0.002185 | 0.548 | 0.0722 | 0.1195 | 0.319 | 0.0048 | 0.000794 | 1,080 | 0.0026 | 0.0777 | 0.062 | 0.01885 | 1.895 |
| | GC-YP-35 O-Apr-16 | Gold Creek | Ovary | 84 | 0.0033 | 1.38 | 0.0566 | 0.14 | 0.285 | <0.0049 | 0.0006 | 1,090 | 0.0025 | 0.0837 | 0.07 | 0.0254 | 1.93 |
| | GC-YP-37 O-Apr-16 | Gold Creek | Ovary | 82 | 0.00225 | 0.753 | 0.0362 | 0.298 | 0.231 | <0.005 | 0.00347 | 889 | 0.0015 | 0.0466 | 0.063 | 0.0258 | 2.09 |

### Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | Fe µg/g dw | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-YP-1-Aug-14 | Sand Creek | Muscle | 5.96 | 0.00875 | 0.316 | 22,200 | 0.0132 | 1,200 | 0.841 | 0.0033 | 1,200 | 0.0162 | 10,300 | 0.0122 | 29.1 | <0.00011 | 0.00071 |
|  | SC-YP-2-Aug-14 | Sand Creek | Muscle | 10.9 | 0.0103 | 0.173 | 20,200 | 0.0366 | 1,390 | 2.70 | 0.014 | 1,970 | 0.112 | 10,600 | 0.143 | 20.3 | <0.00010 | 0.00331 |
|  | SC-YP-3-Aug-14 | Sand Creek | Muscle | 9.14 | 0.00973 | 0.538 | 20,800 | 0.0157 | 1,400 | 2.03 | 0.0122 | 1,480 | 0.033 | 10,200 | 0.0337 | 21.1 | <0.00013 | 0.00155 |
|  | SC-YP-4-Aug-14 | Sand Creek | Muscle | 6.85 | 0.0117 | 0.770 | 21,100 | 0.0430 | 1,270 | 1.74 | 0.0027 | 1,130 | 0.0531 | 14,000 | 0.134 | 18.5 | <0.00011 | 0.00058 |
|  | GC-YP-1-Aug-14 | Gold Creek | Muscle | 23.7 | 0.0162 | 0.316 | 19,300 | 0.0383 | 1,400 | 1.51 | 0.00858 | 1,820 | 0.102 | 11,700 | 0.166 | 15.1 | <0.00034 | 0.00311 |
|  | GC-YP-2-Aug-14 | Gold Creek | Muscle | 7.15 | 0.0076 | 0.173 | 20,200 | <0.016 | 1,480 | 0.99 | 0.0083 | 1,020 | 0.0134 | 9,540 | 0.0057 | 20.7 | <0.00060 | <0.00098 |
|  | GC-YP-3-Aug-14 | Gold Creek | Muscle | 5.90 | 0.0078 | 0.538 | 22,400 | 0.0118 | 1,320 | 0.872 | 0.00486 | 998 | 0.0355 | 10,300 | 0.0386 | 27.5 | <0.00026 | 0.00134 |
|  | GC-YP-4-Aug-14 | Gold Creek | Muscle | 10.1 | 0.0112 | 0.770 | 23,100 | 0.0232 | 1,400 | 0.886 | 0.00368 | 689 | 0.0415 | 11,600 | 0.0305 | 23.9 | <0.00026 | 0.00113 |
|  | GC-YP-5-Aug-14 | Gold Creek | Muscle | 5.35 | 0.0106 | 0.657 | 23,050 | 0.0213 | 1,280 | 0.547 | 0.00371 | 961 | 0.0224 | 11,400 | 0.00357 | 25.4 | <0.00025 | <0.00041 |
|  | GC-YP-6-Aug-14 | Gold Creek | Muscle | 7.28 | 0.00744 | 0.400 | 21,300 | 0.0203 | 1,340 | 0.853 | 0.00642 | 798 | 0.048 | 10,400 | 0.0209 | 18.8 | <0.00027 | 0.00072 |
|  | GC-YP-7-Aug-14 | Gold Creek | Muscle | 5.79 | 0.00819 | 0.674 | 22,200 | 0.0208 | 1,240 | 0.666 | 0.00349 | 818 | 0.0165 | 10,800 | 0.00543 | 25.6 | <0.00026 | 0.00057 |
|  | GC-YP-8-Aug-14 | Gold Creek | Muscle | 7.23 | 0.00866 | 0.303 | 20,400 | 0.0194 | 1,370 | 0.935 | 0.00735 | 1,550 | 0.049 | 10,800 | 0.0149 | 20.9 | <0.00026 | 0.00723 |
|  | GC-YP-9-Aug-14 | Gold Creek | Muscle | 4.93 | 0.00678 | 0.399 | 22,200 | 0.0111 | 1,390 | 0.64 | 0.00629 | 961 | 0.0168 | 10,900 | 0.00526 | 25.8 | <0.00027 | <0.00043 |
|  | GC-YP-10-Aug-14 | Gold Creek | Muscle | 4.37 | 0.00738 | 0.442 | 22,400 | 0.0252 | 1,350 | 0.981 | 0.0039 | 823 | 0.017 | 10,800 | 0.00478 | 15.1 | <0.00026 | 0.00077 |
| 2015 | SC-YP-01-Apr-15 | Sand Creek | Muscle | 11.0 | 0.00644 | 0.216 | 18,600 | <0.0085 | 1,260 | 1.020 | 0.0080 | 877 | 0.0185 | 9,740 | 0.01160 | 23.7 | <0.000035 | <0.0014 |
|  | SC-YP-10-Apr-15 | Sand Creek | Muscle | 9.5 | 0.00646 | 0.417 | 24,100 | 0.0199 | 1,390 | 1.170 | 0.0059 | 1,800 | 0.0202 | 12,000 | 0.02500 | 32.4 | <0.000028 | <0.0011 |
|  | SC-YP-15-Apr-15 | Sand Creek | Muscle | 36.8 | 0.01600 | 0.330 | 18,100 | 0.0389 | 1,290 | 7.280 | 0.0116 | 1,110 | 0.0518 | 10,400 | 0.15500 | 18.4 | <0.000035 | 0.0022 |
|  | SC-YP-17-Apr-15 | Sand Creek | Muscle | 10.6 | 0.00644 | 0.404 | 20,900 | 0.0291 | 1,190 | 0.968 | 0.0069 | 1,390 | 0.0202 | 9,650 | 0.02090 | 34.7 | 0.000047 | <0.0011 |
|  | SC-YP-19-Apr-15 | Sand Creek | Muscle | 6.3 | 0.00650 | 0.331 | 24,400 | 0.0135 | 1,300 | 0.940 | 0.0069 | 1,420 | 0.0353 | 10,800 | 0.00704 | 32.4 | <0.000029 | <0.0012 |
|  | SC-YP-25-Apr-15 | Sand Creek | Muscle | 17.9 | 0.01010 | 0.191 | 22,000 | 0.0249 | 1,300 | 1.210 | 0.0085 | 753 | 0.0269 | 10,700 | 0.01330 | 19.1 | <0.000029 | 0.0017 |
|  | SC-YP-01-Apr-15 | Sand Creek | Ovary | 28.2 | 0.00560 | 0.0205 | 7,920 | 0.0309 | 1,120 | 3.40 | 0.0474 | 10,400 | 0.0249 | 8,710 | 0.00900 | 12.3 | 0.0000254 | 0.00170 |
|  | SC-YP-10-Apr-15 | Sand Creek | Ovary | 31.1 | 0.00790 | 0.0238 | 8,750 | 0.0592 | 1,180 | 2.71 | 0.0396 | 12,600 | 0.0143 | 9,260 | 0.00679 | 14.9 | 0.0000173 | 0.00130 |
|  | SC-YP-17-Apr-15 | Sand Creek | Ovary | 33.4 | 0.00515 | 0.0155 | 7,445 | 0.120 | 1,085 | 2.14 | 0.0398 | 12,300 | 0.0107 | 7,985 | 0.00346 | 16.5 | 0.00000620 | 0.00125 |
|  | SC-YP-19-Apr-15 | Sand Creek | Ovary | 34.3 | 0.00609 | 0.0142 | 9,155 | 0.0875 | 1,115 | 2.28 | 0.0441 | 13,650 | 0.0111 | 9,035 | 0.00523 | 15.7 | 0.0000158 | <0.0011 |
|  | ER-YP-01-Apr-15 | Elk River | Muscle | 19.1 | 0.01160 | 0.379 | 22,800 | 0.0503 | 1,230 | 1.450 | 0.0167 | 1,380 | 0.0263 | 12,000 | 0.01250 | 26.8 | <0.0000041 | 0.0019 |
|  | ER-YP-02-Apr-15 | Elk River | Muscle | 9.8 | 0.00890 | 0.354 | 25,400 | 0.0396 | 1,200 | 0.904 | 0.0133 | 1,490 | 0.0108 | 12,400 | 0.02140 | 32.9 | <0.0000042 | 0.0014 |
|  | ER-YP-04-Apr-15 | Elk River | Muscle | 14.8 | 0.00880 | 0.987 | 24,100 | 0.0530 | 1,250 | 1.120 | 0.0117 | 1,960 | 0.0203 | 12,400 | 0.01700 | 32.3 | 0.0000154 | 0.0018 |
|  | ER-YP-05-Apr-15 | Elk River | Muscle | 21.4 | 0.01140 | 0.789 | 21,200 | 0.1130 | 1,190 | 1.540 | 0.0620 | 2,920 | 0.0723 | 12,000 | 0.06880 | 29.1 | <0.0000049 | 0.0035 |
|  | ER-YP-07-Apr-15 | Elk River | Muscle | 7.6 | 0.00460 | 0.874 | 9,940 | 0.0194 | 502 | 0.416 | 0.0028 | 1,300 | 0.0076 | 6,210 | 0.01290 | 14.0 | <0.0000040 | <0.0012 |
|  | ER-YP-08-Apr-15 | Elk River | Muscle | 7.4 | 0.00716 | 1.670 | 24,550 | 0.0239 | 1,180 | 0.634 | 0.0117 | 2,380 | 0.0191 | 12,400 | 0.01840 | 38.1 | 0.0000071 | <0.0011 |
|  | ER-YP-09-Apr-15 | Elk River | Muscle | 9.2 | 0.00900 | 0.322 | 23,900 | 0.0342 | 1,190 | 1.010 | 0.0077 | 1,110 | 0.0211 | 12,400 | 0.04270 | 30.5 | <0.0000041 | 0.0014 |
|  | ER-YP-10-Apr-15 | Elk River | Muscle | 15.5 | 0.00620 | 0.505 | 21,500 | 0.0734 | 1,130 | 1.060 | 0.0126 | 2,070 | 0.0169 | 11,500 | 0.02660 | 16.9 | <0.0000040 | <0.0011 |
|  | ER-YP-11-Apr-15 | Elk River | Muscle | 7.7 | 0.00810 | 0.295 | 23,200 | 0.0396 | 1,310 | 1.120 | 0.0134 | 825 | 0.0116 | 11,900 | 0.00354 | 29.1 | <0.0000040 | <0.0011 |
|  | ER-YP-12-Apr-15 | Elk River | Muscle | 19.2 | 0.00890 | 1.340 | 23,400 | 0.0439 | 1,150 | 0.855 | 0.0131 | 3,040 | 0.0196 | 13,600 | 0.02650 | 40.1 | <0.0000040 | 0.0016 |
|  | ER-YP-01-Apr-15 | Elk River | Ovary | 54.1 | 0.01545 | 0.018 | 7,825 | 0.2485 | 1,190 | 4.795 | 0.0388 | 11,150 | 0.0551 | 9,645 | 0.02030 | 11.9 | 0.00005 | 0.0013 |
|  | ER-YP-02-Apr-15 | Elk River | Ovary | 34.0 | 0.00521 | 0.0175 | 7,200 | 0.229 | 1,285 | 3.14 | 0.0367 | 11,400 | 0.0159 | 8,820 | 0.0111 | 12.0 | <0.000035 | 0.00101 |
|  | ER-YP-04-Apr-15 | Elk River | Ovary | 30.5 | 0.00498 | 0.0454 | 7,860 | 0.222 | 1,230 | 2.57 | 0.0337 | 12,300 | 0.00970 | 9,290 | 0.00243 | 12.6 | 0.0000820 | 0.000510 |
|  | ER-YP-05-Apr-15 | Elk River | Ovary | 26.7 | 0.00401 | 0.0250 | 7,220 | 0.366 | 1,160 | 1.97 | 0.0352 | 11,200 | 0.0140 | 8,930 | 0.00678 | 12.0 | 0.000109 | <0.00047 |
|  | ER-YP-07-Apr-15 | Elk River | Ovary | 31.9 | 0.00450 | 0.137 | 8,510 | 0.145 | 1,330 | 2.19 | 0.0314 | 11,700 | 0.00820 | 9,240 | 0.00340 | 14.8 | <0.000033 | <0.00045 |
|  | ER-YP-08-Apr-15 | Elk River | Ovary | 129 | 0.00580 | 0.267 | 16,800 | 0.0669 | 749 | 1.77 | 0.0557 | 7,860 | 0.0122 | 11,000 | 0.00760 | 35.2 | <0.000037 | 0.00104 |
|  | ER-YP-09-Apr-15 | Elk River | Ovary | 38.2 | 0.00316 | 0.0118 | 8,090 | 0.209 | 1,030 | 3.03 | 0.0467 | 11,500 | 0.0129 | 8,780 | 0.00637 | 13.1 | <0.000035 | <0.00046 |
|  | ER-YP-10-Apr-15 | Elk River | Ovary | 41.1 | 0.00475 | 0.0236 | 8,170 | 0.310 | 1,090 | 2.39 | 0.0384 | 12,800 | 0.0201 | 9,040 | 0.00962 | 8.14 | 0.0000530 | 0.000900 |

**Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Fe µg/g dw | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-YP-11-Apr-15 | Elk River | Ovary | 34.8 | 0.00464 | 0.0128 | 7,670 | 0.292 | 1,170 | 3.17 | 0.0475 | 9,450 | 0.0215 | 9,040 | 0.00365 | 12.0 | 0.0000465 | 0.000665 |
| | ER-YP-12-Apr-15 | Elk River | Ovary | 47.9 | 0.00611 | 0.0999 | 8,460 | 0.139 | 1,230 | 2.60 | 0.0341 | 12,700 | 0.0144 | 9,290 | 0.00664 | 17.2 | 0.0000350 | 0.000610 |
| | GC-YP-01-Apr-15 | Gold Creek | Muscle | 19.2 | 0.01210 | 1.020 | 23,700 | 0.0506 | 1,310 | 1.550 | 0.0096 | 2,120 | 0.1170 | 13,000 | 0.02300 | 30.4 | <0.000028 | 0.0088 |
| | GC-YP-02-Apr-15 | Gold Creek | Muscle | 18.9 | 0.01100 | 0.592 | 20,700 | 0.0463 | 1,250 | 1.760 | 0.0068 | 1,860 | 0.0307 | 11,600 | 0.01160 | 24.3 | <0.000027 | <0.0011 |
| | GC-YP-03-Apr-15 | Gold Creek | Muscle | 12.4 | 0.00636 | 0.496 | 23,100 | 0.0182 | 1,290 | 1.210 | 0.0078 | 1,650 | 0.0238 | 10,500 | 0.02000 | 27.7 | <0.000029 | 0.0018 |
| | GC-YP-04-Apr-15 | Gold Creek | Muscle | 9.4 | 0.00744 | 0.834 | 23,600 | 0.0274 | 1,280 | 0.685 | 0.0066 | 1,410 | 0.0675 | 10,900 | 0.01160 | 32.6 | <0.000029 | 0.0107 |
| | GC-YP-05-Apr-15 | Gold Creek | Muscle | 11.4 | 0.00583 | 0.554 | 23,500 | 0.0181 | 1,240 | 0.930 | 0.0066 | 1,110 | 0.0211 | 10,400 | 0.01540 | 31.4 | <0.000028 | 0.0030 |
| | GC-YP-06-Apr-15 | Gold Creek | Muscle | 15.1 | 0.00661 | 1.205 | 24,650 | 0.0225 | 1,235 | 0.865 | 0.0079 | 1,735 | 0.0134 | 11,350 | 0.00600 | 30.1 | <0.000029 | <0.001115 |
| | GC-YP-07-Apr-15 | Gold Creek | Muscle | 9.1 | 0.00723 | 0.794 | 21,100 | 0.0950 | 1,270 | 1.260 | 0.0058 | 2,200 | 0.0283 | 14,300 | 0.00717 | 32.4 | <0.000029 | <0.0012 |
| | GC-YP-08-Apr-15 | Gold Creek | Muscle | 12.1 | 0.00657 | 1.130 | 24,600 | 0.0235 | 1,210 | 0.617 | 0.0076 | 1,520 | 0.0163 | 11,200 | 0.00340 | 35.0 | <0.000029 | <0.0011 |
| | GC-YP-09-Apr-15 | Gold Creek | Muscle | 5.9 | 0.00643 | 2.040 | 21,800 | 0.0305 | 1,100 | 0.474 | 0.0055 | 2,450 | 0.0081 | 10,400 | 0.00295 | 30.8 | <0.000028 | <0.0011 |
| | GC-YP-10-Apr-15 | Gold Creek | Muscle | 7.3 | 0.00716 | 0.728 | 21,700 | 0.0340 | 1,210 | 1.260 | 0.0049 | 1,340 | 0.0418 | 11,500 | 0.01000 | 29.7 | <0.000029 | 0.0059 |
| | GC-YP-01-Apr-15 | Gold Creek | Ovary | 35.6 | 0.00538 | 0.0378 | 7,850 | 0.110 | 1,170 | 3.16 | 0.0294 | 11,800 | 0.0169 | 9,080 | 0.00401 | 12.7 | <0.000036 | 0.000550 |
| | GC-YP-02-Apr-15 | Gold Creek | Ovary | 32.8 | 0.00572 | 0.0255 | 8,250 | 0.103 | 1,160 | 2.61 | 0.0336 | 11,300 | 0.0101 | 9,230 | 0.00445 | 11.8 | <0.000037 | 0.000650 |
| | GC-YP-03-Apr-15 | Gold Creek | Ovary | 22.7 | 0.00505 | 0.0227 | 7,860 | 0.0756 | 1,330 | 2.30 | 0.0325 | 12,600 | 0.0105 | 9,300 | 0.00177 | 11.6 | <0.000034 | 0.00134 |
| | GC-YP-04-Apr-15 | Gold Creek | Ovary | 29.9 | 0.00540 | 0.0292 | 9,550 | 0.0966 | 1,210 | 2.13 | 0.0365 | 13,700 | 0.0145 | 9,890 | 0.00989 | 16.7 | <0.000037 | 0.00108 |
| | GC-YP-05-Apr-15 | Gold Creek | Ovary | 23.1 | 0.00474 | 0.0242 | 8,170 | 0.104 | 1,170 | 2.83 | 0.0374 | 12,700 | 0.0103 | 8,820 | 0.00355 | 13.2 | <0.000035 | 0.000850 |
| | GC-YP-06-Apr-15 | Gold Creek | Ovary | 33.6 | 0.00447 | 0.0654 | 9,005 | 0.112 | 1,270 | 2.93 | 0.0383 | 14,850 | 0.00825 | 10,100 | 0.00179 | 13.4 | 0.0000505 | <0.00058 |
| | GC-YP-07-Apr-15 | Gold Creek | Ovary | 27.6 | 0.00476 | 0.0334 | 9,250 | 0.181 | 1,220 | 2.49 | 0.0302 | 12,900 | 0.00800 | 9,970 | 0.00302 | 17.1 | <0.000037 | 0.000850 |
| | GC-YP-08-Apr-15 | Gold Creek | Ovary | 30.2 | 0.00467 | 0.0381 | 7,850 | 0.101 | 1,350 | 2.04 | 0.0373 | 13,500 | 0.00620 | 10,000 | 0.00116 | 14.0 | <0.000032 | <0.00052 |
| | GC-YP-09-Apr-15 | Gold Creek | Ovary | 61.9 | 0.00428 | 0.0676 | 8,870 | 0.153 | 1,200 | 2.36 | 0.0323 | 14,300 | 0.0110 | 10,200 | 0.00290 | 15.0 | <0.000038 | 0.000730 |
| | GC-YP-10-Apr-15 | Gold Creek | Ovary | 29.1 | 0.00584 | 0.0291 | 8,810 | 0.102 | 1,250 | 2.63 | 0.0337 | 13,300 | 0.00790 | 9,810 | 0.00700 | 15.1 | <0.000037 | 0.00179 |
| 2016 | SC-YP-01 M-Apr-16 | Sand Creek | Muscle | 25.5 | 0.0127 | 0.501 | 24,800 | 0.0315 | 1,420 | 1.51 | 0.0045 | 1,330 | 0.0499 | 11,700 | 0.0169 | 33.9 | <0.000051 | 0.00078 |
| | SC-YP-03 M-Apr-16 | Sand Creek | Muscle | 20 | 0.0103 | 0.506 | 24,000 | 0.0283 | 1,350 | 1.45 | 0.0029 | 1,340 | 0.0402 | 12,700 | 0.0116 | 38.2 | <0.000049 | 0.00105 |
| | SC-YP-05 M-Apr-16 | Sand Creek | Muscle | 11.6 | 0.0088 | 0.301 | 23,000 | 0.0271 | 1,360 | 1.63 | 0.0054 | 1,760 | 0.0223 | 14,000 | 0.00687 | 30.6 | <0.000047 | <0.00056 |
| | SC-YP-06 M-Apr-16 | Sand Creek | Muscle | 12.7 | 0.0078 | 0.57 | 21,500 | 0.0562 | 1,190 | 1.13 | 0.0057 | 2,110 | 0.0425 | 13,400 | 0.00874 | 35.9 | <0.000049 | <0.00058 |
| | SC-YP-09 M-Apr-16 | Sand Creek | Muscle | 13.1 | 0.0085 | 0.344 | 21,200 | 0.0418 | 1,210 | 1.32 | 0.0043 | 1,660 | 0.0264 | 11,400 | 0.0129 | 33.2 | <0.00005 | 0.00072 |
| | SC-YP-10 M-Apr-16 | Sand Creek | Muscle | 11 | 0.0114 | 0.337 | 22,300 | 0.0761 | 1,440 | 2.47 | 0.0071 | 2,040 | 0.0454 | 19,200 | 0.0135 | 40.3 | <0.000049 | <0.00058 |
| | SC-YP-14 M-Apr-16 | Sand Creek | Muscle | 16.1 | 0.00949 | 0.551 | 23,000 | 0.0287 | 1,370 | 0.892 | 0.004 | 1,730 | 0.0264 | 11,700 | 0.0181 | 34.7 | 0.0000173 | 0.00067 |
| | SC-YP-17 M-Apr-16 | Sand Creek | Muscle | 11.9 | 0.00645 | 0.531 | 22,600 | 0.0264 | 1,290 | 0.762 | 0.0083 | 1,430 | 0.045 | 10,700 | 0.00479 | 32.3 | 0.0000177 | <0.00055 |
| | SC-YP-18 M-Apr-16 | Sand Creek | Muscle | 14.2 | 0.0114 | 0.447 | 22,200 | 0.0475 | 1,410 | 1.34 | 0.0031 | 1,550 | 0.0428 | 11,400 | 0.0104 | 32.6 | 0.000019 | 0.00064 |
| | SC-YP-19 M-Apr-16 | Sand Creek | Muscle | 8.6 | 0.00723 | 0.416 | 19,600 | 0.0231 | 1,310 | 1.1 | 0.0041 | 1,410 | 0.0831 | 10,100 | 0.0293 | 35.4 | 0.0000115 | <0.00058 |
| | SC-YP-01 O-Apr-16 | Sand Creek | Ovary | 31.7 | 0.00691 | 0.024 | 7,460 | 0.0654 | 1,190 | 2.77 | 0.0392 | 14,100 | 0.0158 | 8,190 | 0.0149 | 13.2 | <0.000086 | 0.00346 |
| | SC-YP-03 O-Apr-16 | Sand Creek | Ovary | 38.1 | 0.00624 | 0.0225 | 7,520 | 0.113 | 1,150 | 2.36 | 0.0413 | 14,600 | 0.0216 | 8,190 | 0.00238 | 15.4 | <0.000088 | 0.00048 |
| | SC-YP-05 O-Apr-16 | Sand Creek | Ovary | 35.4 | 0.0081 | 0.0135 | 8,440 | 0.0843 | 1,180 | 2.45 | 0.045 | 14,000 | 0.0341 | 9,010 | 0.00578 | 13.5 | <0.000087 | <0.00038 |
| | SC-YP-06 O-Apr-16 | Sand Creek | Ovary | 29.6 | 0.00567 | 0.0191 | 8,540 | 0.169 | 1,270 | 1.91 | 0.0337 | 14,500 | 0.0112 | 9,440 | 0.00174 | 18.5 | <0.000084 | <0.00037 |
| | SC-YP-09 O-Apr-16 | Sand Creek | Ovary | 29.7 | 0.00568 | 0.012 | 8,060 | 0.221 | 1,090 | 1.79 | 0.0388 | 16,100 | 0.013 | 8,350 | 0.00354 | 15.7 | <0.000087 | 0.00063 |
| | SC-YP-10 O-Apr-16 | Sand Creek | Ovary | 32.95 | 0.005145 | 0.0152 | 7,685 | 0.203 | 1,170 | 3.24 | 0.04245 | 15,500 | 0.01805 | 8,825 | 0.006605 | 17.7 | 0.0000855 | 0.00083 |
| | SC-YP-14 O-Apr-16 | Sand Creek | Ovary | 38.9 | 0.00631 | 0.0236 | 7,630 | 0.127 | 1,180 | 2.43 | 0.0388 | 15,300 | 0.0156 | 8,650 | 0.00652 | 14.1 | <0.000088 | 0.00086 |
| | SC-YP-17 O-Apr-16 | Sand Creek | Ovary | 34.4 | 0.00535 | 0.0194 | 7,920 | 0.221 | 1,150 | 2.42 | 0.0403 | 16,000 | 0.026 | 8,390 | 0.00204 | 14.4 | <0.000087 | 0.00057 |
| | SC-YP-18 O-Apr-16 | Sand Creek | Ovary | 38.6 | 0.00516 | 0.0195 | 8,130 | 0.291 | 1,120 | 2.25 | 0.0423 | 17,900 | 0.0143 | 8,330 | 0.00278 | 15.1 | <0.000088 | 0.00086 |
| | SC-YP-19 O-Apr-16 | Sand Creek | Ovary | 37.6 | 0.00471 | 0.0156 | 7,510 | 0.138 | 1,130 | 2.08 | 0.0355 | 14,300 | 0.0168 | 8,220 | 0.00285 | 16.7 | <0.000083 | 0.00104 |
| | ER-YP-01 M-Apr-16 | Elk River | Muscle | 13.2 | 0.0074 | 0.534 | 21,900 | 0.0349 | 1,320 | 1.08 | 0.0027 | 1,560 | 0.0567 | 10,200 | 0.0211 | 33.2 | <0.000045 | 0.00163 |
| | ER-YP-02 M-Apr-16 | Elk River | Muscle | 11.65 | 0.0079 | 1.07 | 24,850 | 0.0959 | 1,290 | 0.9345 | 0.00415 | 2,090 | 0.0292 | 12,750 | 0.03945 | 35.35 | 0.0000505 | 0.00064 |
| | ER-YP-03 M-Apr-16 | Elk River | Muscle | 12.8 | 0.0117 | 0.198 | 16,600 | 0.127 | 1,360 | 2.21 | 0.0087 | 1,300 | 0.0682 | 19,700 | 0.0278 | 20.1 | <0.00005 | 0.001 |

