NEW GOLD RAINY RIVER MINE
APPENDIX K
PINEWOOD BIOLOGICAL AND SULFATE, MERCURY MONITORING REPORT

PINEWOOD RIVER ANNUAL TERMS OF REFERENCE AND BIOLOGICAL MONITORING REPORT (2024)

REPORT PREPARED FOR:

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PINEWOOD RIVER ANNUAL TERMS OF REFERENCE AND BIOLOGICAL MONITORING REPORT (2024)

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EXECUTIVE SUMMARY

The Rainy River Mine (RRM) is owned by New Gold Inc. (New Gold). The mine is located approximately 65 km northwest of Fort Frances and 420 km northwest of Thunder Bay, Ontario. The RRM is located within the Pinewood River watershed which flows past the mine, eventually draining into the Rainy River approximately 40 km downstream.

Operations at RRM presently include an open pit and underground mining with ore processed at the Rainy River Mill, located on site. The mine has an anticipated mine life of around 16 years (AMEC 2014). The mine came into commercial production in September 2017 and is currently subject to amended Environmental Compliance Approval (ECA) Number 2290-CAVKGN as issued April 14, 2022 by the Ontario Ministry of Environment, Conservation, and Parks (MECP). The Amended ECA includes an allowable throughput of up to 32,400 tonnes of ore per day with a quarterly average throughput of up to 27,000 tonnes per day.

The current Environmental Compliance Approval (ECA, #2290-CAVKGN) issued on April 14, 2022 and the former ECA (# 5178-9TUPD9) contain a number of conditions to assess the potential effects of the mine, particularly discharge and flow regime change, on the receiver, the Pinewood River. This report has been prepared to meet:

- ECA, #2290-CAVKGN Condition 9(3) and Condition 12(8) – A long-term study to evaluate the potential effects of flow reductions on the biological communities within the Pinewood River watershed;
- ECA #7004-BC7KQ5 Condition 10(9) and Condition 12(10) – Potential loadings of sulfate and mercury to the Pinewood River watershed; and,
- Paragraph 35(2)(b) Fisheries Act Authorization #15-HCAA-00039 Condition 2.2.4.

These three above requirements are to be assessed in accordance with the following Terms of Reference (TOR) submitted to MECP as well as in compliance with the terms and schedule within the New Gold Fisheries Offset Plan (AMEC 2015).

- Terms of Reference: Study to Assess Potential Mercury Loadings to the Pinewood River Watershed. Per Environmental Compliance Approval #5178-9TUPD9 Condition 8(5). Version 1, August 2016
- Pinewood River Biological Monitoring Plan. Per Environmental Compliance Approval #5781-9VJQ2J Condition 10(5) and #5178-9TUPD9 Condition 8(7). Version 2. December 2016.

Overview of the Pinewood River Annual Monitoring Study

The annual assessment of a potential mine-related impact on the Pinewood River includes an assessment of:

- water depth in both impounded and non-impounded habitat at four locations in the Pinewood River; (hereafter, Water Level Monitoring);
- site catchment and Pinewood River surface water quality including two reference and four possibly mine-influenced downstream locations (hereafter, Mercury and Sulfate Catchment and Surface Water Assessment and Loadings Assessment);
- the fish community (hereafter, Fish Community Survey); and,
- small-bodied fish tissue mercury concentrations (hereafter, Fish Tissue Analysis).

Conclusions

The current study provided the following conclusions:

- Water level loggers indicate that Area 1–4 non-impounded and impounded habitats continue to exhibit seasonal differences in water level fluctuations mirroring precipitation variations in 2024 and over longer 2021–2024 periods. Area 3 tends to exhibit the highest variability in water level while Area 2 tends to have the highest water levels and lowest variability. Water levels and fluctuations continue to suggest no distinct pattern to suggest the impounded or non-impounded areas are affected by mine-related activities. Beaver activity along the Pinewood River has contributed to the pooling of water along sections of the river and is a possible factor influencing water levels in this vicinity.
- In 2024, mining is likely not a major contributing factor to surface water concentrations of mercury in the Pinewood River. Both site catchment and surface water total and dissolved mercury water concentrations tended to be below detection limits and Provincial Water Quality Objectives (PWQO) and Canadian Council of Ministers of the Environment (CCME) guidelines. The tailings management area site catchment water samples tended to have higher and more variable concentrations than other site catchments (e.g., sediment pond #1 and #2) but still below the PWQO.
- In 2024, site catchment and surface water methylmercury concentrations also continue to remain low and in most cases below the values observed at the reference locations. All concentrations were below CCME guidelines of 4 ng/L. An evaluation of the potential for enhanced methylation (>50% methylmercury:total mercury) revealed sampled site catchments tended to be <5 % and that surface water stations were more variable, tended to be >10% with none exceeding the 50% ratio.

- Total and dissolved mercury loads (i.e., kg/day) attributed to mine discharge and background water were proportional to discharge and background water flows, respectively, because median and 90th percentile concentrations were <DL in all samples.

- Sulfate loads (i.e., kg/day) attributed to mine discharge were higher than background during months of discharge. During months with discharge (12–31% of total river flow), mine-attributed loads were 98-100%.

- Sulfate concentrations in surface water at exposure sites began returning to reference levels in the months after discharge.

- Fish communities in the reference and exposure areas continue to be diverse with 11 to 17 species being identified and with various age classes present. Density and dominant species varied between areas and between years.

- In 2024, Common Shiner (*Luxilus cornutus*) and Central Mudminnow (*Umbra limi*) mean tissue concentrations at all areas were below the consumption guidelines for sensitive populations of 0.5 mg/kg (MECP 2015) and the 0.2 mg/kg fish-protective level (Beckvar et al. 2005). A small proportion of individual Common Shiner tissue results were above the fish-protective level.

- Common Shiner and Central Mudminnow fish tissue mercury concentrations were influenced by a combination of sample areas, length, and sample year. For both species, a large amount of residual variability, after accounting for sample location and length is attributed to Area-Year relationships. Despite being below the 0.5 mg/kg consumption guideline, PWNF has consistently higher mean tissue mercury concentrations than PWREF; its magnitude of difference (MOD) relative to PWREF tends to be above 25% based on multiple models (both 2024 models and models examining longer term trends). Continued monitoring in 2025 with more spatially explicit fish identification may serve useful in examining within-area variability and potential effect of mining activities on Common Shiner and Central Mudminnow at PWNF.

Recommendations

- In 2024, it was identified that Area-Year combinations explain a large proportion of variability in fish mercury concentrations. In past reports, fish from various gear are pooled and then processed. In 2025, a more spatially explicit approach through fish tags that links tissue concentration with sampling gear and location may provide further insight into spatial variability in sites, particularly at PWNF.

- In 2025, more effort should be put into finding larger fish at PWNF which will allow for a wider range of fish sizes.

- Determine feasibility for obtaining lower detection limits for total and dissolved mercury (currently 5 ng/L or 0.000005 mg/L) to better align with detection limits of

methylmercury (currently 0.02 ng/L although it tends to be higher due to sample matrix effects like chemical interference, colour, and turbidity). The terms of reference identified method detection limits of 0.1 ng/L as appropriate. This will make the calculation of the methylmercury:total mercury more accurate. If not possible, consider requesting non-censored analytical values (number produced by the analytical instruments) that could be used in a robust statistical framework for estimating summary statistics (e.g., regression-on-order-statistics for censored data) rather than simple substitution.

- Continue to ensure that site catchments and surface water locations are sampled at least monthly for methylmercury during the open water season to meet the terms of reference objectives.
- Continue to analyze fish mercury data using ANCOVA (using yearly data) and LMMs (for assessing general trends).

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1.0 Introduction

1.1 Background Information

The Rainy River Mine (RRM) is a gold-silver mine located in northwestern Ontario in the District of Rainy River, approximately 65 km northwest of Fort Frances and 420 km west of Thunder Bay (**Figure 1-1**). Located within the Pinewood River watershed, the Pinewood River flows past the RRM and continues for approximately 40 km until the confluence with Rainy River. The mine occupies approximately 6,050 hectares of land and is owned by New Gold Inc. (New Gold).

The RRM began processing ore in September 2017, fifty years after it was first explored in 1967. In 2005, the project was acquired by Rainy River Resources Ltd. with initial baseline studies conducted in 2008. In 2013, the RRM was acquired by New Gold. An Environmental Assessment (EA) report, which included baseline conditions, was submitted in 2014 (AMEC, 2014). Provincial and Federal EA approvals were granted in 2015 leading to the RRM site construction.

Effluent discharge at the mine is intermittent and is regulated by the mine's current provincial ECA (Number 2290-CAVKGN) issued by the MECP April 14, 2022. This ECA provides flow and seasonal requirements for discharge. Discharge of both treated water and site run-off is intermittent and based on precipitation (i.e., river flow) rather than mine production with the mine being self-sufficient from a water recycling point of view. The locations of the four discharge points (currently three active: SED2, EDL1, EDL2) are provided in **Figure 1-1**.

1.2 Objectives of the Current Report

Compliance with New Gold's ECA conditions as well as conditions of their Fisheries Act Authorization #15-HCAA-00039 require several annual aquatic studies to be conducted on the Pinewood River. The study components described herein are intended to meet the requirements of Condition 9(3) and Condition 10(9) of the current ECA and were conducted following methods established in previously submitted Terms of Reference (TOR; AMEC, 2016, 2016b).

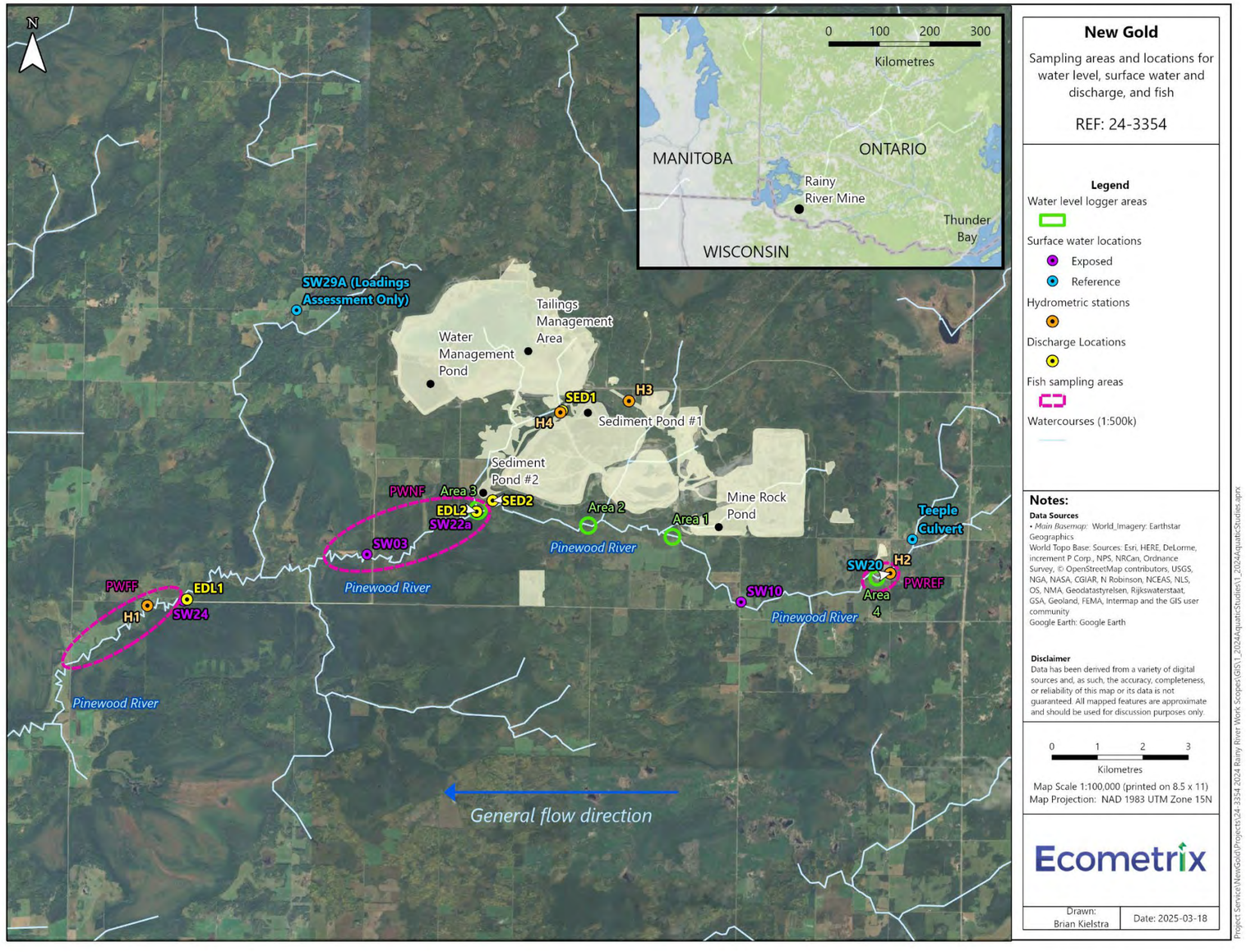

Figure 1-1: Water level, surface water and discharge, and fish collection locations near Rainy River Mine, 2024.

2.0 General Approach to Pinewood River Annual Monitoring Program

The 2024 Pinewood Annual River Monitoring Program consisted of surveys designed to evaluate potential effects associated with changes in flow of the Pinewood River and catchment and effluent discharge on the resident Pinewood River fish community. The four components were:

1. Water Level Monitoring;
2. Mercury and Sulfate Catchment and Surface Water Assessment and Loadings Assessment;
3. Fish Community Survey; and,
4. Fish Tissue Analysis.

The Water Level Monitoring and Mercury and Sulfate Catchment and Surface Water Assessment and Loadings Assessment components were completed from January to December 2024. To address changes to water level, previously installed water level loggers were monitored in both impounded and non-impounded locations within four distinct areas along the Pinewood River (**Figure 1-1**). To address changes in mercury and sulfate concentrations, water samples were collected from site catchments (i.e., distinct areas on the mine site that collect/retain water) as well as four potential exposure stations and two upstream reference stations along the Pinewood River (**Figure 1-1**). Measurements were compared across sites in 2024 and against the time series from previous reports.

The Fish Community Survey and Fish Tissue Analysis component sampling occurred during July 2024; the typical low water season as outlined in the Terms of Reference (TOR) (AMEC, 2016). Three areas along the Pinewood River near the mine were sampled: two exposure areas downstream of each of the major effluent discharges, and one reference area, upstream of the mine site and outside the influence of the mine operations. These areas were the same as those used in previous iterations of the monitoring program:

- the Reference area (PWREF) upstream of RRM.
- a Near-field area (PWNF), downstream of the EDL2 Loslo Creek discharge; and,
- a Far-field area (PWFF), downstream of the EDL1 discharge (**Figure 1-1**).

The fish community assessment utilized, at the minimum, the prescribed amount of fishing effort required according to the TOR (AMEC, 2016b). The amount of minimum effort is provided in **Table 2-1**.

Details of the individual components for the assessments are provided in subsequent sections.

Table 2-1: Summary of annual Pinewood River monitoring program components.