**Table G.11:** **Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Fe µg/g dw | Ga µg/g dw | Hg µg/g dw | K µg/g dw | Li µg/g dw | Mg µg/g dw | Mn µg/g dw | Mo µg/g dw | Na µg/g dw | Ni µg/g dw | P µg/g dw | Pb µg/g dw | Rb µg/g dw | Re µg/g dw | Sb µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-YP-05 M-Apr-16 | Elk River | Muscle | 23.5 | 0.0065 | 0.324 | 22,900 | 0.0406 | 1,240 | 0.838 | 0.0057 | 1,510 | 0.0259 | 11,500 | 0.0189 | 35.7 | <0.000052 | 0.00064 |
|  | ER-YP-06 M-Apr-16 | Elk River | Muscle | 19.8 | 0.0198 | 0.154 | 14,800 | 0.217 | 1,510 | 4.16 | 0.0093 | 2,060 | 0.124 | 29,700 | 0.0671 | 15.7 | <0.000049 | 0.00104 |
|  | ER-YP-07 M-Apr-16 | Elk River | Muscle | 20.1 | 0.0096 | 0.416 | 23,000 | 0.0403 | 1,320 | 0.845 | 0.004 | 1,570 | 0.0263 | 11,200 | 0.0487 | 34.9 | <0.000047 | 0.00088 |
|  | ER-YP-09 M-Apr-16 | Elk River | Muscle | 12.2 | 0.0081 | 0.504 | 22,300 | 0.0698 | 1,260 | 0.982 | 0.0035 | 1,780 | 0.0293 | 11,700 | 0.0269 | 28.5 | <0.00005 | 0.00063 |
|  | ER-YP-10 M-Apr-16 | Elk River | Muscle | 11.3 | 0.0082 | 0.505 | 23,600 | 0.0748 | 1,320 | 1.23 | 0.006 | 1,470 | 0.0356 | 12,900 | 0.0531 | 24.7 | <0.00005 | 0.00082 |
|  | ER-YP-11 M-Apr-16 | Elk River | Muscle | 12.4 | 0.0098 | 0.397 | 23,400 | 0.129 | 1,410 | 1.62 | 0.0071 | 1,690 | 0.0435 | 16,500 | 0.0118 | 36.2 | 0.000049 | 0.00092 |
|  | ER-YP-16 M-Apr-16 | Elk River | Muscle | 9.03 | 0.009 | 1.31 | 23,300 | 0.0439 | 1,340 | 1.02 | 0.0033 | 1,830 | 0.0253 | 13,100 | 0.0145 | 36.4 | <0.00005 | 0.00065 |
|  | ER-YP-01 O-Apr-16 | Elk River | Ovary | 35.3 | 0.00604 | 0.018 | 8,230 | 0.206 | 1,150 | 3.12 | 0.0351 | 14,300 | 0.0243 | 9,500 | 0.00929 | 16.3 | <0.00012 | <0.00044 |
|  | ER-YP-02 O-Apr-16 | Elk River | Ovary | 33.4 | 0.00442 | 0.0471 | 8,060 | 0.532 | 1,210 | 2.53 | 0.0351 | 13,100 | 0.0129 | 9,030 | 0.0196 | 14.3 | <0.00012 | 0.0008 |
|  | ER-YP-03 O-Apr-16 | Elk River | Ovary | 37.6 | 0.00708 | 0.0141 | 7,190 | 0.267 | 1,320 | 3.58 | 0.0447 | 11,000 | 0.0401 | 9,290 | 0.00954 | 10.4 | <0.00012 | 0.00361 |
|  | ER-YP-05 O-Apr-16 | Elk River | Ovary | 41.6 | 0.004835 | 0.01865 | 8,010 | 0.1995 | 1,115 | 2.33 | 0.03585 | 12,750 | 0.0254 | 9,045 | 0.00643 | 15.7 | 0.00012 | 0.00239 |
|  | ER-YP-06 O-Apr-16 | Elk River | Ovary | 38.5 | 0.00557 | 0.0103 | 7,490 | 0.251 | 1,290 | 3.18 | 0.0373 | 11,500 | 0.0377 | 9,420 | 0.00604 | 9.65 | <0.00011 | 0.00282 |
|  | ER-YP-07 O-Apr-16 | Elk River | Ovary | 39.8 | 0.00622 | 0.0188 | 7,800 | 0.253 | 1,190 | 2.67 | 0.0316 | 12,200 | 0.0262 | 9,150 | 0.0138 | 15.4 | <0.00012 | 0.00211 |
|  | ER-YP-09 O-Apr-16 | Elk River | Ovary | 36.4 | 0.00578 | 0.0253 | 7,710 | 0.347 | 1,160 | 2.24 | 0.0371 | 12,000 | 0.0282 | 9,960 | 0.0092 | 13.4 | <0.00012 | 0.00177 |
|  | ER-YP-10 O-Apr-16 | Elk River | Ovary | 37.3 | 0.00504 | 0.0215 | 7,650 | 0.426 | 1,230 | 3.05 | 0.0447 | 13,300 | 0.0353 | 9,170 | 0.00693 | 10.6 | <0.00012 | 0.00254 |
|  | ER-YP-11 O-Apr-16 | Elk River | Ovary | 41.8 | 0.01 | 0.0164 | 7,280 | 0.559 | 1,110 | 2.14 | 0.0376 | 12,600 | 0.0494 | 8,400 | 0.00928 | 14.6 | <0.00012 | 0.00274 |
|  | ER-YP-16 O-Apr-16 | Elk River | Ovary | 35.3 | 0.00437 | 0.0647 | 8,420 | 0.164 | 1,170 | 1.81 | 0.032 | 13,400 | 0.0219 | 8,770 | 0.0045 | 17 | <0.00011 | 0.00363 |
|  | GC-YP-06 M-Apr-16 | Gold Creek | Muscle | 25.3 | 0.0103 | 1.65 | 23,000 | 0.0377 | 1,180 | 0.89 | 0.0076 | 2,450 | 0.0201 | 11,600 | 0.0107 | 33.3 | <0.000004 | 0.001 |
|  | GC-YP-09 M-Apr-16 | Gold Creek | Muscle | 18.4 | 0.00973 | 0.279 | 21,100 | 0.0266 | 1,320 | 1.42 | 0.0044 | 2,030 | 0.0479 | 10,100 | 0.0181 | 23.7 | <0.0000047 | 0.0016 |
|  | GC-YP-21 M-Apr-16 | Gold Creek | Muscle | 15.2 | 0.0075 | 0.671 | 22,900 | 0.0159 | 1,370 | 1.24 | 0.0045 | 1,570 | 0.0414 | 10,500 | 0.0228 | 26.6 | <0.000004 | 0.0013 |
|  | GC-YP-23 M-Apr-16 | Gold Creek | Muscle | 7.01 | 0.00685 | 1.07 | 23,700 | 0.0414 | 1,210 | 0.649 | 0.003 | 1,620 | 0.0248 | 11,100 | 0.00517 | 36.5 | <0.0000041 | 0.00313 |
|  | GC-YP-24 M-Apr-16 | Gold Creek | Muscle | 12.9 | 0.00887 | 0.399 | 22,400 | 0.0564 | 1,290 | 1.46 | 0.0048 | 2,090 | 0.0338 | 12,200 | 0.0232 | 33.7 | 0.0000112 | 0.00108 |
|  | GC-YP-31 M -Apr-16 | Gold Creek | Muscle | 10.405 | 0.007265 | 1.21 | 23,150 | 0.05095 | 1,190 | 0.4085 | 0.0026 | 1,645 | 0.01385 | 10,700 | 0.00621 | 35.4 | 0.0000127 | 0.00064 |
|  | GC-YP-32 M-Apr-16 | Gold Creek | Muscle | 45.9 | 0.00787 | 0.454 | 21,900 | 0.0255 | 1,260 | 1.54 | 0.0103 | 1,410 | 0.112 | 11,500 | 0.0287 | 28 | <0.0000046 | 0.00273 |
|  | GC-YP-33 M-Apr-16 | Gold Creek | Muscle | 11.1 | 0.00975 | 0.444 | 23,000 | 0.0287 | 1,370 | 1.78 | 0.0044 | 1,400 | 0.0299 | 14,000 | 0.0143 | 28.8 | <0.0000039 | <0.00053 |
|  | GC-YP-35 M-Apr-16 | Gold Creek | Muscle | 12.3 | 0.0102 | 0.488 | 25,300 | 0.0348 | 1,440 | 1.61 | 0.0041 | 1,520 | 0.133 | 14,700 | 0.0291 | 33.6 | 0.000009 | 0.00381 |
|  | GC-YP-37 M-Apr-16 | Gold Creek | Muscle | 10.1 | 0.00675 | 1.12 | 23,400 | 0.0259 | 1,240 | 1.09 | 0.0027 | 1,570 | 0.0222 | 10,600 | 0.0127 | 33.5 | <0.0000042 | 0.00118 |
|  | GC-YP-06 O-Apr-16 | Gold Creek | Ovary | 29.4 | 0.00631 | 0.07 | 8,040 | 0.116 | 1,320 | 1.96 | 0.03 | 13,500 | 0.0172 | 9,320 | 0.00342 | 15.3 | <0.0001 | 0.0005 |
|  | GC-YP-09 O-Apr-16 | Gold Creek | Ovary | 30.3 | 0.00652 | 0.0139 | 8,040 | 0.111 | 1,140 | 4.48 | 0.039 | 12,500 | 0.0204 | 8,520 | 0.00384 | 13 | <0.0001 | 0.00054 |
|  | GC-YP-21 O-Apr-16 | Gold Creek | Ovary | 41.4 | 0.00729 | 0.0378 | 7,680 | 0.0731 | 1,270 | 5.39 | 0.0383 | 12,200 | 0.0286 | 8,760 | 0.0153 | 11 | <0.0001 | 0.00084 |
|  | GC-YP-23 O-Apr-16 | Gold Creek | Ovary | 36.3 | 0.00798 | 0.0338 | 7,900 | 0.317 | 1,320 | 2.98 | 0.0348 | 13,200 | 0.0157 | 9,080 | 0.00807 | 17.3 | <0.0001 | 0.0005 |
|  | GC-YP-24 O-Apr-16 | Gold Creek | Ovary | 32.2 | 0.00563 | 0.0145 | 8,150 | 0.202 | 1,270 | 1.82 | 0.0329 | 12,800 | 0.0176 | 8,720 | 0.00454 | 16.6 | <0.000096 | 0.0009 |
|  | GC-YP-31 O-Apr-16 | Gold Creek | Ovary | 25.4 | 0.00515 | 0.0428 | 7,940 | 0.289 | 1,180 | 2.24 | 0.0224 | 12,500 | 0.018 | 8,950 | 0.00195 | 17.1 | <0.000092 | 0.00166 |
|  | GC-YP-32 O-Apr-16 | Gold Creek | Ovary | 27.2 | 0.0044 | 0.0246 | 8,600 | 0.0818 | 1,220 | 1.72 | 0.0306 | 13,000 | 0.0249 | 8,740 | 0.00311 | 14.6 | <0.000099 | 0.00228 |
|  | GC-YP-33 O-Apr-16 | Gold Creek | Ovary | 29.05 | 0.004675 | 0.0228 | 8,310 | 0.09215 | 1,140 | 1.95 | 0.03395 | 12,400 | 0.0296 | 8,615 | 0.00351 | 13.4 | 0.000098 | 0.002885 |
|  | GC-YP-35 O-Apr-16 | Gold Creek | Ovary | 33.2 | 0.0058 | 0.0276 | 8,250 | 0.0894 | 1,210 | 2.38 | 0.038 | 14,300 | 0.0305 | 8,830 | 0.00492 | 14.2 | <0.0001 | 0.00148 |
|  | GC-YP-37 O-Apr-16 | Gold Creek | Ovary | 29.3 | 0.00508 | 0.0492 | 7,980 | 0.159 | 1,110 | 2.03 | 0.0309 | 12,700 | 0.0133 | 8,880 | 0.0027 | 15.1 | <0.00011 | 0.00119 |

**Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016**

| Year | Sample ID | Area | Tissue Type | Se µg/g dw | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | SC-YP-1-Aug-14 | Sand Creek | Muscle | 1.56 | 0.00451 | 0.155 | 0.000332 | 0.169 | 0.0500 | <0.00023 | 0.00711 | 0.00074 | 22.2 | 0.0225 |
| | SC-YP-2-Aug-14 | Sand Creek | Muscle | 1.84 | 0.00682 | 1.05 | 0.000764 | 0.201 | 0.0219 | 0.00038 | 0.0104 | 0.00163 | 21.0 | 0.0179 |
| | SC-YP-3-Aug-14 | Sand Creek | Muscle | 1.74 | 0.00882 | 0.799 | 0.000551 | 0.210 | 0.0263 | <0.00027 | 0.00747 | 0.00101 | 20.6 | 0.00968 |
| | SC-YP-4-Aug-14 | Sand Creek | Muscle | 1.97 | 0.00265 | 3.75 | 0.000594 | 0.219 | 0.0279 | 0.00064 | 0.0132 | 0.00123 | 20.2 | 0.00524 |
| | GC-YP-1-Aug-14 | Gold Creek | Muscle | 2.17 | 0.0216 | 2.46 | 0.00476 | 0.721 | 0.0216 | 0.00161 | 0.0339 | 0.00916 | 17.7 | 0.0461 |
| | GC-YP-2-Aug-14 | Gold Creek | Muscle | 1.81 | 0.0038 | 0.0956 | 0.00062 | 0.154 | 0.0325 | <0.00091 | 0.00287 | 0.00077 | 18.0 | 0.0136 |
| | GC-YP-3-Aug-14 | Gold Creek | Muscle | 2.60 | 0.00335 | 0.110 | 0.000298 | 0.175 | 0.0336 | <0.00040 | 0.00449 | 0.00099 | 23.0 | 0.0096 |
| | GC-YP-4-Aug-14 | Gold Creek | Muscle | 2.66 | 0.00763 | 0.576 | 0.00160 | 0.311 | 0.0237 | 0.00055 | 0.0140 | 0.00449 | 20.5 | 0.0140 |
| | GC-YP-5-Aug-14 | Gold Creek | Muscle | 2.59 | 0.00147 | 0.538 | 0.0001035 | 0.130 | 0.0387 | <0.00038 | 0.00261 | 0.00092 | 20.1 | 0.00466 |
| | GC-YP-6-Aug-14 | Gold Creek | Muscle | 2.27 | 0.00459 | 0.0672 | 0.000277 | 0.153 | 0.0230 | <0.00040 | 0.00418 | 0.00067 | 21.5 | 0.00736 |
| | GC-YP-7-Aug-14 | Gold Creek | Muscle | 2.71 | 0.00227 | 0.525 | 0.000164 | 0.113 | 0.0332 | <0.00039 | 0.00324 | 0.00048 | 19.7 | 0.00369 |
| | GC-YP-8-Aug-14 | Gold Creek | Muscle | 3.01 | 0.00248 | 0.817 | 0.00013 | 0.124 | 0.0261 | <0.00039 | 0.00673 | 0.00049 | 20.3 | 0.0102 |
| | GC-YP-9-Aug-14 | Gold Creek | Muscle | 3.06 | 0.00205 | 0.152 | 0.000056 | 0.107 | 0.0238 | <0.00040 | 0.00305 | 0.00033 | 21.0 | 0.00279 |
| | GC-YP-10-Aug-14 | Gold Creek | Muscle | 3.02 | 0.0031 | 0.152 | 0.000072 | 0.125 | 0.0202 | <0.00040 | 0.00303 | 0.00043 | 17.6 | 0.0180 |
| 2015 | SC-YP-01-Apr-15 | Sand Creek | Muscle | 1.25 | 0.00202 | 1.33 | 0.00089 | 0.1850 | 0.0408 | 0.00054 | 0.01040 | 0.00171 | 21.7 | 0.0250 |
| | SC-YP-10-Apr-15 | Sand Creek | Muscle | 3.49 | 0.00116 | 1.88 | 0.00041 | 0.1230 | 0.0336 | 0.00026 | 0.00743 | 0.00062 | 23.3 | 0.0143 |
| | SC-YP-15-Apr-15 | Sand Creek | Muscle | 1.93 | 0.00424 | 2.10 | 0.0047 | 0.5500 | 0.0262 | 0.00111 | 0.04960 | 0.00797 | 23.9 | 0.0354 |
| | SC-YP-17-Apr-15 | Sand Creek | Muscle | 2.2 | 0.00203 | 0.37 | 0.00157 | 0.1450 | 0.0498 | 0.00022 | 0.00572 | 0.00120 | 25.0 | 0.0185 |
| | SC-YP-19-Apr-15 | Sand Creek | Muscle | 3.16 | 0.00130 | 0.35 | <0.00041 | 0.1390 | 0.0404 | <0.00023 | 0.00415 | 0.00031 | 25.9 | 0.0106 |
| | SC-YP-25-Apr-15 | Sand Creek | Muscle | 4.03 | 0.00250 | 0.87 | 0.00297 | 0.3070 | 0.0634 | 0.00052 | 0.01900 | 0.00399 | 20.6 | 0.0237 |
| | SC-YP-01-Apr-15 | Sand Creek | Ovary | 2.05 | <0.0012 | 1.73 | 0.000613 | 0.0862 | 0.0310 | 0.000784 | 0.0348 | 0.00308 | 69.0 | 0.00666 |
| | SC-YP-10-Apr-15 | Sand Creek | Ovary | 4.33 | <0.0012 | 1.99 | 0.00181 | 0.139 | 0.0158 | 0.000637 | 0.0272 | 0.00334 | 77.1 | 0.00753 |
| | SC-YP-17-Apr-15 | Sand Creek | Ovary | 2.36 | <0.0012 | 1.48 | 0.000662 | 0.0898 | 0.0197 | 0.000186 | 0.0164 | 0.00103 | 67.5 | 0.00588 |
| | SC-YP-19-Apr-15 | Sand Creek | Ovary | 3.35 | 0.00120 | 1.67 | 0.000289 | 0.0831 | 0.0118 | 0.000312 | 0.0167 | 0.000905 | 69.2 | 0.00690 |
| | ER-YP-01-Apr-15 | Elk River | Muscle | 3.01 | 0.00260 | 1.51 | 0.00192 | 0.2880 | 0.0466 | 0.00089 | 0.02620 | 0.00417 | 34.4 | 0.0073 |
| | ER-YP-02-Apr-15 | Elk River | Muscle | 3.99 | <0.0012 | 0.91 | 0.000402 | 0.1720 | 0.0348 | 0.00032 | 0.01190 | 0.00200 | 30.8 | 0.0117 |
| | ER-YP-04-Apr-15 | Elk River | Muscle | 3.67 | 0.00190 | 1.30 | 0.000787 | 0.1650 | 0.0293 | 0.00044 | 0.00994 | 0.00141 | 36.0 | 0.0079 |
| | ER-YP-05-Apr-15 | Elk River | Muscle | 3.91 | 0.00610 | 2.11 | 0.00198 | 0.3190 | 0.0287 | 0.00104 | 0.03120 | 0.00359 | 27.3 | 0.0142 |
| | ER-YP-07-Apr-15 | Elk River | Muscle | 1.52 | <0.0012 | 0.60 | 0.000564 | 0.1030 | 0.0138 | 0.00018 | 0.00688 | 0.00107 | 19.9 | 0.0027 |
| | ER-YP-08-Apr-15 | Elk River | Muscle | 3.41 | 0.00230 | 0.39 | 0.0002595 | 0.1150 | 0.0385 | 0.00024 | 0.00629 | 0.00081 | 27.9 | 0.0044 |
| | ER-YP-09-Apr-15 | Elk River | Muscle | 3.32 | 0.00230 | 1.57 | 0.000927 | 0.1300 | 0.0292 | 0.00027 | 0.00589 | 0.00108 | 24.9 | 0.0081 |
| | ER-YP-10-Apr-15 | Elk River | Muscle | 15 | 0.00300 | 0.80 | 0.000463 | 0.1240 | 0.0510 | 0.00012 | 0.00638 | 0.00069 | 32.3 | 0.0047 |
| | ER-YP-11-Apr-15 | Elk River | Muscle | 4.45 | <0.0012 | 0.93 | 0.000222 | 0.1020 | 0.0541 | 0.00025 | 0.00307 | 0.00033 | 17.5 | 0.0021 |
| | ER-YP-12-Apr-15 | Elk River | Muscle | 3.91 | 0.00180 | 2.41 | 0.000484 | 0.1100 | 0.0412 | 0.00051 | 0.00811 | 0.00077 | 44.4 | 0.0054 |
| | ER-YP-01-Apr-15 | Elk River | Ovary | 3.75 | 0.00223 | 1.96 | 0.00723 | 0.5895 | 0.0460 | 0.00256 | 0.08200 | 0.01625 | 73.7 | 0.0179 |
| | ER-YP-02-Apr-15 | Elk River | Ovary | 4.36 | 0.000850 | 1.39 | 0.000534 | 0.142 | 0.0298 | 0.000505 | 0.0326 | 0.00258 | 75.1 | 0.0046 |
| | ER-YP-04-Apr-15 | Elk River | Ovary | 3.56 | <0.00064 | 1.46 | 0.000100 | 0.0880 | 0.0176 | 0.000490 | 0.0176 | 0.00101 | 78.7 | 0.0510 |
| | ER-YP-05-Apr-15 | Elk River | Ovary | 4.11 | <0.00064 | 1.43 | 0.000148 | 0.0890 | 0.0181 | 0.000510 | 0.0166 | 0.000980 | 68.0 | 0.0252 |
| | ER-YP-07-Apr-15 | Elk River | Ovary | 3.34 | <0.00060 | 1.40 | 0.000129 | 0.0810 | 0.00918 | 0.000610 | 0.0170 | 0.000930 | 71.2 | 0.0146 |
| | ER-YP-08-Apr-15 | Elk River | Ovary | 4.80 | 0.00161 | 0.32 | 0.000371 | 0.115 | 0.0465 | 0.00119 | 0.0269 | 0.00190 | 139 | 0.0114 |
| | ER-YP-09-Apr-15 | Elk River | Ovary | 3.57 | <0.00062 | 1.51 | 0.000102 | 0.0810 | 0.0255 | 0.000410 | 0.0210 | 0.000980 | 72.1 | 0.0160 |
| | ER-YP-10-Apr-15 | Elk River | Ovary | 10.3 | 0.000650 | 1.37 | 0.000184 | 0.114 | 0.0229 | 0.000440 | 0.0216 | 0.000680 | 69.0 | 0.00480 |

## Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | Se µg/g dw | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | ER-YP-11-Apr-15 | Elk River | Ovary | 4.38 | <0.00063 | 1.37 | 0.000178 | 0.0730 | 0.0368 | 0.000795 | 0.0258 | 0.00173 | 71.4 | 0.00385 |
|  | ER-YP-12-Apr-15 | Elk River | Ovary | 3.84 | 0.000780 | 1.51 | 0.00240 | 0.177 | 0.0352 | 0.00109 | 0.0338 | 0.00432 | 82.2 | 0.00890 |
|  | GC-YP-01-Apr-15 | Gold Creek | Muscle | 2.51 | 0.00466 | 3.08 | 0.0034 | 0.3530 | 0.0263 | 0.00076 | 0.02010 | 0.00530 | 24.6 | 0.0392 |
|  | GC-YP-02-Apr-15 | Gold Creek | Muscle | 2.69 | 0.00206 | 2.35 | 0.00301 | 0.3850 | 0.0206 | 0.00080 | 0.01910 | 0.00606 | 28.5 | 0.0613 |
|  | GC-YP-03-Apr-15 | Gold Creek | Muscle | 2.77 | 0.00459 | 0.82 | 0.00061 | 0.1620 | 0.0301 | 0.00103 | 0.00645 | 0.00136 | 22.5 | 0.0312 |
|  | GC-YP-04-Apr-15 | Gold Creek | Muscle | 2.55 | 0.00194 | 0.67 | <0.00040 | 0.1240 | 0.0335 | <0.00023 | 0.00661 | 0.00037 | 21.6 | 0.0394 |
|  | GC-YP-05-Apr-15 | Gold Creek | Muscle | 2.76 | 0.00275 | 0.34 | 0.00048 | 0.1320 | 0.0315 | 0.00030 | 0.00450 | 0.00080 | 24.3 | 0.0251 |
|  | GC-YP-06-Apr-15 | Gold Creek | Muscle | 2.345 | 0.00154 | 0.86 | <0.00040 | 0.1380 | 0.0236 | 0.00052 | 0.00538 | 0.00130 | 25.6 | 0.0203 |
|  | GC-YP-07-Apr-15 | Gold Creek | Muscle | 2.73 | <0.00071 | 4.82 | <0.00040 | 0.1120 | 0.0344 | 0.00048 | 0.00472 | 0.00032 | 28.2 | 0.0157 |
|  | GC-YP-08-Apr-15 | Gold Creek | Muscle | 2.61 | <0.00070 | 0.75 | <0.00040 | 0.1010 | 0.0288 | <0.00022 | 0.00273 | 0.00025 | 24.2 | 0.0106 |
|  | GC-YP-09-Apr-15 | Gold Creek | Muscle | 3.16 | 0.00136 | 0.15 | <0.00039 | 0.0957 | 0.0274 | <0.00022 | 0.00259 | 0.00022 | 21.0 | 0.0151 |
|  | GC-YP-10-Apr-15 | Gold Creek | Muscle | 2.49 | 0.00129 | 2.41 | <0.00041 | 0.1250 | 0.0319 | 0.00032 | 0.00673 | 0.00069 | 22.8 | 0.0119 |
|  | GC-YP-01-Apr-15 | Gold Creek | Ovary | 2.66 | 0.000690 | 1.27 | 0.00107 | 0.166 | 0.0208 | 0.000660 | 0.0389 | 0.00286 | 80.0 | 0.00810 |
|  | GC-YP-02-Apr-15 | Gold Creek | Ovary | 3.31 | 0.000680 | 1.37 | 0.00145 | 0.160 | 0.0166 | 0.00108 | 0.0154 | 0.0153 | 72.9 | 0.00950 |
|  | GC-YP-03-Apr-15 | Gold Creek | Ovary | 3.49 | 0.000780 | 1.49 | <0.000048 | 0.0728 | 0.0216 | 0.000421 | 0.0107 | 0.000940 | 73.5 | 0.00640 |
|  | GC-YP-04-Apr-15 | Gold Creek | Ovary | 2.73 | 0.00179 | 1.38 | 0.000194 | 0.0823 | 0.0124 | 0.000381 | 0.0108 | 0.000980 | 71.1 | 0.00515 |
|  | GC-YP-05-Apr-15 | Gold Creek | Ovary | 3.71 | 0.000870 | 1.40 | 0.000169 | 0.0867 | 0.0238 | 0.000512 | 0.0200 | 0.00119 | 72.6 | 0.00810 |
|  | GC-YP-06-Apr-15 | Gold Creek | Ovary | 3.09 | 0.00064 | 1.40 | 0.000108 | 0.0849 | 0.0192 | 0.000935 | 0.0203 | 0.00204 | 80.0 | 0.00318 |
|  | GC-YP-07-Apr-15 | Gold Creek | Ovary | 3.68 | <0.00063 | 1.40 | <0.000053 | 0.0620 | 0.0292 | 0.000434 | 0.0108 | 0.000340 | 70.0 | 0.00351 |
|  | GC-YP-08-Apr-15 | Gold Creek | Ovary | 3.12 | 0.000920 | 1.26 | 0.0000820 | 0.0561 | 0.0244 | 0.000391 | 0.0136 | 0.000780 | 76.8 | 0.00562 |
|  | GC-YP-09-Apr-15 | Gold Creek | Ovary | 3.64 | 0.00104 | 1.59 | 0.000140 | 0.0713 | 0.0215 | 0.000565 | 0.0132 | 0.00117 | 78.3 | 0.00282 |
|  | GC-YP-10-Apr-15 | Gold Creek | Ovary | 3.35 | <0.00062 | 1.66 | 0.000450 | 0.0652 | 0.0232 | 0.000509 | 0.0265 | 0.000870 | 81.6 | 0.00241 |
| 2016 | SC-YP-01 M-Apr-16 | Sand Creek | Muscle | 2 | 0.00177 | 1.19 | 0.00531 | 0.294 | 0.0419 | 0.00055 | 0.021 | 0.00383 | 24.9 | 0.0098 |
|  | SC-YP-03 M-Apr-16 | Sand Creek | Muscle | 1.85 | 0.002 | 2.08 | 0.00244 | 0.463 | 0.0515 | 0.00092 | 0.0238 | 0.00437 | 22.8 | 0.011 |
|  | SC-YP-05 M-Apr-16 | Sand Creek | Muscle | 2.44 | <0.00084 | 4.06 | 0.000357 | 0.115 | 0.0708 | 0.00063 | 0.0147 | 0.00085 | 26.7 | 0.0037 |
|  | SC-YP-06 M-Apr-16 | Sand Creek | Muscle | 2.54 | 0.0012 | 3.92 | 0.00101 | 0.176 | 0.0628 | 0.00038 | 0.00779 | 0.0012 | 26.8 | 0.0057 |
|  | SC-YP-09 M-Apr-16 | Sand Creek | Muscle | 1.32 | 0.00124 | 1.49 | 0.00152 | 0.227 | 0.0843 | 0.00083 | 0.0105 | 0.00207 | 23 | 0.0074 |
|  | SC-YP-10 M-Apr-16 | Sand Creek | Muscle | 1.79 | 0.00118 | 10.3 | 0.000916 | 0.155 | 0.0547 | 0.00146 | 0.019 | 0.00154 | 39.7 | 0.0077 |
|  | SC-YP-14 M-Apr-16 | Sand Creek | Muscle | 1.73 | 0.00276 | 0.783 | 0.00175 | 0.296 | 0.0482 | 0.00049 | 0.0174 | 0.00365 | 20.9 | 0.0163 |
|  | SC-YP-17 M-Apr-16 | Sand Creek | Muscle | 1.64 | 0.0011 | 0.108 | 0.00064 | 0.146 | 0.0426 | <0.00019 | 0.00765 | 0.0011 | 25.3 | 0.0115 |
|  | SC-YP-18 M-Apr-16 | Sand Creek | Muscle | 1.62 | 0.00202 | 0.794 | 0.00215 | 0.249 | 0.0423 | 0.00052 | 0.0157 | 0.00385 | 19.6 | 0.0116 |
|  | SC-YP-19 M-Apr-16 | Sand Creek | Muscle | 1.34 | 0.00141 | 0.804 | 0.00082 | 0.135 | 0.0509 | 0.00025 | 0.00609 | 0.002 | 17.2 | 0.0253 |
|  | SC-YP-01 O-Apr-16 | Sand Creek | Ovary | 2.72 | 0.00153 | 1.41 | 0.00202 | 0.0844 | 0.0223 | 0.00065 | 0.0282 | 0.00165 | 63.8 | 0.00231 |
|  | SC-YP-03 O-Apr-16 | Sand Creek | Ovary | 2.05 | <0.00065 | 1.74 | 0.000456 | 0.105 | 0.0332 | 0.00058 | 0.0284 | 0.00175 | 66.3 | 0.00463 |
|  | SC-YP-05 O-Apr-16 | Sand Creek | Ovary | 2.62 | 0.00105 | 2.2 | 0.00189 | 0.22 | 0.0376 | 0.0008 | 0.0494 | 0.00439 | 70.9 | 0.00743 |
|  | SC-YP-06 O-Apr-16 | Sand Creek | Ovary | 3.04 | <0.00062 | 1.66 | 0.000223 | 0.0991 | 0.0177 | 0.00028 | 0.00818 | 0.00075 | 78.9 | 0.00377 |
|  | SC-YP-09 O-Apr-16 | Sand Creek | Ovary | 1.91 | 0.00073 | 1.3 | 0.000304 | 0.0828 | 0.0246 | 0.00029 | 0.0114 | 0.00118 | 58.5 | 0.0025 |
|  | SC-YP-10 O-Apr-16 | Sand Creek | Ovary | 2.095 | 0.00063 | 1.76 | 0.0005385 | 0.10845 | 0.04365 | 0.000505 | 0.01755 | 0.0021 | 72.75 | 0.004685 |
|  | SC-YP-14 O-Apr-16 | Sand Creek | Ovary | 2.14 | 0.00097 | 1.53 | 0.000742 | 0.173 | 0.0333 | 0.00047 | 0.0175 | 0.00224 | 73.4 | 0.00571 |
|  | SC-YP-17 O-Apr-16 | Sand Creek | Ovary | 2.07 | <0.00064 | 1.52 | 0.000094 | 0.0825 | 0.025 | 0.00023 | 0.0116 | 0.0007 | 67 | 0.00308 |
|  | SC-YP-18 O-Apr-16 | Sand Creek | Ovary | 2.38 | 0.00076 | 1.51 | 0.000535 | 0.109 | 0.0177 | 0.00038 | 0.0141 | 0.0014 | 61 | 0.0322 |
|  | SC-YP-19 O-Apr-16 | Sand Creek | Ovary | 1.74 | <0.00061 | 1.45 | 0.000678 | 0.197 | 0.0246 | 0.00056 | 0.0101 | 0.00454 | 67.9 | 0.0129 |
|  | ER-YP-01 M-Apr-16 | Elk River | Muscle | 3.7 | 0.00596 | 0.143 | 0.000811 | 0.238 | 0.122 | 0.00024 | 0.0146 | 0.00279 | 20.9 | 0.0128 |
|  | ER-YP-02 M-Apr-16 | Elk River | Muscle | 3.785 | 0.00202 | 1.552 | 0.0007435 | 0.1885 | 0.02935 | 0.00074 | 0.01061 | 0.001505 | 31.2 | 0.0081 |
|  | ER-YP-03 M-Apr-16 | Elk River | Muscle | 4.83 | 0.00252 | 12.1 | 0.00103 | 0.231 | 0.0505 | 0.0017 | 0.0363 | 0.00241 | 43.1 | 0.0339 |

## Table G.11: Metal Concentrations (µg/g Dry Weight) in Yellow Perch Tissues Collected in Koocanusa Reservoir, 2014 to 2016

| Year | Sample ID | Area | Tissue Type | Se µg/g dw | Sn µg/g dw | Sr µg/g dw | Th µg/g dw | Ti µg/g dw | Tl µg/g dw | U µg/g dw | V µg/g dw | Y µg/g dw | Zn µg/g dw | Zr µg/g dw |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | ER-YP-05 M-Apr-16 | Elk River | Muscle | 4.14 | 0.00192 | 0.163 | 0.0013 | 0.215 | 0.0759 | 0.00074 | 0.0171 | 0.00334 | 32.7 | 0.0174 |
| | ER-YP-06 M-Apr-16 | Elk River | Muscle | 4.54 | 0.00336 | 23.4 | 0.00227 | 0.366 | 0.0626 | 0.00337 | 0.0623 | 0.00572 | 43.7 | 0.0252 |
| | ER-YP-07 M-Apr-16 | Elk River | Muscle | 2.89 | 0.00308 | 0.172 | 0.0025 | 0.35 | 0.0534 | 0.00067 | 0.027 | 0.00564 | 25 | 0.0156 |
| | ER-YP-09 M-Apr-16 | Elk River | Muscle | 3.64 | 0.00245 | 0.659 | 0.0015 | 0.216 | 0.0602 | 0.00046 | 0.0173 | 0.00298 | 22.2 | 0.0116 |
| | ER-YP-10 M-Apr-16 | Elk River | Muscle | 4.56 | 0.00362 | 1.84 | 0.000524 | 0.17 | 0.0814 | 0.00053 | 0.0129 | 0.00149 | 24 | 0.0166 |
| | ER-YP-11 M-Apr-16 | Elk River | Muscle | 3.43 | 0.00165 | 5.96 | 0.000253 | 0.158 | 0.0527 | 0.00089 | 0.0201 | 0.00099 | 28.5 | 0.0043 |
| | ER-YP-16 M-Apr-16 | Elk River | Muscle | 3.99 | 0.0014 | 2.44 | 0.000667 | 0.282 | 0.0419 | 0.00048 | 0.0116 | 0.00243 | 21 | 0.005 |
| | ER-YP-01 O-Apr-16 | Elk River | Ovary | 3.66 | 0.0013 | 1.69 | 0.00114 | 0.098 | 0.0802 | 0.00042 | 0.0204 | 0.00128 | 78.3 | 0.00332 |
| | ER-YP-02 O-Apr-16 | Elk River | Ovary | 4.3 | 0.00122 | 1.62 | 0.000506 | 0.093 | 0.0195 | 0.00062 | 0.0201 | 0.00134 | 83.4 | 0.00705 |
| | ER-YP-03 O-Apr-16 | Elk River | Ovary | 5.45 | 0.00142 | 1.63 | 0.0044 | 0.177 | 0.037 | 0.00096 | 0.0646 | 0.0036 | 77 | 0.00719 |
| | ER-YP-05 O-Apr-16 | Elk River | Ovary | 4.715 | 0.000745 | 1.785 | 0.0002725 | 0.0905 | 0.01815 | 0.00081 | 0.05955 | 0.00179 | 76.7 | 0.0032 |
| | ER-YP-06 O-Apr-16 | Elk River | Ovary | 5.55 | 0.00103 | 1.71 | 0.000386 | 0.108 | 0.0462 | 0.00105 | 0.0622 | 0.00263 | 73.6 | 0.00451 |
| | ER-YP-07 O-Apr-16 | Elk River | Ovary | 3.66 | 0.001 | 1.46 | 0.00143 | 0.161 | 0.0151 | 0.0006 | 0.0316 | 0.0027 | 68 | 0.00543 |
| | ER-YP-09 O-Apr-16 | Elk River | Ovary | 4.93 | 0.00091 | 2.61 | 0.000665 | 0.134 | 0.0199 | 0.00077 | 0.0267 | 0.00388 | 77.7 | 0.0284 |
| | ER-YP-10 O-Apr-16 | Elk River | Ovary | 4.52 | 0.00065 | 1.62 | 0.000177 | 0.096 | 0.0327 | 0.00097 | 0.042 | 0.0019 | 76.9 | 0.0138 |
| | ER-YP-11 O-Apr-16 | Elk River | Ovary | 3.63 | 0.00192 | 1.45 | 0.00345 | 0.409 | 0.0199 | 0.00122 | 0.0669 | 0.0065 | 67.3 | 0.0203 |
| | ER-YP-16 O-Apr-16 | Elk River | Ovary | 3.9 | 0.00198 | 1.53 | 0.000367 | 0.11 | 0.012 | 0.00044 | 0.0173 | 0.0016 | 66.5 | 0.00576 |
| | GC-YP-06 M-Apr-16 | Gold Creek | Muscle | 2.97 | 0.00313 | 0.829 | 0.00328 | 0.246 | 0.0298 | 0.00054 | 0.016 | 0.00575 | 30.2 | 0.0176 |
| | GC-YP-09 M-Apr-16 | Gold Creek | Muscle | 3.26 | 0.00352 | 0.544 | 0.00167 | 0.347 | 0.0465 | 0.00055 | 0.0208 | 0.00428 | 22.5 | 0.0493 |
| | GC-YP-21 M-Apr-16 | Gold Creek | Muscle | 3.12 | 0.00142 | 0.197 | 0.00139 | 0.187 | 0.0425 | 0.00042 | 0.0121 | 0.00367 | 19.8 | 0.0205 |
| | GC-YP-23 M-Apr-16 | Gold Creek | Muscle | 2.68 | 0.00153 | 0.515 | 0.00055 | 0.131 | 0.043 | <0.00019 | 0.00577 | 0.00127 | 20.7 | 0.00554 |
| | GC-YP-24 M-Apr-16 | Gold Creek | Muscle | 2.74 | 0.00516 | 1.7 | 0.0008 | 0.171 | 0.0323 | 0.00042 | 0.0115 | 0.00183 | 25.7 | 0.00914 |
| | GC-YP-31 M -Apr-16 | Gold Creek | Muscle | 2.665 | 0.00235 | 0.13 | 0.000335 | 0.1235 | 0.0259 | 0.000235 | 0.003335 | 0.00058 | 26.15 | 0.00618 |
| | GC-YP-32 M-Apr-16 | Gold Creek | Muscle | 2.84 | 0.00553 | 1.99 | 0.00087 | 0.223 | 0.0373 | 0.0007 | 0.027 | 0.00208 | 27.1 | 0.0646 |
| | GC-YP-33 M-Apr-16 | Gold Creek | Muscle | 3.57 | 0.00293 | 4.14 | 0.00046 | 0.151 | 0.0585 | 0.00068 | 0.0129 | 0.00084 | 27.2 | 0.00598 |
| | GC-YP-35 M-Apr-16 | Gold Creek | Muscle | 3.29 | 0.0202 | 3.85 | 0.00187 | 0.321 | 0.0527 | 0.00084 | 0.0187 | 0.00279 | 26.9 | 0.0404 |
| | GC-YP-37 M-Apr-16 | Gold Creek | Muscle | 3.06 | 0.00242 | 0.361 | 0.00069 | 0.181 | 0.0267 | <0.00019 | 0.00523 | 0.00154 | 19.6 | 0.0071 |
| | GC-YP-06 O-Apr-16 | Gold Creek | Ovary | 4.01 | 0.00175 | 1.33 | 0.00035 | 0.115 | 0.00946 | <0.00062 | 0.0111 | 0.00158 | 73.2 | 0.00588 |
| | GC-YP-09 O-Apr-16 | Gold Creek | Ovary | 3.55 | 0.0012 | 1.63 | 0.000455 | 0.149 | 0.0209 | 0.00072 | 0.033 | 0.00243 | 70.1 | 0.00948 |
| | GC-YP-21 O-Apr-16 | Gold Creek | Ovary | 4.36 | 0.00211 | 1.56 | 0.00222 | 0.235 | 0.0233 | 0.00203 | 0.0447 | 0.00749 | 73.5 | 0.0151 |
| | GC-YP-23 O-Apr-16 | Gold Creek | Ovary | 3.43 | 0.00172 | 1.44 | 0.00256 | 0.153 | 0.0293 | <0.0006 | 0.0266 | 0.00243 | 77.8 | 0.00602 |
| | GC-YP-24 O-Apr-16 | Gold Creek | Ovary | 3.37 | 0.0013 | 1.47 | 0.00137 | 0.132 | 0.0102 | <0.00057 | 0.0269 | 0.00117 | 67.2 | 0.00584 |
| | GC-YP-31 O-Apr-16 | Gold Creek | Ovary | 3.71 | 0.00089 | 1.36 | 0.00017 | 0.0922 | 0.0144 | <0.00055 | 0.0087 | 0.00066 | 76.2 | 0.0035 |
| | GC-YP-32 O-Apr-16 | Gold Creek | Ovary | 4.37 | 0.00151 | 1.76 | 0.000155 | 0.103 | 0.0106 | 0.00069 | 0.0213 | 0.00142 | 77.2 | 0.00824 |
| | GC-YP-33 O-Apr-16 | Gold Creek | Ovary | 4.39 | 0.001155 | 1.745 | 0.000129 | 0.0777 | 0.0178 | 0.0006 | 0.02115 | 0.001555 | 74.4 | 0.00439 |
| | GC-YP-35 O-Apr-16 | Gold Creek | Ovary | 4.07 | 0.00168 | 1.64 | 0.000311 | 0.112 | 0.0179 | 0.00071 | 0.044 | 0.0019 | 70.5 | 0.00385 |
| | GC-YP-37 O-Apr-16 | Gold Creek | Ovary | 4.03 | 0.00108 | 1.41 | 0.000128 | 0.091 | 0.0121 | <0.00063 | 0.0187 | 0.00129 | 75.5 | 0.00361 |