Attribute	Monitoring Requirement	Report Schedule
Fish Habitat	Water Level monitoring (2 loggers per area; 1 for non-impounded [Type 1] habitat and 1 for impounded [Type 2] habitat).	Annual Reports are due to both the MECP and the DFO on or before March 31 of each year.
Fish Species Presence (Richness), Life Cycle Usage (Length frequency histograms), Abundance (Catch Per Unit Effort), and Tissue Quality (Mercury concentrations)	Fish Sampling will be conducted annually during the summer for 5 years.	
	Tissue quality sample size per area: 50 adult Common Shiner	
	Minimum effort per area: • Minnow traps (600 traps hours) • Seine nets (9 individual 15 m net hauls) • Electrofishing (3,000 seconds) • Gill nets (6 standard gill net sets (50 m multiple mesh panels for 12 to 16 hrs per set.	

3.0 Water Level Monitoring

The following section outlines work completed and results of the Water Level Monitoring component. The key results are as follows:

- Non-impounded Type 1 Habitat and Impounded Type 2 Habitat continue to show seasonal variability in water levels in 2024 and over longer 2021–2024 periods examined. The relative response to precipitation varies by Area. Area 3, the most downstream, tends to exhibit the highest variability in water level in response to precipitation events;
- Area 2 Non-impounded Type 1 Habitat and Impounded Type 2 Habitat continue to have the highest water levels and lowest variability in 2024 and over longer 2021–2024 periods. Area 2 Impounded Type 2 Habitat had a significant positive long-term trend in water level.
- Area 1 Impounded Type 2 Habitat had an abrupt increase in water level coincident with a precipitation event and sustained this increase throughout 2024. New Gold staff confirmed that this is related to new beaver activity downstream of the transducer this year.
- Water levels and fluctuations continue to suggest no distinct pattern identified to suggest the impounded or non-impounded areas are affected by mine-related activities.

Further details are outlined in **Sections 3.1–3.3** below.

3.1 Sample Collection

In 2017, eight Solinst 3001 LT Levelogger Edge M10 water level loggers were installed to monitor water levels in the Pinewood River. Pairs of loggers were installed in four areas with one logger installed in a narrow non-impounded area (Type 1 Habitat) and the other installed in an impounded area (Type 2 Habitat; AMEC, 2018; **Figure 1-1**). A central barometric logger was deployed to correct water level for atmospheric pressure changes. Loggers recorded water pressure and temperature at 15-minute intervals. Loggers were retrieved and data were downloaded and provided to Ecometrix by the RRM Environmental Department.

3.2 Data Analysis

Ecometrix exported raw data from logger download files using Solinst Levelogger Software. Data were screened for abnormal values. Levelogger and barometric sensor values were converted to water column equivalent (mH_2O). Levelogger values were barometrically corrected by subtracting the barometric mH_2O from the levelogger mH_20 (Solinst Canada Ltd., 2023).

Plots and summary statistics for 2024 as well as for data from previous Ecometrix reports (years 2021–2024) were used to evaluate trends in water level over time. In some cases, previous reports contained missing data (e.g., Area 4) or abnormal values that were screened out. In 2024,

on December 13th there were records of <0 which did not align with the rest of the data; these were excluded from calculations and plots. Medians were calculated per month to evaluate positive/negative trends in water level per year and over the whole time series using a Spearman rank correlation test; monthly medians were used to reduce smaller-scale variability and avoid autocorrelation properties (i.e., that level depends on the previous level to a certain extent) when the goals are related to general trends in water level.

3.3 Results

In 2024, plots of Non-impounded Type 1 Habitat and Impounded Type 2 Habitat continued to reflect seasonal cycles and precipitation patterns as in previous reports. Generally, water levels increased coincident with snowmelt and gradually declined until October after which levels rose. Precipitation events were associated with shorter increases and subsequent decreases in water level (**Figure 3-1)**. These trends were similar over the longer period from 2021–2024 (**Figure 3-2**).

For Non-impounded Type 1 Habitat ordered from upstream to downstream, the 2024 median and range of water level in Area 4 was 0.840 (0.619–1.834) mH_2O, in Area 1 was 1.285 (0.761–1.881 mH_2O, in Area 2 was 1.445 (1.057–2.687) mH_2O, and in Area 3 was 1.320 (0.772–2.378) mH_2O. Therefore, minimum to maximum fluctuations tended to be around 1.2–1.5 mH_2O across all areas and that, in general, water level in Area 2 > Area 3 > Area 1 >Area 4 with largely overlapping ranges during spring freshet and precipitation events (**Figure 3-1**). The coefficient of variation (CV) was 0.207 for Area 4, 0.204 for Area 1, 0.078 for Area 2, 0.215 for Area 3 indicating that, in general, water level fluctuations in Area 3 > Area 4 ≈ Area 1 > Area 2 (**Table 3-1**, **Figure 3-1**). This contrasts slightly to 2023 where Area 4 was more variable but follows the general pattern of Area 3 being the most variable from 2021–2024 (**Table 3-1**, **Figure 3-2**). Area 2 tends to have the highest water level and less susceptibility to precipitation events based on longer term trends (**Table 3-1**, **Figure 3-2**). There was a statistically significant increasing trend in water level in Area 3 ($p < 0.05$; **Table 3-2**) but not in other Areas.

For Impounded Type 2 Habitat, the 2024 median and range of water level in Area 4 was 0.152 (0.000–1.254) mH_2O, in Area 1 was 1.285 (0.642–1.728) mH_2O, in Area 2 was 2.376 (2.029–2.601) mH_2O, and in Area 3 was 0.842 (0.311–1.898) mH_2O. Therefore, minimum to maximum fluctuations tended to be around 0.3–1.5 mH_2O across all areas and that, in general, water level in Area 2 > Area 1 > Area 3 >Area 4 with largely overlapping ranges during spring freshet (**Figure 3-1**). The CV was 0.982 for Area 4, 0.204 for Area 1, 0.041 for Area 2, and 0.322 for Area 3 indicating that, in general, water fluctuations in Area 4 > Area 3 >Area 1 > Area 2. This contrasts slightly to the general pattern of Area 3 being most variable in 2021 and 2022 but is consistent with findings from 2023 (**Table 3-1**, **Figure 3-2**). Again, Area 2 tends to have the highest water level and less susceptibility to precipitation events based on longer term trends (**Table 3-1**, **Figure 3-2**). There was a statistically significant increasing trend in water level in Area 2 and 3 ($p < 0.05$; **Table 3-2**) but not in other Areas.

The abrupt increase in and sustained change in water level at Area 1 is related to new beaver activity confirmed by New Gold Staff along the Pinewood River, as this has contributed to the

pooling of water along sections of the river and is possibly a factor influencing water levels in this vicinity.

Together, these seasonal findings and occasional abrupt changes continue to suggest no distinct pattern in the impounded or non-impounded areas that could indicate an effect of mine-related activities.

Table 3-1: Water levelogger summary statistics by Area and Habitat Type from 2021–2024. Areas are ordered upstream (reference Area 4) to downstream (exposure Area 1–3). Habitat Types are 1 – Non-impounded and 2 – Impounded.

Area	Type	Year	N	Mean	SD	CV	Min	Q25	Q50	Q75	Q95	Max
4	1	2021	--	--	--	--	--	--	--	--	--	--
4	1	2022	2712	0.942	0.085	0.091	0.804	0.878	0.915	0.992	1.105	1.143
4	1	2023	35040	0.808	0.204	0.253	0.566	0.677	0.740	0.861	1.181	1.895
4	1	2024	35035	0.876	0.182	0.207	0.619	0.746	0.840	0.950	1.227	1.834
4	2	2021	--	--	--	--	--	--	--	--	--	--
4	2	2022	33561	0.987	0.154	0.156	0.743	0.862	0.948	1.098	1.259	1.617
4	2	2023	35040	0.441	0.266	0.604	0.002	0.222	0.448	0.600	0.937	1.435
4	2	2024	34024	0.206	0.202	0.982	0.000	0.074	0.152	0.248	0.624	1.254
1	1	2021	34158	1.249	0.345	0.276	0.434	1.126	1.341	1.508	1.615	1.753
1	1	2022	33661	1.367	0.135	0.099	1.119	1.270	1.342	1.420	1.652	1.901
1	1	2023	35040	1.132	0.229	0.203	0.761	0.935	1.037	1.346	1.467	1.881
1	1	2024	35035	0.8758	0.1816	0.2073	0.6179	0.7459	0.8395	0.9505	1.2274	1.8342
1	2	2021	33297	0.894	0.312	0.349	0.284	0.621	1.045	1.120	1.254	1.398
1	2	2022	35183	1.039	0.157	0.151	0.842	0.937	0.989	1.060	1.383	1.801
1	2	2023	35040	0.892	0.173	0.194	0.584	0.789	0.891	0.969	1.186	1.748
1	2	2024	35035	1.185	0.242	0.204	0.642	0.942	1.285	1.392	1.489	1.728
2	1	2021	34158	1.364	0.196	0.144	1.021	1.166	1.393	1.514	1.673	1.741
2	1	2022	33667	1.632	0.154	0.095	1.291	1.513	1.669	1.757	1.817	2.117
2	1	2023	35040	1.642	0.179	0.109	1.265	1.466	1.647	1.810	1.867	2.043
2	1	2024	35035	1.412	0.110	0.078	1.057	1.345	1.445	1.485	1.538	1.687
2	2	2021	33297	2.013	0.194	0.097	1.674	1.817	2.045	2.162	2.320	2.387
2	2	2022	33669	2.275	0.154	0.068	1.942	2.148	2.308	2.406	2.470	2.615
2	2	2023	35040	2.390	0.092	0.038	2.179	2.306	2.408	2.468	2.506	2.624
2	2	2024	35035	2.357	0.097	0.041	2.029	2.312	2.376	2.427	2.477	2.601
3	1	2021	34158	0.79	0.318	0.403	0.346	0.524	0.708	0.936	1.503	1.934
3	1	2022	35187	1.256	0.392	0.312	0.661	0.948	1.256	1.388	2.043	3.008
3	1	2023	35040	1.276	0.229	0.18	0.663	1.178	1.28	1.326	1.603	2.6
3	1	2024	35035	1.342	0.288	0.215	0.772	1.105	1.320	1.574	1.756	2.378
3	2	2021	33297	0.339	0.313	0.923	0.000	0.097	0.241	0.476	1.042	1.481
3	2	2022	32212	0.776	0.404	0.521	0.200	0.431	0.759	0.926	1.598	2.551
3	2	2023	35040	0.813	0.225	0.276	0.230	0.724	0.806	0.854	1.133	2.141
3	2	2024	35035	0.858	0.276	0.322	0.311	0.634	0.842	1.073	1.264	1.898

Notes:
N is number of observations.
SD is standard deviation.
CV is coefficient of variation
Q represent quantiles (i.e., percentiles).
Units except for CV in mH_2O.

Table 3-2: Water levelogger correlations between water depth and time by Area and Habitat Type from 2021–2024. Areas are ordered upstream (reference Area 4) to downstream (exposure Area 1–3). Habitat Types are 1- Non-impounded and 2 – Impounded. See notes.

Area	Type	Spearman's ρ	Bootstrapped p-value
4	1	-0.23	0.263
4	2	-0.17	0.313
1	1	0.08	0.297
1	2	0.09	0.524
2	1	0.27	0.063
2	2	0.52	<0.001
3	1	0.32	0.027
3	2	0.32	0.026

Notes: Spearman's ρ (rho) is a measure of the correlation between two variables. Here, it is a correlation with time. A high positive value indicates water level has increased through time. Spearman's ρ ranges from -1 to 1, where values closer to 1 indicate a higher correlation strength. Generally, correlation coefficients > |0.3| indicate moderate and > |0.5| indicate strong correlations. There is no assumption of the shape of the trend (i.e., linear, exponential). The p-value can be considered a measure of the statistical significance of the trend, with a low number indicating the relationship is not likely due to random chance.

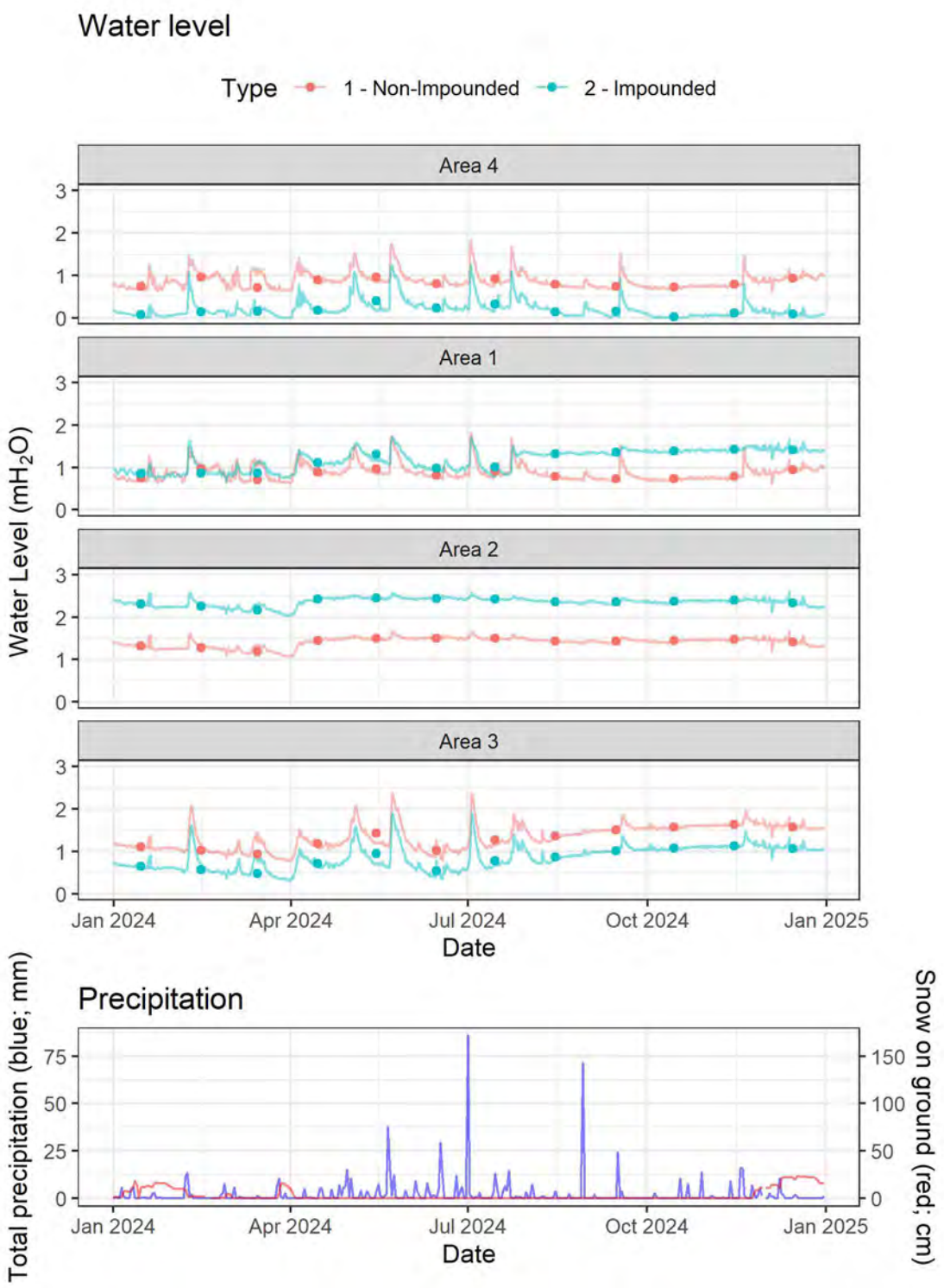

Figure 3-1: Water level logger data from the Pinewood River in Non-impounded Type 1 and Impounded Type 2 habitat types in 2024. Precipitation data from nearby (<30 km) BARWICK weather station. Areas are ordered upstream (reference Area 4) to downstream (exposure Area 1–3). Dots are monthly medians.