**Table G.12:** **Metal Concentrations (µg/g Dry Weight) in Westslope Cutthroat Trout Muscle Collected in Koocanusa Reservoir, April 2015 and 2016**

| Year | Sample ID | Area | Tissue Type | Total wet mass | Total dry mass | Dry matter | Moisture | Ag | Al | As | B | Ba | Be | Bi | Ca | Cd | Co | Cr | Cs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | g | g | % | % | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | SC-WCT-01-Apr-15 | Sand Creek | Muscle | 0.04699 | 0.0111 | 0.24 | 76 | <0.00091 | 3.9 | 0.11 | <0.34 | 0.55 | <0.018 | 0.0003 | 4,750 | 0.003 | 0.026 | 0.567 | 0.030 |
| 2016 | SC-WCT-01 M-Apr-16 | Sand Creek | Muscle | 5.85517 | 1.27697 | 0.218093 | 78 | <0.0005 | 4.16 | 0.0419 | 0.122 | 0.306 | <0.0054 | 0.000661 | 2,160 | <0.0024 | 0.0175 | 0.0684 | 0.0157 |
| | SC-WCT-02-Apr-16 | Sand Creek | Muscle | 0.0373 | 0.00941 | 0.252279 | 75 | <0.0023 | 303 | 0.206 | 0.47 | 5.54 | 0.0116 | 0.00211 | 1,060 | 0.0094 | 0.143 | 0.757 | 0.0436 |
| | SC-WCT-03-Apr-16 | Sand Creek | Muscle plug | 0.02012 | 0.00559 | 0.277833 | 72 | <0.0039 | 130 | 0.055 | <0.47 | 1.84 | <0.015 | 0.00118 | 6,450 | 0.0199 | 0.0561 | 1.4 | 0.0323 |
| | ER-WCT-01 M-Apr-16 | Elk River | Muscle | 4.45329 | 0.95363 | 0.214141 | 79 | <0.0005 | 2.22 | 0.0513 | 0.222 | 0.239 | <0.0054 | 0.000523 | 2,200 | <0.0024 | 0.0262 | 0.0509 | 0.016 |
| | GC-WCT-01-Apr-16 | Gold Creek | Muscle plug | 0.03372 | 0.00803 | 0.238138 | 76 | <0.0026 | 3.88 | 0.145 | <0.32 | 1.5 | <0.0098 | 0.00041 | 4,810 | 0.0053 | 0.0442 | 0.097 | 0.0275 |
| | GC-WCT-02-Apr-16 | Gold Creek | Muscle plug | 0.02227 | 0.00499 | 0.224068 | 78 | <0.0043 | 0.716 | 0.064 | <0.53 | 0.122 | <0.016 | 0.00059 | 1,180 | <0.006 | 0.0411 | 0.347 | 0.025 |
| | GC-WCT-03-Apr-16 | Gold Creek | Muscle plug | 0.0386 | 0.00882 | 0.228497 | 77 | <0.0024 | 2.1 | 0.054 | <0.3 | 0.0965 | <0.0092 | 0.00047 | 484 | <0.0034 | 0.0208 | 0.141 | 0.0269 |

## **Table G.12:** Metal Concentrations (µg/g Dry Weight) in Westslope Cutthroat Trout Muscle Collected in Koocanusa Reservoir, April 2015 and 2016

| Year | Sample ID | Area | Tissue Type | Cu | Fe | Ga | Hg | K | Li | Mg | Mn | Mo | Na | Ni | P | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | SC-WCT-01-Apr-15 | Sand Creek | Muscle | 0.98 | 14.2 | 0.0105 | 0.082 | 19,200 | <0.015 | 1,330 | 0.89 | 0.0137 | 1,620 | 0.320 | 14,200 | 0.054 |
| 2016 | SC-WCT-01 M-Apr-16 | Sand Creek | Muscle | 1 | 27.1 | 0.0069 | 0.223 | 23,900 | 0.011 | 1,400 | 1.01 | <0.003 | 976 | 0.0488 | 13,700 | 0.00676 |
| | SC-WCT-02-Apr-16 | Sand Creek | Muscle | 1.27 | 226 | 0.121 | 0.139 | 18,100 | 0.205 | 1,480 | 4.72 | 0.0118 | 1,010 | 0.298 | 10,600 | 0.645 |
| | SC-WCT-03-Apr-16 | Sand Creek | Muscle plug | 1.32 | 117 | 0.044 | 0.147 | 16,600 | 0.121 | 1,390 | 2.97 | 0.0128 | 2,230 | 0.198 | 13,000 | 0.173 |
| | ER-WCT-01 M-Apr-16 | Elk River | Muscle | 1.59 | 17.5 | 0.0045 | 0.134 | 23,000 | 0.0297 | 1,350 | 0.857 | <0.003 | 1,080 | 0.0277 | 14,000 | 0.00834 |
| | GC-WCT-01-Apr-16 | Gold Creek | Muscle plug | 0.977 | 20.8 | 0.0073 | 0.154 | 17,300 | <0.021 | 1,230 | 1.05 | 0.0046 | 1,330 | 0.163 | 12,600 | 0.0409 |
| | GC-WCT-02-Apr-16 | Gold Creek | Muscle plug | 1.55 | 18.6 | 0.007 | 0.249 | 18,500 | <0.035 | 1,160 | 0.366 | 0.007 | 1,550 | 0.107 | 10,700 | 0.0059 |
| | GC-WCT-03-Apr-16 | Gold Creek | Muscle plug | 1.47 | 17.4 | 0.0053 | 0.19 | 18,700 | <0.02 | 1,210 | 0.298 | 0.0043 | 824 | 0.0468 | 10,900 | 0.00565 |

## Table G.12: Metal Concentrations (µg/g Dry Weight) in Westslope Cutthroat Trout Muscle Collected in Koocanusa Reservoir, April 2015 and 2016

| Year | Sample ID | Area | Tissue Type | Rb | Re | Sb | Se | Sn | Sr | Th | Ti | Tl | U | V | Y | Zn | Zr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt | µg/g dry wt |
| 2015 | SC-WCT-01-Apr-15 | Sand Creek | Muscle | 8.8 | <0.00064 | 0.0031 | 3.59 | 0.0079 | 3.440 | 0.00150 | 0.138 | 0.0349 | 0.0008 | 0.0095 | 0.001 | 24.1 | 0.009 |
| 2016 | SC-WCT-01 M-Apr-16 | Sand Creek | Muscle | 11.6 | <0.000043 | <0.0011 | 1.8 | 0.0017 | 1.23 | 0.000834 | 0.153 | 0.0089 | 0.000444 | 0.0464 | 0.00226 | 15.9 | 0.00602 |
| | SC-WCT-02-Apr-16 | Sand Creek | Muscle | 10.3 | <0.00033 | 0.0089 | 5.01 | 0.0335 | 1.65 | 0.231 | 7.17 | 0.0161 | 0.0238 | 0.363 | 0.145 | 18.6 | 0.169 |
| | SC-WCT-03-Apr-16 | Sand Creek | Muscle plug | 7.9 | <0.00054 | 0.0325 | 2.1 | 0.0272 | 5.11 | 0.024 | 2.04 | 0.0163 | 0.00745 | 0.152 | 0.0797 | 26.6 | 0.072 |
| | ER-WCT-01 M-Apr-16 | Elk River | Muscle | 10.9 | 0.000127 | 0.0015 | 4.92 | 0.0013 | 0.873 | 0.00052 | 0.117 | 0.025 | 0.000423 | 0.0053 | 0.00111 | 18.8 | 0.00656 |
| | GC-WCT-01-Apr-16 | Gold Creek | Muscle plug | 7.6 | <0.00037 | <0.0021 | 4.39 | 0.0079 | 3.28 | 0.00056 | 0.177 | 0.0172 | 0.00153 | 0.0099 | 0.00194 | 21.9 | 0.111 |
| | GC-WCT-02-Apr-16 | Gold Creek | Muscle plug | 8.6 | <0.00061 | <0.0035 | 3.17 | <0.0057 | 0.656 | <0.0008 | 0.108 | 0.0185 | <0.00075 | 0.0062 | <0.0014 | 16.6 | 0.0236 |
| | GC-WCT-03-Apr-16 | Gold Creek | Muscle plug | 8.4 | <0.00034 | <0.002 | 2.13 | 0.004 | 0.209 | <0.00045 | 0.129 | 0.0131 | <0.00043 | 0.0049 | <0.0008 | 24.5 | 0.0167 |

# APPENDIX H
# LABORATORY AGING DATA

2014

2015

2016

**2014**

1.0

Peamouth Chub. - Project 2509. Koocanusa.

**FISH AGING TALLY FORM**

| SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SC | April 11 | PC | 01 | | 236 | M | Oto. | 8 | ++ | (7) | 9° | Poss. 10° | |
| 2 | SC | ″ | PC | 02 | | 276 | F | Oto. | 10 | ++ | (6-7) | 11° | Poss. 12° @ edge | |
| 3 | SC | ″ | PC | 03 | | 309 | F | Oto. | 13 | ++ | (6) | 14° | Poss ±1 or 2 | |
| 4 | ″ | April 11 | PC | 04 | | 266 | F | Oto. | 11 | ++ | (6-7) | 12° | 1 oto. Poss. ±1. | |
| 5 | ″ | ″ | PC | 05 | | 215 | M | Sc | 3 | ++ | (6) | 4°. | Wrong otoliths collected. | |
| 6 | SC | ″ | PC | 06 | | 272 | F | Oto. | 16 | ++ | (7) | 17° | 17° Poss 16° | |
| 7 | SC | ″ | PC | 07 | | 232 | F | Sc | 4 | ++ | (6) | 5° | No Otoliths. 1st? | |
| 8 | SC | April 11 | PC | 08 | | 224 | M | Oto. | 4 | ++ | (7) | 5° | 1 oto. | ** |
| 9 | SC | ″ | PC | 09 | | 24 | ?F | Oto. | 7 | ++ | (7) | 8° | | x |
| 10 | ″ | ″ | PC | 10 | | 234 | F | Oto. | 6 | ++ | (7) | 7° | | x |
| 11 | ″ | ″ | PC | 11 | | 24 | F | Oto. | 5 | ++ | (7) | 6° | | |
| 12 | ″ | April 12 | PC | 12 | | 286 | F | Oto. | 9 | ++ | (6-7) | 10° | Poss. 11° Tough Jm | |
| 13 | SC | ″ | PC | 13 | | 233 | M | Oto. | 7 | ++ | (7) | 8° | | x |
| 14 | ″ | ″ | PC | 14 | | 265 | F | Oto. | 13 | ++ | (6-7) | 14° | 14° Poss 13° | |
| 15 | ″ | ″ | PC | 15 | | 267 | F | Oto. | 10 | ++ | ″ | 11° | Poss ±1 | |
| 16 | ″ | April 12 | PC | 16 | | 236 | F | Oto. | 5 | ++ | (7) | 6° | | x |
| 17 | ″ | ″ | PC | 17 | | 234 | F | Oto. | 6 | ++ | (7) | 7° | | |
| 18 | SC | ″ | PC | 18 | | 241 | F | Oto. | 10 | ++ | (6-7) | 11° | Poss. ±1. | |
| 19 | SC | ″ | PC | 19 | | 20 | ? | Oto. | 2 | ++ | ″ | 3° | F.C.? Scales = 3° | 2++(6) F.C.?-E Use 3°. |
| 20 | ″ | April 12 | PC | 20 | | 292 | F | Oto. | 16 | ++ | (6) | 17° | Poss. overaging by 1 or 2. | |
| 21 | ″ | April 13 | PC | 21 | | 282 | F | Oto. | 16 | ++ | (7) | 17° | 17° | x |
| 22 | ″ | ″ ″ | PC | 22 | | 215 | M | Oto. | 5 | ++ | (6-7) | 6° | 1 otolith. 1st? | |
| 23 | ″ | ″ 14 | PC | 23 | | 227 | F | Oto. | 11 | ++ | (7) | 12° | | x |
| 24 | ″ | ″ | PC | 24 | | 246 | F | Oto. | 5 | ++ | (6-7) | 6° | Poss 5° Tough Jm. | |
| 25 | SC | ″ | PC | 25 | | 247 | ?F | Oto. | 5 | ++ | (7) | 6° | 2nd? | |
| 26 | ″ | April 14 | PC | 26 | | 228 | M | Oto. | 5 | ++ | (6) | 6° | 1/2 oto. 1st? almost gone? | Sc = 6° 5+ (6) |
| 27 | ″ | ″ | PC | 27 | | 245 | F | Oto. | 6 | ++ | (6-7) | 7° | 2nd? poss. F.C. | |
| 28 | SC | ″ | PC | 28 | | 20 | ?M | Oto. | 4 | ++ | (7) | 5° | | xx |
| 29 | ″ | ″ | PC | 29 | | 24 | F | Oto. | 4 | ++ | (7) | 5° | 1 oto. F.C.? | Sc = 5° 4++ (6) |
| 30 | ″ | ″ | ″ | 30 | | 212 | M | Oto. | 3 | ++ | (7) | 4° | | x |
| 31 | SC | April 14 | PC | 31 | | 233 | F | Oto. | 4 | ++ | (7) | 5° | | xx |
| 32 | ″ | ″ | PC | 32 | | 304 | F | Oto. | 18 | ++ | (6-7) | 19° | 19° Poss ±1 or 2 | |
| 33 | ″ | ″ | PC | 33 | | 201 | M | Oto. | 4 | ++ | (7) | 5° | | |

Note: Some very tough aging especially on older fish. Edges are often difficult because of the shape & surface structure of the otoliths. It is essential to prep both otoliths as often only 1 or 2 halves are assessable.

Sc = 05
Oto = 31.

2.0

Peamouth Chub - Project 2509. Koocanusa

**FISH AGING TALLY FORM**

| | SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 34 | SC | April 14 | PC | 34 | | 214 | M | Oto. | 3 | ++ | (7) | 4° | | x |
| | 35 | SC | " | PC | 35 | | 213 | M | Oto. | 4 | ++ | (6-7) | 5° | weaker Jrn. | |
| | 36 | " | " | PC | 36 | | 262 | F | Oto. | 7 | ++ | (7) | 8° | 2nd? | |
| | 37 | " | April 14 | PC | 37 | | 17.9 | M | Oto. | 4 | ++ | (7) | 5° | | |
| | 38 | " | April 15 | PC | 38 | | 301 | F | Oto. | 14 | ++ | (6-7) | 15° | 16°; 15° Poss 16° | |
| | 39 | SC | April 17 | PC | 39. | | 24 | M | Oto. | 10 | ++ | (7) | 11° | | xx |
| | 40 | SC | " 18 | PC | 40 | | 251 | M | Oto. | 7 | ++ | (7) | 8° | | |
| | | | | | | | | | | | | | | | |
| | 41 | GC | April 11 | PC | 01 | | 264 | F | Oto. | 6 | ++ | (7) | 7° | | |
| | 42 | GC | " | PC | 02 | | 242 | F | Oto. | 6 | ++ | (6-7) | 7° | Poor Jrn. | |
| | 43 | " | " | PC | 03 | | 250 | ?F | Oto. | 6 | ++ | (7) | 7° | | |
| | 44 | " | April 12 | PC | 04 | | 245 | M | Oto. | 5 | ++ | (7) | 6° | FC@ | |
| | 45 | GC. | " | PC | 05 | | 245 | F | Oto. | 7 | ++ | (7) | 8° | FC@. | |
| | 46 | GC | " | PC | 06 | | 290 | F | Oto. | 15 | ++ | (7) | 16° | Poss ±1. | |
| | 47 | " | April 12 | PC | 07 | | 235 | F | Oto. | 4 | ++ | (7) | 5° | 1 otolith Weak Jrn Sc = 4° 3+(6) Use 5° | |
| | 48 | " | " | PC | 08 | | 278 | M | Oto. | 8 | ++ | (7) | 9° | FC@. | |
| | 49 | " | " | PC | 09 | | 283 | F | Oto. | 14 | ++ | (5-6) | 15° | 15°. Tough Jrn. | |
| | 50 | GC | " | PC | 10 | | 277 | F | Oto. | 13 | ++ | (6-7) | 14° | 1 otolith. Tough edge after 9-10. | |
| | 51. | " | April 12 | PC | 11 | | 282 | F | Oto. | 10 | ++ | " | 11° | 11°; Poss 12° @ edge | |
| | 52 | " | " | PC | 12 | | 231 | M | Oto. | 5 | ++ | (7) | 6° | | |
| | 53 | " | " | PC | 13 | | 265 | F | Oto. | 7 | ++ | (7) | 8° | | xx |
| | 54 | " | " | PC | 14 | | 231 | M | Oto. | 7 | ++ | (7) | 8° | FC@ | x |
| | 55 | GC | " | PC | 15 | | 262 | F | Oto. | 7 | ++ | (7) | 8° | | x |
| | 56 | " | April 12 | PC | 16 | | 231 | M | Oto. | 4 | ++ | (7) | 5° | 2nd Oto. P.C. | |
| | 57 | " | " | PC | 17 | | 215 | M | Oto. | 3 | ++ | (7) | 4° | Sc = 4*(6) | |
| | 58 | " | April 13 | PC | 18 | | 267 | F | Oto. | 7 | ++ | (7) | 8° | | |
| | 59 | GC | " | PC | 19 | | 251 | F | Oto. | 3 | ++ | (6) | 4° | Poss 5th @ edge - Poor Jrn. | |
| 2 # 60. * | 60 | GC | " | PC | 20 | | 231 | M | Oto. | 7 | ++ | (7) | 8° | 1 otolith | |
| * | 60 | GC | " | PC | 21 | | 270 | F | Oto. | 11 | ++ | (6-7) | 12° | Tough Jrn. | |
| | 61 | " | " | PC | 22 | | 227 | F | Oto. | 3 | ++ | " | 4° | Wit = 4° FC@. | |
| | 62 | " | April 14 | PC | 23 | | 268 | F | Oto. | 7 | ++ | (7) | 8° | | x |
| | 63 | " | " | PC | 24 | | 258 | M | Oto. | 4 | ++ | (7) | 5° | | |
| | 64 | " | " | PC | 25 | | 248 | M | Oto. | 4 | ++ | (6) | 5° | Tough Jrn. Sc. 6° 5+(6) Use 5° | |

3.0

Peamouth Chub. - Project 2509. Koocanusa

**FISH AGING TALLY FORM**

| SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65 | GC | April 14 | PC | 26 | | 226 | F | Oto. | 4 | ++ | (7) | 5° | | × |
| 66 | GC | " | PC | 27 | | 18.8 | IM | Oto. | 2 | ++ | (7) | 3° | Sc = 4° 31 (6) Poss 3* | → Use 3° ✓✓ |
| 67 | " | " | PC | 28 | | 245 | M | Oto. | 7 | ++ | (7) | 8° | | × |
| 68 | GC | " | PC | 29 | | 242 | M | Oto. | 4 | ++ | (7) | 5° | | |
| 69 | " | April 14 | PC | 30 | | 298 | F | Oto. | 16 | ++ | (6-7) | 17° | 17°. 1st? Poss ±1 | × |
| 70 | " | " | PC | 31 | | 204 | IM | Oto. | 3 | ++ | (7) | 4° | | |
| 71 | GC | " | PC | 32 | | 256 | M | Oto | 7 | ++ | (6) | 8° | Poss 9° @ edge | |
| 72 | GC | " | PC | 33 | | 277 | F | Oto. | 7 | ++ | (6) | 8° | Poss 7° Bad? | |
| 73 | " | April 14 | PC | 34 | | 251 | M | Oto. | 4 | ++ | (6-7) | 5° | Poss 6° | |
| 74 | GC | " | PC | 35 | | 247 | F | Oto. | 7 | ++ | (7) | 8° | 1oto = Excellent | ×× |
| 75 | " | " | PC | 36 | | 285 | F | Oto. | 15 | ++ | (6-7) | 16° | 1otolith 16°; | |
| 76 | | April 15 | PC | 37 | | 247 | M | Oto. | 6 | ++ | (7) | 7° | | × |
| | | | | | | | | | | | | | | |
| 77 | ER | April 11 | P.C. | 01 | | 259 | F | Oto. | 10 | + | (6) | 11° | Poss ±1 Poor Jom. | |
| 78 | ER | " | PC | 02 | | 277 | F | Oto. | 16 | ++ | (6-7) | 17° | 17°; Poss ±1 Tough Jm. | |
| 79 | ER | April 11 | PC | 03 | | 236 | M | Oto. | 14 | ++ | (7) | 15° | 1otolith 15° | |
| 80 | ER | " | PC | 04 | | 269 | F | Oto. | 9 | ++ | (6) | 10° | 1otolith Poss ±1 | |
| 81 | ER | " | PC | 05 | | 287 | F | Oto. | 10 | ++ | (6) | 11° | 1otolith " " | |
| 82. | ER | April 11 | PC | 06 | | 273 | F | Oto. | 10 | ++ | (6-7) | 11° | Poss. 10° | |
| 83 | ER | " | PC | 07 | | 285 | F | Oto. | 10 | ++ | (5-6) | 11° | Tough Jm. Poss. ±1 | |
| 84 | ER | April 12 | PC | 08 | | 293 | F | Oto. | 23 | ++ | (6-7) | 24° | " " 24° Poss ±1 or 2 | |
| 85 | ER | " | PC | 09 | | 271 | F | Oto. | 11 | ++ | (7) | 12° | 12° FC's? | |
| 86 | ER | " | PC | 10 | | 29 | F | Oto. | 18 | ++ | (6) | 19° | 20°; 19° Poss ±1 or 2 | |
| 87 | ER | " | PC | 11 | | 303 | F | Oto. | 14 | ++ | (4-5) | 15° | Very tough Jmation: True annuli?? | |
| 88 | ER | " | PC | 12 | | 287 | F | Oto. | 16 | ++ | (6-7) | 17° | " " " Poss 16-17. | |
| 89 | ER | April 12 | PC | 13 | | 23 | F | Oto. | 7 | ++ | (7) | 8° | | |
| 90 | ER | " | PC. | 14 | | 31.5 | F | Oto. | 20 | ++ | (6) | 21° | 22°; 21° Poss ±1 or 2 Tough Jm. | |
| 91 | ER. | April 13 | PC | 15 | | 228 | M | Oto. | 5 | ++ | (7) | 6° | | |
| 92 | ER | April 14 | PC | 16 | | 257 | F | Oto. | 7 | ++ | (6-7) | 8° | Poss. 9° | |
| 93 | ER | " | PC | 17 | | 263 | F | Oto. | 9 | ++ | (6-7) | 10° | Poss. 11° | |
| 94 | ER | April 15 | PC | 18 | | 288 | F | Oto. | 20 | ++ | " | 21° | 21° Tough Jm. | |
| 95 | ER | April 15 | PC | 19 | | 281 | F | Oto. | 14 | ++ | (6) | 15° | 15° " Poss ±1 or 2. | |
| 96 | ER | " | PC | 20 | | 257 | F | Oto. | 10 | ++ | (5-6) | 11° | True annuli ?? | |

Note: GC fish pretty good. Jmation is fair to good often on 1 of the 2 otoliths. Good to have both to prep.

Note: ER fish. Some tougher aging in this group. Jmation is tougher to follow than previous areas possibly because there are possibly more older fish.

4.0

Peamouth Chub / Rainbow Trout - Koocanusa #2509.

## FISH AGING TALLY FORM

| SAM | EFF | 2014 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 97 | ER | April 15 | PC | 21 | | 301 | F | Oto. | 15 | ++ | (5-6) | 16° | 16° Poor Zon. Poss ±1 to 3 | |
| 98 | ER | " | PC | 22 | | 258 | F | Oto. | 19 | ++ | (6-7) | 20° | 20°/19° Poss. ±1 | |
| 99 | ER | " | PC | 23 | | 219 | M | Oto. | 7 | ++ | (7) | 8° | | xx |
| 100 | ER | April 15 | PC | 24 | | 238 | M | Oto. | 4 | ++ | (7) | 5° | | |
| 101 | ER | April 18 | PC | 25 | | 292 | F | Oto. | Unable to Age >15 Yrs. | | | | Good to 10-11. Poor edge area | |
| 102 | ER | " 19 | PC | 26 | | 243 | M | Oto. | 4 | ++ | (7) | 5° | | |
| 103 | ER | " | PC | 27 | | 256 | M | Oto. | 7 | ++ | (6-7) | 8° | Poss. 9° | |
| 104 | ER | " | PC | 28 | | 255 | M | Oto. | 9 | ++ | (7) | 10° | | |
| 105 | ER | " | PC | 29 | | 268 | M | Oto. | 11 | ++ | (6) | 12° | 1st? Poss ±1 ecentric | |
| 106 | ER | April 19 | PC | 30 | | 265 | M | Oto. | 11 | ++ | (6-7) | 12° | Poss. 11° | |
| 107 | ER | " | PC | 31 | | 245 | M | Oto. | 7 | ++ | (7) | 8° | | xx |
| 108 | ER | " | PC | 32 | | 233 | M | Oto. | 8 | ++ | (7) | 9° | | |
| 109 | ER | " | PC | 33 | | 228 | M | Oto. | 11 | ++ | (6-7) | 12° | Poss ±1. | |
| | | | | | | | | | | | | | | |
| 110 | KOSC | | BB | 6 | | 626 | F | Oto. | 6 | ++ | (6-7) | 7° | FCO-1; Tough Zon. | |
| | | | | | | | | | | | | | | |
| 111 | KOSC1 | Feb 14 | R.T. | 1 | | 535 | F | Oto. | 5 | ++ | (6) | 6° | Both PC. Poss 5°. | Use 6° |
| " | " | " | " | " | | " | " | Sc | 5 | ++ | (6) | 6° | Poss 8°. | |
| 112. | KOER3 | Feb 15 | R.T. | 1 | | 46 | M | Oto | 4 | ++ | (6-7) | 5° | Both PC | Use 5° |
| " | " | " | " | " | | " | " | Sc | 5 | + | (6) | 6° | | |
| 113 | KOGC-1 | Feb 16 | R.T. | 2 | | 314 | F | Oto | 3 | + | (6) | 4° | Poss. 3° 3rd? | 4° |
| " | " | " | " | " | | " | " | Sc | 3 | ++ | (7) | 4° | | |
| 114 | KOGC-2 | Feb 14 | R.T. | 1 | | 57 | F | Sc | 5 | ++ | (7) | 6° | No OTOLITHS. | |
| 115 | SC | April 14 | R.T. | 01 | | 398 | F | Oto | 3 | ++ | (6) | 4° | Poss. 5° FC@ 1st? | 5° (Poss. 4°) |
| " | " | " | " | " | | " | " | Sc | 4 | ++ | (6) | 5° | Slower 3-4. | |
| 116 | SC | April 16 | R.T. | 02 | | 345 | F | Oto | 4 | ++ | (6-7) | 5° | 1st? Poss. 4°. | 5° |
| " | " | " | " | " | | " | " | Sc | 4 | ++ | (7) | 5° | | |
| 117 | SC | " | R.T. | 03 | | 515 | F | Oto | 5 | ++ | (7) | 6° | Use 6° | 6° x |
| " | " | " | " | " | | " | " | Sc | 4 | ++ | (6) | 5° | | |

1.0

Koocanusa - Project 2509.

↓ Best Age

## FISH AGING TALLY FORM

| SAM | EFF | 2014 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sc | Aug 19 | PM | 01 | | | | Oto. | 12 | + | (7) | 12+ | |
| 2 | Sc | " | PM | 02 | | | | Oto. | 8 | + | (6-7) | 8+ | 8th near edge Poss 7++ |
| 3 | Sc | " | PM | 03 | | | | Oto. | 7 | + | " | 7+ | 7th C edge. Poss 6++ |
| 4 | Sc | Aug 19. | PM | 04 | | | | Oto. | 9 | ++ | (6-7) | 9++ | Poss 10th C edge. |
| 5 | Sc. | " | PM | 05 | | | | Oto. | 9 | + | (7) | 9+ | FC 1-2 |
| 6 | Sc | " | PM | 06 | | | | Oto. | 4 | + | (7) | 4+ | |
| 7 | Sc | Aug 21 | PM | 07 | | | | Oto. | 11 | ++ | (7) | 11++ | Poss 12* C edge. |
| 8 | Sc | " | PM | 08 | | | | Oto. | 11 | + | (6-7) | 11+ | |
| 9 | Sc | " | PM | 09 | | | | Oto. | 12 | + | (7) | 12+ | 12th C edge - 2nd oto P.C. |
| 10 | Sc | " | PM | 10 | | | | Oto. | 6 | + | (6) | 6+ | Poss 5th 1st? Poor breaks |
| | | | | | | | | | | | | | |
| 11 | Sc. | Aug. 21 | LSS | 01 | | | | Sc. | 8 | ++ | (6-7) | 8++ | |
| 12 | Sc | " Aug 23 | LSS | 2 | | | | Sc | 9 | ++ | (6) | 9++ | Poss 10 @ edge |
| 13 | Sc. | " | LSS | 3 | | | | Sc | 12 | ++ | (6) | 12++ | edge ?? Prob. older |
| 14 | Sc | " | LSS | 4 | | | | Sc | 8 | ++ | (5) | 8++ | Poor Zon. |
| | | | | | | | | | | | | | |
| 15 | Sc | Aug 21 | YP | 1 | | | | Oto. | 11 | + | (7) | 11+ | |
| 16 | Sc. | " | YP | 2 | | | | Oto | 1 | ++ | (7) | 1++ | 1 oto. |
| 17 | Sc | " | YP | 3 | | | | Oto | 2 | ++ | (6) | 2++ | 1 oto; Shut-2 1st? Poss 1++ |
| 18 | Sc. | Aug 23 | YP | 4 | | | | Oto. | 11 | + | (7) | 11+ | |
| | | | | | | | | | | | | | |
| 19. | Sc | Aug 23 | PC | 1 | | | | Oto. | 11 | + | (6-7) | 11+ | 11th.? Poss 10++ |
| 20 | Sc. | " | PC | 2 | | | | Oto. | 11 | + | (7) | 11+ | |
| | | | | | | | | | | | | | |
| * 21 | Sc. | | BT | 01 | | | | Sc | 4 | ++ | (6) | 4++ | Poor Scales |
| " | " | | " | " | | | | FR | 8 | ++ | (6) | 8++ | True annuli ?? |
| 22 | Sc | Aug 23 | KO | 1 | | | | Sc | No Sample | | | | Unable to prepare |
| 23 | " | " | KO | 2 | | | | Sc | | " | | | " |
| 24 | " | " | KO | 3 | | | | Sc | | " | | | " |
| 25 | " | " | KO | 4 | | | | Sc | | " | | | " |
| 26. | " | " | KO | 5 | | | | Sc. | | " | | | " |
| 27 | Sc | Aug 23 | KO | 6 | | | | Sc. | 2 | + | (6) | 2+ | " Probable. |
| 28 | " | " | KO | 7 | | | | Oto. | 2 | + | (6) | 2+ | Poor Zon. |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | |

× (1) × (4) ×× (5) × (15) × (18)

21: 8++ (poss. I/)

28: 2+

Note: PM otoliths - Tough breaks - Difficult to prep. Pretty good zonation but tough edges. Some could go ±1 either way.
LSS - scales - Probably not overly reliable. Strongly suggest taking Pectoral fin rays.

2.0

Koocanusa - Project 2509.

## FISH AGING TALLY FORM

| SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | Sc | Aug 23 | KO | 8 | | | | Oto. | 2 | + | (6-7) | 2+ | 1oto. Fco-1. | Sc=2+(6) |
| 30 | Sc | " | KO | 9 | | | | Oto. | 2 | + | (6) | 2+ | 1oto. Fp-2 | |
| 31 | Sc | " | KO | 10 | | | | Oto. | 2 | + | (7) | 2+ | | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 32 | Sc | " | KO | 11 | | | | Oto. | 2 | ++ | (6-7) | 2++ | | |
| 33 | Sc. | Aug 23 | KO | 12 | | | | Oto. | 2 | + | " | 2+ | 1oto. weaker Zon. | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 34 | " | " | KO | 13 | | | | Oto. | 2 | ++ | (6) | 2++ | 1st? Poss 1++ | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 35 | Sc | Aug 25 | KO | 14 | | | | Sc | Unable to Prep. | | | | | |
| 36 | " | " | KO | 15 | | | | Sc | " | " | " | | | |
| 37 | Sc | " | KO | 16 | | | | Sc | " | " | " | | | |
| 38 | " | " | KO | 17 | | | | Oto. | 2 | ++ | (6-7) | 2++ | | |
| 39 | " | Aug 25 | KO | 18 | | | | Oto. | 2 | + | " | 2+ | Poss 1++ | |
| 40 | Sc | " | KO | 19 | | | | Oto | 2 | + | " | 2+ | 1oto. 1st? | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 41 | Sc | " | KO | 20 | | | | Oto. | 2 | + | (6) | 2+ | Fco-1. Poss 3+ | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 42 | Sc | " | KO | 21 | | | | Oto. | 2 | + | (6-7) | 2+ | | x |
| 43 | " | " | KO | 22 | | | | Oto. | 2 | ++ | " | 2++ | | |
| 44 | " | Aug 25 | KO | 23 | | | | Oto. | 2 | + | (7) | 2+ | | x |
| 45 | " | " | KO | 24 | | | | Oto. | 2 | ++ | (6-7) | 2++ | 2nd? Poss-1++ | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 46 | Sc | " | KO | 25 | | | | Oto. | 3 | ++ | (5-6) | 3++ | Weak Zon. Slow 2-3? | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| | | | | | | | | | | | | | | |
| 47 | Sc | Aug 25 | BU | 01 | | | | | Unable to Prep. | | | | | |
| | | | | | | | | | | | | | | |
| 48 | GC | Aug 19. | PM | 1 | | | | Oto. | 8 | + | (6-7) | 8+ | 8th near edge? Poss 7++ | |
| 49 | GC | " | PM | 2 | | | | Oto. | 6 | + | (7) | 6+ | | |
| 50 | " | Aug. 20 | PM | 3 | | | | Oto. | 8 | + | (6-7) | 8+ | 8th near edge | |
| 51 | " | " | PM | 4 | | | | Oto. | 8 | ++ | (6) | 8++ | Poor edge. Poss 9+ | |
| 52 | GC | " | PM | 5 | | | | Oto. | 7 | + | (6-7) | 7+ | edge.? | |

Note: KO.-otoliths - Not great zonation on most of these fish. Annular definition is often weak. Most look like 2+ or 2++ but some could be 1++ fish.

3.0

Koocanusa - Project 2509

**FISH AGING TALLY FORM**

| SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | GC | Aug 20 | PM | 6 | | | | Oto. | 10 | + | (5-6) | 10+ | Poor breaks; Poor Zon. Poss ±1. |
| 54 | " | " | PM | 7 | | | | Oto. | 9 | + | (7) | 9+ | × |
| 55 | GC | " | PM | 8 | | | | Oto | 7 | + | (7) | 7+ | Slower 0-1. |
| 56 | " | " | PM | 9 | | | | Oto. | 10 | + | (7) | 10+ | FC1-2 × |
| 57 | " | " | PM | 10 | | | | Oto. | 12 | + | (6-7) | 12+ | Poss ±1 @ the edge |
| 58 | GC | Aug 19 | YP | 1 | | | | Oto. | 2 | ++ | (7) | 2++ | |
| 59 | " | " | YP | 2 | | | | Oto. | 1 | ++ | (7) | 1++ | |
| 60a | GC | Aug 20 | YP | 3 | | | | Oto. | 3 | ++ | (7) | 3++ | × |
| 60B | GC | " | YP | 4 | | | | Oto. | 3 | + | (6-7) | 3+ | 1 oto. |
| 61 | GC | " 22 | YP | 5 | | | | Oto. | 3 | + | (7) | 3+ | 1 oto. |
| 62 | " | " | YP | 6 | | | | Sp. | 2 | ++ | (7) | 2++ | |
| 63 | " | " | YP | 7 | | | | Oto. | 3 | ++ | (7) | 3++ | × |
| 64 | " | " | YP | 8 | | | | Oto. | 2 | ++ | (7) | 2++ | |
| 65 | " | Aug 22 | YP | 9 | | | | Oto. | 2 | ++ | (7) | 2++ | × |
| 66 | GC | " | YP | 10 | | | | Oto. | 2 | ++ | (7) | 2++ | × |
| 67 | GC. | Aug 22 | LSS | 1 | | | | Sc. | 8 | ++ | (6) | 8++ | Edge? Slow 7-8-Edge |
| 68 | GC | " | LSS | 2 | | | | Sc. | 9 | ++ | (6) | 9++ | " 1st?? |
| 69 | " | " | LSS | 3 | | | | Sc. | 8 | ++ | (5-6) | 8++ | edge area eroded. Mostly Regen. |
| 70 | " | " | LSS | 4 | | | | Sc. | 8 | * | (6) | 8* | edge? FC@7th. |
| 71 | GC. | " | LSS. | 5 | | | | Sc | 8 | ++ | (6-7) | 8++ | × |
| 72 | " | " | LSS | 6 | | | | Sc | 5 | ++ | (6) | 5++ | FC3-4; edge? |
| 73 | " | Aug 22 | LSS | 7 | | | | Sc | 8 | ++ | (6) | 8++ | |
| 74 | " | " | LSS. | 8 | | | | Sc | 8 | ++ | (6-7) | 8++ | |
| 75 | " | " | LSS | 9. | | | | Sc | 9 | ++ | " | 9++ | |
| 76 | GC | " | LSS | 10 | | | | Sc. | 5 | + | (6) | 5+ | Mostly Regen 1st? |
| 77 | GC. | Aug 22 | PC | 1 | | | | Oto. | 5 | + | (7) | 5+ | × |
| 78 | GC | Aug 25 | WCT | 1 | | | | Sc | 2 | ++ | (7) | 2++ | |
| 79 | " | " 26 | WCT | 2 | | | | Sc | 3 | ++ | (6) | 3++ | Poss 4* @ edge; 2 stream; 2 lake |
| 80 | " | " | WCT | 3 | | | | Sc | 2 | ++ | (5-6) | 2++ | mostly Regen scales |

Note: LSS. scales O.K. but not a lot of faith in scale ages. Strongly suggest pectoral Finrays be taken as a primary structure.

4.0

Koocanusa - Project #2509-

| FISH AGING TALLY FORM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
| 81 | GC | Aug 25 | KO | 1 | | | | Oto. | 2 | ++ | (6-7) | 2++ | weak Zon. | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | 2nd annulus on edge | |
| 82 | GC | " | KO | 2 | | | | Oto. | 1 | ++ | (6) | 1++ | FC(2) 0-1; 1-Edge Poss 2++ Vis=2+ | 1++ |
| " | " | " | " | " | | | | Sc | 1 | ++ | (7) | 1++ | inside - FC 0-1). | |
| 83 | GC | Aug 25 | KO | 3 | | | | Oto. | 2 | + | (6) | 2+ | Otoliths RC. - 2nd? Vis=2+ | 2+ |
| " | " | " | " | " | | | | Sc | 1 | ++ | (7) | 1++ | FC 1-Edge; edge? | |
| 84 | " | " | KO | 4 | | | | Oto. | 1 | ++ | (6) | 1++ | FC 0-1? Poss 2++ | 1++ |
| " | " | " | " | " | | | | Sc | 1 | ++ | (7) | 1++ | | |
| 85 | GC | " | KO | 5 | | | | Oto. | 1 | ++ | (6-7) | 1++ | | × |
| 86 | " | " 26 | KO | 6 | | | | Oto. | 1 | ++ | (7) | 1++ | | × |
| | | | | | | | | | | | | | | |
| 87 | GC | Aug 26 | RT | 01 | | | | Sc | 5 | + | (6) | 5+ | 1stream; 5lake edge? Poss 4++. | |
| | | | | | | | | | | | | | | |
| | ELK RIVER | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 88 | ER | Aug 20 | LSS | 1 | | | | Sc | 8 | ++ | (6) | 8++ | edge? | |
| 89 | ER | " 22 | LSS | 2 | | | | Sc | 9 | ++ | (6-7) | 9++ | 1st in close | |
| 90 | ER | Aug 22 | LSS | 3 | | | | Sc | 9 | ++ | (6) | 9++ | mostly Regen' edge? | |
| 91 | " | " | LSS | 4 | | | | Sc | 12 | * | (5-6) | 12* | slow stacking on edge? | |
| 92 | " | " | LSS | 5 | | | | Sc | 12 | * | " | 12* | " " | |
| 93 | " | " | LSS | 6 | | | | Sc | 8 | ++ | (5) | 8++ | eroded edge: stacking?? | |
| 94 | ER | Aug 22 | LSS | 7 | | | | Sc | 8 | ++ | (6-7) | 8++ | edge? | |
| 95 | " | " | LSS | 8 | | | | Sc | 7 | + | (5) | 7+ | Poor Zon. 2nd? edge? | |
| 96 | " | " | LSS | 9 | | | | Sc | 8 | ++ | (6) | 8++ | mostly Reg'n Poss 9+/ | |
| 97 | | Aug 24 | LSS | 10 | | | | Sc | 10 | + | (6) | 10+ | edge? poss. 11th @ 10th | |
| | | | | | | | | | | | | | | |
| 98 | ER | Aug 20 | PM | 1 | | | | Oto. | 5 | ++ | (6-7) | 5++ | Poss. 6th @ edge | |
| 99 | ER | " | PM | 2 | | | | Oto. | 9 | + | " | 9+ | 9th @ edge | |
| 100 | " | " | PM | 3 | | | | Oto. | 5 | ++ | (6-7) | 5++ | edge? | |
| 101 | " | " | PM | 4 | | | | Oto. | 7 | ++ | (7) | 7++ | | ×× |
| 102 | ER | Aug 20 | PM | 5 | | | | Oto. | 10 | ++ | (7) | 10++ | Poss 9++ edge? | |
| 103 | " | Aug 22 | PM | 6 | | | | Oto. | 25 | + | (6) | 25+ | Poss ±1 to 3. Last plane to age after prep | |
| 104 | " | " | PM | 7 | | | | Oto. | 9 | ++ | (7) | 9++ | Poss 10th @ edge | |

Note: KO otoliths in G.C. not great. Generally weak zonation. True annuli tough to sort out.

LSS - scales for LSS in ER tough to age. Many with mostly regenerated scales. Strongly suggest taking fin rays as primary structures on any sucker species.

5.0

Koocanusa - Project #2509.

## FISH AGING TALLY FORM

| SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105. | ER | Aug 22 | PM | 8 | | | | Oto. | 12 | + | (6-7) | 12+ | 12+ @ edge ' poss. 11++ | |
| 106 | " | " | PM | 9 | | | | Oto. | 12 | ++ | (7) | 12++ | (Poss. 13 @ edge. | x |
| 107 | " | " | PM | 10 | | | | Oto. | 11 | + | (7) | 11+ | | x |
| | | | | | | | | | | | | | | |
| 108 | ER | Aug 21 | KO | 1 | | | | Oto. | 3 | ++ | (6-7) | 3++ | weaker zon. FCO-1. 3++ ✓ | 3++ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | 2nd annulus near edge ?? | |
| 109 | ER | " | KO | 2 | | | | Oto. | 4 | + | (7) | 4+ | weaker annular defin | |
| 110 | " | Aug 22 | KO | 3 | | | | Oto. | 3 | + | (6) | 3+ | 1 oto. 2nd.? slower 2-3 | 3++ (Poss. 2++) |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 111 | " | " | KO | 4 | | | | Oto. | 2 | ++ | (6) | 2++ | 2nd.? weaker. | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 112 | ER | Aug 24 | KO | 5 | | | | Oto. | 3 | ++ | (6-7) | 3++ | slower 2-3. 2nd oto. PC. | 3++ (Poss. 2++) |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | Sc = 2+ (7) | |
| 113. | " | Aug 25 | KO | 6 | | | | Sc | — Unable to Prepp. — | | | | | |
| 114 | " | " | KO | 7 | | | | Sc | " | | " | " | | |
| 115 | " | " | KO | 8 | | | | Sc | " | | " | " | | |
| 116 | " | " | KO | 9 | | | | Sc | " | | " | " | | |
| 117 | " | " | KO | 10 | | | | Sc | " | | " | " | | |
| 118. | ER | " | KO | 11 | | | | Oto. | 2 | + | (7) | 2+ | 1 oto. FCO-1. | x |
| 119 | ER | Aug 25 | KO | 12 | | | | Oto. | 2 | ++ | (6-7) | 2++ | FC@ 2nd | |
| 120 | " | " | KO | 13 | | | | Oto. | 3 | ++ | " | 3++ | 1 oto. | x |
| 121 | ER | Aug 26 | KO | 14 | | | | Oto. | 3 | + | (6) | 3+ | 1 oto. weak zon. - Poss 2+ | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 122 | ER | " | KO | 15 | | | | Oto. | 3 | + | (6-7) | 3+ | slower 1-2. | |
| 123 | " | " | KO | 16 | | | | Oto. | 2 | ++ | (6) | 2++ | Very weak zon. Poss 3++ | 2+ |
| " | " | " | " | " | | | | Sc | 2 | + | (7) | 2+ | | |
| 124 | " | Aug 26 | KO | 17 | | | | Oto. | 2 | ++ | (7) | 2++ | | x |
| | | | | | | | | | | | | | | |
| 125 | ER | Aug 22 | PC | 1 | | | | Oto. | 10 | ++ | (6-7) | 10++ | FC@. Tough zon. | |
| 126 | ER | " | PC | 2 | | | | Oto. | 9 | + | (7) | 9+ | | x |
| 127 | " | Aug. 24 | PC | 3 | | | | Oto. | 17 | ++ | (6-7) | 17++ | Poss ±1. | |
| 128 | " | " 26 | PC | 4 | | | | Oto. | 9 | + | (7) | 9+ | | x |
| 129. | ER | Aug 22 | BT. | 01 | | | | Oto | 3 | + | (6) | 3+ | weaker zon. | |
| 130 | ER | " 25 | WCT | 1 | | | | Sc | 2 | ++ | (6-7) | 2++ | FC@ edge - Poss. 2 stream; 1 Lake. | |

Note: PM. oto's. in zone ER pretty good zonation. Edge call tough on juvenile fish. Good annular defin. Better breaks. Not as much shattering during prep. 8 KO from ER zone. Annular defin often weak. Tough to sort out true annuli.

**2015**

1.0

Sand Creek 2015. Project # 2564.

## FISH AGING TALLY FORM

|  | SAM | EFF | 2015<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 1 | Sc | April 22 | CSU. | 01 |  |  |  | FR | 12 | H | (6) | 13° | 1st? edge? Takeout |  |
| 02 | 2 | " | " | . | 02 |  |  |  | FR | 11 | H | (6-7) | 12° | " FC(11-12. |  |
| 03 | 3 | Sc | " | " | 03 |  |  |  | FR | 9 | H | " | 10° | 1st? edge? Poss 11° |  |
| 04 | 4 | Sc | April 24 | CSU | 04 |  |  |  | FR | 14 | H | (6-7) | 15° | " " Poss 1/ Countie |  |
| 05 | 5 | " | " 27 | CSU. | 05 |  |  |  | FR | 10 | + | " | 11° | " " Poss. 10° |  |
| 06 | 6 | " | May 01 | CSU | 06 |  |  |  | FR | 15 | H | (7) | 16° | " " edge? 15°, 16°, 14° Poss 15° |  |
| 07 | 7 | " | " | CSU | 07 |  |  |  | FR | 14 | + | (6-7) | 15° | " " " ? |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 075 | 8 | Sc. | April 23 | YP | 01 |  |  |  | Sp. | 2 | * | (6-7) | 2* | FC@. |  |
| 076 | 9 | " | " 27 | YP | 03 |  |  |  | Sp. | 2 | * | " | 2* | FC 0-1. |  |
| 077 | 10 | " | " | YP | 04 |  |  |  | Sp. | 1 | H | (7) | 2° |  |  |
| 078 | 11 | Sc | " | YP | 05 |  |  |  | Sp | 1 | H | (7) | 2° |  |  |
| 079. | 12 | " | Apr. 28 | YP | 06 |  |  |  | Sp | 3 | * | (7) | 3* |  | xx |
| 080 | 13. | " | " | YP | 07 |  |  |  | Sp. | 1 | H | (6-7) | 2° | FC 1-13 edge.? |  |
| * 081 | — | Sc | " | YP | 08 |  |  |  | Sp. | 3 | * | (7) | 3* |  | x |
| 082 | 14 | " | " | YP | 09 |  |  |  | Sp. | 3 | H | (7) | 4° |  |  |
| 083 | 15 | " | " | YP | 10 |  |  |  | Sp. | 2 | H | (6-7) | 3° |  |  |
| 084 | 16 | " | " | YP. | 11 |  |  |  | Sp | 2 | * | (7) | 2* |  |  |
| 085 | 17 | " | " | YP. | 12 |  |  |  | Sp. | 2 | * | (7) | 2* |  | x |
| 086 | 18 | " | April 29 | YP | 13 |  |  |  | Sp. | 2 | * | (7) | 2* |  | x |
| 087 | 19 | Sc. | " | YP | 14 |  |  |  | Sp. | 2 | * | (6-7) | 2* | FC@ 0-1: 1-edge. |  |
| 088 | 20 | " | April 30 | YP. | 15 |  |  |  | Sp. | 2 | * | (6) | 2* | FC@ 1st? |  |
| 089 | 21 | " | " | YP | 16 |  |  |  | Sp. | 1 | H | (7) | 2° | Poss 2* on edge |  |
| 090 | 22 | " | " | YP. | 17 |  |  |  | Sp | 3 | * | (7) | 3* |  | x |
| 091 | 23 | " | May 01 | YP | 18 |  |  |  | Sp. | 3 | * | (7) | 3* |  |  |
| 092 | 24 | " | " | YP | 19 |  |  |  | Sp. | 3 | * | (7) | 3* | edge? Poss 3° | xx |
| 093 | 25 | " | " | YP | 20 |  |  |  | Sp. | 3 | + | (7) | 4° |  |  |
| 094 | 26 | " | " | YP | 21 |  |  |  | Sp. | 3 | * | (7) | 3* |  |  |
| 095. | 27 | Sc. | " | YP. | 22 |  |  |  | Sp. | 1 | H | (6-7) | 2° | FC(5). |  |
| 096 | 28 | " | " | YP. | 23 |  |  |  | Sp. | 3 | * | " | 3* | 1st is weaker? |  |
| 097 | 29 | " | May 01 | YP | 24 |  |  |  | Sp. | 2 | * | " | 2* | Lots of growth 0-1. |  |
| 098. | 31 | " | " | YP | 25 |  |  |  | Sp. | 2 | * | " | 2* | FC 0-1. |  |

Note: SC-CSU-finrays-some very tricky centres and edges. Most taken a little far out. First annulus often gone. Tough edge call on some due to possible slower growth @ edge in last season.?

SC-YP- Need scales as a back-up.

2.0

Sand Creek (Sc)

Project #2564

**FISH AGING TALLY FORM**

| | SAM | EFF | 2015 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 099 | 32 | Sc | May 01. | YP | 26 | | | | Sp | 2 | * | (6) | 2* | Poor Reg. FC e 1st | |
| 0/100 | 33 | 〃 | 〃 | 〃 | 27 | | | | Sp. | 2 | * | (6) | 2* | FC h-Edge ; Poss 3°. | |
| | | | | | | | | | | | | | | | |
| | 34 | Sc. | April 22 | NSC | 01 | | | | Oto. | 6 | ++ | (7) | 7° | FCC edge | |
| | 35 | Sc | 〃 23 | NSC | 03 | | | | Oto. | 10 | ++ | (7) | 11° | Poss 12° c edge | |
| | 36 | 〃 | 〃 | NSC | 04 | | | | Oto. | 10 | ++ | (6) | 11° | 1 oto. wrong oto. Poss ± 1. | |
| | 37 | Sc. | April 24 | NSC | 06 | | | | Oto. | 9 | ++ | (6-7) | 10° | 1st? Poss 9° | |
| | 38 | 〃 | 〃 | NSC | 07 | | | | Oto. | 7 | ++ | (7) | 8° | | x |
| | 39 | 〃 | 〃 25 | NSC. | 09 | | | | Oto. | 12 | + | (7) | 13° | | x |
| | 40 | 〃 | 〃 | NSC. | 10 | | | | Oto | 13 | ++ | (6-7) | 14° | Poss ± 1. | |
| * | 90 | Sc | 〃 | NSC | 11 | | | | Oto. | 12 | + | 〃 | 13° | 〃 〃 | |
| * | 92 | Sc. | 〃 | NSC | 12 | | | | Oto. | 10 | ++ | (6) | 11° | 1 oto. 1st? Poss ± 1 | |
| | 41 | Sc. | April 25 | NSC | 13 | | | | Oto. | 13 | + | (6-7) | 14° | edge? | |
| | 42 | Sc | 〃 | NSC | 15 | | | | Oto. | 12 | + | (6) | 13° | 1 oto. Tough after 8-10. | |
| | 43 | 〃 | 〃 | NSC | 16 | | | | Oto. | 9 | ++ | (5-6) | 10° | Poor 2 oto. | x x |
| | 44 | 〃 | 〃 | NSC | 17 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| | 45 | 〃 | 〃 | NSC | 18 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| | 46 | Sc | April 25 | NSC. | 19 | | | | Oto. | 10 | + | (6-7) | 11° | Edge? Poss 10° | |
| | 47 | 〃 | 〃 | NSC | 21 | | | | Oto. | 9 | ++ | 〃 | 10° | 〃 | |
| | 48 | 〃 | 〃 | NSC | 22 | | | | Oto. | 8 | ++ | 〃 | 9° | 〃 | |
| | 49 | 〃 | 〃 | 〃 | 23 | | | | Oto. | 8 | ++ | (6-7) | 9° | 1st? Poss 8° | |
| | 50 | 〃 | 〃 | 〃 | 25 | | | | Oto. | 9 | ++ | (6) | 10° | Poss 11° edge? | |
| | 51 | Sc | April 25 | NSC | 26 | | | | Oto. | 9 | ++ | (6-7) | 10° | | |
| | 52 | 〃 | 〃 | 〃 | 27 | | | | Oto. | 11 | ++ | 〃 | 12° | 1 oto. Poss ± 1 | |
| | 53 | 〃 | 〃 | 〃 | 28 | | | | Oto. | 11 | ++ | 〃 | 12° | 〃 | x x |
| | 54 | 〃 | 〃 | 〃 | 29 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| | 55 | 〃 | 〃 | 〃 | 30 | | | | Oto. | 8 | ++ | (6-7) | 9° | | |
| | 56 | Sc | April 25 | NSC | 31 | | | | Oto. | 8 | ++ | (6) | 9° | FC(a) | |
| | 57 | 〃 | 〃 | 〃 | 32 | | | | Oto. | 9 | ++ | (7) | 10° | 1 oto. | |
| | 58 | 〃 | 〃 | 〃 | 33 | | | | Oto. | 7 | ++ | (6) | 8° | 1 oto. Poss ± 1. | |
| | 59 | 〃 | 〃 | 〃 | 34 | | | | Oto. | 5 | ++ | (7) | 6° | 1 oto. | |
| | 60 | 〃 | 〃 26 | NSC | 35 | | | | Oto. | 8 | ++ | (7) | 9° | Slower 5-6 | x x |

Note: Secondary otoliths pretty good on some fish for these NSC samples.
: Edge area a tough call on some fish. Last annulus near edge often tough to sort out.

3.0

Sand Creek

Project #2564.

## FISH AGING TALLY FORM

| SAM | EFF | 2015 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | Sc | April 26 | NSC | 36 | | | | Oto. | 9 | ++ | (7) | 10° | |
| 62 | " | April 27 | " | 37 | | | | Oto. | 8 | ++ | (6-7) | 9° | Poss 10° |
| 63 | " | " | " | 38 | | | | Oto. | 6 | ++ | (7) | 7° | |
| 64 | " | " | " | 39 | | | | Oto. | 11 | ++ | (6-7) | 12° | Poss ±1 |
| 65. | Sc | " | NSC | 40 | | | | Oto. | 7 | ++ | (7) | 8° | |
| 66 | " | April 27 | " | 41 | | | | Oto. | 8 | ++ | (7) | 9° | |
| 67 | " | " | " | 42 | | | | Oto. | 7 | ++ | (7) | 8° | |
| 68 | " | " | " | 43 | | | | Oto. | 8 | ++ | (7) | 9° | 1 oto. |
| 69 | " | " | " | 44 | | | | Oto. | 12 | ++ | (7) | 13° | 1 oto. |
| 70 | Sc | April 27 | NSC | 45 | | | | Oto. | 8 | ++ | (7) | 9° | |
| 71 | " | April 28 | NSC | 46 | | | | Oto. | 12 | ++ | (6-7) | 13° | 1 oto. |
| 72 | " | " | NSC | 47 | | | | Oto. | 12 | ++ | (7) | 13° | 1 oto. |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 73 | Sc. | April 22 | RSC | 01 | | | | Sc. | 1 | ++ | (6-7) | 2° | |
| 74 | " | " 25 | RSC | 03 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 75 | " | " 26 | RSC | 04 | | | | Oto. | 3 | ++ | (6-7) | 4° | 1st ? maybe a FC Poss 3° |
| 76 | Sc | April 28 | RSC | 06 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 77 | " | April 30 | RSC | 07 | | | | Oto. | 2 | ++ | (6-7) | 3° | |
| 78 | " | " | RSC | 08 | | | | Oto. | 2 | + | (7) | 3° | |
| 79 | Sc. | May 01 | RSC | 09 | | | | Oto. | 2 | ++ | (7) | 3° | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 80 | Sc | April 24 | PCC | 01 | | | | Oto. | 6 | + | (6-7) | 7° | |
| 81 | " | April 25 | PCC | 02 | | | | Oto. | 5 | ++ | (6) | 6° | 1 oto. Tough Ing. |
| 82 | " | " | PCC | 03 | | | | Oto. | 7 | + | (6-7) | 8° | 7th? Poss. 7°. |
| 83 | " | " | PCC | 04 | | | | Oto. | 7 | ++ | " | 8° | Edge. ?? |
| 84 | Sc | " | PCC | 05 | | | | Oto. | 10 | ++ | (7) | 11° | 1 oto. |
| 85 | " | " | PCC | 06 | | | | Oto. | 11 | ++ | (6-7) | 12° | tough after |
| 86 | " | April 25 | PCC | 07 | | | | Oto. | 8 | ++ | (7) | 9° | |
| 87 | " | " | PCC | 08 | | | | Oto. | 13 | ++ | (7) | 14° | Poss ±1 |
| 88 | Sc | April 26 | PCC | 09 | | | | Oto. | 8 | ++ | (7) | 9° | |
| 89 | " | " | PCC | 10 | | | | Oto. | 12 | ++ | (7) | 13° | |

4.0

Sand Creek / Gold Creek Project 2564

**FISH AGING TALLY FORM**

| SAM | EFF | 2015 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 91 | Sc | April26 | PCC | 11 | | | | Oto. | 5 | ++ | (6-7) | 6° | Poor Zon. |
| 93 | Sc | " | PCC | 12 | | | | Oto. | 11 | ++ | " | 12° | " 1st? |
| 94 | " | " | PCC | 13 | | | | Oto. | 11 | ++ | " | 12° | |
| 95 | " | " | PCC | 14 | | | | Oto. | 20 | ++ | (7) | 21° | 21°: Poss. 20° x |
| 96 | " | " | PCC | 15 | | | | Oto. | 10 | ++ | (6-7) | 11° | Poss. 12° |
| 97 | Sc | April27 | PCC | 16 | | | | Oto. | 16 | ++ | (7) | 17° | 17°: |
| 98 | " | " | PCC | 17 | | | | Oto. | 12 | ++ | (7) | 13° | Poss. 14° |
| 99 | " | " | PCC | 18 | | | | Oto. | 26 | ++ | (6) | 27° | 27°: Poss 31 to 3. Tough Zon. |
| 100 | " | " | PCC | 19 | | | | Oto. | 10 | ++ | (6-7) | 11° | 1st? |
| 101 | " | " | PCC | 20 | | | | Oto. | 8 | ++ | (7) | 9° | |
| 102 | Sc | April27 | PCC | 21 | | | | Oto. | 9 | + | (7) | 10° | x x |
| 103 | " | " | PCC | 22 | | | | Oto. | 9 | ++ | (7) | 10° | tough edge |
| 104 | " | " | PCC | 23 | | | | Oto. | 12 | ++ | (6-7) | 13° | edge.? |
| 105 | " | " | PCC | 24 | | | | Oto. | 9 | ++ | (5) | 10° | Very poor Zonation - deformed.? |
| 106 | Sc | " | PCC | 25 | | | | Oto. | Unable to Age | | | | " " " " P.C. x |
| 107 | " | " | PCC | 26 | | | | Oto. | 12 | + | (7) | 13° | |
| 108 | " | " | PCC | 27 | | | | Oto. | 14 | ++ | (7) | 15° | 15° |
| 109 | " | April28 | PCC | 28 | | | | Oto. | 3 | ++ | (7) | 4° | Tricky Zon |
| 110 | " | " | PCC | 29 | | | | Oto. | 11 | ++ | (7) | 12° | " x |
| 111 | Sc. | April30 | PCC | 30 | | | | Oto. | 3 | ++ | (7) | 4° | |
| 112 | " | " | PCC | 31 | | | | Oto. | 4 | ++ | (6) | 5° | Tough Zon |
| 113 | " | " | PCC | 32 | | | | Oto. | 5 | ++ | (7) | 6° | " |
| 114 | " | " | PCC | 33 | | | | Oto. | 7 | ++ | (6-7) | 8° | Poss. 7° 2nd? |
| | Gold Creek. | | | | | | | | | | | | |
| 115 | GC | April27 | RSC | 01 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 116 | GC | " | RSC | 05 | | | | Oto. | 2 | ++ | (7) | 3° | x x |
| 117 | GC | " | RSC | 07 | | | | Oto. | 3 | ++ | (6-7) | 4° | 1st? Poss 3° |
| 118 | GC | " | RSC | 08 | | | | Oto. | 3 | ++ | (7) | 4° | x |
| 119 | GC | April27 | RSC | 09 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 120 | " | " | RSC | 10 | | | | Oto. | 3 | ++ | (7) | 4° | x |
| | | | | | | | | | | | | | |
| 121 | GC | April23 | MW | 01 | | | | FR | 3 | + | (4) | 4° | No Scales ?? |

↑ Box 1

Box 2 ↓

Note: Sc - PCC - Otolith zonation tough to sort out on some of these fish. More difficult to get an even break than say the NSC or RSC. A few deformed otoliths as well.