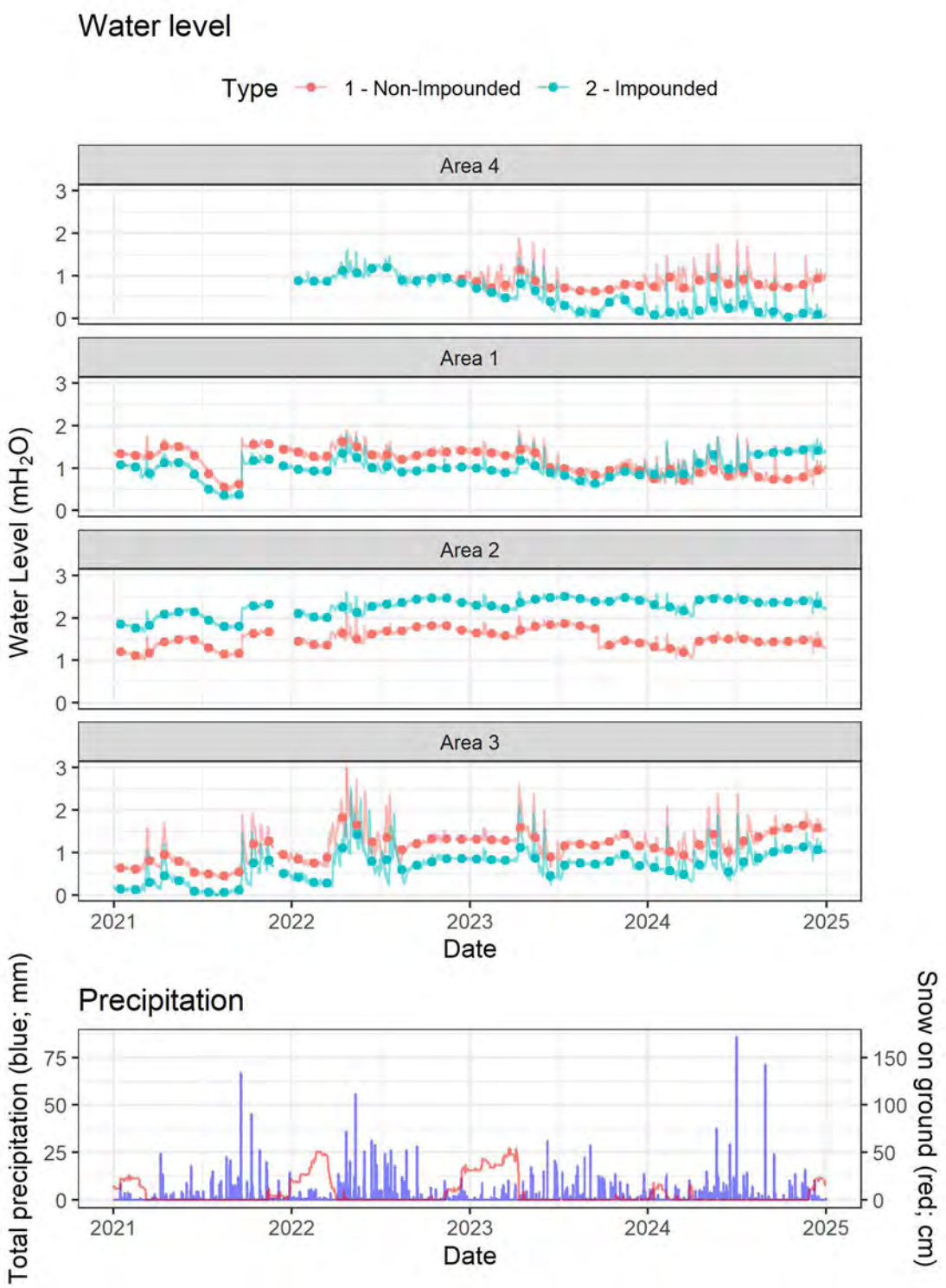

Figure 3-2: Water level logger data from the Pinewood River in Non-impounded Type 1 and Impounded Type 2 habitat types from 2021–2024. Precipitation data from nearby <30 km) BARWICK weather station. Areas are ordered upstream (reference Area 4) to downstream (exposure Area 1–3). Dots are monthly medians.

4.0 Mercury and Sulfate Catchment and Surface Water Assessment and Loadings Assessment

4.1 Context

The following is summarized from text and references within the original Terms of Reference document (AMEC, 2016).

Environmental mercury is found in three principal states:

- Inorganic ionic mercury (mainly Hg^{2+});
- Elemental mercury (Hg); and
- Methylmercury.

The methylmercury form is of most concern as it is readily taken up and biomagnified by fish and wildlife (i.e., absorbed faster than excreted) and subsequently by human consumers.

Methylmercury is primarily formed from converting inorganic mercury to methylmercury in reducing environments by sulfate reducing bacteria (SRB). Examples of reducing environments include organic soils that can provide the largest reservoir for active flux of methylmercury in the environment.

Addition of sulfate to waterbodies can increase SRB growth and the subsequent release of methylmercury; maximum methylation rates occur at redox boundaries associated with fluctuating water levels. At RRM, it is expected that sulfate in drainage waters will increase as a result of ore and mine rock sulfide (S^{2-}) oxidation and that releases will vary with time and location.

The optimal sulfate concentration for mercury methylation by SRB is approximately 10–50 mg/L. Below this level, SRB growth is inhibited while, above this level, sediment sulfide concentrations may limit mercury availability for methylation – it is hypothesized high sulfide concentrations form charged Hg-S ligand pairs that are unable to pass through SRB cell membranes.

Sulfate can be converted to sulfide by SRB in organic sediments where formaldehyde (CH_2O) is present:

$$2CH_2O + SO_4^{2-} \rightarrow H_2S + 2HCO_3^-,$$

which can result in sulfide ions reacting with metal ions to form insoluble metal sulfide precipitates according to:

$$M^{2+} + S^{2-} \rightarrow MS_{precipitate}.$$

Mercury sulfide is stable compared to other metal sulphides and unavailable for methylation if anoxic conditions are maintained in the sediments. Upon oxidation, sulfide is converted to sulfate and mercury becomes available for methylation.

Mine effluent treatment works (e.g., Water Management Pond) or mineral stockpiles that drain to effluent treatment facilities can contain and/or generate mine contact waters with elevated sulfate concentrations which can increase mercury methylation. Freshwater diversion ponds not part of effluent treatment facilities, when flooded, can also increase mercury methylation through their anoxic conditions.

The purpose of the following sections is to assess 2024 mercury and sulfate concentrations in site catchments (i.e., distinct areas on the mine site that collect/retain water), Pinewood River receiver areas and, where possible, compare these concentrations to longer term trends.

4.2 Overview of Findings

The key results of the Mercury and Sulfate Catchment and Surface Water Assessment are as follows:

- Total and dissolved mercury water concentrations across all site catchments and months except the tailings management area (TMA) and SED1 were below detection limits (5 ng/L)and therefore below both PWQO of 200 ng/L and CCME guideline of 26 ng/L dissolved mercury. The TMA and SED1 had higher and more variable concentrations than other site catchments but were below the PWQO.

- Site catchment methylmercury was not sampled as often as total and dissolved mercury. All locations were sampled at least once and all sites were well below the CCME 4 ng/L guideline.

- Site catchment sulfate concentrations tended to be consistent through time at each location but ranged widely across locations. As expected, mine effluent treatment works had elevated sulfate concentrations with the mine rock pond (MRP), TMA, and water management pond (WMP) tending to be higher than the British Columbia Ministry of Environment and Climate Change Strategy (BCMECCS) guideline of 429 mg/L at 250 mg/L hardness.

- Surface water total and dissolved mercury concentrations at all sites were below detection limits (5 ng/L) and below the PWQO of 200 ng/L and CCME guideline of 26 ng/L.

- Surface water methylmercury concentrations were above the detection limits (0.02 ng/L) with no statistical difference between reference sites and exposure sites. There were statistical temporal differences associated with Month due to modest increased concentrations in June, July, and August, but all concentrations were below CCME guidelines of 4 ng/L.

- The BCMECCS sulfate guideline can change depending on water hardness. Surface water sulfate concentrations fell below the BCMECCS sulfate guideline at their respective water hardness. A high proportion of samples (98%) were also below the 128 mg/L (at hardness 0–30 mg/L, the lowest guideline). Statistical differences were observed for Area and Month largely driven by higher concentrations downstream of EDL1 in November relative to reference sites.

- Total and dissolved mercury loads (i.e., kg/day) attributed to mine discharge and background water were proportional to discharge and background water flows, respectively, because median and 90th percentile concentrations were <DL in all samples.

- Sulfate loads (i.e., kg/day) attributed to mine discharge were higher than background during months of discharge. During months with discharge the discharge accounted for 12-31% of the river flow and 98-100% of the loadings.

- Sulfate concentrations in surface water at exposure sites tended to return to reference levels in the months after discharge.

- An evaluation of the potential for enhanced methylation (>50% methylmercury:total mercury) revealed site catchments were consistently <5% and that surface water stations tended to be more variable and >10% but none exceeded the 50% ratio.

Further details are outlined in **Sections 4.3–4.7** below.

4.3 Sample Collection

In 2024, RRM Environmental Department staff collected the routine water quality samples for the Mercury and Sulfate Catchment and Surface Water Assessment component as part of their sampling requirements for monitoring programs.

For the catchment assessment, samples were taken from the Tailings Management Area (TMA amalgamating all TMA Cell 1 and Cell 2 per discussions with RRM Environmental Department Staff), Mine Rock Pond (MRP), Water Management Pond (WMP), Sediment Pond 1 (SED1), and Sediment Pond 2 (SED2) (**Figure 1-1**).

For the surface water assessment, samples were collected at two reference locations upstream of the mine (Teeple Culvert and SW20) and four stations proceeding downstream from potential mine influence along the Pinewood River (SW10, SW22A, SW03 and SW24). Sample locations in relation to the mine infrastructure are provided in **Figure 1-1** and are the same as those used in previous annual assessments.

Each sample was collected below the surface into an upstream facing pre-labelled sample bottle to avoid floating material and contamination by the sample collector. Preservative was added in the field following collection, if required. Samples were kept in coolers with ice and transported to the RRM environmental laboratory. Upon arrival at the laboratory on site samples were either

shipped the same day or stored in the refrigerator prior to shipment to ALS in Thunder Bay. Available sample values for mercury (total, dissolved, and total methylmercury), sulfate (as SO_4), and hardness (as $CaCO_3$) were taken from laboratory reports for analysis.

4.4 Data Analysis

4.4.1 Site Catchments and Surface Water Assessment

For site catchments and surface water, each of the five water quality parameters (total mercury, dissolved mercury, methylmercury, sulfate, and hardness) were summarized on an annual basis and evaluated graphically. Concentrations reported were also compared to PWQOs (OMOEE, 1994), the CCME (CCME 2024), and, for sulfate, the BCMECCS water quality guidelines (BCMECCS 2023). For all parameters, when a value was <DL the DL value was used as a conservative estimate for the evaluation. These values were used when generating summary statistics.

For surface water, parameters were evaluated graphically both within the 2024 sampling year and by comparing the mean values at each sampling locations for each parameter since the program began in 2017.

Following AMEC (2016), two-way Analysis of Variance (ANOVA) was undertaken to examine differences in means between reference (Teeple Culvert and SW20) and exposure (SW10, SW22A, SW03, and SW24) and across months. Only methylmercury and sulfate models were completed because almost all values for total mercury and dissolved mercury were below detection limits (DL). Statistical differences were assessed at the $p = 0.05$ significance level. For sulfate, values were log10-transformed to better meet the normality and equal variance assumptions of ANOVA.

4.4.2 Discharge Loadings Assessment

A loadings assessment of mine discharge relative to background was completed for total mercury, dissolved mercury, and sulfate in 2024. Methylmercury could not be assessed as there was no coincident sampling in the mine discharges (SED2, EDL2, and EDL1) to facilitate its assessment. In general, average monthly flow readings (units: m^3/day) were multiplied by monthly concentrations (median and 90^{th} percentile; units: mg/L) and subsequently converted to monthly loading rates (units: kg/day) for the three parameters. Loadings from mine discharge were compared to loadings from background.

RRM uses flow readings taken downstream of EDL1 (H1) to guide permitted discharge per their ECA. Flow readings are also gathered upstream of mine influence at H2 (in Water Level Monitoring Area 4). Discharge sites from upstream to downstream are SED1 which doesn't currently discharge; and SED2, EDL2, and EDL1 which discharge intermittently as a function of H1 flow. H2 is representative of water entering the zone of mine influence whereas H1 is representative of flow as the Pinewood River migrates outside of mine influence.

Monthly average flow rates were calculated during 2024 for mine discharge locations and background. Since H1 encompasses flow from all upstream sources including mine discharge locations and background, background flow was calculated as:

$$\text{Background} = H1 - (SED1 + SED2 + EDL2 + EDL1), \quad (1)$$

where the units of each are in m^3/day.

Monthly median and 90th percentile concentrations were also calculated in mg/L during 2024 for mine discharge locations and background. For all constituents, when a value was <DL the DL was conservatively substituted for the sample. Background concentration was assumed to be the average of the two upstream reference sites (Teeple Culvert and SW20).

Average monthly loading rates were subsequently calculated from monthly average flow rates and monthly median and 90th percentile concentrations and converted to units of monthly average kg/day.

4.5 Results

4.5.1 Site Catchments and Surface Water Assessment

4.5.1.1 Site Catchments

In 2024, site catchment surface water concentrations of total and dissolved mercury at all locations except the TMA and SED1 were below detection limits of 5 ng/L and therefore below the PWQO of 200 ng/L and CCME guideline of 26 ng/L (**Table 4-1**, **Figure 4-1**). The TMA and SED1 was well below the 200 ng/L guideline (median: 37.8 ng/L and <5 ng/L, respectively) but had higher and more variable concentrations for total and dissolved mercury than other sites (**Table 4-1**, **Figure 4-1**).

Methylmercury was sampled during the ice-free season. At MRP, all samples were below detection limits of 0.02 ng/L. At TMA, three out of four samples were below detection limits. The remaining sites had detectable levels of methylmercury but were all <1 ng/L, well below the CCME 4 ng/L guideline (**Table 4-1**, **Figure 4-1)**.

Sulfate concentrations tended to be consistent through time at each location but range widely across locations (**Table 4-1**, **Figure 4-2**). For example, median and range concentration at SED1 was 28.0 (minimum 19.8 to maximum 56.7) mg/L whereas at the TMA it was 964 (minimum 563.0 to 1240.0) mg/L and in the MRP it was 799.0 (minimum 418.0 to 1350.0) mg/L. Generally, concentrations were SED1 < SED2 < WMP < MRP < TMA. Concentrations at MRP, TMA, and WMP were generally above the BCMECCS guideline for the protection of aquatic life of 429 mg/L sulfate using a hardness value of 250 mg/L.

Table 4-1: Catchment water parameter summary statistics, 2024.

Catchment	Parameter	N	N < DL	Mean	SD	CV	Min	Q25	Q50	Q75	Q95	Max
MRP	Mercury - Total (ng/L)	37	37	5	0	0	5	5	5	5	5	5
SED1	Mercury - Total (ng/L)	36	36	6.3	7.5	1.2	5	5	5	5	5	50
SED2	Mercury - Total (ng/L)	29	29	5	0	0	5	5	5	5	5	5
TMA	Mercury - Total (ng/L)	35	0	37.6	22.1	0.6	9.5	15.0	37.8	57.2	68.3	81.1
WMP	Mercury - Total (ng/L)	27	27	5	0	0	5	5	5	5	5	5
MRP	Mercury - Dissolved (ng/L)	37	37	5	0	0	5	5	5	5	5	5
SED1	Mercury - Dissolved (ng/L)	36	36	5	0	0	5	5	5	5	5	50
SED2	Mercury - Dissolved (ng/L)	29	29	5	0	0	5	5	5	5	5	5
TMA	Mercury - Dissolved (ng/L)	35	2	33.1	22.9	0.7	5.0	11.7	28.6	54.0	65.7	78.6
WMP	Mercury - Dissolved (ng/L)	27	27	5	0	0	5	5	5	5	5	5
MRP	Methylmercury - Total (ng/L)	7	7	0.02	0	0	0.02	0.02	0.02	0.02	0.02	0.02
SED1	Methylmercury - Total (ng/L)	8	0	0.149	0.076	0.514	0.077	0.090	0.140	0.163	0.270	0.300
SED2	Methylmercury - Total (ng/L)	7	0	0.150	0.163	1.087	0.056	0.067	0.081	0.135	0.406	0.511
TMA	Methylmercury - Total (ng/L)	4	3	0.061	0.067	1.110	0.020	0.020	0.031	0.072	0.142	0.160
WMP	Methylmercury - Total (ng/L)	6	0	0.073	0.049	0.669	0.021	0.033	0.066	0.112	0.133	0.137
MRP	Hardness (mg/L)	37	0	921	197	0	517	788	872	1040	1246	1450
SED1	Hardness (mg/L)	36	0	149	26	0	106	125	148	172	184	206
SED2	Hardness (mg/L)	29	0	396	96	0	74	416	430	442	466	475
TMA	Hardness (mg/L)	35	0	588	50	0	407	566	605	622	636	658
WMP	Hardness (mg/L)	27	0	527	112	0	23	526	542	566	628	670
MRP	Sulfate - Total (mg/L)	37	0	798.0	181.9	0.2	418.0	698.0	799.0	878.0	1058.0	1350.0
SED1	Sulfate - Total (mg/L)	36	0	29.8	7.4	0.2	19.8	23.9	28.0	33.9	40.9	56.7
SED2	Sulfate - Total (mg/L)	29	0	326.4	100.4	0.3	56.4	305.0	334.0	416.0	445.8	462.0
TMA	Sulfate - Total (mg/L)	35	0	965.9	129.7	0.1	563.0	909.5	964.0	1010.0	1150.0	1240.0
WMP	Sulfate - Total (mg/L)	27	0	640.9	150.7	0.2	28.5	613.5	650.0	727.0	783.7	844.0

Notes:
For all summary statistics, the detection limit (DL) is conservatively substituted for the parameter value when calculating the statistic.
In one instance (SED1), there was an atypical <DL value where the DL was 50 ng/L instead of the typical 5 ng/L. Summary statistics reflect findings based on this value.
N is number of observations.
DL is detection limit.
SD is standard deviation.
CV is coefficient of variation
Q represent quantiles (i.e., percentiles).
-- indicates no data available.

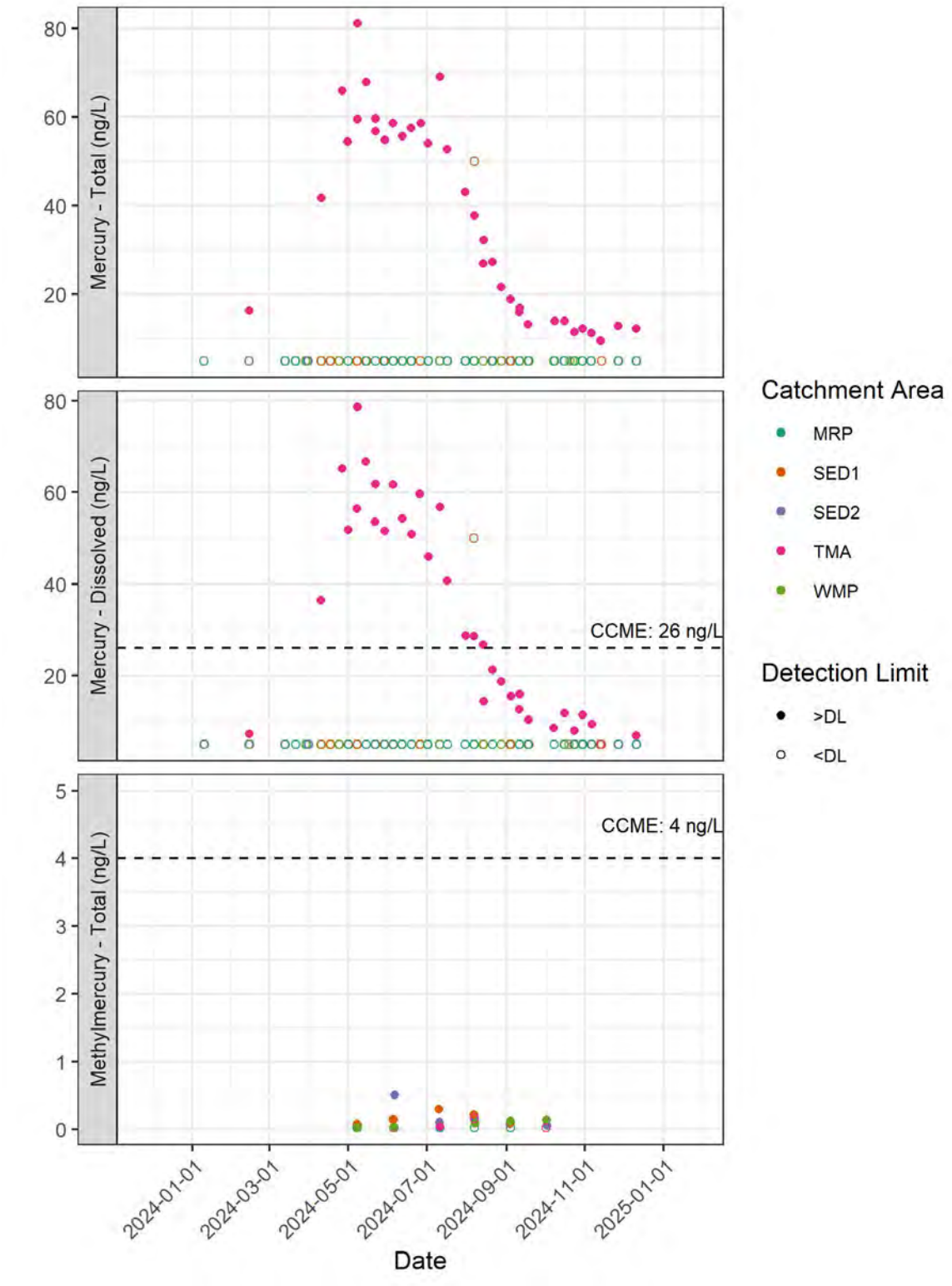

Figure 4-1: Concentrations for mercury species at catchment locations, 2024.

Note: The Ontario PWQO for Dissolved Mercury is 200 ng/L. CCME guideline presented for reference. Catchment areas are Mine Rock Pond (MRP), Sediment Pond #1 (SED1), Sediment Pond #2 (SED2), Tailings Management Area (TMA), and Water Management Pond (WMP).

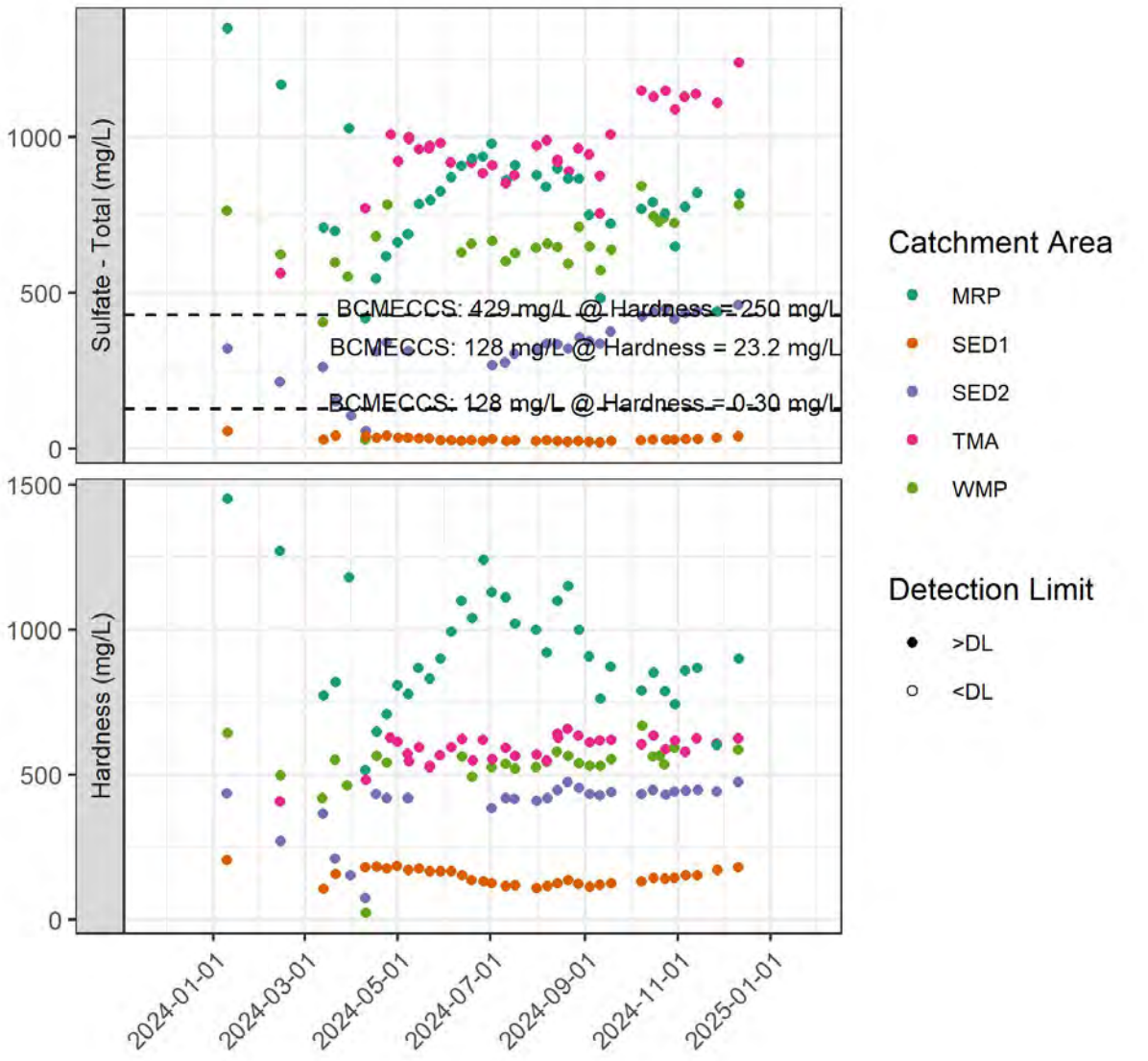

Figure 4-2: Concentrations for sulfate and hardness at catchment locations, 2024.

Note: The Ontario PWQO for Dissolved Mercury is 200 ng/L. CCME and BCMECCS guidelines presented for reference. For sulfate, guidelines are at most conservative (0 mg/L hardness), the minimum observed hardness in 2024 was 23.2 mg/L, and the upper limit of hardness for the guideline (250 mg/L). Catchment areas are Mine Rock Pond (MRP), Sediment Pond #1 (SED1), Sediment Pond #2 (SED2), Tailings Management Area (TMA), and Water Management Pond (WMP).

4.5.1.2 Surface water

In 2024, surface water concentrations of total and dissolved mercury in all samples were below detection limits of 5 ng/L and therefore below the PWQO of 200 ng/L and CCME guideline of 26 ng/L, respectively (**Table 4-2**, **Figure 4-3**). Across years, mean concentrations are relatively stable, at or near detection limits, and below guidelines; any large changes in mean concentrations (e.g., 2020) appear to be the result of DL changes rather than site conditions (e.g., in 2020, many reported DL were 30 ng/L) (**Figure 4-5**).

In 2024, all samples had detectable concentrations of methylmercury (DL = 0.02 ng/L) although all were below the CCME guideline of 4 ng/L (**Table 4-2**, **Figure 4-3**). There was no statistical difference between Areas (reference vs. exposure; $F = 0.40$, $p = 0.53$) but there was a statistical difference between Months ($F = 6.21$, $p < 0.001$). This was largely due to modest increased concentrations in August (not a discharge month) 2024 compared to other months. Across years, mean concentrations were also relatively stable (similar mean concentrations ± 1 SD) with mean concentrations below the CCME guideline of 4 ng/L (**Figure 4-5**).

In 2024, nearly all samples had detectable concentrations of sulfate. The BCMECCS guideline for the protection of aquatic life for sulfate changes depending on water hardness (blue line in **Figure 4-4**). All sulfate concentrations were below the guideline for hardness up to 250 mg/L after which site-specific guidelines are recommended (BCMECCS 2024). If the line were extended, the samples in 2024 would still fall under this curve (**Figure 4-6**). One hundred percent of samples were below the 429 mg/L sulfate guideline (at hardness 297 mg/L, the highest observed in 2024 across all sites), 100% of samples were below the 309 mg/L guideline (at hardness 89 mg/L, the lowest observed in 2024) and 98% were below 128 mg/L (at hardness 30 mg/L, the lowest guideline). Nevertheless, there were statistical differences between Areas ($F = 61.11$, $p < 0.001$) and Months ($F = 9.79$, $p < 0.001$). Area and Month differences were largely driven by higher concentrations downstream of EDL2 at sites SW22A, SW03, and SW24 in October and November, 2024 (**Figure 4-3**). Averaging across months, the magnitude of difference at exposure sites was 192% relative to reference sites based on mean sulfate concentrations (1.82 mg/L reference versus 26.28 mg/L exposure). Across years, results show low values and variability in sulfate concentrations at upstream reference sites versus downstream exposure sites, but mean concentrations remain below BCMECCS guidelines (**Figure 4-5**).

Table 4-2: Surface water parameter summary statistics for locations ordered from upstream to downstream, 2024.