5.0

Gold Creek Project 2564

| FISH AGING TALLY FORM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2015 | | | | | ✓ | | | | | | | |
| SAM | EFF | DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
| 122 | GC | April22 | PCC | 01 | | | | Oto. | 9 | ++ | (6) | 10° | Poss ±1 | |
| 123 | " | " | PCC | 02 | | | | Oto. | 10 | ++ | (6-7) | 11° | Poss 12° @ edge | |
| 124 | " | " | PCC | 03 | | | | Oto. | 9 | ++ | (5-6) | 10° | Poor Control 10° true annuli? | |
| 125 | " | " | PCC | 04 | | | | Oto. | 12 | ++ | (6) | 13° | " " 13° Poss ±1 | |
| 126 | GC. | April22 | PCC | 05 | | | | Oto. | 12 | ++ | (6-7) | 13° | Poss 12° | |
| 127 | " | April23 | PCC | 06 | | | | Oto. | 24 | ++ | (7) | 25° | 25°; 26° Poss ±1or2 | |
| 128 | " | " | PCC | 07 | | | | Oto. | 8 | ++ | (7) | 9° | | x |
| 129 | " | " | PCC | 08 | | | | Oto. | 3 | ++ | (7) | 4° | FL2. weak Zone | |
| 130 | " | " | PCC | 09 | | | | Oto. | 13 | ++ | (7) | 14° | | |
| 131 | GC | April23 | PCC | 10 | | | | Oto. | 12 | ++ | (7) | 13° | edge | |
| 132 | " | " | " | 11 | | | | Oto. | 11 | ++ | (6-7) | 12° | Poss ±1 | |
| 133 | " | " | " | 12 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 134 | " | " | " | 13 | | | | Oto. | 23 | ++ | (6-7) | 24° | 24°; 24° Poss ±1or 2 | |
| 135 | " | " | " | 14 | | | | Oto. | Unable to Age | | | - | very poor zonation | |
| 136 | GC | April24 | PCC | 15 | | | | Oto. | 16 | ++ | (6-7) | 17° | 17°/ Poss ±1or2 | |
| 137 | " | " | " | 16 | | | | Oto. | 9 | ++ | " | 10° | | |
| 138 | " | " | " | 17 | | | | Oto. | 4 | ++ | " | 5° | Poss 6° @ edge | |
| 139 | " | " | " | 18 | | | | Oto. | 8 | ++ | (7) | 9° | FL2-3 | |
| 140 | " | " | " | 19 | | | | Oto. | 12 | ++ | (7) | 13° | 1 oto. Tricky edge | x |
| 141 | GC | April24 | PCC | 20 | | | | Oto. | 5 | ++ | (7) | 6° | | x |
| 142 | " | " | " | 21 | | | | Oto. | 9 | ++ | (6-7) | 10° | Poss 9° | |
| 143 | " | " | " | 22 | | | | Oto. | 9 | ++ | (5-6) | 10° | Tough Zon. Poss ±1. | |
| 144 | " | " | " | 23 | | | | Oto. | 13 | + | (7) | 14° | Poss 13° | |
| 145 | " | " | " | 24 | | | | Oto. | 13 | ++ | (7) | 14° | | xx |
| 146 | GC | April24 | PCC | 25 | | | | Oto. | 15 | ++ | (5-6) | 16° | Tough. 17°. Poss ±1or 2 | |
| 147 | " | " | " | 26 | | | | Oto. | 10 | ++ | " | 11° | 1 oto. Tough Zon. | |
| 148 | " | " | " | 27 | | | | Oto. | 10 | ++ | (5) | 11° | " | |
| 149 | GC | April24 | " | 28 | | | | Oto. | 11 | ++ | (6-7) | 12° | Poss ±1 | |
| 150 | " | " 25 | " | 29 | | | | Oto. | 4 | + | " | 5° | | |
| 151 | " | April26 | PCC | 30 | | | | Oto. | 4 | ++ | (7) | 5° | 1 oto. | x |
| 152 | " | " | " | 31 | | | | Oto. | 11 | ++ | (7) | 12° | 1 oto. Poss 13° | |
| 153 | " | " | PCC | 32 | | | | Oto | 8 | ++ | (7) | 9° | | x |
| ? 154 | Sc? | " | " | 33 | | | | Oto. | 5 | ++ | (7) | 6° | | |

Note: GC-PCC - Some very tough & tricky zonation. Many of these fish could vary by ±1or2 years. Tough to sort out true annuli and edges are very tough.

6.0

Gold Creek

Project #2564.

## FISH AGING TALLY FORM

| SAM | EFF | 2015 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 155 | GC | April27 | PCC | 34 | | | | Oto. | 6 | ++ | (7) | 7° | | xx |
| 156 | " | " | " | 35 | | | | Oto. | 4 | ++ | (7) | 5° | | x |
| 157 | " | " | " | 36 | | | | Oto. | 4 | ++ | (6) | 5° | Poor Zonation | |
| 158 | GC | April29 | PCC | 37 | | | | Oto. | 6 | ++ | (7) | 7° | | |
| 159 | " | May01 | " | 38 | | | | Oto. | 5 | ++ | (7) | 6° | | xx |
| 160 | " | " | PCC | 39 | | | | Oto. | 3 | ++ | (6) | 4° | Edge? Poss. 5° | |
| 161 | GC | April22 | NSC | 01 | | | | Oto. | Unable to Age >20 YRs. | | | | Good to 19-20. Probable 24-26. | |
| 162 | " | " | NSC | 02 | | | | Oto. | 6 | ++ | (6-7) | 7° | 1 oto. Poss 6° | |
| 163 | " | " | " | 03 | | | | Oto. | 9 | ++ | (7) | 10° | 1 oto. | x |
| 164 | | " | " | 04 | | | | Oto. | 7 | ++ | (6-7) | 8° | | |
| 165 | GC | " | NSC | 05 | | | | Oto. | 8 | + | (7) | 9° | 1 oto. | x |
| 166 | " | " | NSC | 06 | | | | Oto. | 7 | ++ | (7) | 8° | | xx |
| 167 | " | April23 | " | 10 | | | | Oto. | 8 | ++ | (7) | 9° | | x |
| 168 | " | " 24 | " | 13 | | | | Oto. | 8 | ++ | (6-7) | 9° | Poss 10° | |
| 169 | " | " | " | 14 | | | | Oto. | 10 | ++ | (7) | 11° | 1 oto. | |
| 170 | GC. | " | NSC | 15 | | | | Oto. | 8 | + | (6) | 9° | 1 oto. edge? | |
| 171 | " | " | " | 16 | | | | Oto. | 9 | ++ | (7) | 10° | | xx |
| 172 | " | " | " | 17 | | | | Oto. | 9 | + | (6-7) | 10° | 9th? Poss. 9° | |
| 173 | " | " | " | 18 | | | | Oto. | 9 | ++ | (7) | 10° | | x |
| 174 | " | " | " | 19 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 175 | GC | April24 | NSC | 20 | | | | Oto. | 7 | ++ | (7) | 8° | | xx |
| 176 | " | " | " | 21 | | | | Oto. | 5 | ++ | (6-7) | 6° | Poss 7° | |
| 177 | " | " | " | 22 | | | | Oto. | 8 | ++ | (5) | 9° | Poor Zonation | |
| 178 | GC | " | NSC | 23 | | | | Oto. | 8 | ++ | (6) | 9° | 1 oto. " " | |
| 179 | " | April25 | NSC. | 26 | | | | Oto. | 10 | + | (6) | 11° | poor edge | |
| 180 | " | " | " | 27 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 181 | " | " | " | 28 | | | | Oto. | 7 | ++ | (6-7) | 8° | 1 oto. edge? Poss 7°. | |
| 182 | " | " | NSC | 30 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 183 | " | " | " | 31 | | | | Oto. | 11 | ++ | (7) | 12° | | |
| 184 | " | " | " | 32 | | | | Oto. | 11 | + | (6-7) | 12° | 1 oto. | |
| 185 | " | April26 | " | 33 | | | | Oto. | 9 | ++ | (7) | 10° | | xx |

Note: GC-PCC - Very tough aging.
GC-NSC - Much better Zonation than PCC. Also more younger fish.
Zonation much more reliable on NSC otoliths from Gold Creek
when compared to PCC samples.

7.0

Gold Creek / Elk River Project 2564.

**FISH AGING TALLY FORM**

↑ Box 2 / Box 3.

| SAM | EFF | 2015 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 186 | GC | April 26 | NSC | 34 | | | | Oto. | 8 | ++ | (7) | 9° | 1 oto. | |
| 187 | GC | " | NSC | 35 | | | | Oto. | 7 | ++ | (7) | 8° | | xx |
| 188 | " | " | NSC | 36 | | | | Oto. | 7 | ++ | (7) | 8° | 1 oto. | xx |
| 189 | " | " | " | 37 | | | | Oto. | 7 | ++ | (7) | 8° | | |
| 190 | " | April 27 | " | 38 | | | | Oto. | 7 | ++ | (7) | 8° | | x |
| 191 | " | " | " | 39 | | | | Oto. | 8 | ++ | (7) | 9° | | xx |
| 192 | GC | " | NSC | 40 | | | | Oto. | 7 | ++ | (7) | 8° | | x |
| 193 | " | " | " | 41 | | | | Oto | 8 | ++ | (7) | 9° | | xx |
| 194 | " | " | " | 42 | | | | Oto. | 8 | ++ | (7) | 9° | 1 oto. | x |
| 195 | " | " | " | 43 | | No Oto. | | Sc | 4 | ++ | (5) | 5° | 1st? edge? "Would not use" | |
| 196 | " | April 29 | " | 44 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 197 | GC. | April 29 | NSC | 45 | | | | Oto. | 7 | ++ | (7) | 8° | 2nd otolith P.C. | |
| 198 | " | " | " | 46 | | | | Oto. | 8 | ++ | (7) | 9° | | x+ |
| 199 | " | " | " | 47 | | | | Oto. | 6 | ++ | (7) | 7° | | x |
| 200 | " | " | " | 48 | | | | Oto. | 7 | ++ | (7) | 8° | | x |
| 201 | GC | April 30 | NSC | 49. | | | | Oto. | 11 | ++ | (7) | 12° | | xx |
| | | | | | | | | | | | | | | |
| 236. | GC | April 30 | RB. | 01 | | | | [Oto | 3 | ++ | (6-7) | 4° | FC 2-3. | |
| " | " | " | " | " | | | | Sc | 3 | ++ | (6) | 4° | Tough Zon FC1-2. Lots of growth 1-2. | ] 4 |
| | ELK RIVER | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 253 | ER | April 23. | RSC | 02 | | | | Oto. | 3 | ++ | (7) | 4° | | |
| 254 | ER | " | RSC | 04 | | | | Oto. | 2 | ++ | (7) | 3° | | x |
| 255 | ER. | " | RSC | 05 | | | | Oto. | 2 | ++ | (6) | 3° | 1 oto. wrong oto. | |
| 256 | " | " 24 | RSC | 07 | | | | Oto. | 3 | ++ | (7) | 4° | | xx |
| 257 | " | " 26 | RSC | 08 | | | | Oto. | 3 | + | (7) | 4° | | x |
| 258 | " | " | RSC | 09 | | | | Oto. | 3 | ++ | (7) | 4° | | xx |
| 259 | " | " | RSC | 10 | | | | Oto. | 4 | ++ | (6-7) | 5° | | |
| 260 | ER | April 28 | RSC | 11 | | | | Oto. | 3 | ++ | (7) | 4° | | x |
| 261 | " | " 29 | RSC | 13 | | | | Oto. | 3 | ++ | (7) | 4° | | |
| 262 | " | " 30 | RSC. | 15 | | | | Oto. | 2 | ++ | (7) | 3° | | |
| 263 | " | " | RSC | 16 | | | | Oto | 2 | ++ | (6-7) | 3°. | | |

Note: RSC - otoliths - Zonation is good to excellent. Fairly straight forward to age.

g.w

Elk River

Project # 2564

**FISH AGING TALLY FORM**

| SAM | EFF | 2015<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 314 | ER | April22 | NSC | 01 | No | Oto. | | Sc | Unable | to | age. | | | |
| 315 | ER | " | NSC | 02 | | | | Oto | 12 | + | (7) | 13° | | |
| 316 | " | " | NSC | 03 | | | | Oto. | 9 | + | (7) | 10° | | x |
| 317 | " | April23 | NSC | 04 | | | | Oto. | 13 | ++ | (6-7) | 14° | Poss ±1. | |
| 318 | " | " | " | 05 | | | | Oto. | 9 | ++ | (7) | 10° | | xx |
| 319 | ER | " | " | 06 | | | | Oto. | 10 | ++ | (7) | 11° | Slow 0-1. | |
| 320 | " | " | NSC | 07 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| 321 | " | " | " | 08 | | | | Oto. | 7 | ++ | (6-7) | 8° | | |
| 322 | " | " | " | 09 | | | | Oto. | 10 | ++ | (7) | 11° | | xx |
| 323 | ER | April23 | NSC | 10 | | | | Oto. | 7 | ++ | (6-7) | 8° | Poss 9° edge. | |
| 324 | " | " | " | 11 | | | | Oto. | 8 | + | " | 9° | 8th? Poss 8° | |
| 325 | " | " | " | 12 | | | | Oto. | 14 | ++ | " | 15° | 15° Edge stacking - slow Poss 2 for 2 | |
| 326 | " | " | " | 13 | | | | Oto. | 12 | ++ | (7) | 13° | | xx |
| 327 | " | " | " | 14 | | | | Oto. | 12 | ++ | (6-7) | 13° | Poss 12° | |
| 328 | ER | April23 | NSC | 15 | | | | Oto. | 7 | ++ | (7) | 8° | | xx |
| 329 | " | " | " | 16 | | | | Oto. | 10 | ++ | (7) | 11° | | x |
| 330 | " | " | " | 17 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 331 | " | " | NSC | 19 | | | | Oto. | 10 | + | (7) | 11° | | |
| 332 | " | " | " | 21 | | | | Oto. | 8 | + | (7) | 9° | 1oto. | |
| 333 | " | " | " | 23 | | | | Oto. | 12 | ++ | (7) | 13° | 1oto. | x |
| 334 | ER | April24 | NSC | 24 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 335 | " | " | " | 25. | | | | Oto. | 12 | ++ | (7) | 13° | 1oto. | x |
| 336 | ER | April26 | " | 27 | | | | Oto. | 12 | ++ | (7) | 13° | | x |
| 337 | " | " | " | 28 | | | | Oto. | 8 | + | (6-7) | 9° | 8th? | |
| 338 | " | " | " | 29 | | | | Oto. | 8 | ++ | (7) | 9° | Tough Grn. | |
| 339 | " | " | NSC | 30 | | | | Oto. | 9 | ++ | (7) | 10° | | x |
| 340 | " | " | " | 31 | | | | Oto. | 9 | + | (6-7) | 10° | | |
| 341 | " | " | " | 32 | | | | Oto. | 8 | ++ | " | 9° | | |
| 342 | " | " | " | 33 | ×↓ | | | Oto. | 11 | + | (7) | 12° | 1oto. | |
| 343 | ER | April27 | NSC | 35 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 344 | " | " | " | 36 | | | | Oto. | 5 | ++ | (6) | 6° | 1st? Poss 5° | |
| 345 | " | " | " | 37 | | | | Oto | 7 | ++ | (7) | 8° | 1oto. | |
| 346 | " | " | " | 38 | | | | Oto. | 8 | ++ | (6) | 9° | Poss ±1. | |
| – | ER | April26 | NSC | 34. | | | | Oto | 8 | ++ | (7) | 9° | 1oto. | |

Elk River    Project #2564.

**FISH AGING TALLY FORM**

| SAM | EFF | 2015. DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 347 | ER | April 27 | NSC | 39 | | | | Oto. | 8 | ++ | (7) | 9° | |
| 348 | " | " | " | 40 | | | | Oto. | 12 | ++ | (7) | 13° | x |
| 349 | " | April 28 | " | 41 | | | | Oto. | Unable to age - Poor Zon. >15 yrs. Prob 15 to 20. | | | | |
| 350 | ER | " | NSC. | 42 | | | | Oto. | 13 | ++ | (7) | (14°) | Poss 15° @ edge |
| 351 | " | " | " | 43 | | | | Oto. | 12 | ++ | (7) | 13° | x |
| 352 | " | April 29 | " | 44 | | | | Oto. | 9 | ++ | (6-7) | 10° | |
| 353 | " | " | NSC | 45 | | | | Oto. | 6 | ++ | " | 7° | Poss 8° @ edge |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 354 | ER | April 22. | PCC | 01 | No Otoliths. | | | Sc. | 4 | + | (5) | 5° | edge ?? - Would not rely on scale age. |
| 355 | ER | " | PCC | 02 | | | | Oto. | 21 | ++ | (6) | 22° | Among oto's. 17°; 21° |
| 356 | ER | " | PCC | 03 | | | | Oto. | 20 | ++ | (7) | 21° | " " 21° |
| 357 | " | " | PCC | 04 | | | | Oto. | 10 | ++ | (6) | 11° | Poss ±1 1 of each oto. |
| 358 | " | " | PCC | 05 | | | | Oto. | 14 | ++ | (6-7) | 15° | 1 oto. 14° |
| 359 | ER | " | PCC | 06 | | | | Oto. | 14 | ++ | (7) | 15° | 15° Both oto. = 15°. xx |
| 360 | " | April 22 | PCC | 07 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 361 | " | " | PCC | 08 | | | | Oto. | 8 | ++ | (7) | 9° | |
| 362 | " | " | PCC | 09 | | | | Oto. | 16 | ++ | (7) | 17° | 17°-17°. Poss 18° @ edge x |
| 363 | " | " | PCC | 10 | | | | Oto. | 12 | ++ | (6-7) | 13° | 13°; Poss ±1. |
| 364 | " | " | PCC | 11 | | | | Oto. | 19 | ++ | (5) | 20° | 20°; Poss ±1 to 3. Tough Zon. |
| 365 | ER. | " | PCC | 12 | | | | Oto. | 18 | ++ | (6) | 19° | 19° Poss ±1 or 2 [illegible] |
| 366 | " | " | " | 13 | | | | Oto. | 12 | ++ | (7) | 13° | edge ? |
| 367 | " | April 23 | " | 14 | | | | Oto. | 19 | ++ | (5-6) | 20° | 1st? 21°; Poss ±1 to 3. Tough Zon. |
| 368 | " | " | " | 15 | | | | Oto. | 20 | ++ | (6-7) | 21° | 1st? 21° Poss ±1 or 2. |
| 369 | ER | " | PCC | 14 | | | | Oto. | 8 | ++ | (6) | 9° | Tough Zon |
| 370 | " | " | PCC | 18 | | | | Oto. | 14 | ++ | (7) | 15° | 14°·15°·15° xx |
| 371 | " | " | " | 20 | | | | Oto. | 14 | ++ | (5) | 15° | 16°·15°; Poss ±1 or 2. Tough Zon |
| 372 | " | " | " | 21 | | | | Oto. | 8 | + | (6-9) | 9° | edge ?? Poss 8° |
| 373 | " | " | " | 22 | | | | Oto. | 16 | ++ | (5) | 17° | 17°; 17° Very tough Zon Poss ±1 to 3 |
| 374 | " | April 23 | PCC | 23 | | | | Oto. | 12 | ++ | (7) | 13° | 13° x |
| 375 | " | April 26 | PCC | 24 | | | | Oto. | 3 | ++ | (7) | 4° | F(5) |
| 376 | " | " | " | 25 | | | | Oto. | 8 | ++ | (7) | 9° | xx |
| 377 | ER. | April 27 | PCC | 26 | | | | Oto. | 8 | ++ | (6-7) | 9° | 1 oto. Slow 7-8-9. |

Note: ER-NSC otoliths pretty good. Good zonation on most fish. Some very old fish very tough to assess.

ER-PCC otoliths. Some tough aging. Difficult zonation on many.

Samples ER-PCC-02 and ER-PCC-03 both aged by scales as well. Both aged as 7° at (5). Scales underaging by 12-13 years. !

10.0

Elk River

Project #2564

**FISH AGING TALLY FORM**

| SAM | EFF | 2015<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 378 | ER | April 27 | PCC | 27 | | | | Oto. | 11 | ++ | (7) | 12° | | x |
| 379 | " | April 28 | " | 28 | | | | Oto. | 5 | ++ | (7) | 6° | | xx |
| 380 | " | " | " | 29 | | | | Oto. | Unable to Age | | | - | Probable 10-13. Poor Zon. | |
| 381 | " | " | " | 30 | | | | Oto. | 5 | ++ | (7) | 6° | | |
| 382 | " | " | PCC | 31 | | | | Oto. | 8 | ++ | (7) | 9° | | x |
| 383 | " | " | " | 32 | | | | Oto. | 5 | + | (6-7) | 6° | Poss. 5° 5th? | |
| 384 | ER | April 28 | PCC | 33 | | | | Oto. | 11 | ++ | (6) | 12° | Poss ±1 | |
| 385 | " | " | " | 35 | | | | Oto. | 8 | ++ | (7) | 9° | | x |
| 386 | " | " | " | 36 | | | | Oto. | 12 | ++ | (6-7) | 13° | 1st? | |
| 387 | " | April 29 | PCC | 37 | | | | Oto. | 5 | ++ | (7) | 6° | | x |
| 388 | " | " | " | 38 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 389 | " | " | " | 39 | | | | Oto. | 5 | ++ | (7) | 6° | | x |
| 390 | ER | April 29 | PCC | 40 | | | | Oto. | 8 | ++ | (7) | 9° | | x |
| 391 | " | " | " | 41 | | | | Oto. | 3 | ++ | (7) | 4° | 1 oto. | x |
| 392 | " | " | " | 42 | | | | Oto. | 8 | ++ | (6-7) | 9° | | |
| 393 | " | " | " | 43 | | | | Oto. | 3 | ++ | (7) | 4° | | |

Note: ER-PCC-otoliths - Some are very good for zonation. Others show very tough zonation to follow.
Older fish generally tougher to assess.
Edge condition is a tough call on some fish. A few could be older by a year.

1.0

Gold Creek (GC) Project #2564

FISH AGING TALLY FORM

| | SAM | EFF | DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0101 | 202 | GC. | April22 | YP. | 01 | | | | Sp. | 3 | ++ | (7) | 4° | FC0-1 | x |
| 0102 | 203 | " | " | YP | 02 | | | | Sp. | 2 | ++ | (6-7) | 3° | FC@ 2nd? | |
| " 103 | 204 | " | April23 | YP | 03 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| " 104 | 205 | GC. | " | YP | 04 | | | | Sp. | 4 | * | (7) | 4* | Annulus on edge | x |
| " 105 | 206 | " | " | YP | 05 | | | | Sp. | 2 | ++ | (7) | 3° | Probable (3*on edge | |
| 0106 | 207 | " | " | YP. | 06 | | | | Sp. | 5 | ++ | (7) | 6° | | x |
| " 107 | 208 | " | -24 | YP | 07 | | | | Sp. | 3 | ++ | (7) | 4° | | |
| " 108 | 209 | GC | April25 | YP. | 08 | | | | Sp. | 3 | ++ | (7) | 4° | | |
| " 109 | 210 | " | " | YP. | 09 | | | | Sp. | 5 | + | (7) | 6° | | |
| " 110 | 211 | " | " | YP | 10 | | | | Sp. | 3 | ++ | (7) | 4° | | |
| 0 111 | 212 | " | " | YP. | 11 | | | | Sp. | 8 | * | (7) | 8* | | |
| 0.112 | 213 | " | " | YP. | 12 | | | | Sp. | 3 | + | (6) | 4° | Edge? Poss 3* | |
| " 113 | 214 | " | April26 | YP | 14 | | | | Sp. | 2 | * | (7) | 2* | FC(a) | |
| " 114 | 215 | GC. | " | YP. | 15 | | | | Sp. | 1 | ++ | (6-7) | 2° | FC(a)· | |
| " 115 | 216 | " | " | YP. | 16 | | | | Sp. | 2 | * | (7) | 2* | | x |
| 0116 | 217 | " | " | YP | 17 | | | | Sp. | 2 | * | (6-7) | 2* | FC(a)· | |
| " 117 | 218 | " | " | YP | 18 | | | | Sp. | 2 | ++ | (7) | 3° | | xx |
| " 118 | 219 | " | April27 | YP | 19 | | | | Sp. | 2 | * | (6-7) | 2* | FC0-1· | |
| " 119 | 220 | " | " | YP | 20 | | | | Sp. | 2 | * | (6) | 2* | FC(a) 1st out? | |
| 0 120 | 221 | GC | " | YP | 21 | | | | Sp. | 2 | * | (6-7) | 2* | | |
| " 121 | 222 | " | April29 | YP | 22 | | | | Sp. | 2 | * | " | 2* | Poor Son. | |
| " 122 | 223 | " | " | " | 23 | | | | Sp. | 2 | * | " | 2* | FC(a) | |
| " 123 | 224 | " | " | " | 24 | | | | Sp. | 2 | * | " | 2* | FC(a) | |
| " 124 | 225 | " | " | " | 25. | | | | Sp. | 2 | * | (6-7) | 2* | FC0-1· | |
| 0125 | 226 | " | " | YP | 26 | | | | Sp. | 1 | ++ | (7) | 2° | | |
| " 126 | 227 | " | " | " | 27 | | | | Sp. | 2 | * | (6-7) | 2* | FC 0-1· | |
| " 127 | 228 | " | April30 | " | 28 | | | | Sp. | 2 | * | (7) | 2* | Poss·2°· | * |
| " 128 | 229 | GC. | " | " | 29 | | | | Sp. | 2 | * | (7) | 2* | | xxx |
| " 129 | 230 | " | May01 | YP | 30 | | | | Sp. | 3 | * | (6-7) | 3* | FC0-1· Poss 4* | |
| " 130 | 231 | " | " | " | 31 | | | | Sp. | 7 | + | " | 8° | Poss· 7+ | |
| " 131 | 232 | " | " | " | 32 | | | | Sp. | 1 | ++ | (7) | 2° | Poss·2*C edge | |
| " 132 | 233 | " | " | YP | 33 | | | | Sp. | 3 | * | (7) | 3* | | |
| " 133 | 234 | " | " | " | 34 | | | | Sp. | 1 | ++ | (6) | 2° | FC(a) 0-1; 1-2. | |

2.0

Gold Creek (GC) Project #2564

**FISH AGING TALLY FORM**

| | SAM | EFF | DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0134 | 235 | GC | May 01 | YP | 35 | | | | Sp. | 1 | H | (6) | 2° | Poss. 2* |
| * 0135 | — | " | " | YP | 36 | | | | Sp. | 1 | H | (7) | 2° | " " |
| | | | | | | | | | | | | | | |
| 08 | 237 | GC | April 22 | CSU | 01 | | | | FR | 11 | H | (6-7) | 12° | Poss ±1 @ edge |
| 09 | 238 | " | " | CSU | 02 | | | | FR | 11 | H | (7) | 12° | FC(a). |
| 010 | 239 | " | " | CSU | 03 | | | | FR | 9 | H | (5) | 10° | Poor Zon. True annuli ?? Poss. |
| 011 | 240 | GC. | April 23 | CSU | 04 | | | | FR | 9 | H | (6-7) | 10° | 1st? Poor Zon. ?? Poss ±1. ±1 to 2 |
| 012 | 241 | " | " | CSU | 05 | | | | FR | 11 | + | (7) | 12° | 1st? edge x |
| 013 | 242 | " | April 24 | " | 07 | | | | FR | 9 | H | (6-7) | 10° | 1st? Poss 11-12 |
| 014 | 243 | " | " 25 | " | 08 | | | | FR | 10 | H | " | 11° | 1st? Poss ±1. |
| 015 | 244 | GC. | " | " | 09 | | | | FR | 15 | H | (7) | 16° | 16° xx |
| 016 | 245 | " | " | CSU | 10 | | | | FR | 14 | H | (6) | 15° | 1st? 15° Poor Zon. 16° Poss ±1 to 2. |
| 017 | 246 | " | " | " | 11 | | | | FR | 12 | + | (6-7) | 13° | edge? Poss 12° |
| 018 | 247 | " | April 27 | CSU. | 13 | | | | FR | 11 | H | (7) | 12° | FC(a). |
| 019 | 248 | " | " 29 | " | 14 | | | | FR | 11 | H | (7) | 12° | Poss 11+12° x |
| 020 | 249 | " | " | " | 16 | | | | FR | 13 | H | (6) | 14° | FC(a) Tough Zon. |
| 021 | 250 | " | " | " | 16 | | | | FR | 10 | + | (6-7) | 11° | Poss. 10+ @ edge |
| 022 | 251 | GC | April 30 | " | 17 | | | | FR | 11 | * | (7) | 11* | FC(a) edge? |
| 023 | 252 | " | May 01 | CSU | 18 | | | | FR | 8 | * | (6-7) | 8* | FC(a) edge? |
| | | | | | | | | | | | | | | |
| — | 236 | GC | April 30 | RB | 01 | | | | Oto. | 3 | H | (6-7) | 4° | FC-2-3. |
| | " | " | " | " | " | | | | Sc | 3 | H | (6) | 4° | Tough Zon. FC1-2 lots of growth 1-2. ? |
| | | | | | | | | | | | | | | |
| 041 | 121 | GC. | April 23 | MW | 01 | | | | FR. | 3 | + | (4) | 4° | Terrible ray-only 1 ray taken. No Scales. |
| | | | | | | | | | | | | | | |
| | — | GC | April 26 | BT | 01 | | | | Sc | 3 | H | (6) | 4° | Few good scales. dirty. FC1-2, |

Note: YP-spines from Gold Creek. Pretty good zonation. Looks like fairly rapid growth. Would like to see scales as a back-up. Prefer otoliths if fish culled!

CSU-fin rays.-Gold Creek-Some very tough zonation on fin rays. Lots of apparent false checking (FC's). 1st annulus and edge often a tough call.

Elk River

Project 2564

**FISH AGING TALLY FORM**

| | SAM | EFF | 2015<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 024 | 264 | ER. | April22 | CSU | 01 | | | | FR | 12 | + | (7) | 13° | 1st? |
| 025 | 265 | ER. | " | CSU | 02 | | | | FR | 10 | ++ | (7) | 11° | FC1-2 |
| 026 | 266 | " | " | " | 04 | | | | FR | 16 | + | (6-7) | 17° | 1st? edge? Poss ± 1 edge |
| 027 | 267 | " | " | " | 05 | | | | FR | 10 | + | (6-7) | 11° | centre? |
| 028 | 268 | " | April23 | CSU | 06 | | | | FR | 8 | * | (7) | 8* | |
| 029 | 269 | ER | " 26 | " | 08 | | | | FR | 12 | + | (6-7) | 13° | Poss older. FC(2) |
| 030 | 270 | " | " | " | 09 | | | | FR | 12 | + | " | 13° | 1st? edge? Poss ±1. |
| 031 | 271 | " | " | CSU | 10 | | | | FR | 10 | * | (7) | 10* | |
| 032 | 272 | " | " | " | 11 | | | | FR | 10 | ++ | (7) | 11° | edge? |
| 033 | 273 | ER. | April28 | " | 12 | | | | FR | 12 | ++ | (7) | 13° | 1st? |
| 034 | 274 | " | " | " | 13 | | | | FR | 12 | + | (6)(7) | 13° | " Poss 1st? |
| 035 | 275 | " | " | CSU | 14 | | | | FR | 8 | * | (7) | 8* | |
| 036 | 276 | " | " | " | 15 | | | | FR | 8 | ++ | (6-7) | 9° | |
| 037 | 277 | " | April29 | " | 16 | | | | FR | 8 | + | (6-7) | 9° | Tough edge? 1st? |
| 038 | 278 | ER. | April30 | CSU | 17 | | | | FR | 12 | ++ | (6) | 13° | Tough [illegible] poss ±1 or 2 |
| 039 | 279 | " | " | " | 18 | | | | FR | 13 | ++ | (6) | 14° | (" ) " " " |
| 040 | 280 | " | " | CSU | 19 | | | | FR | 9 | ++ | (6) | 10° | 1st? " " True annuli ?? |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 042 | 281 | ER | April23. | YP | 01 | | | | Sp. | 3 | * | (7) | 3* | Poss 3° C edge ? |
| 043 | 282 | " | " | YP | 02 | | | | Sp. | 3 | * | (7) | 3* | |
| 044 | 283 | " | " | YP | 03 | | | | Sp | 1 | ++ | (7) | 2° | |
| 045 | 284 | " | April26 | " | 04 | | | | Sp. | 4 | * | (7) | 4* | FC(2) |
| 046 | 285 | ER | " 27 | YP | 05 | | | | Sp. | 3 | * | (6) | 3* | edge? FC(2). |
| 047 | 286 | " | " | " | 06 | | | | Sp. | 2 | ++ | (7) | 3° | Poss 3* C edge |
| 048 | 287 | " | " 28 | " | 07 | | | | Sp. | 5 | ++ | (7) | 6° | |
| 049 | 288 | " | April29 | " | 08 | | | | Sp | 8 | * | (7) | 8* | |
| 050 | 289 | " | " | " | 09 | | | | Sp. | 2 | ++ | (7) | 3° | edge? Poss 3* |
| 051 | 290 | ER | " | YP | 10 | | | | Sp. | 3 | ++ | (6-7) | 4° | edge? |
| 052 | 291 | " | " | YP | 11 | | | | Sp. | 1 | ++ | (7) | 2° | Lots of growth 0-1-2. |
| 053 | 292 | " | " | " | 12 | | | | Sp. | 5 | * | (7) | 5* | 1st? FC(2) edge? |
| 054 | 293 | ER. | " | YP | 13 | | | | Sp. | 2 | * | (6) | 2* | FC(2). |
| 055 | 294 | " | " | YP | 14 | | | | Sp. | 2 | ++ | (7) | 3° | |

Note: Elk River - CSU - fin rays. Again, tough interpretation on many of these fish. True annuli often tough to sort out from false checking. First annulus and edge often a tough call.