Surface Water Location	Parameter	N	N < DL	Mean	SD	CV	Min	Q25	Q50	Q75	Q95	Max
Teeple Culvert - Reference	Mercury - Total (ng/L)	6	6	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW20 - Reference	Mercury - Total (ng/L)	10	10	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW10	Mercury - Total (ng/L)	10	10	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW22A	Mercury - Total (ng/L)	11	11	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW03	Mercury - Total (ng/L)	10	10	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW24	Mercury - Total (ng/L)	9	9	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
Teeple Culvert - Reference	Mercury - Dissolved (ng/L)	6	6	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW20 - Reference	Mercury - Dissolved (ng/L)	10	10	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW10	Mercury - Dissolved (ng/L)	10	10	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW22A	Mercury - Dissolved (ng/L)	11	11	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW03	Mercury - Dissolved (ng/L)	10	10	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
SW24	Mercury - Dissolved (ng/L)	9	9	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
Teeple Culvert - Reference	Methylmercury - Total (ng/L)	6	0	0.617	0.458	0.743	0.057	0.309	0.546	0.985	1.173	1.190
SW20 - Reference	Methylmercury - Total (ng/L)	5	0	0.433	0.255	0.589	0.190	0.226	0.341	0.662	0.728	0.744
SW10	Methylmercury - Total (ng/L)	7	0	0.403	0.176	0.438	0.146	0.269	0.474	0.515	0.602	0.632
SW22A	Methylmercury - Total (ng/L)	7	0	0.469	0.301	0.641	0.140	0.323	0.344	0.571	0.931	1.010
SW03	Methylmercury - Total (ng/L)	7	0	0.531	0.316	0.595	0.123	0.362	0.395	0.757	0.955	0.962
SW24	Methylmercury - Total (ng/L)	7	0	0.438	0.279	0.638	0.120	0.249	0.381	0.607	0.828	0.857
Teeple Culvert - Reference	Sulfate - Total (mg/L)	3	0	1.3	0.9	0.7	0.5	0.8	1.2	1.7	2.2	2.3
SW20 - Reference	Sulfate - Total (mg/L)	10	1	2.8	2.9	1.0	0.3	0.5	1.6	4.3	7.4	8.7
SW10	Sulfate - Total (mg/L)	10	0	3.2	2.6	0.8	0.6	1.5	2.8	3.8	7.3	9.6
SW22A	Sulfate - Total (mg/L)	11	0	21.2	37.8	1.8	1.0	1.3	6.3	10.2	94.8	116.0
SW03	Sulfate - Total (mg/L)	10	0	21.1	29.4	1.4	1.9	3.0	6.4	30.7	71.5	91.8
SW24	Sulfate - Total (mg/L)	9	0	59.6	96.7	1.6	0.7	1.8	7.1	93.6	221.2	288.0
Teeple Culvert - Reference	Hardness (mg/L)	0	0	--	--	--	--	--	--	--	--	--
SW20 - Reference	Hardness (mg/L)	10	0	135.8	24.4	0.2	90.6	120.8	138.5	150.8	167.4	171.0
SW10	Hardness (mg/L)	10	0	127.6	25.0	0.2	89.0	109.3	128.5	139.8	164.2	166.0
SW22A	Hardness (mg/L)	11	0	163.0	22.9	0.1	121.0	150.0	164.0	175.5	194.0	205.0
SW03	Hardness (mg/L)	10	0	169.7	24.2	0.1	127.0	157.8	170.0	176.5	204.9	222.0
SW24	Hardness (mg/L)	9	0	169.9	59.4	0.3	106.0	130.0	154.0	203.0	264.2	297.0

For all summary statistics, the detection limit (DL) is conservatively substituted for the parameter value when calculating the statistic.
N is number of observations.
DL is detection limit.
SD is standard deviation.
CV is coefficient of variation
Q represent quantiles (i.e., percentiles).
-- indicates no data available.

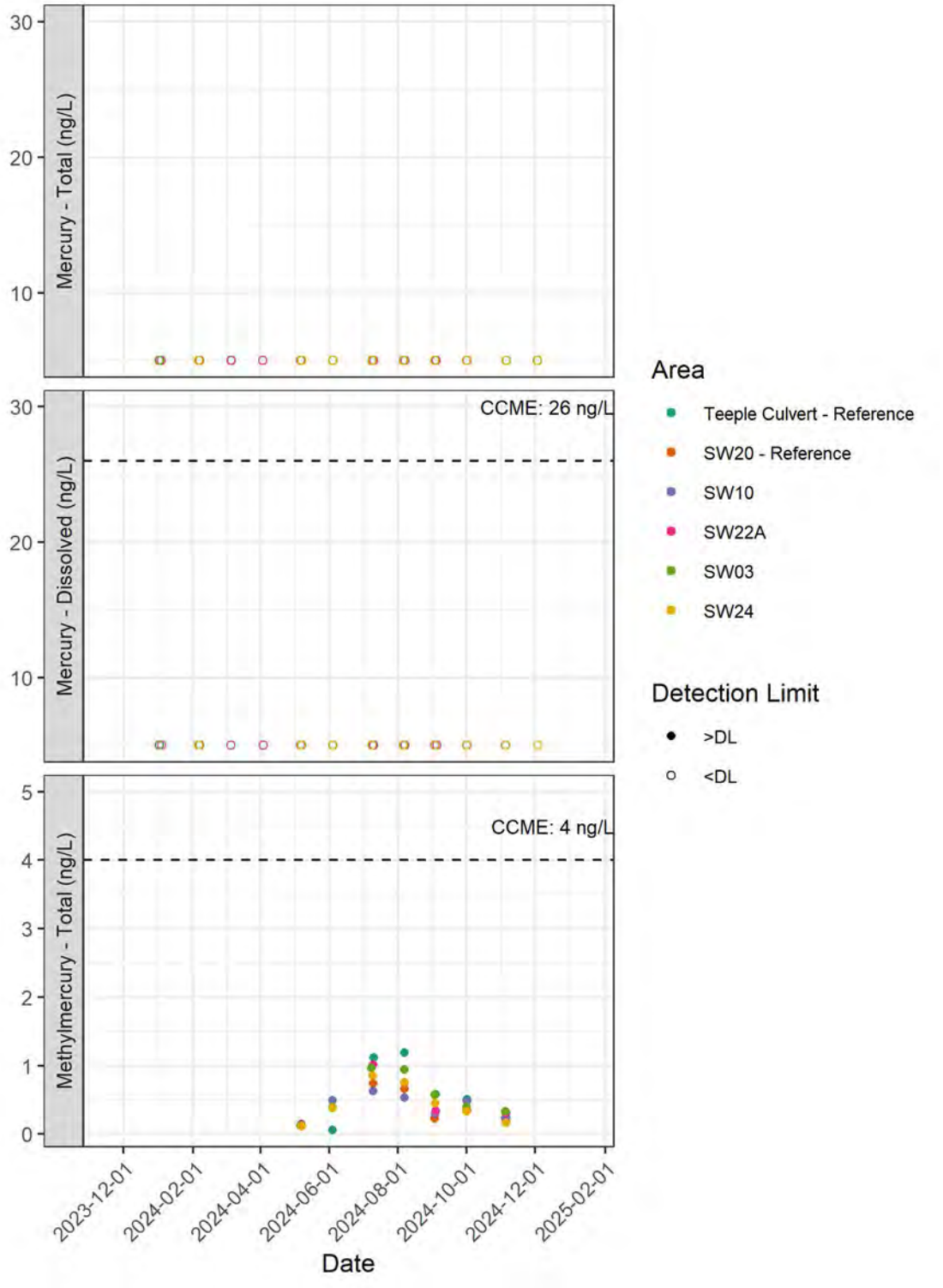

Figure 4-3: Concentrations for mercury species at surface water sampling locations, 2024.

Note: The Ontario PWQO for Dissolved Mercury is 200 ng/L. CCME and BCMECCS guidelines presented for reference. Areas in the legend are ordered from most upstream (top) to most downstream (bottom).

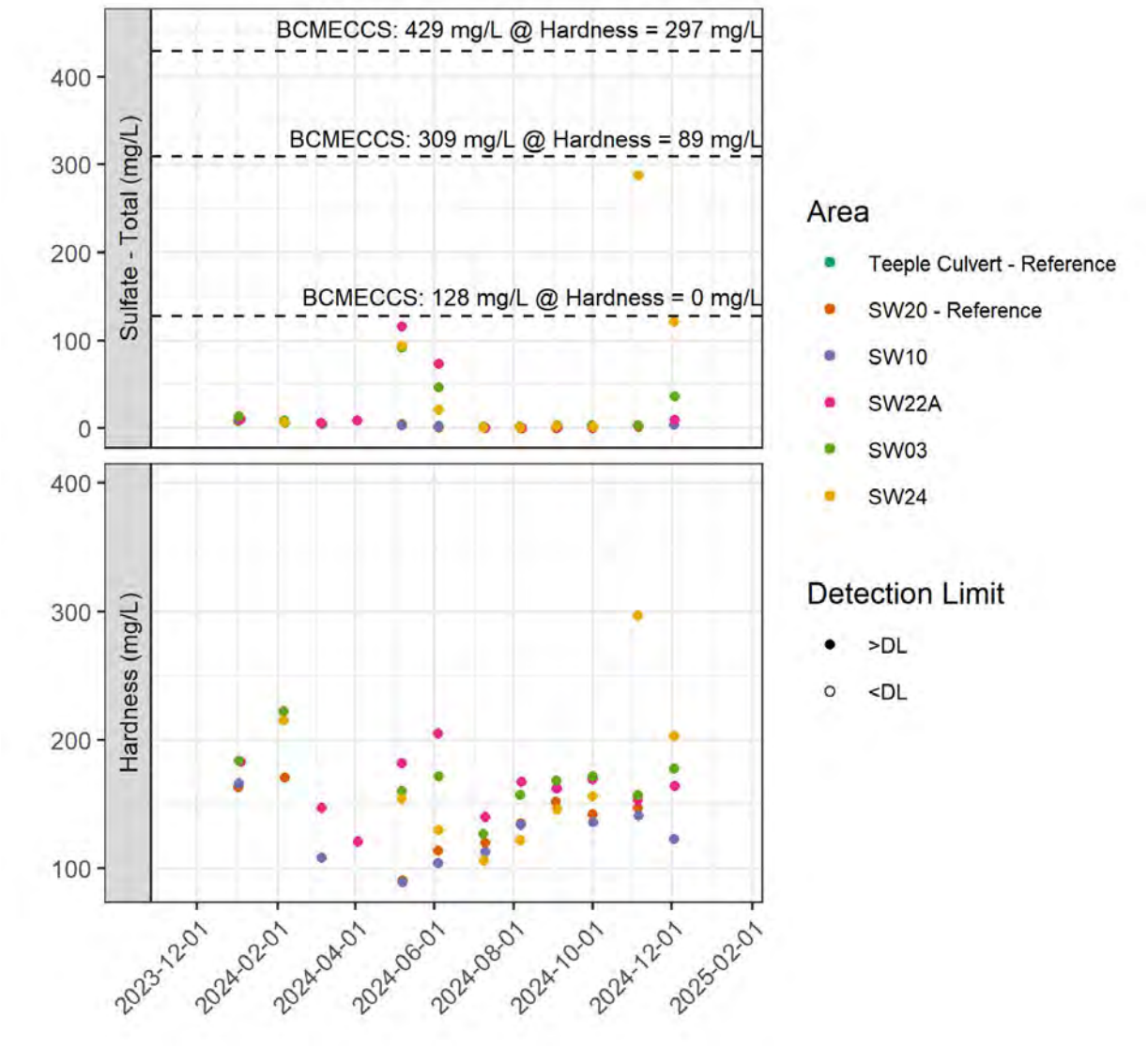

Figure 4-4: Concentrations for sulfate and hardness at surface water sampling locations, 2024.

Note: The Ontario PWQO for Dissolved Mercury is 200 ng/L. CCME and BCMECCS guidelines presented for reference. For sulfate, guidelines are at the most conservative (0 mg/L hardness), the minimum observed hardness in 2024 was 89 mg/L, and the maximum observed hardness in 2024 was 297 mg/L. Areas in legend are ordered from most upstream (top) to most downstream (bottom).

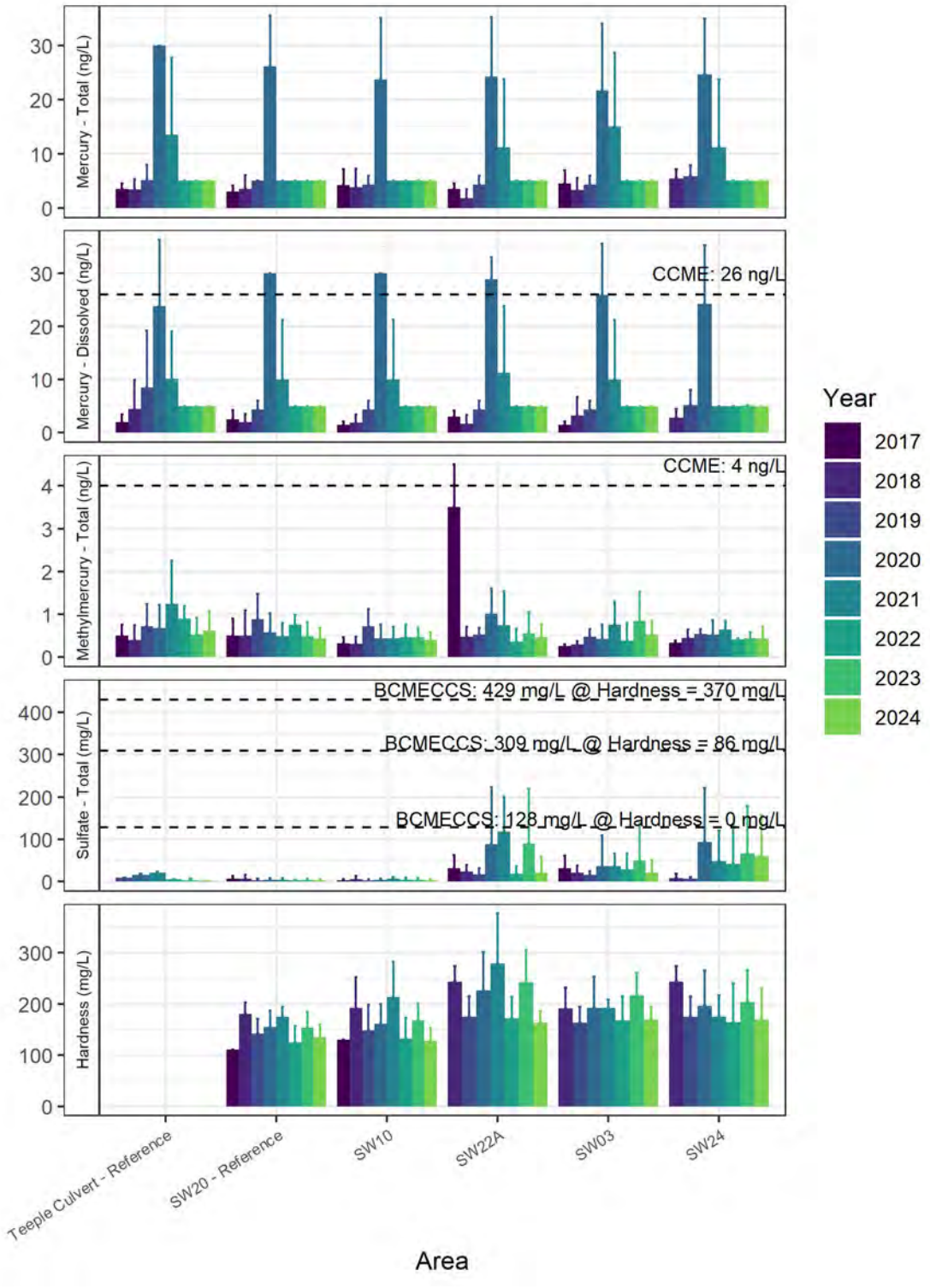

Figure 4-5: Concentrations for mercury species, sulfate, and hardness at surface water sampling locations (mean+ 1 standard deviation), 2017 to 2024.

Note: The Ontario PWQO for Dissolved Mercury is 200 ng/L. CCME and BCMECCS guidelines presented for reference. For sulfate, guidelines are at the most conservative (0 mg/L hardness) and the minimum observed hardness in 2024 was 89 mg/L. Areas are ordered from most upstream (left) to most downstream (right).

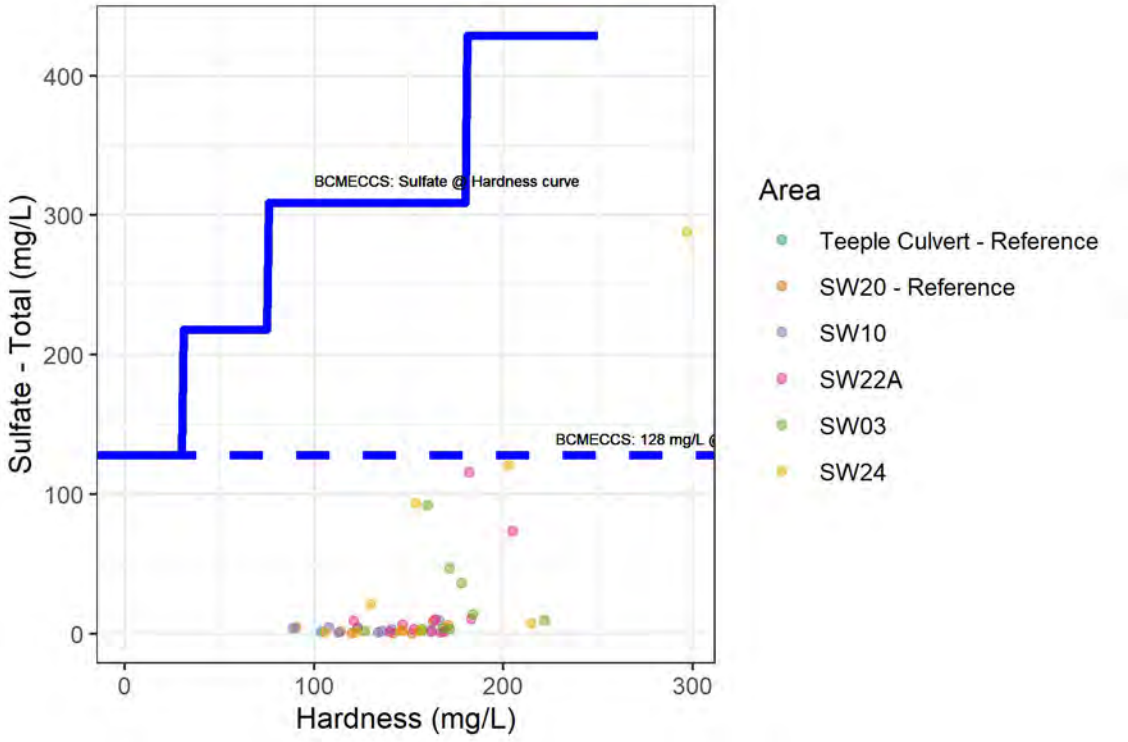

Figure 4-6: Concentrations of sulfate against hardness at surface water locations, 2024. Blue line is BCMECCS guideline for sulfate at different hardness levels. Dashed line is the guideline as it would be applied to reference hardness levels.

4.5.2 Loadings Assessment

4.5.2.1 Local Hydrology and Discharge Volumes

Monthly average flow rates were variable in terms of mine discharge and background. The mine did not discharge from January to March, July to October, and in December. Mine discharge represented approximately 12–25% of average monthly flow rate during April–June, and approximately 31% in November (**Table 4-3**).

4.5.2.2 Total Mercury and Dissolved Mercury

All median monthly concentrations for total mercury and dissolved mercury were below the detection limit of 0.000005 mg/L (i.e., 5 ng/L; **Table 4-4**). Substituting the DL for all of the values resulted in loadings being directly proportional to average monthly flow rates for both constituents (**Table 4-5**). The same result is found when using the 90th percentile concentrations for total as well as the median and 90th percentiles for dissolved mercury (**Table 4-6** to **Table 4-11**).

4.5.2.3 Sulfate

All monthly median sulfate concentrations were above the detection limit of 0.3 mg/L except for the July and August background samples (**Table 4-12**). During months with discharge the effluent accounted for between 12–31% of total flow (April to June and November) in the Pinewood River, and the mine attributed sulfate loads that averaged between 98–100% of the total load in the river.

The 90th percentile findings were nearly identical to those trends discussed using median data. During months with discharge (April to June and November), the loads averaged approximately 98–100% of the total river load.

Considering the discharge months of April, May, June, and November, only the downstream surface water station SW24 (downstream of EDL1) had a median concentration that was at or higher than the BCMECCS guideline of 128 mg/L sulfate and this only occurred in November (a discharge month) and December (following discharge). However, in June the median concentrations were near reference concentrations for SW22A (downstream of EDL2 and SED2), SW03 (further downstream), and SW24 (**Figure 4-7**). Currently, downstream concentrations appear to quickly return to background after discharge stops (i.e., within 1 month based on these coarse timesteps).

Table 4-3: Monthly average flow rates (m^3/day) for background and mine discharge locations in 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (m^3/day; on average)				Totals (m^3/day, on average)			Percentages (%, on average)	
	SED1	SED2	EDL2	EDL1	Background	Discharge	Total Flow	Background	Discharge
Jan	0	0	0	0	10549	0	10549	100.00%	0.00%
Feb	0	0	0	0	76631	0	76631	100.00%	0.00%
Mar	0	0	0	0	45613	0	45613	100.00%	0.00%
Apr	0	5428	14565	18104	114533	38098	152630	75.00%	25.00%
May	0	12360	20826	30086	384446	63271	447717	85.90%	14.10%
Jun	0	6461	1004	1352	67991	8816	76807	88.50%	11.50%
Jul	0	0	0	0	207953	0	207953	100.00%	0.00%
Aug	0	0	0	0	30076	0	30076	100.00%	0.00%
Sep	0	0	0	0	32750	0	32750	100.00%	0.00%
Oct	0	0	0	0	9396	0	9396	100.00%	0.00%
Nov	0	0	7568	20760	61986	28328	90314	68.60%	31.40%
Dec	0	0	0	0	61516	0	61516	100.00%	0.00%

Table 4-4: Median concentrations of total mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (mg/L)				Background (mg/L)
	SED1	SED2	EDL2	EDL1	
Jan	--	--	--	--	0.000005
Feb	--	--	--	--	0.000005
Mar	--	--	--	--	0.000005
Apr	--	0.000005	0.000005	0.000005	0.000005
May	--	0.000005	0.000005	0.000005	0.000005
Jun	--	0.000005	0.000005	0.000005	0.000005
Jul	--	--	--	--	0.000005
Aug	--	--	--	--	0.000005
Sep	--	--	--	--	0.000005
Oct	--	--	--	--	0.000005
Nov	--	--	0.000005	0.000005	0.000005
Dec	--	--	--	--	0.000005

Table 4-5: Average monthly loadings using median concentrations of total mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (kg/day, on average)				Totals (kg/day, on average)			Percentages (%, on average)	
	SED1	SED2	EDL2	EDL1	Background	Discharge	Total	Background	Discharge
Jan	--	--	--	--	0.00005	0	0.00005	100%	0%
Feb	--	--	--	--	0.00038	0	0.00038	100%	0%
Mar	--	--	--	--	0.00023	0	0.00023	100%	0%
Apr	--	0.00003	0.00007	0.00009	0.00057	0.00019	0.00076	75%	25%
May	--	0.00006	0.0001	0.00015	0.00192	0.00032	0.00224	86%	14%
Jun	--	0.00003	0.00001	0.00001	0.00034	0.00004	0.00038	89%	11%
Jul	--	--	--	--	0.00104	0	0.00104	100%	0%
Aug	--	--	--	--	0.00015	0	0.00015	100%	0%
Sep	--	--	--	--	0.00016	0	0.00016	100%	0%
Oct	--	--	--	--	0.00005	0	0.00005	100%	0%
Nov	--	--	0.00004	0.0001	0.00031	0.00014	0.00045	69%	31%
Dec	--	--	--	--	0.00031	0	0.00031	100%	0%

Notes for **Table 4-4** and **Table 4-5**:
For all calculations, the detection limit (DL) was conservatively substituted for the parameter value.
-- indicates no data available.

Table 4-6: 90th percentile concentrations of total mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (mg/L)				Background (mg/L)
	SED1	SED2	EDL2	EDL1	
Jan	--	--	--	--	0.000005
Feb	--	--	--	--	0.000005
Mar	--	--	--	--	0.000005
Apr	--	0.000005	0.000005	0.000005	0.000005
May	--	0.000005	0.000005	0.000005	0.000005
Jun	--	0.000005	0.000005	0.000005	0.000005
Jul	--	--	--	--	0.000005
Aug	--	--	--	--	0.000005
Sep	--	--	--	--	0.000005
Oct	--	--	--	--	0.000005
Nov	--	--	0.000005	0.000005	0.000005
Dec	--	--	--	--	0.000005

Table 4-7: Average monthly loadings using 90th percentile concentrations of total mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (kg/day, on average)				Totals (kg/day, on average)			Percentages (%, on average)	
	SED1	SED2	EDL2	EDL1	Background	Discharge	Total Flow	Background	Discharge
Jan	--	--	--	--	0.00005	0	0.00005	100%	0%
Feb	--	--	--	--	0.00038	0	0.00038	100%	0%
Mar	--	--	--	--	0.00023	0	0.00023	100%	0%
Apr	--	0.00003	0.00007	0.00009	0.00057	0.00019	0.00076	75%	25%
May	--	0.00006	0.0001	0.00015	0.00192	0.00032	0.00224	86%	14%
Jun	--	0.00003	0.00001	0.00001	0.00034	0.00004	0.00038	89%	11%
Jul	--	--	--	--	0.00104	0	0.00104	100%	0%
Aug	--	--	--	--	0.00015	0	0.00015	100%	0%
Sep	--	--	--	--	0.00016	0	0.00016	100%	0%
Oct	--	--	--	--	0.00005	0	0.00005	100%	0%
Nov	--	--	0.00004	0.0001	0.00031	0.00014	0.00045	69%	31%
Dec	--	--	--	--	0.00031	0	0.00031	100%	0%

Notes for **Table 4-6** and **Table 4-7**:
For all calculations, the detection limit (DL) was conservatively substituted for the parameter value.
-- indicates no data available.

Table 4-8: Median concentrations of dissolved mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (mg/L)				Background (mg/L)
	SED1	SED2	EDL2	EDL1	
Jan	--	--	--	--	0.000005
Feb	--	--	--	--	0.000005
Mar	--	--	--	--	0.000005
Apr	--	0.000005	0.000005	0.000005	0.000005
May	--	0.000005	0.000005	0.000005	0.000005
Jun	--	0.000005	0.000005	0.000005	0.000005
Jul	--	--	--	--	0.000005
Aug	--	--	--	--	0.000005
Sep	--	--	--	--	0.000005
Oct	--	--	--	--	0.000005
Nov	--	--	0.000005	0.000005	0.000005
Dec	--	--	--	--	0.000005

Table 4-9: Average monthly loadings using median concentrations of dissolved mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (kg/day, on average)				Totals (kg/day, on average)			Percentages (%, on average)	
	SED1	SED2	EDL2	EDL1	Background	Discharge	Total Flow	Background	Discharge
Jan	--	--	--	--	0.00005	0	0.00005	100%	0%
Feb	--	--	--	--	0.00038	0	0.00038	100%	0%
Mar	--	--	--	--	0.00023	0	0.00023	100%	0%
Apr	--	0.00003	0.00007	0.00009	0.00057	0.00019	0.00076	75%	25%
May	--	0.00006	0.0001	0.00015	0.00192	0.00032	0.00224	86%	14%
Jun	--	0.00003	0.00001	0.00001	0.00034	0.00004	0.00038	89%	11%
Jul	--	--	--	--	0.00104	0	0.00104	100%	0%
Aug	--	--	--	--	0.00015	0	0.00015	100%	0%
Sep	--	--	--	--	0.00016	0	0.00016	100%	0%
Oct	--	--	--	--	0.00005	0	0.00005	100%	0%
Nov	--	--	0.00004	0.0001	0.00031	0.00014	0.00045	69%	31%
Dec	--	--	--	--	0.00031	0	0.00031	100%	0%

Notes for **Table 4-8** and **Table 4-9**:
For all calculations, the detection limit (DL) was conservatively substituted for the parameter value.
-- indicates no data available.

Table 4-10: 90th percentile concentrations of dissolved mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (mg/L)				Background (mg/L)
	SED1	SED2	EDL2	EDL1	
Jan	--	--	--	--	0.000005
Feb	--	--	--	--	0.000005
Mar	--	--	--	--	0.000005
Apr	--	0.000005	0.000005	0.000005	0.000005
May	--	0.000005	0.000005	0.000005	0.000005
Jun	--	0.000005	0.000005	0.000005	0.000005
Jul	--	--	--	--	0.000005
Aug	--	--	--	--	0.000005
Sep	--	--	--	--	0.000005
Oct	--	--	--	--	0.000005
Nov	--	--	0.000005	0.000005	0.000005
Dec	--	--	--	--	0.000005

Table 4-11: Average monthly loadings using 90th percentile concentrations of dissolved mercury at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (kg/day, on average)				Totals (kg/day, on average)			Percentages (%, on average)	
	SED1	SED2	EDL2	EDL1	Background	Discharge	Total Flow	Background	Discharge
Jan	--	--	--	--	0.00005	0	0.00005	100%	0%
Feb	--	--	--	--	0.00038	0	0.00038	100%	0%
Mar	--	--	--	--	0.00023	0	0.00023	100%	0%
Apr	--	0.00003	0.00007	0.00009	0.00057	0.00019	0.00076	75%	25%
May	--	0.00006	0.0001	0.00015	0.00192	0.00032	0.00224	86%	14%
Jun	--	0.00003	0.00001	0.00001	0.00034	0.00004	0.00038	89%	11%
Jul	--	--	--	--	0.00104	0	0.00104	100%	0%
Aug	--	--	--	--	0.00015	0	0.00015	100%	0%
Sep	--	--	--	--	0.00016	0	0.00016	100%	0%
Oct	--	--	--	--	0.00005	0	0.00005	100%	0%
Nov	--	--	0.00004	0.0001	0.00031	0.00014	0.00045	69%	31%
Dec	--	--	--	--	0.00031	0	0.00031	100%	0%

Notes for **Table 4-10** and **Table 4-11**:
For all calculations, the detection limit (DL) was conservatively substituted for the parameter value.
-- indicates no data available.