2.0

Elk River  Project 2564

**FISH AGING TALLY FORM**

|  | SAM | EFF | 2015.<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 056 | 295 | ER | April29 | YP | 15 |  |  |  | Sp. | 2 | # | (7) | 3° |  | x |
| 057 | 296 | " | " | YP. | 16 |  |  |  | Sp. | 2 | * | (6) | 2* | FCO-1 ? Poss-3° |  |
| 058 | 297 | " | " | YP | 17 |  |  |  | Sp. | 1 | # | (7) | 2° | FC(2) |  |
| 059 | 298 | ER | April30 | YP. | 19 |  |  |  | Sp. | 1 | # | (6-7) | 2° | FC(2). |  |
| 060 | 299 | " | " | YP | 20 |  |  |  | Sp. | 1 | # | (7) | 2° | Poss. 2* @ edge |  |
| 061 | 300 | " | " | " | 21 |  |  |  | Sp. | 2 | * | (6-7) | 2* | FC(2) |  |
| 062 | 301 | " | " | " | 22 |  |  |  | Sp. | 2 | * | (7) | 2* | FCO-1. |  |
| 063 | 302 | ER | " | YP. | 23. |  |  |  | Sp. | 2 | * | (7) | 2* | FC(2). |  |
| 064 | 303, | " | " | " | 24 |  |  |  | Sp. | 1 | # | (7) | 2° | FCO-1. |  |
| 065 | 304 | " | April30 | YP. | 25 |  |  |  | Sp. | 4 | * | (7) | 4* | FC@ 3rd. |  |
| 066 | 305 | " | " | " | 26 |  |  |  | Sp. | 2 | * | (7) | 2* |  | x |
| 067 | 306 | " | " | " | 27 |  |  |  | Sp. | 3 | * | (7) | 3* |  | x |
| 068 | 307 | " | " | " | 28 |  |  |  | Sp. | 3 | * | (6) | 3* | FC(2) @ 1st & 2nd. |  |
| 069 | 308 | ER | " | YP | 29 |  |  |  | Sp. | 2 | * | (7) | 2* | FCO-1 | x |
| 070 | 309. | " | " | " | 30 |  |  |  | Sp. | 2 | * | (6) | 2* | FC@ 1st. |  |
| 071 | 310 | " | April30 | " | 31 |  |  |  | Sp. | 1 | # | (6) | 2° | FC(2). |  |
| 072 | 311 | ER | May01 | YP | 34 |  |  |  | Sp. | 2 | * | (7) | 2* |  | x |
| 073 | 312 | " | " | " | 35 |  |  |  | Sp. | 1 | # | (4) | 2° | Poor sections. Spine taken out? |  |
| 074 | 313 | " | " | " | 36 |  |  |  | Sp. | 1 | # | (7) | 2° |  |  |

Pg 1.0

Lake Koocanusa - Project #2564.

x or xx - potential QAQC samples.

**FISH AGING TALLY FORM**

| | Sand Creek | 2015 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAM | EFF | DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
| 1 | Sc | Aug 24 | KO | 1 | | | M | Sc. | 2 | ++ | (6) | 2++ | Poss. 3+ @ edge |
| 2 | " | " | KO | 2 | | | M | Oto. | 2 | + | (6-7) | 2+ | |
| 3 | " | " | KO | 3 | | | M | Oto | 2 | ++ | " | 2++ | FC(2) |
| 4 | Sc | " | KO | 4 | | | M | Oto. | 2 | + | (6) | 2+ | FC1-2. Poss. 3++ |
| 5 | Sc | " | KO | 5 | | | " | Oto. | 2 | + | (7) | 2+ | xx |
| 6 | Sc | Aug 24 | KO | 6 | | | " | Oto. | 2 | + | (7) | 2+ | |
| 7 | Sc | " | KO | 7 | | | M | Oto | 2 | + | (7) | 2+ | 1 oto. |
| 8 | " | " | KO | 8 | | | " | Oto. | 2 | ++ | (7) | 2++ | Vis = 2+ |
| 9 | " | " | KO | 9 | | | M | Oto. | 2 | ++ | (6-7) | 2++ | " " P.C. FC0-1. |
| | ELK RIVER | | | | | | | | | | | | |
| 10 | ER | Aug 25 | KO | 01 | | | M | Oto. | 2 | + | (6-7) | 2+ | 2nd? Vis = 2+ |
| 11 | ER | " | KO | 02 | | | M | Oto. | 2 | + | " | 2+ | Poss 1++ |
| 12 | " | " | KO | 03 | | | M | Oto. | 2 | + | (7) | 2+ | Vis = 2+ |
| 13 | " | " | KO | 04 | | | M | Oto. | 2 | + | (7) | 2+ | " " 2++ |
| 14 | " | " | KO | 05 | | | F | Oto. | 2 | + | (7) | 2+ | " " xx |
| 15 | ER | Aug 25 | KO. | 06 | | | F | Oto. | 2 | ++ | (6-7) | 2++ | " " FC 2-Edge |
| 16 | " | " | KO. | 07 | | | M | Oto. | 2 | ++ | (7) | 2++ | " " xx |
| 17 | " | " | KO. | 08 | | | M | Oto. | 2 | + | (7) | 2+ | " " |
| 18 | " | " | KO | 10 | | | F | Oto. | 2 | ++ | (6-7) | 2++ | FC2-Edge Poss: 3+ |
| | SAND CREEK | | | | | | | | | | | | |
| 19 | SC | Aug 22 | NSC | 01 | | | | Oto. | 14 | + | (7) | 14+ | Poss. 13++ |
| 20 | SC | " | NSC | 02 | | | | Oto. | 13 | + | (6) | 13+ | Poss ±1 @ edge |
| 21 | " | " | NSC | 03 | | | | Oto. | 6 | ++ | (7) | 6++ | x |
| 22 | " | " | NSC | 04 | | | | Oto. | 11 | + | (7) | 11+ | xx |
| 23 | SC | " | NSC | 05 | | | | Oto. | 9 | ++ | (6) | 9++ | 1 oto. Good to 7-8. edge ? Poss 10+ @ edge |
| 24 | Sc | Aug 22 | NSC | 06 | | | | Oto. | 13 | + | (6-7) | 13+ | edge? |
| 25 | " | " | NSC | 07 | | | | Oto. | 8 | ++ | " | 8++ | " " |
| 26 | " | " | NSC | 08 | | | | Oto. | 9 | + | (7) | 9+ | |
| 27 | Sc | " | NSC | 09 | | | | Oto. | 8 | ++ | (7) | 8++ | 1 oto. |
| 28 | " | " | NSC | 10 | | | | Oto. | 10 | ++ | (7) | 10++ | edge? |

Note: Most otoliths require considerable scraping to remove tissue.

Note: Edge is a tough call on some of the SC-NSC fish. Many look ++ but maybe 1 year older on the edge

Pg. 2.0

Lake Koocanusa - Project #2564.

**FISH AGING TALLY FORM**

| SAM | EFF | 2015<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | SC | Aug 24 | NSC | 11 | | | | Oto. | 13 | ++ | (5-6) | 13++ | 1 oto. 13++ Poor Break, Poss ±1 or 2 |
| | Elk River | | | | | | | | | | | | |
| 32 | ER | Aug 23 | NSC | 01 | | | | Oto. | 6 | ++ | (6-7) | 6++ | |
| 33 | ER | " | NSC | 02 | | | | Oto. | 8 | ++ | (6) | 8++ | 8++ Poss ±1 @ edge |
| 34 | " | | NSC | 03 | | | | Oto. | 13 | ++ | (6-7) | 13++ | 13++ Tough Oto. |
| 35 | " | " | NSC | 04 | | | | Oto. | 12 | ++ | (6-7) | 12++ | Poss 13++ @ edge. |
| 36 | ER | " | NSC | 05 | | | | Oto. | 8 | + | (6) | 8+ | 1 oto. edge? |
| 37 | ER | " | NSC | 06 | | | | Oto | 6 | ++ | (7) | 6++ | 1 oto. 2nd wrong oto. edge? |
| 38 | " | " | NSC | 07 | | | | Oto. | 8 | ++ | (6-7) | 8++ | Poss 9+ @ edge |
| 39 | " | Aug 23. | NSC | 08 | | | | Oto. | 9 | + | (6-7) | 9+ | edge?? Poss ±1 @ edge |
| 40 | " | " | NSC | 09 | | | | Oto. | 6 | + | (7) | 6+ | Poss 5++ |
| 41 | " | " | NSC | 10 | | | | Oto. | 9 | ++ | (6-7) | 9++ | edge? |
| | GOLD CREEK | | | | | | | | | | | | |
| 43. | GC | Aug 24 | NSC | 01 | | | | Oto. | 7 | ++ | (6-7) | 7++ | Poss. 8+ @ edge |
| 44 | GC | " | NSC | 02 | | | | Oto. | 12 | + | (7) | 12+ | 12+ edge? x |
| 45 | " | " | NSC | 03 | | | | Oto. | 6 | + | (6) | 6+ | |
| 46 | " | " | NSC | 04 | | | | Oto. | 6 | + | (7) | 6+ | x |
| 47 | GC | " "25 | NSC | 05 | | | | Oto. | 6 | ++ | (6-7) | 6++ | 6++ edge? Tough Zos. |
| 48 | " | Aug 25 | NSC | 06 | | | | Oto. | 6 | ++ | " | 6++ | " |
| 49 | " | " | NSC | 07 | | | | Oto. | 6 | ++ | (7) | 6++ | xx |
| 50 | " | " | " | 08 | | | | Oto. | 6 | + | (6-7) | 6+ | Poss. 5++ edge? |
| 51 | GC | " | NSC | 09 | | | | Oto. | 4 | ++ | (7) | 4++ | x |
| 52 | GC | Aug 26 | NSC | 10 | | | | Oto. | 9 | + | (6-7) | 9+. | 9++ |

Notes: In all NSC samples, the edge is often a difficult call. Some ++ fish may be 1 year older. Edges are often rounded off or obliterated by a dark surface layer that makes edge assessment difficult especially if growth is not substantial.
Difficult call on edges.

**2016**

1.0

Sport Fish (Large) · Project # 16-49 2016.

**FISH AGING TALLY FORM**

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | ELKR | April 19. | BT | 01 | | | | Sc | 3 | ++ | (6-7) | 4° | 3rd weaker. | |
| 12 | " | " | BT. | 02 | | | | Sc | 3 | ++ | (6) | 4° | 1st? Poss 3°. | |
| 13 | ELKR | " | BT. | 03 | | | | Sc | 3 | ++ | (6-7) | 4° | | |
| 14 | " | " | BT. | 05 | | | | - NO scales. | | | | | | |
| 15 | " | April 21 | BT. | 06 | | | | Oto. | 3 | ++ | (6-7) | 4° | No Scales | |
| 16 | | " 24 | BT. | 09 | | | | Sc | 5 | * | " | 5* | Poss 6° edge. | |
| 17 | | April 24 | B.T. | 10 | | | | Sc | 5 | + | " | 6° | | |
| | | | | | | | | | | | | | | |
| 652 | ELKR | April 21. | WCT | 01 | | | | [Oto | 3 | ++ | (6-7) | 4° | | ] 4° |
| " | " | " | " | " | | | | Sc | 2 | ++ | (6-7) | 3° | FCC edge | |
| | | | | | | | | | | | | | | |
| 648 | ELKR. | April 22 | KO | 01 | | | | Oto. | 2 | ++ | (5-6) | 3° | True annuli?? FCO-1. | |
| 649 | " | " | KO | 02 | | | | Oto. | 3 | ++ | (6) | 4° | weak zon | |
| 650 | " | " | KO | 03 | | | | Oto. | 4 | ++ | (5) | 5° | poss±1 (weak zon. Ud = 6° | |
| 651 | " | " | KO | 04 | | | | | 4 | ++ | (6) | 5° | Weak zon) | |
| | | | | | | | | | | | | | | |
| | | | Note KO. otoliths poor to age. Weak zonation. True annuli tough to sort out. | | | | | | | | | | | |
| | | | BT. scales OK. but not great to age. Would suggest fin rays if otoliths | | | | | | | | | | | |
| | | | are not available. | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 01 | Sand Ck | April 19 | B.T. | 01 | 232 | | | Sc | NO Scales | | | | | |
| 02 | " | " | BT | 02 | 427 | | | Sc | 3 | + | (6) | 4° | 3rd? | |
| 03 | Sand Ck | April 20 | BT. | 03 | 755 | | | Sc | NO Scales | | | | - just slime. | |
| 04 | " | " | BT. | 04 | 341 | | | Sc | 3 | ++ | (6) | 4° | Shows 1-2 | |
| 05 | " | " | BT. | 05 | 432 | | | Sc. | 3 | ++ | (7) | 4° | | |
| 06 | " | April 21 | BT. | 06 | - | | | Sc. | 3 | ++ | (6) | 4° | | |
| 07 | " | " | BT | 07 | - | | | Sc | 3 | ++ | (6-7) | 4° | | |
| 08 | " | " | BT. | 08 | - | | | Sc | 2 | ++ | (5-6) | 3° | few dirty scales. | |
| 09 | " | " | BT. | 09 | - | | | Sc | 1 | ++ | (5) | 2° | Poss 3° few scales | |
| 10 | " | " | BT | 10 | - | | | Sc | 2 | ++ | (5) | 3° | All Regen Dirty | |
| 641 | Sand Ck | April 20 | MW | 01 | - | | | [Oto | 8 | ++ | (6) | 9° | Poss±1 | ] 9° |
| " | " | " | " | " | " | | | Sc | 8 | ++ | (6) | 9°. | poss ±1. 1st? Shows 5-6 | |

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Project 16-49. (C.S.U.) 2016

## FISH AGING TALLY FORM

| NSES #↓ | SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C1 | 26 | Sand Crk | April 19 | C.S.U. | 02 | | | | FR | 9 | ++ | (6-7) | 10° | 12° 10° 10° 1st? FC's | |
| | 27 | 〃 | 〃 | 〃 | 03 | | | | FR | 10 | ++ | 〃 | 11° | Poss. 12th @ 10th. | |
| | 28 | 〃 | 〃 | 〃 | 04 | | | | FR | 12 | ++ | 〃 | 13° | 1st? Poss ±1. | |
| | 29 | Sand Crk | April 20 | C.S.U. | 05 | | | | FR | 12 | ++ | (6-7) | 13° | Poss. 14-15 | |
| C5 | 30 | 〃 | 〃 | 〃 | 08 | | | | FR | 11 | ++ | 〃 | 12° | Poss ±1 | |
| | 31 | 〃 | 〃 | 〃 | 10 | | | | FR | 11 | ++ | 〃 | 12° | Poss. 13° @ edge | |
| | 32 | 〃 | 〃 | 〃 | 12 | | | | FR | 15 | ++ | 〃 | 16° | Poss ±1. | |
| | 33 | 〃 | 〃 | 〃 | 13 | | | | FR | 12 | ++ | (6) | 13° | Fine annuli ?? | |
| | 34 | Sand Crk | April 20 | CSU. | 14 | | | | FR | 12 | ++ | (7) | 13° | 1st? | |
| C10 | 35 | 〃 | 〃 | 〃 | 15 | | | | FR | 12 | ++ | (5-6) | 13° | 1st? edge? Poss ± 1 or 2 | |
| | 36 | 〃 | 〃 | 〃 | 16 | | | | FR | 10 | ++ | (7) | 11° | 1st almost gone | x |
| | 37 | 〃 | 〃 | 〃 | 17 | | | | FR | 10 | ++ | (7) | 11° | 1st? | x |
| | 38 | 〃 | 〃 | 〃 | 18 | | | | FR | 13 | ++ | (5-6) | 14° | 16° ± 1 or 2 1st? edge? | |
| | 39 | 〃 | 〃 | 〃 | 19 | | | | FR | 12 | ++ | (6) | 13° | 1st? edge? | |
| C15 | 40 | Sand Crk | April 20 | CSU | 20 | | | | FR | 11 | ++ | (6-7) | 12° | 1st? Poss. 11° | |
| | 41 | 〃 | 〃 | 〃 | 21 | | | | FR | 10 | ++ | 〃 | 11° | 12° 11° 11° | |
| | 42 | 〃 | 〃 | 〃 | 22 | | | | FR | 11 | ++ | (5) | 12° | poss overlaying: Poss. 8-9. | |
| | 43 | 〃 | 〃 | 〃 | 23 | | | | FR | 13 | + | (6-7) | 14° | 14° 1st? | x |
| | 44 | 〃 | 〃 | 〃 | 24 | | | | FR | 11 | ++ | 〃 | 12° | Poss 13-14 Fine annuli ? | |
| C20 | 45 | 〃 | 〃 | 〃 | 25 | | | | FR | 12 | ++ | (6) | 13° | Poss ± 1 or 2 | |
| | 46 | Sand Crk | April 20 | CSU | 27 | | | | FR | 14 | ++ | (6-7) | 15° | 14° 15° 1st? Poss ±1. | |
| | 47 | 〃 | 〃 | 〃 | 28 | | | | FR | 13 | ++ | (7) | 14° | 14° Poss ±1 @ centre | |
| | 48 | 〃 | 〃 | 〃 | 31 | | | | FR | 13 | ++ | (6) | 14° | 15° 14° Poss ± 1 or 2 | |
| | 49 | 〃 | 〃 | 〃 | 32 | | | | FR | 12 | ++ | (6-7) | 13° | 〃 〃 | |
| C25 | 50 | 〃 | 〃 | 〃 | 33 | | | | FR | 12 | ++ | (6) | 13° | 13° 〃 〃 | |
| | 51 | 〃 | 〃 | 〃 | 34 | | | | FR | 11 | + | (6-7) | 12° | 12° Poss ±1 | |
| | 52 | 〃 | April 20 | CSU | 35 | | | | FR | 10 | + | 〃 | 11° | 11° | |
| | 53 | 〃 | 〃 | 〃 | 36 | | | | FR | 10 | ++ | (7) | 11° | 1st? | x |
| | 54 | 〃 | 〃 | 〃 | 37 | | | | FR | 14 | + | (6-7) | 15° | Poss ±1 | |
| C30 | 55 | 〃 | 〃 | 〃 | 38 | | | | FR | 11 | ++ | (7) | 12° | | |
| | 56 | 〃 | 〃 | 〃 | 39 | | | | FR | 9 | + | (6-7) | 10° | 1st? edge? | |
| | 57 | 〃 | 〃 | 〃 | 40 | | | | FR | 11 | ++ | (7) | 12° | Poss ±1 | x |
| | 58 | 〃 | 〃 | 〃 | 41 | | | | FR | 13 | ++ | (6-7) | 14° | 14° Poss ±1. | |

Note: Many envelopes labelled August ?? Assuming all are April.

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Project 16-49 (C.S.U.) 2016.

FISH AGING TALLY FORM

|  | SAM | EFF | 2016.<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C34 | 59 | Sand Crk | April 20 | CSU | 42 |  |  |  | FR | 10 | ++ | (6) | 11° | Poor edge after 7-8. |  |
| C35 | 60 | " | April 21 | " | 45 |  |  |  | FR | 13 | ++ | (6) | 14° |  |  |
|  | 61 | " | " | " | 46 |  |  |  | FR | 11 | ++ | (7) | 12° | 1st? | x |
|  | 62 | " | " | " | 47 |  |  |  | FR. | 12 | ++ | (6-7) | 13° | 1st? |  |
|  | 63 | " | " | " | 48 |  |  |  | FR | 9 | ++ | " | 10° | 1st? Poss ±1 |  |
|  | 64 | Sand Crk | April 22 | CSU. | 49 |  |  |  | FR | 12 | ++ | " | 13° | Poss ±1 |  |
| C40 | 65 | " | " | " | 50 |  |  |  | FR | 9 | ++ | (7) | 10° | 1st? maybe gone |  |
|  | 66 | " | " | " | 51 |  |  |  | FR | 12 | ++ | (7) | 13° | 1st? Poss 11-12 |  |
|  | 67 | " | " | " | 52 |  |  |  | FR | 11 | ++ | (6-7) | 12° | 12° 1st? Poss 13-14 |  |

Note: Sand Creek CSU- finrays are difficult to assess Tough call often on 1st annulus and edge; Mid-zonation well defined and pretty good overall. Ages may vary by 1 or 2 years on some fish. Tough aging.

|  | SAM | EFF | DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C43 | 68 | ElkR | April 19. | CSU | 02 |  |  |  | FR | 13 | ++ | (6-7) | 14° | Poss ±1. |  |
|  | 69 | " | " | " | 03 |  |  |  | FR | 13 | ++ | " | 14° | 13°, 14° Poss. ±1 |  |
| C45 | 70 | " | " | " | 04 |  |  |  | FR | 11 | + | (7) | 12° |  | x |
|  | 71 | ElkR. | Apr 20 | CSU. | 05 |  |  |  | FR. | 12 | + | (7) | 13° | Slow 9-10. | x |
|  | 72 | " | " | " | 06 |  |  |  | FR. | 8 | ++ | (7) | 9° |  |  |
|  | 73 | " | April 21 | CSU | 07 |  |  |  | FR | Unable to Age. |  |  |  | >10 YRs. |  |
|  | 74 | " | " | " | 08 |  |  |  | FR | 10 | ++ | (6-7) | 11° |  |  |
| C50 | 75 | " | " | " | 09 |  |  |  | FR | 9 | ++ | (7) | 10° |  | x |
|  | 76 | ElkR | " | " | 10 |  |  |  | FR | 8 | ++ | (6-7) | 9° |  |  |
|  | 77 | " | " | " | 11 |  |  |  | FR | 12 | ++ | (7) | 13° | 1st? | x |
|  | 78 | " | " | CSU. | 13 |  |  |  | FR | 9 | ++ | (7) | 10° | 10° |  |
|  | 79 | " | April 21. | CSU | 15 |  |  |  | FR | 7 | ++ | (7) | 8° | FC 2-3. |  |
| C55 | 80 | " | April 22 | " | 16 |  |  |  | FR | 14 | ++ | (6) | 15° | Poss ±1 or 2 |  |
|  | 81 | " | " | " | 17 |  |  |  | FR | 10 | + | (7) | 11° | 1st almost gone | x |
|  | 82 | " | " | " | 19 |  |  |  | FR | 14 | ++ | (6) | 15° | Good to 10 or 11. |  |
|  | 83 | " | " | " | 20 |  |  |  | FR | 13 | ++ | " | 14° | Poss ±1. |  |

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## FISH AGING TALLY FORM

| | SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 84 | ELKR | April 22 | C.S.U. | 21 | | | | FR | 12 | ++ | (6-7) | 13° | Poss 14-15 |
| C60 | 85 | " | " | " | 22 | | | | FR | 9 | ++ | (7) | 10° | 1st? |
| | 86 | " | " | " | 23 | | | | FR | 12 | ++ | (7) | 13° | |
| | 87 | ELKR | April 22 | CSU. | 24 | | | | FR | 8 | ++ | (6) | 9° | FC②. |
| | 88 | " | " | " | 25 | | | | FR | 10 | ++ | (6-7) | 11° | Poss ±1 |
| | 89 | " | April 23 | " | 26 | | | | FR | 11 | ++ | (7) | 12° | 1st? |
| C65. | 90 | " | " | " | 27 | | | | FR | 14 | ++ | (7) | 15° | 1st? |
| | 91 | " | " | " | 28 | | | | FR | 11 | ++ | (6-7) | 12° | Poss ±1. |
| | 92 | " | " | " | 29 | | | | FR | 15 | + | " | 16° | 16° Poss ±1 or 2 |
| | 93 | " | " | CSU. | 30 | | | | FR | 10 | ++ | (7) | 11° | FC②. |
| | 94 | " | April 23 | " | 31 | | | | FR. | 12 | ++ | (7) | 13° | |
| C70 | 95 | " | " | " | 32 | | | | FR. | 11 | ++ | (6-7) | 12° | 1st? poss 11° |
| | 96 | " | " | " | 33. | | | | FR | 9 | ++ | " | 10° | FC② ?? |
| | 97 | " | " | " | 34 | | | | FR | 10 | ++ | " | 11° | |
| | 98 | " | " | " | 35 | | | | FR | 8 | ++ | " | 9° | 1st? Poss. 10° @ centre |
| | 99 | " | " | " | 36 | | | | FR | 11 | + | (6-7) | 12° | 12° 1st? |
| C75 | 100 | ELKR. | April 23 | CSU | 37 | | | | FR | 13 | ++ | " | 14° | |
| | 101 | " | " | " | 38 | | | | FR | 13 | ++ | (7) | 14° | 12th.? Poss. 13° |
| | 102 | " | " | " | 39 | | | | FR. | 10 | ++ | (6-7) | 11° | |
| | 103 | " | " | " | 40 | | | | FR | 8 | ++ | " | 9° | slow 5-6? |
| | 104 | " | " | " | 41 | | | | FR | 8 | ++ | " | 9° | Poss. 8° |
| C80 | 105 | ELKR. | April 23 | CSU | 43 | | | | FR | 16 | ++ | (6-7) | 17° | 16°/18° Slow after 9th. Poss ±1. |
| | 106 | " | " | " | 44 | | | | FR | 8 | ++ | (6) | 9° | FC② 8-9 ?? Poss 10-12 |
| | 107 | " | " | " | 45 | | | | FR | 8 | ++ | (6) | 9° | " " ?? true annuli ?? |
| | 108 | " | April 25 | CSU | 46 | | | | FR | 12 | ++ | (6-7) | 13° | 13° |
| | 109 | " | " | " | 47 | | | | FR | 12 | ++ | " | 13° | 12° 13, Poss ±1. |

Note: Similar to Sand Crk. - Mid zonation is good to excellent but the 1st annulus and edge are often a tough call. Zonation is often tough after age 8 to 10. Some 9° fish could be 1 to 3 years older. True annuli tough to sort out.

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Project 16-49. (C.S.U.) 2016. Teck Koocanusa

# FISH AGING TALLY FORM

| NSES # | SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C85 | 110 | GoldCrK | April/20 | C.S.U. | 02 | | | | FR | 12 | ++ | (6-7) | 13° | Poss ±1 | |
| | 111 | " | " | " | 03 | | | | FR | 9 | ++ | (6) | 10° | Poss. 9° | |
| | 112 | " | " | CSU | 04 | | | | FR. | 10 | ++ | (6-7) | 11° | 13°. 11°; 11° | x |
| | 113 | " | " | " | 05 | | | | FR | 12 | ++ | " | 13° | [illegible] True annuli? | |
| | 114 | " | " | " | 06 | | | | FR. | 9 | ++ | (7) | 10° | edge.? poss. 11° | |
| C90 | 115 | " | " | " | 07 | | | | FR | 11 | ++ | (7) | 12° | | |
| | 116 | GoldCrK | April/20 | " | 08 | | | | FR. | 9 | ++ | (6-7) | 10° | 1st? Poss 9° | |
| | 117 | " | " | CSU. | 09 | | | | FR | 12 | ++ | " | 13° | 13° Poss. ±1 @centre. | |
| | 118 | " | April/21 | " | 10 | | | | FR | 12 | ++ | " | 13° | Poss ±1 or 2 | |
| | 119 | " | " | " | 11 | | | | FR | 12 | ++ | " | 13° | " ±1 | |
| C95 | 120 | " | " | " | 12 | | | | FR | 6 | ++ | (6) | 7° | Poss. 8th @ edge | |
| | 121 | " | April/22 | " | 13 | | | | FR. | 8 | * | (7) | 8* | edge.? | x |
| | 122 | " | " | CSU. | 14 | | | | FR | 11 | ++ | (7) | 12° | 1st ?? | x |
| | 123 | " | " | " | 16 | | | | FR. | 12 | ++ | (7) | 13° | | |
| | 124 | " | " | " | 17 | | | | FR | 11 | ++ | (6) | 12° | 1st? 12°; Poss ±1 @centre | |
| C100 | 125 | " | " | " | 19 | | | | FR | 10 | ++ | (6) | 11° | Poss ±1 | |
| | 126 | GoldCrK. | April/23 | " | 20 | | | | FR | 10 | ++ | (6-7) | 11° | " " | |
| | 127 | " | " | CSU | 21 | | | | FR | 11 | ++ | (6) | 12° | Poss ±1. | |
| | 128 | " | " | " | 22 | | | | FR. | 15 | ++ | (7) | 16°. | 16°; 16° Poss ±1 | |
| | 129 | " | " | " | 23 | | | | FR | 10 | ++ | (7) | 11° | Poss. 12° | x |
| C105 | 130 | " | " | " | 24 | | | | FR | 13 | ++ | (6-7) | 14° | 1st? 15°-14° | x |
| | 131 | " | " | " | 25 | | | | FR | 17 | ++ | " | 18° | 18°. 19° Poss ±1 or 2 | |
| | 132 | " | " | " | 26 | | | | FR | Unable to Age | | | Poor | 3m '710 YRs | |
| | 133 | GoldCrK | April/23 | CSU | 27 | | | | FR. | 12 | ++ | (6-7) | 13° | Poss ±1. | |
| | 134 | " | April/24 | " | 28 | | | | FR. | 15 | ++ | (6) | 16° | 16° Tough 7m after 11 | |
| C110 | 135 | " | | " | 29 | | | | FR. | 10 | ++ | (7) | 11° | | xx |
| | 136 | " | " | " | 30 | | | | FR | 12 | ++ | (6-7) | 13° | 1st? | x |
| | 137 | " | " | " | 31 | | | | FR | 9 | ++ | (7) | 10° | " | x |
| | 138 | " | " | " | 32 | | | | FR | 11 | + | (6-7) | 12° | Poss 10-11 | |
| | 139 | GoldCrK. | April/25 | CSU | 34 | | | | FR | 15 | ++ | (6) | 16° | 16° 1st? Poss. 17-18 | |
| C115 | 140 | " | " | " | 35 | | | | FR | 11 | ++ | (6-7) | 12° | 12° Poss ±1 or 2 | |
| | 141 | " | " | " | 36 | | | | FR | 11 | + | (5-6) | 12° | 12° 11° 13°; Poss ±1 or 2 | |
| | 142 | " | " | " | 37 | | | | FR | 11 | ++ | (6-7) | 12° | 1st? ; Poss ±1. Poss 11° | |

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## FISH AGING TALLY FORM

| | SAM | EFF | 2014<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C118 | 143 | Gold Ck | April 25. | C.S.U. | 38 | | | | FR | 9 | ++ | (6) | 10° | FC's | |
| | 144 | " | April 26 | " | 39 | | | | FR | 12 | ++ | (6-7) | 13° | FC's | |
| C120 | 145 | " | " | " | 40 | | | | FR | 10 | ++ | (7) | 11° | | × |
| | 146 | " | " | CSU | 41 | | | | FR | 7 | ++ | (7) | 8° | 1st? | × |
| | 147 | " | " | " | 42 | | | | FR | 8 | ++ | (7) | 9° | | |
| C123 | 148 | Gold Ck | April 27 | CSU | 43 | | | | FR | 16 | ++ | (6-7) | 17° | 17°; 18° Bs ±1o2 | |

Similar to Sand Creek and Elk River samples. Often poor centres and edges but good mid growth. Sample ages could often vary by 1 or 2 years. True annuli often tough to sort out.

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Project #16-49 (2016) Teck Koocanusa.