Table 4-12: Median concentrations of sulfate at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (mg/L)				Background (mg/L)
	SED1	SED2	EDL2	EDL1	
Jan	--	--	--	--	6.65
Feb	--	--	--	--	4.44
Mar	--	--	--	--	2.77
Apr	--	330	722	728	1.94
May	--	289.5	679.5	693	4.045
Jun	--	249	650	646	1.17
Jul	--	--	--	--	0.3
Aug	--	--	--	--	0.3
Sep	--	--	--	--	0.385
Oct	--	--	--	--	0.48
Nov	--	--	721.5	739	1.215
Dec	--	--	--	--	2.91

Table 4-13: Average monthly loadings using median concentrations of sulfate at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (kg/day, on average)				Totals (kg/day, on average)			Percentages (%, on average)	
	SED1	SED2	EDL2	EDL1	Background	Discharge	Total Flow	Background	Discharged
Jan	--	--	--	--	70.15155	0	70.15155	100%	0%
Feb	--	--	--	--	340.2408	0	340.2408	100%	0%
Mar	--	--	--	--	126.3489	0	126.3489	100%	0%
Apr	--	1791.372	10516.19	13179.65	222.1931	25487.22	25709.41	1%	99%
May	--	3578.099	14151.46	20849.28	1555.083	38578.83	40133.91	4%	96%
Jun	--	1608.739	652.2875	873.3331	79.54947	3134.36	3213.909	2%	98%
Jul	--	--	--	--	62.38586	0	62.38586	100%	0%
Aug	--	--	--	--	9.02294	0	9.02294	100%	0%
Sep	--	--	--	--	12.60878	0	12.60878	100%	0%
Oct	--	--	--	--	4.5102	0	4.5102	100%	0%
Nov	--	--	5460.277	15341.8	75.31283	20802.07	20877.39	0%	100%
Dec	--	--	--	--	179.011	0	179.011	100%	0%

Notes for **Table 4-12** and **Table 4-13**:
For all calculations, the detection limit (DL) was conservatively substituted for the parameter value.
-- indicates no data available.

Table 4-14: 90th percentile concentrations of total sulfate at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (mg/L)				Background (mg/L)
	SED1	SED2	EDL2	EDL1	
Jan	--	--	--	--	8.486
Feb	--	--	--	--	5.664
Mar	--	--	--	--	2.77
Apr	--	330.8	726	732	1.94
May	--	324.6	725.5	714.3	4.2835
Jun	--	270	650	646	2.187
Jul	--	--	--	--	0.3
Aug	--	--	--	--	0.498
Sep	--	--	--	--	0.4615
Oct	--	--	--	--	1.101
Nov	--	--	727.5	745.4	1.9395
Dec	--	--	--	--	4.071

Table 4-15: Average monthly loadings using 90th percentile concentrations of total sulfate at discharge and background locations, 2024. Locations are ordered from upstream to downstream.

Month	Mine Discharge (kg/day, on average)				Totals (kg/day, on average)			Percentages (%, on average)	
	SED1	SED2	EDL2	EDL1	Background	Discharge	Total Flow	Discharge	Background
Jan	--	--	--	--	89.51971	0	89.51971	100%	0%
Feb	--	--	--	--	434.0369	0	434.0369	100%	0%
Mar	--	--	--	--	126.3489	0	126.3489	100%	0%
Apr	--	1795.715	10574.45	13252.07	222.1931	25622.24	25844.43	1%	99%
May	--	4011.92	15109.46	21490.1	1646.773	40611.48	42258.26	4%	96%
Jun	--	1744.416	652.2875	873.3331	148.6963	3270.037	3418.733	4%	96%
Jul	--	--	--	--	62.38586	0	62.38586	100%	0%
Aug	--	--	--	--	14.97807	0	14.97807	100%	0%
Sep	--	--	--	--	15.11417	0	15.11417	100%	0%
Oct	--	--	--	--	10.34527	0	10.34527	100%	0%
Nov	--	--	5505.685	15474.66	120.2216	20980.35	21100.57	1%	99%
Dec	--	--	--	--	250.4308	0	250.4308	100%	0%

Notes for **Table 4-14** and **Table 4-15**:
-- indicates no samples

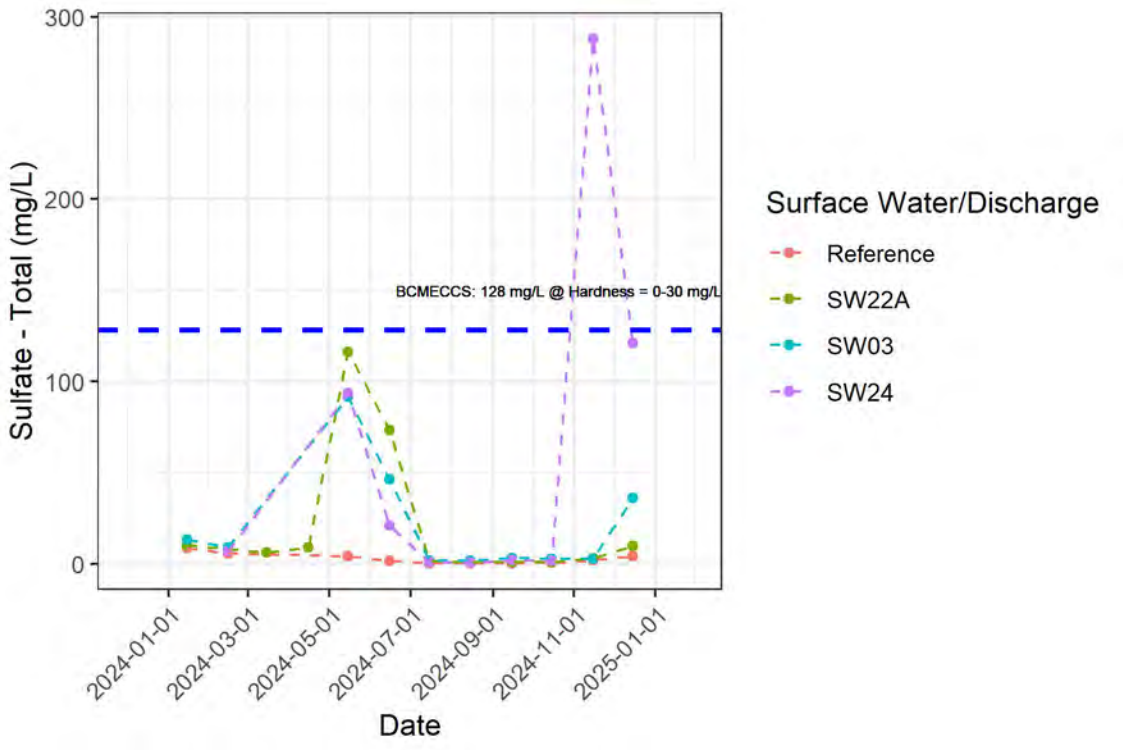

Figure 4-7: Monthly median concentrations of sulfate at surface water locations upstream (average of Teeple Culvert,SW20, and SW29A samples), downstream of SED2 and EDL2 (SW22A and SW03) and EDL1 (SW24), 2024.

4.6 Performance of Mitigation Measures

In 2024, the total and dissolved mercury concentrations from the sampled site catchments (MRP, SED1, SED2, and WMP) with one exception were similar to those measured in the Pinewood River (Teeple Culvert, SW20, SW10, SW22A, SW03, and SW24) – i.e., nearly all samples were less than detection and therefore less than water quality guidelines. There was one instance of an atypical detection limit (50 ng/L vs the typical 5 ng/L) at SED1, however, all other samples were less than detection at 5 ng/L. However, the TMA had higher concentrations with more than 50% of data exceeding 26 ng/L CCME (median: 28.6 ng/L, maximum: 78.6 ng/L) guideline for dissolved mercury but not the PWQO of 200 ng/L dissolved mercury.

Sulfate concentrations at site catchments were higher than surface water samples in the Pinewood River. This is expected as mine contact water drains to recipient waterbodies (e.g., MRP) and is subsequently recycled on site.

Similar to AMEC (2019), available data was used to determine whether enhanced methylation was occurring during 2024 at site catchments or in the Pinewood River. As discussed, enhanced methylation may occur in optimal ranges of sulfur concentrations by sulfate reducing bacteria. Monthly medians were used per area to calculate the ratio of total methylmercury to total mercury. A percentage of 50% may indicate enhanced methylation.

In 2024, most sampled site catchments were at or near 4% total methylmercury:total mercury. The ratios tended to be similar through time and no samples exceeded the 50% ratio. Similarly, no samples at the surface water sites exceeded the 50% ratio, although Teeple Culvert (reference) in August was close at 47.6%. Surface water ratios were more variable across sites and through time – August through October tended to have highest ratios with a maximum ratio of 47.6% at Teeple Culvert.

A potential error that could still arise using this approach is that the detection limit was substituted directly for the unknown concentration if reported as <DL. This is generally a conservative approach, however, for this calculation the denominator is artificially inflated. Substituting ½ DL effectively doubles the ratio per calculation. If a ratio of 50% is to be considered an effective benchmark, then a more robust approach to generate summary statistics using censored data should be explored (e.g., regression on order statistics; Helsel, 2012). Alternatively. discussion with ALS should be undertaken to obtain uncensored data, i.e., true laboratory instrument outputs regardless of value, for these analyses.

Table 4-16: Percent methylmercury of total mercury in site catchments and surface water locations in the Pinewood River, 2024.

Month	Catchments					Surface Water					
	MRP	SED1	SED2	TMA	WMP	Teeple Culvert (Reference)	SW20 (Reference)	SW10	SW22A	SW03	SW24
May	0.4	1.54	1.34	--	--	--	--	5.84	5.6	4.92	4.8
June	0.4	2.92	--	0.034	0.56	2.284	--	19.88	15.8	15.8	15.24
July	0.4	6.0	2.14	0.078	0.92	44.8	29.76	25.28	40.4	38.48	34.28
August	0.4	4.3	3.24	0.59	1.72	47.6	26.48	21.32	29.84	37.56	30.36
September	0.4	1.88	1.62	--	2.4	23.12	9.04	11.92	13.76	23	18.16
October	0.4	2.68	1.12	0.15	2.74	20.52	13.64	18.96	13.52	15.72	13.24
November	--	--	--	--	--	9.64	7.6	9.6	12.32	13.2	6.64

4.7 Recommendations for Additional Mitigation Measures

Currently there is limited evidence that mining operations are increasing total and dissolved mercury downstream of mine operations as indicated by discharge and surface waters being less than detection limits of 5 ng/L (**Section 4.5.1** and **Section 4.5.2**). The mining operations are adding sulfate to the Pinewood River above background. Discharge waters tend to be above the 10–50 mg/L sulfate for optimal methylation. It is possible that sulfate could temporarily increase methylation activity when sulfate is discharged. In 2024, the surface water methylation ratio appears to be elevated in the fall months even at reference sites and is not largely increasing moving through potentially mining-impacted waters (**Table 4–16)**. This is contrary to the 2023 data in which the methylmercury:total ratio appeared to decline by SW03. The Teeple Culvert reference site had the highest ratio but was not over the enhanced methylation 50% ratio, but this likely depends on the denominator in the calculation.

Site catchments, discharge water, and surface water concentrations should be continued to be monitored, and New Gold should consider engaging with the analytical laboratory to achieve lower detection limits to verify the denominator in the enhanced methylation calculations.

5.0 Fish Community Survey

The following section outlines work completed and results of the Fish Community Survey component. The key results are as follows:

- Pinewood River reference (PWREF), near-field (PWNF), and far-field (PWFF) had similar species compositions and species richness in 2024. PWREF had 17 species, PWNF had 11 species, and PWFF had 11 species not including the general category of undetermined Young-of-the-Year (YOY). This is like previous years.
- Despite fish abundance being lower within PWNF and PWFF in 2024 compared with PWREF, this trend has been apparent since 2017. The noted differences between PWREF and both downstream locations remains the same as previous years.
- Length-density plots (analogous to length-frequency histograms) indicate that multiple age classes of a variety of species were captured in 2024 across all areas.

Further details are outlined in **Sections 5.1**–**5.3** below.

5.1 Sample Collection

The fish communities at PWREF, PWNF, and PWFF areas were surveyed utilizing a backpack electrofisher unit, seine nets, baited overnight minnow trap effort and multi-mesh gill net sets. The backpack electrofishing unit was adjusted to appropriate voltage, frequency, and duty cycle settings based on target fish size, water conductivity, and temperature to minimize the risk of harm to fish. Seine nets, with a minimum area of 15 m^2, were hauled in each study area. At least nine seine nets were cast in each area. Minnow traps were baited with dry dog food prior to deployment and checked every 24 hours.

All fish captured were identified and enumerated. Live non-sentinel and excess sentinel species fish were released back into the area from which they were collected. Incidental mortalities were recorded and disposed of as per the conditions of the Licence to Collect Fish for Scientific Purposes No. DFFA-2024-FWCA-00075 issued by the Ontario Ministry of Natural Resources and Forestry.

Common Shiner and Central Mudminnow were retained for further processing.

5.2 Data Analysis

Following AMEC (2016), the catch per unit effort (CPUE) for each fishing method (electrofishing, gill netting, seine netting, and minnow trapping) were calculated per area. Species richness (number of individual species) per area were calculated to determine if species presence is maintained in each area. Length frequency distributions per species per area were graphed with the understanding that qualitative comparisons of results will show any large discrepancies in year classes.

5.3 Results

The fish community in PWREF included (listed in order of abundance) Common Shiner, Brassy Minnow (*Hybognathus hankinsoni*), Finescale Dace (*Chrosomus neogaeus*), Creek Chub (*Semotilus atromaculatus*), Brook Stickleback (*Culaea* inconstans), Northern Pearl Dace (*Margariscus margarita*), Central Mudminnow, White Sucker (*Catostomus commersonii*), Northern Redbelly Dace (*Chrosomus eos*), Hornyhead Chub (*Nocomis biguttatus*), Bluntnose Minnow (*Pimephales notatus*), Brown Bullhead (*Ameiurus nebulosus*), Blacksided Darter (*Percina maculate*), Spottail Shiner (*Notropis hudsonius*), Golden Shiner (*Notemigonus crysoleucas*), and Johnny Darter (*Etheostoma nigrum*) (**Table 5-1**). Seventeen species were identified among the 3,425 individual fish captured (**Table 5-1**). The CPUE was 0.52 fish per hour of gill netting effort, 3.75 fish per 60 seconds of electrofishing effort, 22.33 fish per seine netting effort, and 0.86 fish per minnow trap hour (**Table 5-2** to **Table 5-5**). Seine net CPUE may be underestimated as full pulls were not possible at all locations due to some instances of deep water.