**FISH AGING TALLY FORM**

| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 149 | Sand Crk | April 19. | NSC | 01 | | | | Oto. | 25 | ++ | (6-7) | 26° | Good to 17-18. Poss ±1 or 2, | |
| 150 | " | " | NSC | 03 | | | | Oto. | 13 | ++ | (7) | 14° | 14° | |
| 151 | " | April 20 | NSC | 04 | | | | " | 14 | ++ | (7) | 15° | | × |
| 152 | " | " | " | 05 | | | | " | 9 | ++ | (7) | 10° | | |
| 153 | Sand Crk | April 21 | " | 06 | | | | " | 12 | ++ | (7) | 13° | Poss. 14° | |
| 154 | " | " | " | 07 | NO OTO'S | | | Sc | 6 | ++ | (6) | 7° | | |
| 155 | " | " | NSC | 08 | | | | Oto. | 12 | ++ | (7) | 13° | | ×× |
| 156 | " | " | " | 09 | | | | " | 12 | ++ | (6-7) | 13° | Poss ±1. | |
| 157 | " | " | " | 10 | | | | " | 10 | ++ | (7) | 11° | | × |
| 158 | " | " | " | 11 | | | | Oto. | 13 | ++ | (6-7) | 14° | Poss. 13° | |
| 159 | Sand Crk | April 22 | NSC | 13 | | | | " | 7 | ++ | (7) | 8° | 1 oto. Tough edge. | |
| 160 | " | " | " | 15 | | | | " | 15 | ++ | (7) | 16° | | |
| 161 | " | " | " | 16 | | | | " | 10 | ++ | (7) | 11° | | |
| 162 | " | " | " | 17 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| 163 | " | " | NSC | 18 | | | | " | 9 | ++ | (6) | 10° | 1 oto. 1st? | |
| 164 | " | April 23 | NSC | 19 | | | | " | 10 | ++ | (7) | 11° | | |
| 165 | " | " | " | 20 | | | | " | 13 | + | (7) | 14° | Poss. 13°. | |
| 166 | Sand Crk | " | " | 21 | | | | Oto. | 12 | ++ | (7) | 13° | | |
| 167 | " | " | " | 22 | NO OTO'S. | | | Sc | 5 | ++ | (5-6) | 6° | poor, dirty scales Poss. 7° | |
| 168 | " | April 23 | NSC | 23 | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 169 | " | " | " | 24 | | | | Oto. | 9 | ++ | (7) | 10° | Poss ±1. | |
| 170 | " | " | " | 25 | | | | " | 11 | ++ | (7) | 12° | | |
| 171 | " | " | " | 26. | | | | " | 8 | ++ | (7) | 9° | | × |
| 172 | " | " | " | 27 | | | | " | 10 | ++ | (7) | 11° | | |
| 173 | " | " | NSC | 28 | | | | Oto. | 8 | ++ | (7) | 9° | | × |
| 174 | Sand Crk | April 24 | NSC | 29 | | | | " | 9 | ++ | (7) | 10° | | × |
| 175 | " | April 25 | " | 30. | | | | " | 9 | ++ | (6-7) | 10° | FC 1-2 | |
| 176 | " | " | " | 31 | | | | Oto. | 13 | ++ | (7) | 14° | | × |
| 177 | " | " | " | 33 | | | | Oto. | 20 | ++ | (6) | 21° | 20-22° Poor edge; Good to. Poss ±1 or 2. | |
| — | " | " | NSC | 32 | | | | Oto. | 14 | + | (6-7) | 15° | Poss ±1 | |
| 178 | " | " | NSC. | 34 | | | | Oto. | 14 | ++ | " | 15° | Poss 14°. | |
| 179 | " | " | " | 35. | | | | " | 13 | ++ | (6) | 14° | Poss ±1. | |
| 180 | " | " | " | 36. | | | | " | 13 | ++ | (7) | 14° | | × |

Note: Otoliths tough to prep.

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Project 16-49 (2016): Teck Koocanusa.

FISH AGING TALLY FORM

| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 181 | Sand Crk | April 25 | NSC | 37 | | | | Oto. | 10 | ++ | (7) | 11° | | |
| 182 | " | " | " | 38 | | | | Oto. | 12 | ++ | (7) | 13° | Poss. 12°. | x |
| 183 | " | " | " | 39 | | | | Oto. | 14 | ++ | (7) | 15° | | x |
| 184 | " | " | NSC | 40 | | | | Oto. | 9 | ++ | (6-7) | 10° | | |
| 185 | Sand Crk | April 25 | NSC. | 41 | | | | Oto. | 12 | ++ | (7) | 13° | | |
| 186 | " | " | " | 42 | | | | Oto. | 13 | ++ | (7) | 14° | Poss. 13° | |
| | | | | | | | | | | | | | | |
| Note: Sand Creek NSC. - Pretty good zonation on many fish. Edges tricky on some. | | | | | | | | | | | | | | |
| 187 | Elk R | April 19. | NSC | 01 | wrong oto's | | | Oto. | 14 | ++ | (6) | 15° | 1 oto. 15° Poss. ± 1 or 2 | |
| 188 | Elk R | " | NSC | 02 | | | | Oto. | 8 | ++ | (7) | 9° | 1 oto. | |
| 189 | " | " | " | 03 | | | | Oto. | 8 | ++ | (7) | 9° | 1 oto. | xx |
| 190 | " | " | " | 04 | | | | Oto. | 7 | ++ | (7) | 8° | 1 oto. | |
| 191 | " | " | " | 0.5. | | | | Oto. | 11 | ++ | (6-7) | 12° | 1 oto. edge? | |
| 192 | " | " | " | 06 | | | | Oto. | 9 | ++ | " | 10° | 1 oto. | |
| 193 | Elk R | April 19 | NSC | 07 | wrong oto. | | | Oto. | 12 | ++ | (5-6) | 13° | 1 oto. 13° 14° Poss ± 1 or 2 | |
| 194 | " | " | " | 08 | | | | Oto. | 8 | ++ | (6) | 9° | 1 oto. 1st? Poss. 8° | |
| 195 | " | " | " | 09 | | | | Oto. | Unable to Age >15 yrs | | | | 1 oto. >15 yrs. Poor edges | |
| 196 | " | " | " | 10. | | | | Oto. | 14 | ++ | (6) | 15° | 1 oto. poss 13-14 | |
| 197 | " | " | " | 11 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| 198 | Elk R. | April 19 | NSC | 12 | | | | Oto. | 9 | ++ | (7) | 10° | | xx |
| 199 | " | " | " | 13. | | | | Oto. | 9 | ++ | (6-7) | 10° | 1 oto. | |
| 200 | " | " | " | 14 | | | | Oto | 9 | ++ | (7) | 10° | 1 oto. | |
| 201 | " | April 20 | NSC | 15 | | | | Oto. | 19 | ++ | (6) | 20° | 20° Poss. older. Tough outside growth | |
| 202 | " | " | " | 16 | | | | Oto. | 13 | + | (6-7) | 14° | 15°. 14°. 14° Poss ± 1. | |
| 203 | " | " | " | 17 | | | | Oto. | 13 | ++ | (5) | 14° | 1 oto. poor zon. | |
| 204 | " | " | " | 18 | | | | Oto. | 13 | ++ | (6-7) | 14° | 14° Poss 13°. | |
| 205 | Elk R | April 21 | NSC | 19 | | | | Oto. | 13 | ++ | " | 14° | Poss ± 1. | |
| 206 | " | " | " | 20 | | | | Oto. | 10 | ++ | (7) | 11° | | x |
| 207 | " | " | " | 21 | | | | Oto. | 15 | ++ | (7) | 16°. | 16° Poss. ± 1 | |
| 208 | " | " | " | 22 | | | | Oto. | 10 | ++ | (6-7) | 11° | 1 oto. | |
| 209 | " | " | " | 23 | | | | Oto. | 10 | + | (7) | 11° | | x |
| 210 | " | " | " | 25 | | | | Oto. | 10 | ++ | (6-7) | 11° | | |

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## FISH AGING TALLY FORM

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 211 | ElKR | April 21 | NSC | 26 | | | | Oto. | 8 | ++ | (6) | 9° | Tough Zon. | |
| 212 | " | April 22 | NSC | 27 | | | | Oto. | 14 | ++ | (6-7) | 15° | 15°; Poss 14° | |
| 213 | " | " | " | 28 | | | | Oto. | 21 | ++ | (7) | 22° | 22°; 22° | × |
| 214 | " | " | " | 29 | | | | Oto. | 20 | ++ | (5-6) | 21° | 21°; Poss ±1 or 2 | |
| 215 | " | " | " | 30 | | | | Oto. | 9 | ++ | (7) | 10° | | × |
| 216 | " | " | " | 31 | | | | Oto. | 14 | ++ | (7) | 15° | 15°; 14° Poss ±1. Edge. | |
| 217 | " | " | NSC | 32 | | | | NO SAMPLE. | | | | | | |
| 218 | ElKR. | April 22 | NSC | 33 | | | | Oto. | 8 | ++ | (7) | 9° | 1 oto. | |
| 219. | " | " | " | 34 | | | | " | 9 | ++ | (6-7) | 10° | 1 oto. Edge.? | |
| 220 | " | " | " | 35 | | | | " | 10 | ++ | (7) | 11° | | × |
| 221 | " | " | " | 36 | | | | Oto. | 9 | + | (7) | 10° | | × |
| 222 | " | " | " | 37 | | | | Oto. | 10 | ++ | (7) | 11° | Poss ±1 | |
| 223 | " | " | " | 38 | | | | Oto. | 14 | ++ | (7) | 15° | 15°; | |
| 224 | ElKR | April 22 | NSC | 39. | | | | Oto. | 9 | ++ | (7) | 10° | | × |
| 225 | " | " | " | 40 | | | | Oto. | 10 | ++ | (7) | 11° | | × |
| 226 | " | " | " | 41 | | | | Oto. | 10 | ++ | (5) | 11° | 1 oto. Tough Zon. | |
| 227 | " | April 23 | NSC | 42 | | | | Oto. | 9 | ++ | (7) | 10° | 1 oto. | |
| 228 | " | " | " | 43 | | | | Oto. | 8 | ++ | (7) | 9° | | × |

↑ Box 2

Box 3 ↓

Note: NSC otoliths for Elk River fish sampled are quite good. Tough to prepare but pretty good zonation once prepped. Edge tricky on some.

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 229 | Gold Crk | April 19. | NSC | 01 | | | | Oto. | 12 | ++ | (7) | 13° | 1 oto. | × |
| 230 | " | " | " | 02 | | | | Oto. | 13 | ++ | (6-7) | 14° | 1 oto. Poss. 13° | |
| 231 | " | " | " | 03 | | | | Oto. | 12 | ++ | (7) | 13° | | × |
| 232 | Gold Crk | April 20 | NSC | 05 | | | | Oto | unable to age > | | | 15YRs | 1 oto. >15YRs. Ok to 13+.... | |
| 233 | " | " | " | 06 | | | | Oto. | 14 | ++ | (5-6) | 15° | 1 oto; 15° | |
| 234 | " | " | " | 07 | | | | Oto. | 10 | ++ | (6) | 11° | 1st. | |
| 235 | " | April 21 | NSC | 08 | | | | Oto. | 16 | ++ | (6-7) | 17° | 1 oto. 17° Poss ±1. | |
| 236 | " | " | " | 09 | | | | Oto. | 13 | ++ | (7) | 14° | Poss 13° | |
| 237 | " | " | " | 10. | | | | Oto. | 8 | ++ | (7) | 9° | | |
| 238 | " | " | " | 11 | | | | Oto. | 9 | ++ | (6-7) | 10° | Tough Zon. Poss ±1 | |
| 239 | " | April 22 | NSC | 12 | | | | Oto. | 13 | ++ | (6) | 14° | | |

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## FISH AGING TALLY FORM

| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 240 | Gold Crk | April 22 | NSC | 13 | | | | Oto. | 16 | ++ | (5-6) | 17° | 17°; Tough Zon. |
| 241 | ″ | ″ | ″ | 14 | | | | Oto. | 12 | ++ | (7) | 13° | 1oto. Poss 14° |
| 242 | Gold Crk | April 23 | NSC | 15 | | | | Oto. | 10 | ++ | (6) | 11° | Poss ±1. Tough Zon. |
| 243 | ″ | ″ | ″ | 16 | | | | Oto. | 11 | ++ | (6) | 12° | 12° ″ |
| 244 | ″ | ″ | ″ | 17 | | | | Oto. | 11 | ++ | (6-7) | 12° | Poss ±1 |
| 245 | ″ | April 27 | NSC | 18. | | | | Oto | 9 | ++ | (7) | 10° | 1oto. |
| 246 | ″ | ″ | ″ | 19 | | | | Oto. | 10 | ++ | (6) | 11° | poss ±1 |
| 247 | ″ | ″ | ″ | 20 | | | | Oto. | 7 | ++ | (7) | 8° | 1oto. x |
| 248 | ″ | ″ | ″ | 21 | | | | Oto. | 9 | ++ | (7) | 10° | |
| 249 | ″ | ″ | ″ | 22 | | | | Oto. | 8 | ++ | (6-7) | 9° | Poss. 10th [illegible] |
| 250 | Gold Crk. | April 24 | NSC | 23 | | | | Oto. | 13 | ++ | ″ | 14° | Poss ±1 @ [illegible]. Good to 12. |
| 251 | ″ | April 25 | ″ | 24 | | | | Oto. | 13 | ++ | (7) | 14° | x ^ |
| 252 | ″ | ″ | ″ | 25 | | | | Oto. | 10 | ++ | (6) | 11° | 1oto. 1st? poss 12° |
| 253 | ″ | ″ | ″ | 26 | | | | Oto. | 14 | ++ | (5) | 15° | Tough Zon after 10th. |
| 254 | ″ | ″ | ″ | 27 | | | | Oto. | 13 | ++ | (7) | 14° | 1oto. Poss 15 [illegible] |
| 255 | ″ | ″ | ″ | 28 | | | | Oto. | 9 | ++ | (7) | 10° | |
| 256 | ″ | ″ | ″ | 29 | | | | Oto. | 10 | ++ | (7) | 11° | xx |
| 257 | Gold Crk | April 25 | NSC | 30 | | | | Oto. | 15 | ++ | (6-7) | 16° | 13°, 15° Tough outside 16° |
| 258 | ″ | ″ | ″ | 31 | | | | Oto. | 11 | ++ | (7) | 12° | x |
| 259 | ″ | ″ | ″ | 32 | | | | Oto. | 9 | ++ | (7) | 10° | x |
| 260 | ″ | ″ | ″ | 33 | | | | Oto. | 12 | ++ | (7) | 13° | 1oto. |

Notes: NSC fish otoliths from Gold Creek pretty good overall. Some tough outside zonation on particularly older fish, i.e. greater than 12 to 13 years.

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**FISH AGING TALLY FORM**

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 261 | Sand Crk | April 19. | P.C.C. | 01 | | | | Oto. | 9 | ++ | (6-7) | 10° | 11°, 10° Poss. 11° | |
| 262 | " | " 20 | PCC | 06 | | | | Oto. | 12 | ++ | (7) | 13° | | x |
| 263 | " | " | " | 07 | | | | Oto. | 6 | ++ | (6-7) | 7° | | |
| 264 | " | " | " | 08 | | | | Oto. | 4 | ++ | " | 5° | FCb | |
| 265 | Sand Crk | April 21 | PCC | 09 | | | | Oto. | 8 | ++ | (7) | 9° | | xx |
| 266 | " | " | " | 10 | | | | Oto. | 6 | ++ | (7) | 7° | | |
| 267 | " | " | " | 11 | | | | Oto. | 12 | ++ | (7) | 13° | 13° FCb. | |
| 268 | " | " | " | 12 | | | | Oto. | 12 | ++ | (7) | 13° | 13° FC1-2. | xx |
| 269 | Sand Crk | April 21 | P.C.C. | 14 | | | | Oto. | 6 | ++ | (7) | 7° | 1oto. | |
| 270 | " | " | " | 16 | | | | Oto. | 10 | + | (6-7) | 11° | Poss. 10° | |
| 271 | " | " | " | 17 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| 272 | " | April 23 | P.C.C. | 18 | | | | Oto. | 11 | ++ | (6) | 12° | Poss±1 Tough edge. | |
| 273 | " | " | " | 19 | | | | Oto. | 15 | ++ | (7) | 16° | 1oto. Poss. 17 @ edge | |
| 274 | " | " | " | 20 | | | | Oto. | 13 | ++ | (6) | 14° | Poss ±1. | |
| 275 | " | " | " | 21 | | | | Oto. | 13 | ++ | (7) | 14° | | x |
| 276 | " | " | " | 22 | | | | Oto. | 10 | ++ | (7) | 11° | | xx |
| 277 | " | " | PCC | 23 | | | | Oto. | 6 | ++ | (6) | 7° | Poor edge | |
| 278 | Sand Crk | April 23 | PCC | 24 | | | | Oto. | 5 | ++ | (7) | 6° | | |
| 279 | " | " | " | 25 | | | | Oto. | 6 | ++ | (7) | 7° | | xx |
| 280 | " | " | " | 26 | | | | Oto. | 8 | ++ | (5-6) | 9° | Tough Zm.; Poor break. | |
| 281 | " | " | " | 27 | | | | Oto. | 7 | ++ | (4) | 8° | 1oto. Poor. | |
| 282 | " | " | " | 28 | | | | Oto. | 4 | ++ | (6-7) | 5° | | |
| 283 | " | " | PCC | 29 | | | | Oto. | 9 | ++ | (7) | 10° | 1oto. | |
| 284 | " | " | " | 30 | | | | Oto. | 6 | ++ | (7) | 7° | 1oto. Weaker Zm. | |
| 285 | " | " | " | 31 | | | | Oto. | 12 | ++ | (6-7) | 13° | 12°, 13° | |
| 286 | Sand Crk. | April 23 | PCC | 32 | | | | Oto. | 8 | ++ | (7) | 9° | | x |
| 287 | " | " | " | 33 | | | | Oto. | 11 | ++ | (5-6) | 12° | Poss±1or2 | |
| 288 | " | " | " | 34 | | | | Oto. | 7 | + | (6-7) | 8° | | |
| 289 | " | " | " | 35 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| 290 | " | " | " | 36 | | | | Oto. | 17 | ++ | (6) | 18° | 18°; 18° Poss±1or2 | |
| 291 | " | " | " | 37 | | | | Oto. | 7 | ++ | (6-7) | 8° | 1oto. | |
| 292 | " | " | PCC | 38 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| 293 | " | " | " | 39 | | | | Oto. | 9 | ++ | (7) | 10° | | |

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## FISH AGING TALLY FORM

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 294 | Sand Crk | April 23 | P.C.C. | 40 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 295 | " | " | " | 41 | | | | Oto. | 9 | ++ | (6-7) | 10.° | | |
| 296 | " | " | " | 42 | | | | Oto | 4 | ++ | (6) | 5° | 1 oto. Weak Zon. | |
| 297 | Sand Crk | April 23 | P.C.C. | 43 | | | | Oto. | 6 | ++ | (7) | 7° | FC's | × |
| 298 | " | " | " | 44 | | | | Oto. | 8 | + | (6-7) | 9° | edge? Poss. 8° | |
| 299 | " | " | " | 45 | | | | Oto. | 4 | ++ | (7) | 5° | 1 oto. | |
| 300 | " | " | " | 46 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 301 | " | " | " | 47 | | | | Oto. | 4 | ++ | (7) | 5° | | × |
| 302 | Sand Crk | April 23 | PCC | 48 | | | | Oto. | 9 | ++ | (7) | 10° | | × |
| 303 | " | " | " | 49. | | | | Oto. | 7 | ++ | (7) | 8° | 1 oto. | |
| 304 | " | April 24 | " | 50 | | | | Oto. | 5 | ++ | (7) | 6° | | |
| 305 | " | " | " | 51 | | | | Oto. | 3 | ++ | (6-7) | 4° | Tricky Zon. | |
| 306 | " | " | " | 52 | | | | Oto. | 4 | ++ | " | 5° | | |
| 307 | " | " | " | 53 | | | | Oto. | 3 | ++ | (6) | 4° | 1 oto. Poor Zon. | |
| 308 | " | " | " | 54 | | | | Oto. | 3 | ++ | (6-7) | 4° | " " | |
| 309 | Sand Crk | " | PCC | 55 | | | | Oto. | 3 | ++ | (7) | 4° | | |
| 310 | " | " | " | 56 | | | | Oto. | 4 | ++ | (6) | 5° | | |

Note: PCC otoliths generally O.K. Tough to prep. Edge is often a tough call. May be underaging by 1 year on some fish. Lots @ only 1 otolith making assessment more difficult. Young fish ie 4-5 often difficult zonation. Otoliths very brittle when small.

| SAM | EFF | DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 311 | Elk R. | April 19. | PCC | 01 | No otoliths. | | | Sc | 3 | + | (6) | 4° | | |
| 312 | Elk R. | " | PCC | 02 | | | | Oto. | 4 | ++ | (7) | 5° | | × |
| 313 | " | " | " | 03 | | | | Oto. | 6 | ++ | (6) | 7° | Tough Zon. | |
| 314 | " | " | " | 05 | | | | Oto. | 4 | ++ | (7) | 5° | | × |
| 315 | " | " | " | 06. | | | | Oto. | 4 | ++ | (6-7) | 5° | | |
| 316 | " | " | " | 07 | | | | Oto. | 7 | ++ | (7) | 8° | | |
| 317 | Elk R. | April 19 | PCC | 08 | | | | Oto. | 8 | + | (6-7) | 9° | edge? | |
| 318 | " | " | " | 09 | | | | Oto. | 3 | ++ | " | 4° | | |

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| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | ELKR | April 19 | PCC | 10 | | | | Oto. | 8 | ++ | (4-5) | 9° | edge? Poss. 10-11. | |
| 320 | " | " | " | 11 | | | | Oto. | 6 | ++ | (6-7) | 7° | Tough Zon. | |
| 321 | " | " | " | 12 | | | | Oto. | 3 | ++ | " | 4° | | |
| 322 | ElKR | " | PCC | 13 | | | | Oto. | 3 | ++ | (7) | 4° | FC@ 1st. | x |
| 323 | " | " | " | 14 | | | | Oto. | 4 | ++ | (7) | 5° | | x |
| 324 | " | April 20 | PCC | 15 | | | | Oto. | 6 | ++ | (7) | 7° | | |
| 325 | " | April 22 | " | 16 | | | | Oto. | Unable to Age ?13-14 | | | | O.K. to 10-11, Poor outside | |
| 326 | " | " | " | 17 | | | | Oto. | 17 | ++ | (5-6) | 18° | 18° 18° Poss ±1 to 3. | |
| 327 | " | " | " | 18 | | | | Oto. | 9 | ++ | (7) | 10° | FC@ | |
| 328 | " | " | " | 19 | | | | Oto. | 9 | ++ | (7) | 10° | | |
| 329 | ElKR | " | PCC | 20 | | | | Oto. | 9 | ++ | (7) | 10° | | x |
| 330 | " | " | " | 21 | | | | Oto. | 7 | ++ | (7) | 8° | | x |
| 331 | " | " | " | 22 | | | | Oto. | 9 | ++ | (6-7) | 10° | Poss. 11 @ edge | |
| 332 | " | " | " | 23 | | | | Oto. | 6 | ++ | (7) | 7° | FC@ | |
| 333 | " | April 22 | PCC | 25 | | | | Oto. | 4 | ++ | (6) | 5° | weak Zon. | |
| 334 | " | " | " | 26 | | | | Oto. | 4 | ++ | (6) | 5° | " " | |
| 335 | " | " | " | 27 | | | | Oto. | 8 | ++ | (6) | 9° | | |
| 336 | " | " | " | 28 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 337 | " | " | " | 29 | | | | Oto. | Unable to Age | | | | 1 oto. Poss. 9 to 11. | |
| 338 | ElKR | April 22 | PCC | 30 | | | | Oto. | 8 | ++ | (5-6) | 9° | Tough Zon. | |
| 339 | " | " | " | 31 | | | | Oto. | 12 | ++ | " | 13° | 13° 12° Poss ±1 or 2 | |
| 340 | " | " | " | 32 | | | | Oto. | 10 | ++ | (7) | 11° | FC@ | |
| 341 | " | " | " | 33 | | | | Oto. | 4 | + | (6-7) | 5° | Tough Zon. | |
| 342 | " | " | " | 34 | | | | Oto. | 12 | ++ | (7) | 13° | FC@ | |
| 343 | " | " | " | 36 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 344 | ElKR | April 22 | PCC | 38 | | | | Oto. | 6 | + | (5-6) | 7° | 1 oto. Poor. | |
| 345 | " | " | " | 39 | | | | Oto. | 10 | ++ | " | 11° | Both P.C. Mounted. | |
| 346 | " | " | " | 40 | | | | Oto. | 12 | ++ | (6) | 13° | 1 oto. Poor Zon. 13° Poss ±1. | |
| 347 | " | " | " | 41 | | | | Oto. | 9 | + | (7) | 10° | | x |
| 348 | " | " | " | 42 | | | | Oto. | 4 | ++ | (7) | 5° | FC@ | |
| 349 | ElKR | April 22 | PCC | 43 | | | | Oto. | 4 | ++ | (7) | 5° | " | |
| 350 | " | " | " | 44 | | | | Oto. | 9 | ++ | (6-7) | 10° | | |
| 351 | " | " | " | 45 | | | | Oto. | 5 | ++ | (7) | 6° | FC@ | |

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**FISH AGING TALLY FORM**

| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 352 | ELKR | April 22 | PCC | 46 | | | | Oto. | 9 | ++ | (6-7) | 10° | FCs. |
| 353 | " | " | PCC | 48 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 354 | " | " | " | 49 | | | | Oto. | 12 | ++ | (7) | 13° | |
| 355 | " | " | " | 50 | | | | Oto. | 4 | ++ | (6-7) | 5° | 1 oto. |
| 356 | " | " | PCC | 51 | | | | Oto. | 6 | ++ | (6) | 7° | edge? Poss. 6° |
| 357 | " | " | " | 52 | | | | Oto. | 4 | ++ | (6-7) | 5° | |
| 358 | " | " | " | 53 | | | | Oto | 5 | ++ | " | 6° | 1 oto. FCs |
| 359 | ELKR | April 22 | PCC. | 54 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 360 | " | April 25 | PCC | 55 | | | | Oto. | 4 | ++ | (6) | 5° | 1 oto. 1st? |
| 361 | " | " | " | 56 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 362 | " | " | " | 57 | | | | Oto. | 4 | ++ | (6-7) | 5° | 1 oto. FCs |
| | Notes: Elk River PCC otoliths are very tough to assess. Very difficult to prep due to shattering (more so than previous sites). Zonation is often difficult to follow with more false checking and erratic zonation than in previous sites. Tough Aging. | | | | | | | | | | | | |
| 363 | Gold Crk | April 19 | PCC | 01 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 364 | " | " | PCC | 05 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 365 | " | " | PCC | 13 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 366 | Gold Crk | " | " | 16 | | | | Oto. | 5 | ++ | (7) | 6° | FCs. |
| 367 | " | " | " | 18 | | | | Oto. | 3 | ++ | (6) | 4° | |
| 368 | " | " | " | 21 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 369 | " | " | " | 22 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 370 | Gold Crk | April 20 | PCC | 25 | | | | Oto. | 4 | ++ | (5) | 5° | Poss. 4° - Poor breaks. |
| 371 | " | " | " | 26 | | | | Oto. | 13 | ++ | (6-7) | 14° | 15°; 14°; 13° Poss ±1. |
| — | " | " | " | 27 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 372 | " | " | " | 30 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 373 | " | " | " | 31 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 374 | " | " | " | 33 | | | | Oto. | 4 | ++ | (7) | 5° | |
| 375 | Gold Crk | April 20 | PCC | 34 | | | | Oto. | 4 | ++ | (5-6) | 5° | Poor Zon. |
| 376 | " | " | " | 36 | | | | Oto. | 3 | ++ | (7) | 4° | |
| 377 | " | " | " | 37 | | | | Oto. | 3 | ++ | (6-7) | 4° | FCs. |

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↑ Box 4

Box 5 ↓

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 378 | Gold Crk | April/20 | P.C.C. | 38 | | | | Oto | 3 | ++ | (6-7) | 4° | | |
| 379 | " | "21 | " | 39 | | | | Oto. | 3 | ++ | (5-6) | 4° | poor zonation. | |
| 380 | Gold Crk | April/21 | PCC | 40 | | | | Oto. | 4 | ++ | (7) | 5° | FC@1st. | × |
| 381 | " | " | " | 41 | | | | Oto. | 4 | ++ | (6-7) | 5° | FC(2) | |
| 382 | " | " | " | 42 | | | | Oto. | 3 | ++ | (7) | 4° | 1oto. | × |
| 383 | " | " | " | 44 | | | | Oto. | 10 | ++ | (7) | 11° | 1oto. | |
| 384 | " | April/21 | PCC | 45 | | | | Oto. | 12 | + | (6-7) | 13° | 1oto. Poss 1/@ edge | |
| 385 | " | " | " | 46 | | | | Oto. | 6 | ++ | " | 7° | | |
| 386 | " | " | " | 47 | | | | Oto. | 3 | ++ | (7) | 4° | | × |
| 387 | " | " | " | 48 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 388 | " | " | " | 50 | | | | Oto. | 3 | ++ | (7) | 4° | 1oto. | |
| 389 | " | " | " | 51 | | | | Oto. | 7 | ++ | (7) | 8° | | |
| 390 | Gold Crk. | April/22 | PCC | 52 | | | | Oto | 4 | ++ | (6-7) | 5° | 1oto. FC1-2 | |
| 391 | " | " | " | 53 | | | | Oto. | 4 | ++ | (7) | 5° | FC@1st. | × |
| 392 | " | " | " | 54 | | | | Oto. | 4 | ++ | (5-6) | 5° | poor zonation. | |
| 393 | " | " | " | 55 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 394 | " | " | " | 56. | | | | Oto. | 5 | ++ | (7) | 6° | FC(2) | |
| 395 | " | " | PCC | 58. | | | | Oto. | 4 | ++ | (7) | 5° | | × |
| 396 | " | " | " | 59 | | | | Oto. | 4 | ++ | (7) | 5° | | × |
| 397 | " | " | " | 61 | | | | Oto. | 5 | ++ | (6-7) | 6° | | |
| 398 | " | " | " | 63 | | | | Oto. | 4 | ++ | (6) | 5° | | |
| 399 | Gold Crk | April/22 | PCC. | 64 | | | | Oto. | 3 | ++ | (6-7) | 4° | FC(2). | |
| 400 | " | " | " | 65 | | | | Oto. | 2 | ++ | " | 3° | 1oto FC@1st. | |
| 401 | " | " | " | 66 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 402 | " | " | " | 67 | | | | Oto. | 3 | ++ | (7) | 4° | | × |
| 403 | " | " | " | 68 | | | | Oto. | 3 | ++ | (7) | 4° | FC@1st. | |
| 404 | " | " | " | 69 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 405 | Gold Crk | April/22 | PCC | 70 | | | | Oto. | 4 | ++ | (6) | 5° | Tough [illegible]. | |
| 406 | " | " | " | 73 | | | | Oto. | 3 | ++ | (7) | 4° | 1oto. | |
| 407 | " | " | " | 74 | | | | Oto. | 4 | ++ | (6-7) | 5° | | |
| 408 | " | April/23 | " | 75 | | | | Oto. | 5 | ++ | " | 6° | | |
| 409 | " | " | " | 76 | | | | Oto. | 4 | ++ | " | 5° | FC(2) Poss. 6° | |
| 410 | " | " | " | 77 | | | | Oto. | 4 | ++ | " | 5° | edge-? | |

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Project 16-49. (2016.) Teck Koocanusa.

**FISH AGING TALLY FORM**

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 411 | Gold Crk | April 23 | PCC. | 78 | | | | Oto. | 3 | ++ | (6) | 4° | Fls: | |
| 412 | " | " | " | 79 | | | | Oto. | 3 | ++ | (6-7) | 4° | FC 3-Edge | |
| 413 | " | " | " | 80 | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 414 | Gold Crk. | April 25 | PCC | 81 | | | | Oto. | 11 | + | (7) | 12° | | x |
| 415 | " | " | " | 82 | | | | Oto. | 10 | ++ | (7) | 11° | | |
| 416 | " | " | " | 83 | | | | Oto: | 6 | ++ | (6) | 7° | Tough Zone: | |
| 417 | " | " | " | 84 | | | | Oto: | 11 | ++ | (6) | 12° | Tough Edge area. | |
| 418 | " | " | " | 86 | | | | Oto: | 12 | ++ | (6-7) | 13° | 13° Poss ±1 | |
| 419 | " | " | " | 87 | | | | Oto: | Unable to Age | | | 715 yRs | | |
| 420 | Gold Crk | April 25 | PCC | 88. | | | | Oto. | 4 | ++ | (7) | 5° | | |
| 421 | " | " | " | 89 | | | | Oto. | 8 | ++ | (7) | 9° | 1 oto. | |
| 422 | " | " | " | 90 | | | | Oto: | 12 | ++ | (7) | 13° | 13° | |
| 423 | " | " | " | 91 | | | | Oto | 9 | ++ | (6-7) | 10° | Edge ? | |
| 424 | " | " | " | 92 | | | | Oto: | 7 | ++ | (6) | 8° | poor edge. | |
| 425 | " | " | " | 93 | | | | Oto. | 4 | ++ | (6-7) | 5° | | |
| 426 | " | " | " | 94 | | | | Oto. | 4 | ++ | " | 5° | Poss 6° @ edge | |
| 427 | Gold Crk | April 25 | PCC | 95 | | | | Oto | 5 | ++ | (7) | 6° | | xx |

Notes: PCC otoliths from Gold Creek O.K. Some tough zonation. A lot of younger fish in this group. Edge a tough call on some.

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Project #16-49 (2016) RSC.

x or xx - possible QAQC samples

**FISH AGING TALLY FORM**

| SAM | EFF | 2016.<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 428 | SandCrk. | April20 | RSC | 01 | | | | Oto. | 4 | ++ | (7) | 5° | | x |
| 429. | ″ | ″ 22 | RSC | 03 | | | | Oto. | 2 | ++ | (7) | 3° | | x |
| 430 | ″ | ″ | RSC. | 06 | | | | Oto. | 2 | ++ | (7) | 3° | | |
| 431 | SankCrk | ″ | ″ | 07 | | | | Oto. | 2 | ++ | (7) | 3° | | x |
| 432 | ″ | ″ | ″ | 08 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 433 | ″ | ″ | ″ | 09. | | | | ″ | 2 | ++ | (7) | 3° | | |
| 434 | ″ | April22 | RSC | 10 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 435 | ″ | ″ | ″ | 11 | | | | Oto. | 2 | ++ | (7) | 3° | | |
| 436 | ″ | ″ | ″ | 12 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 437 | ″ | ″ | ″ | 15. | | | | ″ | 2 | ++ | (7) | 3° | FC2. | |
| 438 | ″ | ″ | ″ | 16. | | | | Oto | 2 | ++ | (7) | 3° | 1oto. | |
| 439 | ″ | ″ | RSC | 19 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 440 | SandCrK | April22 | ″ | 20 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 441 | ″ | ″ | ″ | 21 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 442 | ″ | ″ | ″ | 22. | | | | Oto. | 2 | ++ | (7) | 3° | | |
| 443 | ″ | April 23 | RSC | 23 | | | | Oto. | 2 | ++ | (7) | 3° | | |
| 444 | ″ | ″ | ″ | 24 | | | | ″ | 2 | ++ | (6-7) | 3° | FC2. | |
| 445 | ″ | ″ | ″ | 25 | | | | ″ | 2 | ++ | (7) | 3° | | x |
| 446 | ″ | ″ | ″ | 27 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 447 | ″ | ″ | ″ | 28. | | | | ″ | 2 | + | (7) | 3° | | |
| 448 | ″ | ″ | ″ | 29 | | | | Oto. | 1 | ++ | (7) | 2° | | |
| 449 | SandCrk. | April23 | RSC | 30 | | | | ″ | 2 | ++ | (6-7) | 3° | slower 0-1. | |
| 450 | ″ | ″ | ″ | 31 | | | | ″ | 2 | ++ | (7) | 3° | | x |
| 451 | ″ | April24 | RSC | 32 | | | | Oto. | 2 | ++ | (7) | 3° | | |
| 452 | ″ | ″ | ″ | 33 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 453 | ″ | ″ | ″ | 34 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 454 | ″ | ″ | ″ | 35 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 455 | ″ | ″ | ″ | 36 | | | | ″ | 2 | ++ | (7) | 3° | | x |
| 456 | ″ | ″ | RSC | 37 | | | | Oto. | 1 | ++ | (7) | 2° | | x |
| 457 | ″ | ″ | ″ | 38 | | | | ″ | 2 | ++ | (7) | 3° | | x |
| 458 | ″ | ″ | ″ | 39 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 459 | ″ | ″ | ″ | 40 | | | | ″ | 2 | ++ | (7) | 3° | | |
| 460 | ″ | ″ | RSC | 41 | | | | ″ | 1 | ++ | (7) | 2° | | x |

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Project #16-49 (2016.) RSC.

FISH AGING TALLY FORM

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 461 | Sand Crk | April 24 | RSC | 42 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 462 | " | " | RSC | 43 | | | | Oto. | 3 | ++ | (6) | 4° | Poss. 3° 1st weaker ?? |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 463 | ElkR | April 21 | RSC | 05 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 464 | ElkR | " | RSC | 06 | | | | " | 2 | ++ | (7) | 3° | |
| 465 | " | " | " | 07 | | | | " | 2 | ++ | (7) | 3° | |
| 466 | " | " | " | 09 | | | | " | 2 | ++ | (7) | 3° | |
| 467 | " | " | " | 11 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 468 | ElkR | April 21 | RSC. | 13 | | | | " | 2 | ++ | (7) | 3° | |
| 469 | " | " | " | 14 | | | | " | 2 | ++ | (7) | 3° | |
| 470 | " | " | " | 15 | | | | " | 2 | ++ | (7) | 3° | |
| 471 | " | " | " | 16 | | | | " | 2 | ++ | (7) | 3° | |
| 472 | " | " | " | 17 | | | | " | 1 | ++ | (7) | 2° | |
| 473 | " | April 21 | RSC | 18 | | | | Oto. | 3 | + | (6) | 4° | 3rd near edge ?? |
| 474 | " | " | " | 19 | | | | " | 2 | ++ | (6-7) | 3° | FC(2) |
| 475 | " | " | " | 21 | | | | " | 2 | ++ | (7) | 3° | |
| 476 | " | " | " | 22 | | | | " | 3 | ++ | (7) | 4° | |
| 477 | " | " | " | 23 | | | | " | 2 | ++ | (6-7) | 3° | FC 2-3. |
| 478 | " | " | " | 24 | | | | Oto. | 2 | ++ | " | 3° | " " |
| 479 | ElkR. | April 21 | RSC | 26 | | | | " | 2 | ++ | (7) | 3° | |
| 480 | " | " | " | 27 | | | | " | 2 | ++ | (7) | 3° | |
| 481 | " | " | " | 28 | | | | " | 2 | ++ | (7) | 3° | |
| 482 | " | " | " | 29 | | | | Oto. | 2 | ++ | (6-7) | 3° | FC 0-1. |
| 483 | " | " | " | 30 | | | | " | 2 | ++ | (7) | 3° | |
| 484 | " | " | " | 31 | | | | " | 2 | ++ | (7) | 3° | |
| 485 | ElkR | April 21 | RSC | 32 | | | | Oto. | 2 | ++ | (6-7) | 3° | FC 0-1. |
| 486 | " | " | " | 33 | | | | " | 2 | ++ | " | 3° | |
| 487 | " | " | " | 34 | | | | " | 3 | + | " | 4° | |
| 488 | " | " | " | 35 | | | | " | 2 | ++ | (7) | 3° | |
| 489 | " | " | " | 36 | | | | " | 2 | ++ | (7) | 3° | |
| 490 | " | " | RSC | 37 | | | | Oto. | 1 | ++ | (7) | 2° | |
| 491 | " | " | " | 38 | | | | " | 2 | ++ | (7) | 3° | |

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Project 16-49 (2016) RSC.

## FISH AGING TALLY FORM

| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 492 | ElkR | April 21 | RSC | 39 | | | | Oto. | 1 | ++ | (7) | 2° | |
| 493 | " | " | " | 40 | | | | " | 3 | ++ | (6-7) | 4° | 3rd ? weaker; poss. FC. |
| 494 | " | " 25. | " | 41 | | | | " | 2 | ++ | (7) | 3° | |
| 495 | " | April 25 | RSC | 42 | | | | " | 2 | ++ | (7) | 3° | |
| 496 | ElkR | " | " | 43 | | | | Oto. | 2 | ++ | (7) | 3° | |
| | | | | | | | | | | | | | |
| 497 | GoldCrk | April 21 | RSC | 03 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 498 | " | April 23 | " | 07 | | | | Oto. | 2 | ++ | (7) | 3° | FC? |
| 499 | " | " | " | 08 | | | | " | 2 | ++ | (7) | 3° | FC 2-3. |
| 500 | " | " | " | 09. | | | | " | 2 | ++ | (7) | 3° | |
| 501 | " | " | " | 10. | | | | Oto. | 2 | ++ | (7) | 3° | |
| 502 | " | " | RSC | 11 | | | | " | 2 | ++ | (7) | 3° | |
| 503 | " | " | " | 12 | | | | " | 2 | ++ | (7) | 3° | |
| 504 | GoldCrk | April 23 | RSC. | 13 | | | | " | 2 | ++ | (7) | 3° | |
| 50 | " | " | " | 14 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 506 | " | " | " | 16 | | | | " | 2 | ++ | (7) | 3° | |
| 507 | " | " | " | 17 | | | | " | 1 | ++ | (7) | 2° | |
| 508 | " | " | " | 18 | | | | " | 2 | ++ | (7) | 3° | |
| 509 | " | " | " | 19 | | | | " | 1 | ++ | (7) | 2° | FC? |
| 510 | GoldCrk | April 23 | RSC | 20 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 511 | " | " | " | 21 | | | | " | 2 | ++ | (7) | 3° | |
| 512 | " | April 24 | RSC | 22 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 513 | " | " | " | 23 | | | | " | 4 | ++ | (7) | 5° | |
| 514 | " | " | " | 24 | | | | " | 2 | ++ | (7) | 3° | |
| 515 | " | " | " | 25 | | | | " | 2 | ++ | (7) | 3° | |
| 516 | " | " | " | 26 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 517 | GoldCrk | April 24 | RSC | 27 | | | | " | 1 | ++ | (7) | 2° | |
| 518 | " | " | " | 28 | | | | " | 3 | ++ | (7) | 4° | |
| 519 | " | | " | 29 | | | | " | 2 | ++ | (7) | 3° | |
| 520 | " | " | " | 30 | | | | " | 2 | ++ | (7) | 3° | |
| 521 | " | " | " | 31 | | | | " | 2 | ++ | (7) | 3° | |
| 522 | " | April 24 | RSC | 32 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 523 | " | " | " | 33 | | | | " | 2 | ++ | (7) | 3° | |

↑ Box 1

Box 2 ↓

4.0

Project 16-49 (2016) R.S.C.

## FISH AGING TALLY FORM

| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 524 | Gold Crk | April 24 | RSC | 34 | | | | Oto. | 2 | ++ | (7) | 3° | |
| 525 | " | " | " | 35 | | | | Oto. | 2 | ++ | (6-7) | 3° | FC(2) |
| 526 | " | " | " | 36 | | | | " | 2 | ++ | (7) | 3° | |
| 527 | " | " | " | 37 | | | | " | 2 | ++ | (7) | 3° | FC(2) |
| 528 | Gold Crk | April 24 | RSC | 38 | | | | Oto. | 3 | ++ | (7) | 4° | |
| 529 | " | " | " | 39 | | | | " | 1 | ++ | (7) | 2° | |
| 530 | " | " | " | 40 | | | | " | 2 | ++ | (7) | 3° | |
| 531 | " | " | " | 41 | | | | " | 1 | ++ | (7) | 2° | |
| 532 | " | " | RSC | 42 | | | | " | 1 | ++ | (7) | 2° | |
| 533 | " | " | " | 43 | | | | Oto | 1 | ++ | (7) | 2° | |
| 534 | " | " | " | 44 | | | | " | 2 | ++ | (7) | 3° | |

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Project 16-49. Yellow Perch (2016).

**FISH AGING TALLY FORM**

| NSES # ↓ | SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C124 | 535 | Sand CrK | April/20 | YP. | 01 | | | | Sp. | 2 | H | (7) | 3° | | x |
| | 536 | " | " | " | 02 | | | | Sp. | 2 | H | (7) | 3° | | |
| C126 | 537 | Sand Crk | April/21 | YP | 03 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 538 | " | " | " | 04 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 539 | " | April/22 | YP | 05 | | | | Sp. | 2 | H | (6-7) | 3° | | |
| | 540 | " | April/23 | " | 06 | | | | Sp. | 3 | H | (7) | 4° | | |
| C130 | 541 | " | " | " | 07 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 542 | " | " | " | 08 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 543 | " | " | YP | 09 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 544 | Sand CrK | " | " | 10 | | | | Sp. | 3 | * | (7) | 3* | annulus forming on edge | |
| | 545 | " | " | " | 11 | | | | Sp. | 2 | H | (7) | 3° | FC@2nd | |
| C135 | 546 | " | April/24 | YP | 12 | | | | Sp. | 2 | H | (7) | 3° | FC1-2. | |
| | 547 | " | " | " | 13 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 548 | " | April/25 | " | 14 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 549 | " | " 24 | YP | 15 | | | | Sp. | 2 | H | (6) | 3° | FC@2nd. | |
| | 550 | " | " 27 | " | 16 | | | | Sp. | 2 | H | (7) | 3° | | x |
| C140 | 551 | " | " | YP | 17 | | | | Sp. | 2 | H | (7) | 3° | | x |
| | 552 | " | " | " | 18 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 553 | Sand CrK | " | " | 19 | | | | Sp. | 2 | H | (7) | 3° | FC②. | |
| | 554 | " | " | " | 20 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 555 | " | " | " | 21. | | | | Sp. | 3 | H | (7) | 4° | Poss. 4* @ edge | xx |
| C145 | 556 | " | " | YP. | 22 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 557 | " | " | " | 23 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 558 | " | April/27 | YP | 24 | | | | Sp. | 2 | H | (6-7) | 3° | FC0-1. | |
| | 559 | " | " | " | 25 | | | | Sp. | 2 | H | " | 3° | FC② | |
| | 560 | " | " | " | 26 | | | | Sp. | 3 | H | (7) | 4° | | x |
| C150 | 561 | " | " | " | 27 | | | | Sp. | 3 | H | (7) | 4° | | |
| | 562 | " | " | YP | 28 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 563 | " | " | YP | 29 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 564 | " | " | " | 30 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 565 | " | " | " | 31 | | | | Sp. | 2 | H | (7) | 3° | | |
| C155 | 566 | Sand CrK | April/27 | " | 32 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 567 | " | " | " | 33 | | | | Sp. | 2 | H | (7) | 3° | | |
| C157 | 568 | " | " | " | 34 | | | | Sp. | 2 | H | (7) | 3° | FC1-2. | |

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NSES# Project 16-49. Yellow Perch 2016. (Teck Koocanusa)

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## FISH AGING TALLY FORM

| | SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D1 | 569 | EIKR | April/19 | YP | 01 | | | | Sp. | 2 | ++ | (7) | 3° | Lots of growth 0-1. | |
| | 570 | " | "21 | YP | 02 | | | | Sp | 4 | + | (7) | 5° | " | |
| | 571 | " | " | YP | 03 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 572 | " | " | " | 04 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| D5 | 573 | " | " | " | 05 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| D6 | 574 | EIKR | April/21 | YP | 06 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 575 | " | " | " | 07 | | | | Sp. | 3 | * | (7) | 3* | FC @ 2nd. | |
| | 576 | " | " | " | 08 | | | | Sp. | 1 | ++ | (7) | 2° | | |
| | 577 | " | " | YP | 09 | | | | Sp. | 2 | ++ | (6) | 3° | FC 0-1. | |
| D10 | 578 | " | " | " | 10 | | | | Sp. | 3 | ++ | (7) | 4° | | xx |
| | 579 | " | April/22 | YP | 11 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 580 | " | " | " | 12 | | | | Sp. | 2 | ++ | (6-7) | 3° | FC @ 2nd. | |
| | 581 | " | " | " | 13 | | | | Sp. | 2 | * | (7) | 2* | annulus on edge | |
| | 582 | " | " | " | 14 | | | | Sp. | 1 | ++ | (7) | 2° | | x |
| D15 | 583 | EIKR | " | YP | 15 | | | | Sp. | 2 | ++ | (7) | 3° | | x |
| | 584 | " | April/23 | " | 16 | | | | Sp. | 4 | ++ | (7) | 5° | | xx |
| | 585 | " | " | " | 17 | | | | Sp | 2 | ++ | (7) | 3° | | |
| | 586 | " | " | " | 18 | | | | Sp. | 2 | ++ | (6) | 3° | poor sections | |
| | 587 | " | April/24 | YP | 19 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| D20 | 588 | " | " | " | 20 | | | | Sp. | 2 | ++ | (7) | 3° | | xx |
| | 589 | " | " | " | 21 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 590 | " | " | " | 22 | | | | Sp. | 2 | ++ | (7) | 3° | | x |
| | 591 | EIKR | " | " | 23 | | | | Sp. | 4 | + | (7) | 5° | Poss 4+ | |
| | 592 | " | " | " | 24 | | | | Sp. | 6 | * | (7) | 6* | Poss. 7° @ edge | x |
| D25 | 593 | " | April/25 | YP | 25 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 594 | " | " | " | 26 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 595 | " | " | " | 27 | | | | Sp. | 2 | ++ | (7) | 3° | | x |
| | 596 | " | April/26 | YP | 28 | | | | Sp | 3 | ++ | (7) | 4° | | x |
| | 597 | " | " | " | 29 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| D30 | 598 | " | " | " | 30 | | | | Sp | 2 | ++ | (7) | 3° | FC 1-2. | |
| | 599 | " | " | " | 33 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 600 | " | " | " | 34 | | | | Sp. | 2 | ++ | (6-7) | 3° | | |
| D33 | 601 | " | April/27 | YP | 35 | | | | Sp | 1 | ++ | (7) | 2° | | |

Note: Spines - zonation pretty good on most.

3.0

N.S.E.S. # Project 16-49. Yellow Perch 2016. (Teck Koocanusa.)

**FISH AGING TALLY FORM**

| N.S.E.S. # | SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C158 | 602 | Gold Crk | April 20 | YP | 01 | | | | Sp. | 2 | H | (7) | 3°· | | |
| | 603 | " | " | YP | 02 | | | | Sp | 2 | H | (7) | 3° | | |
| C160 | 604 | " | " | " | 03 | | | | Sp. | 2 | H | (7) | 3° | FC(2) | |
| | 605 | " | " | " | 04 | | | | Sp. | 2 | H | (6-7) | 3° | | |
| | 606 | " | " | YP | 05 | | | | Sp. | 2 | H | " | 3° | | |
| | 607 | " | April 21 | " | 06 | | | | Sp | 3 | H | (7) | 4° | | × |
| | 608 | " | " | " | 07 | | | | Sp. | 2 | H | (7) | 3° | | |
| C165 | 609 | Gold Crk | " | YP | 09 | | | | Sp. | 2 | H | (6-7) | 3° | | |
| | 610 | " | " | " | 10 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 611 | " | " | " | 11 | | | | Sp. | 2 | H | (7) | 3° | | × |
| | 612 | " | " | " | 12 | | | | Sp. | 2 | H | (7) | 3°. | | |
| | 613 | " | " | YP. | 13 | | | | Sp. | 2 | H | (6-7) | 3° | | |
| C170 | 614 | Gold Crk | April 21 | " | 14 | | | | Sp. | 2 | H | (7) | 3° | FC(2). | |
| | 615 | " | " | " | 15 | | | | Sp. | 1 | H | (7) | 2° | " " | |
| | 616 | " | " | " | 16 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 617 | " | " | " | 18 | | | | Sp. | 2 | H | (6-7) | 3° | FC 1-2 | |
| | 618 | " | " | " | 19. | | | | Sp. | 2 | H | (7) | 3° | | × |
| C175 | 619 | " | " | YP | 20 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 620 | " | " | " | 21 | | | | Sp. | 2 | H | (7) | 3° | | × |
| | 621 | Gold Crk | April 21 | " | 22 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 622 | " | April 22 | " | 23 | | | | Sp. | 4 | H | (7) | 5° | | × |
| | 623 | " | " | " | 24 | | | | Sp. | 2 | H | (7) | 3° | | |
| C180 | 624 | " | " | " | 25 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 625 | " | " | YP | 26 | | | | Sp. | 2 | H | (6-7) | 3° | 1st ?, | |
| | 626 | " | " | " | 27 | | | | Sp. | 2 | H | (6) | 3° | FC(2). | |
| | 627 | " | " | " | 28 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 628 | " | " | " | 29 | | | | Sp. | 2 | H | (7) | 3° | | × |
| C185 | 629 | Gold Crk. | April 22 | YP | 30 | | | | Sp. | 2 | H | (7) | 3° | | |
| | 630 | " | April 23 | YP | 31 | | | | Sp. | 5 | * | (7) | 5* | annulus on edge; edge | ? |
| | 631 | " | " | " | 32 | | | | Sp | 2 | H | (7) | 3° | | × |
| | 632 | " | " | " | 33 | | | | Sp. | 2 | H | (7) | 3° | FC(2). | |
| | 633 | " | " | " | 35 | | | | Sp. | 2 | H | (6-7) | 3° | FC(2). | |
| C190 | 634 | " | " | " | 36 | | | | Sp | 3 | H | " | 4° | | |

4.0

Project 16-49. Yellow Perch 2016. (Teck Koocanusa).

**FISH AGING TALLY FORM**

| NSES #↓ | SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C191 | 635 | Gold Crk. | April 24 | YP | 37 | | | | Sp. | 3 | ++ | (7) | 4° | | |
| | 636 | " | " | " | 38 | | | | Sp. | 2 | ++ | (7) | 3° | | x |
| | 637 | " | April 25 | YP | 39 | | | | Sp. | 2 | ++ | (7) | 3° | | |
| | 638 | " | " | " | 40 | | | | Sp. | 2 | ++ | (7) | 3° | | x |
| C195 | 639 | " | " | " | 41 | | | | Sp. | 2 | ++ | (6) | 3° | poor zonation | |
| | 640 | " | April 27 | YP | 42 | | | | Sp. | 2 | ++ | (6-7) | 3° | | |

Note 8 Y Perch otoliths from Gold Creek samples considerably more difficult to assess than previous groups. More false checking and zonation is less clear than previous samples. Annuli not as well defined etc.

2.0

Sport Fish (large) Project #16-49.(2016.)

**FISH AGING TALLY FORM**

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 642 | Sand Ck | April 19 | R.T. | 01 | | | | Oto. | 2 | ++ | (6) | 3° | Vis = 3° 2++ FC 1-2 Poss 4 | 3° |
| 6 " | " | " | " | " | | | | Sc | 1 | ++ | (6) | 2° | FC 0-1 ?? | |
| 643 | Sand Ck | " | R.T. | 02 | | | | Oto | 3 | ++ | (6) | 4° | Vis = 3° 2++ | 4° Poss 3° |
| " | " | " | " | " | | | | Sc. | 2 | ++ | (6-7) | 3° | FC @ 2nd. | |
| 644 | Sand Ck | April 25 | RT | 04 | | | | Oto | 3 | ++ | (6-7) | 4° | FC 0-1. Poss 5° | 4° |
| " | " | " | " | " | | | | Sc | 2 | ++ | (6) | 3° | FC 1-2 ?? | |
| | | Note: Both tissues difficult to assess and not much corelation between two. | | | | | | | | | | | | |
| 645. | Sand Ck | April 19 | WCT | 01 | | | | Oto | 5 | ++ | (6-7) | 6° | 3rd? Poss. 5° | |
| " | " | " | " | " | | | | Sc | 4 | * | (6) | 4* | Poss 5° @ edge | |
| 646 | " | April 21 | WCT | 02 | | | | Sc | 3 | * | (6) | 3* | 1st weak; FC 2-Edge | ? |
| 647 | " | " | " | 03 | | | | Sc | 3 | + | (6-7) | 4° | | |
| | | | | Note: Few scales - some O.K. | | | | | | | | | | |
| 18 | Gold Ck | April 20 | BT | 01 | | | | NO Scales | | | | | | |
| 19 | " | " | BT | 02 | | | | Oto | 4 | ++ | (6-7) | 5° | FC 0-1. x | 5° x |
| " | " | " | " | " | | | | Sc | 3 | ++ | (6) | 4° | | |
| 20 | Gold Ck | " | BT. | 03 | | | | Oto. | 3 | + | (6) | 4° | True annuli? | 4° |
| " | " | " | " | " | | | | Sc | 3 | + | (6-7) | 4° | | |
| 21 | " | April 24 | B.T. | 04 | | | | Oto | 4 | + | (6) | 5° | True annuli | 5° |
| " | " | " | " | " | | | | Sc | 2 | ++ | (5) | 3° | All Regen 1st? | |
| 22 | " | " | BT | 05 | | | | Oto. | 4 | ++ | (6-7) | 5° | 1st? Poss 4° x | 5° x |
| " | " | " | " | " | | | | Sc | 3 | ++ | (6) | 4° | 1st? Poss 5°. | |
| 23 | Gold Ck | April 24 | BT. | 06 | | | | Oto. | 4 | + | (6) | 5° | slow 2-3 ? | 5° |
| " | " | " | " | " | | | | Sc | 3 | + | (6) | 4° | poss 3° 3rd? | |
| 24 | " | April 27 | BT | 07 | | | | Oto. | 4 | ++ | (5-6) | 5° | 2nd Cyst. | 5° |
| " | " | " | " | " | | | | Sc | 3 | ++ | (6) | 4° | | |
| | | | Note: B.T. - Both tissues very tough to age. True annuli tough to sort out | | | | | | | | | | | |
| | | | of otoliths. Scales not great either. | | | | | | | | | | | |
| * 25 | B.S. | Jan 24 | B.B. | 01 | | | | Oto. | 5 | ++ | (6-7) | 6° | | |
| 653 | Gold Ck | April 25 | MW | 02 | | | | Oto. | 3 | ++ | (5-6) | 4° | | 5° |
| " | " | " | " | " | | | | Sc | 4 | ++ | (6) | 5° | | |

* Area B.S. - B.B.

3°

Sport Fish (Large) Project #16-49. (2016.)

**FISH AGING TALLY FORM**

| SAM | EFF | 2016.<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 654 | Gold Crk | April 23 | R.T. | 01 | | | | Oto. | 2 | ++ | (6) | 3° | Vis = 4° 3++ FC0-1 | 3° |
| " | " | " | " | " | | | | Sc | 4 | ++ | (6-7) | 5° | | |
| 655 | Gold Crk | April 24 | R.T. | 02 | | | | Oto | 2 | ++ | (7) | 3° | Vis = 3° 2++ | 3°. |
| " | " | " | " | " | | | | Sc | 2 | ++ | (7) | 3° | | |
| 656 | " | " | RT | 03 | | | | Oto. | 2 | ++ | (6-7) | 3° | Vis = 3° 2++ | 3° |
| " | " | " | " | " | | | | Sc | 3 | ++ | (6) | 4° | FC1-2? | |

Otoliths O.K. - Scales tough to assess. True annuli ??

| SAM | EFF | DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 657 | Gold Crk | April 20 | WCT | 01 | | | | Sc | 3 | * | (6) | 3* | 2 Scales. |
| 658 | " | " 24 | WCT | 02 | | | | Sc | 2 | ++ | (6) | 3° | 2 Scales FC1-2 |
| 659 | " | " | WCT. | 03 | | | | Sc | 2 | ++ | (5-6) | 3° | 1 Scale |

NO scales taken - only 1 or 2 to work with ?

General: Scales generally not well collected for any of the sports species. With many samples very few, if any scales and often dirty. Otoliths generally tough to age on Brook Trout & Rainbow trout from these sampling sites. M Whitefish also tough. May want to try to collect fin rays as well as otoliths and scales if future collections from these sites.

1.0

Project # 16-49.

## FISH AGING TALLY FORM

| SAM | EFF | 2016<br>DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | ER | Aug 28 | KO | 01A | | | | Oto. | 3 | ++ | (7) | 3++ | | x |
| 12 | ER | ″ | KO | 02A | | | | Oto. | 3 | ++ | (6-7) | 3++ | FC(2) | |
| 13 | ″ | ″ | KO | 03A | | | | Oto. | 3 | ++ | (7) | 3++ | 1st weaker | |
| 14 | ″ | ″ | KO | 04A | | | | Oto. | 3 | ++ | (7) | 3++ | | xx |
| 15 | ″ | ″ | KO | 05A | | | | Oto. | 3 | ++ | (7) | 3++ | FC(2) | |
| 16 | ER | Aug 28 | KO | 06A | | | | Oto. | 3 | ++ | (6) | 3++ | 2nd is weaker. | |
| 17 | ″ | ″ | KO | 07A | | | | Oto. | 3 | ++ | (7) | 3++ | FC(2) | |
| 18 | ″ | ″ | KO | 08A | | | | Oto. | 3 | ++ | (6-7) | 3++ | FC(2) | |
| 19 | ″ | ″ | KO | 09A | | | | Oto. | 3 | ++ | (7) | 3++ | | xx |
| 20 | ER | ″ | KO | 10A | | | | Oto. | 3 | ++ | (7) | 3++ | FC(2) | |
| | | | | | | | | | | | | | | |
| 41 | SC | Aug 24 | KO | 01A | | | | Oto. | 3 | ++ | (6) | 3++ | FC 2-3. Poss. 4++ | |
| 42 | SC | ″ | KO | 02A | | | | Oto. | 2 | ++ | (6-7) | 2++ | True annuli ?? FC(2) | |
| 43 | SC | ″ | KO. | 03A | | | | Oto. | 2 | ++ | ″ | 2++ | FC 0-1. | |
| 44 | SC | ″ | KO | 04A | | | | Oto. | 2 | ++ | ″ | 2++ | FC(2) | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 01 | ER | Aug 23 | NSC | 01A | | | | Oto. | 18 | ++ | (6-7) | 18++ | 17++ 19++ Poss ±1 edge | |
| 02 | ″ | ″ | NSC | 02A | | | | Oto. | 15 | + | (6) | 15+ | 14+ · 15+ Poor edge. Poss 16-17. | |
| 03 | ″ | ″ | NSC | 03A | | | | Oto, | 17 | ++ | (5-6) | 17++ | 1 oto. Poss ±1 or 2 @ edge Good to 15th. | |
| 04 | ER | ″ | NSC | 04A | | | | Oto. | 18 | + | (7) | 18+ | 16++ 18+ 18++ | |
| 05 | ″ | ″ | NSC | 05A | | | | Oto. | 14 | + | (6-7) | 14+ | 14+, 15+ edge? Poss ±1 edge | |
| 06 | ″ | ″ | NSC | 06A | | | | Oto. | 10 | ++ | (7) | 10++ | | xx |
| 07 | ER. | Aug 23 | NSC | 07A | | | | Oto. | 8 | ++ | (7) | 8++ | | |
| 08 | ″ | ″ | NSC | 08A | | | | Oto. | 17 | ++ | (7) | 17++ | 1 oto. 17++ 17++ Poss 18+ edge | |
| 09 | ″ | ″ | NSC | 09A | | | | Oto. | 20 | + | (6-7) | 20+ | OK to 15-16. 20+ 20+ Poss. 18-19. | |
| 10 | ER | ″ | NSC | 10A | | | | Oto. | 14 | + | (7) | 14+ | 14+ edge? | |
| | | | Note: Zonation O.K. but tough edges on many of these samples. Poss ±1 or 2 on some fish. Tough to get good breaks. | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 21 | GC | Aug 23 | NSC | 01A | | | | Oto. | 10 | ++ | (7) | 10++ | | x |
| 22 | GC | ″/28 | NSC | 02A | | | | Oto. | 14 | + | (7) | 14+ | 14+ · 14+ | x |
| 23 | ″ | ″ ″ | NSC | 03A | | | | Oto. | 13 | + | (7) | 13+ | 13+ 13+ | xxx |

2.0

Project 16-49.

## FISH AGING TALLY FORM

| SAM | EFF | 2016 DATE | SPC | FISH | FLEN | TLEN | SEX | AGEMT | NCA | EDGE | CONF | AGEA | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | GC | Aug 28 | NSC | 04A | | | | Oto. | 13 | + | (6) | 13+ | 13+; Poss ±1. |
| 25 | GC | " | NSC | 05A | | | | Oto. | 10 | ++ | (7) | 10++ | 2nd Oto PC. |
| 26 | " | " | NSC | 06A | | | | Oto. | 9 | ++ | (7) | 9++ | 9+, 9++ |
| 27 | " | " | NSC | 07A | | | | Oto. | 12 | ++ | (7) | 12++ | |
| 28 | GC | " | NSC | 08A | | | | Oto. | 12 | + | (7) | 12+ | |
| 29 | " | " | NSC | 09A | | | | Oto. | 11 | ++ | (7) | 11++ | |
| 30 | GC | Aug. 28 | NSC | 10A | | | | Oto. | 14 | ++ | (6-7) | 14++ | 14++: Poss ±1 to 2 @ edge |
| | | | Note: Overall, much better breaks & zonation than Elk Creek samples. | | | | | | | | | | |
| 31 | SC | Aug 24 | NSC | 01A | | | | Oto. | 12 | ++ | (7) | 12++ | 12++ |
| 32 | SC | " | NSC | 02A | | | | Oto. | 11 | ++ | (7) | 11++ | |
| 33 | " | " | NSC | 03A | | | | Oto. | 9 | ++ | (7) | 9++ | edge? |
| 34 | " | " | NSC | 04A | | | | Oto. | 11 | ++ | (7) | 11++ | |
| 35 | SC | " | NSC | 05A | | | | Oto. | 13 | ++ | (7) | 13++ | 13++: Poss 14+ @ edge |
| 36 | " | " | NSC | 06A | | | | Oto. | 9 | ++ | (6-7) | 9++ | Poss 10+ @ edge |
| 37 | " | " | NSC | 07A | | | | Oto. | 14 | ++ | (7) | 14++ | 14+ 14++ Poss ±1 @ edge. |
| 38 | " | Aug 28 | NSC | 08A | | | | Oto. | 10 | ++ | (7) | 10++ | 10++ |
| 39 | SC | " | NSC | 09A | | | | Oto. | 15 | + | (6-7) | 15+ | 15+): Poss ±1. |
| 40 | " | " | NSC | 10A | | | | Oto. | 12 | + | (7) | 12+ | |
| | | | Note: Sand Creek. Otoliths in this batch again show pretty good zonation. Some tricky edges but again, better than Elk Creek. | | | | | | | | | | |