The fish community in PWNF included (listed in order of abundance) undetermined YOY, Common Shiner, Central Mudminnow, Golden Shiner, Brown Bullhead, Northern Pike, Blacksided Darter, Johny Darter, White Sucker, Finescale Dace, Rock Bass (*Ambloplites rupestris*), and Sauger (*Sander canadensis*). Examining fish community records from past reports, this appears to be the first instance of Sauger detected in close proximity although Sauger have been captured downstream in the large-bodied fish reports. There were 11 species identified among the 293 fish caught (**Table 5-1**). The CPUE for the various effort types were 0.14 fish per gill net hour, 0.45 fish per 60 seconds of electrofishing effort, 22.20 fish per seine netting effort, and 0.0013 fish per minnow trap hour (**Table 5-2** to **Table 5-5**). Again, seine net CPUE may be underestimated as full pulls were not possible at all locations due to some instances of deep water.

The fish community in PWFF included (listed in order of abundance) Common Shiner, Golden Shiner, undetermined YOY, Northern Pike, Central Mudminnow, White Sucker, Johnny Darter, Finescale Dace, Blackside Darter, Trout Perch (*Percopsis omiscomaycus*), Rock Bass, and Creek Chub. There were 11 species identified among the 101 fish caught (**Table 5-1**). The CPUE at this site included 0.04 fish per gill net hour, 0.07 fish per 60 seconds of electrofishing, 6.46 fish per seine net haul, and 0.00041 fish per minnow trap hour (**Table 5-2** to **Table 5-5**).

A total of 3,819 fish representing 21 species were captured during the 2024 Pinewood River fish community survey across the three areas (PWREF, PWNF, PWFF) (**Table 5-1**). Length-distribution plots indicate that multiple age classes of a variety of species were captured in 2024 (**Figure B-1** to **Figure B-2**). Fish abundance has been lower within the PWNF and PWFF areas in all years since 2017. With the exception of changes in fish abundance and that lower species counts are detected in some years and not others, the fish community has largely been similar in all years from 2017 to 2024 indicating Rainy River Mine operations have minimal impact on the resident fish communities within the Pinewood River.

Table 5-1: Total catch by species in the Pinewood River, 2019 – 2024

Species	2019			2020			2021			2022			2023			2024		
	PWREF	PWNF	PWFF	PWREF	PWNF	PWFF	PWREF	PWNF	PWFF	PWREF	PWNF	PWFF	PWREF	PWNF	PWFF	PWREF	PWNF	PWFF
Blacknose Dace	8	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Blackside Darter	0	3	66	0	13	21	0	4	0	0	0	8	3	29	27	6	14	4
Bluntnose Minnow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0
Brassy Minnow	49	6	72	79	16	15	14	0	0	3	0	0	16	0	0	718	0	0
Brook Stickleback	478	7	4	361	0	5	1360	0	0	211	1	5	323	191	0	130	0	0
Brown Bullhead	0	81	0	1	153	0	2	11	14	29	212	6	5	352	5	8	17	0
Central Mudminnow	40	50	24	117	33	32	79	7	30	86	50	6	83	15	5	71	37	7
Common Shiner	82	112	51	107	54	55	54	80	21	74	162	63	683	65	6	1663	48	32
Creek Chub	55	55	3	12	3	1	9	3	7	21	2	3	176	61	1	187	0	1
Fathead Minnow	12	0	41	54	1	0	13	0	0	16	1	2	0	0	0	5	0	0
Finescale Dace	35	0	0	279	21	0	982	1	4	10	0	0	34	0	0	398	2	5
Golden Shiner	3	53	12	4	402	10	9	67	5	9	7	1	6	50	18	1	22	16
Hornyhead Chub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0
Johnny Darter	0	17	293	0	131	319	0	15	27	0	0	3	7	136	4	1	10	6
Logperch	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Mimic Shiner	20	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern Pearl Dace	42	0	0	46	0	0	149	17	4	282	2	1	1	0	0	123	0	0
Northern Pike	0	56	7	44	35	8	0	21	25	5	11	5	17	32	12	0	16	8
Northern Redbelly Dace	193	0	6	114	0	0	0	0	0	64	0	0	211	0	0	31	0	0
River Darter	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0
Rock Bass	0	0	1	0	0	0	0	0	4	0	0	5	0	0	2	0	2	2
Sauger	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Shorthead Redhorse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Spottail Shiner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Trout Perch	0	8	126	0	6	31	0	0	0	0	0	2	0	1	2	0	0	3
Walleye	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
White Sucker	68	98	127	26	93	51	4	35	33	25	10	2	83	74	12	57	4	7
YOY (undifferentiated Cyprinid)	898	1	46	487	99	8	36	138	298	340	78	83	72	75	5	0	120	10
Total Catch	**1,983**	**552**	**882**	**1,731**	**1,061**	**556**	**2,711**	**399**	**490**	**1,175**	**536**	**196**	**1,720**	**1,082**	**102**	**3,425**	**293**	**101**
Richness (no YOY)	**13**	**13**	**15**	**13**	**14**	**11**	**11**	**11**	**12**	**13**	**10**	**15**	**14**	**12**	**14**	**17**	**11**	**11**

Table 5-2: Fish effort and catch summary for gill netting in the Pinewood River, 2017 – 2024

Area	Gill Netting																				
	Effort (hours)							Total catch							CPUE (#fish/hours)						
	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024
PWREF	81	117	114	120	107	110.2	110.8	16	476	153	81	134	64	58	0.2	4.1	1.3	0.7	1.25	0.58	0.52
PWNF	96	129	109	130	100	108.2	134.4	4	24	28	59	17	42	19	0.04	0.2	0.3	0.5	0.17	0.39	0.14
PWFF	-	77	102	118	120	125.9	105.5	-	6	18	34	0	16	4	-	0.1	0.2	0.3	0.08	0.13	0.04

Table 5-3: Fish effort and catch summary for electrofishing in the Pinewood River, 2017 – 2024

Area	Electrofishing																				
	Effort (seconds)							Total catch							CPUE (#fish/60 seconds)						
	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024
PWREF	3,030	3,000	3,003	4,017	3,141	3,043	3,071	57	185	119	44	222	128	192	1.1	3.7	2.4	0.7	4.24	2.52	3.75
PWNF	6,108	5,510	3,325	3,421	4,193	3,607	5,978	10	85	113	13	34	503	45	0.1	0.9	2	0.2	0.49	8.37	0.45
PWFF	-	3,002	3,000	3,468	3,346	3,336	3,618	-	99	51	102	15	26	4	-	2	1	1.8	0.27	0.47	0.07

Table 5-4: Fish effort and catch summary for seine netting in the Pinewood River, 2017 – 2024

Area	Seine Netting																				
	Effort (hauls)							Total Catch							CPUE (#fish/haul)						
	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024
PWREF	9	9	9	9	9	9	9	201	1272	1335	1591	666	1200	201	22.3	141.3	148.3	176.8	74.00	133.33	22.33
PWNF	9	16	12	9	17	15	10	19	325	897	322	258	494	222	2.1	20.3	74.8	5.8	15.18	32.93	22.2
PWFF	-	16	13	9	11	10	13	-	753	484	365	135	58	84	-	47.1	37.2	40.6	12.27	5.8	6.46

Table 5-5: Fish effort and catch summary for minnow trapping in the Pinewood River, 2017 – 2024

Area	Minnow Trapping																				
	Effort (hours)							Total Catch							CPUE (#fish/hour)						
	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024	2017	2019	2020	2021	2022	2023	2024
PWREF	659	971	792	733	1054	632.92	690.83	360	57	124	995	153	328	2974	0.5	0.1	0.2	1.36	0.15	0.51	0.86
PWNF	622	3,480	701	660	2088	715	888.16	18	83	22	5	227	43	7	0.03	0.02	0.03	0.01	0.11	0.060	0.0013
PWFF	-	1633	654	729	1,833	643.33	1480.76	-	14	3	9	40	1	9	-	0.01	0.005	0.01	0.02	0.0016	0.00041

6.0 Fish Tissue Analysis

The following section outlines work completed and results of the Fish Tissue Analysis component. Common Shiner was the primary target species for the analysis like previous reports. Common Shiner is typically found in the three study areas in sufficient density for meaningful analyses. Per reports completed from 2021–2023, a secondary target species of Central Mudminnow was used along with Common Shiner to assess bioaccumulation potential and for examining species-specific life history/niche bias associated with sampling a single species.

For reference, a whole-body mercury level of 0.2 mg/kg wet weight (wwt) has been suggested to be protective of juvenile and adult fish (i.e., those that eat other smaller fish) using mostly literature-based sublethal endpoints (growth, reproduction, development, behaviour; Beckvar et al., 2005). Hereafter, this is referred to as the *fish-protective level*. Health Canada has also established a standard of 0.5 mg/kg wwt as the maximum acceptable concentration of mercury in commercially sold fish, enforceable by the Canadian Food Inspection Agency (Health Canada, 2007). Although this guideline is only applicable to commercially sold fish, 0.5 mg/kg wwt is also the level at which the MECP recommends a complete consumption restriction for vulnerable populations (i.e., women of child-bearing age and children under 15 years of age; MECP 2015). Common Shiner are not typically consumed by humans, yet this guideline is referenced to provide some perspective on mercury body burden levels in edible fish.

The key results are as follows:

- In 2024, Common Shiner mean tissue mercury concentrations at all areas were below the consumption guideline for sensitive populations of 0.5 mg/kg (MECP 2015) and 0.2 mg/kg fish-protective level (Beckvar et al., 2005). However, one individual of 50 (2%) at PWREF and three individuals of 41 (7%) were above the 0.2 mg/kg fish-protective level.

- In 2024, a modelled interaction required comparing fish of different sizes that represented overlapping size ranges across areas. At 4.8 cm, PWNF and PWFF were statistically similar. PWNF had ~40% higher concentrations at 5.9 cm and ~55% higher at 6.8 cm compared to PWREF and PWNF, respectively. At 9.2 cm, only PWREF and PWFF could be compared and were statistically similar. Across 2019–2024, there was a general trend of PWNF having higher concentrations than PWREF and PWFF, although mean concentrations tending to be below the 0.2 mg/kg fish-protective level as well as the 0.5 mg/kg Health Canada level

- In 2024, Central Mudminnow mean tissue mercury concentrations at all sites were below the consumption guidelines for sensitive populations of 0.5 mg/kg (MECP 2015) and the 0.2 mg/kg fish-protective level.

- In 2024, Central Mudminnow in PWNF had 61% higher mean tissue mercury concentration than PWREF and 17% higher than PWFF. Similar to Common Shiner,

across 2022–2024, there was a general trend of PWNF having higher concentrations than PWREF and PWFF, although mean concentrations tending to be below the 0.2 mg/kg fish-protective level as well as the 0.5 mg/kg Health Canada level. Further details are outlined in **Sections 6.1**–**6.3** below.

6.1 Sample Collection

The original sample design targeted up to 30 YOY and 50 age 1+ Brook Stickleback (AMEC 2016) in each of the PWREF, PWNF, and PWFF areas. Due to low sample sizes, subsequent studies targeted up to 50 Common Shiner (CS) of various sizes per area (Minnow 2020, Minnow 2021, Ecometrix 2022, Ecometrix 2023, Ecometrix 2024). Since 2022, Central Mudminnow (CMM) have been included as a secondary species.

During the fish community assessment, up to 50 Common Shiner and at least 15 Central Mudminnow per area were targeted across size ranges for tissue metals analysis. All retained fish were measured for fork length and total length to the nearest millimetre using a fish measuring board. Weight was determined to the nearest milligram using an appropriately calibrated analytical balance. Each fish head containing the otolith aging structures was placed in a labelled bag. The remainder of the body without internal organs was placed in an appropriately, labelled bag for the purposes of tissue chemistry analysis. Both samples were kept frozen.

At the conclusion of the field collection, tissue samples were submitted to Bureau Veritas (BV), a laboratory that specialized in tissue analysis along with a chain-of-custody (COC) record. Total mercury and moisture analyses were conducted on a homogenized portion of each fish. The mercury concentrations were provided in wwt values using the Cold Vapor Atomic Fluorescence methodology. Otoliths along with a COC were shipped to AAE Tech Services Inc. for fish age determination.

6.2 Data Analysis

6.2.1 Analytical Context

The original sample design recommended two-way Analysis of Variance (ANOVA) investigating the main effects of Area and Age and their interaction on tissue mercury concentrations (AMEC 2016). A log-linear relationship is well established in the literature, where mercury tends to increase with body size (Tang et al., 2013). Following the change in target species to Common Shiner, subsequent reports used Analysis of Covariance (ANCOVA) to conduct statistical comparisons of mercury concentrations at common fish size (i.e., fork length) between PWREF, PWNF, and PWFF (Minnow 2020, Minnow 2021, Ecometrix 2022, Ecometrix 2023).

For 2024 data, the ANCOVA method was repeated. For longer-term trends using 2019–2024 data, an alternative model was used and is described below.

In Ecometrix (2024), it was recommended subsequent year analyses consider using linear mixed effects models (LMMs) as alternative to two-way ANCOVA. This is because one-way or two-way

ANCOVA can be appropriate for smaller studies, but with each year there are more parameters needing to be estimated and the analysis becomes more difficult to interpret. An LMM can effectively model if mercury concentration is predicted by Area and fish size (i.e., fixed effects or average effects) but that average mercury concentration can vary by year and that the average relationship between mercury concentration and fish size can vary within each Area-Year combination (i.e., random effects), which has been reported in past studies.

An additional benefit of this approach is for any Area-Year combinations with less data, predictions "borrow strength" from other data and relationships within the model – the practical implication being that for groups with less data, estimates rely more heavily on overall mean relationships whereas groups with more data will more closely approximate their groups mean value. This was demonstrated in a recently published paper in which Ecometrix staff contributed (Smenderovac *et al.* 2025).

For reference, the model formula is:

$$\log_{10}(\text{Hg}_{\text{mg/kg}})_{ijk} = \beta_0 + \beta_1 \log_{10}(\text{Length}_{\text{cm}})_{ijk} + \beta_2 \text{Area}_i + u_{0j} + u_{0ij} + u_{1ij} \log_{10}(\text{Length}_{\text{cm}})_{ijk} + \epsilon_{ijk}$$

where,

- $\log_{10}(\text{Hg}_{\text{mg/kg}})_{ijk}$ is the log$_{10}$-transformed mercury concentration for the *k*th fish in the *i*th Area and j*th* Year;
- β_0 is the overall intercept;
- β_1 is the overall fixed effect coefficient for log$_{10}$-transformed fish size (i.e., fork or total length);
- β_2 is the fixed effect coefficient for the *i*th Area (i.e., PWREF, PWNF, PWFF);
- u_{0j} is the random intercept for the *j*th Year (e.g., 2024);
- u_{0ij} is the random intercept for the *i*th Area in the *j*th Year (e.g., PWNF-2024);
- u_{1ij} is the random slope for the *i*th Area in the *j*th Year (e.g., PWNF-2024); and
- ϵ_{ijk} is the residual error term for the observation.

In summary, predictions from LMMs represent an informed estimate based on data and the model structure.

6.2.2 Common Shiner

For the 2024 data, an ANCOVA was run with log10-transformed wwt tissue mercury concentration as the response variable, Area as a factor variable (i.e., PWREF, PWNF, and PWFF), log10-transformed Fork Length as a covariate, and their interaction. Effects were considered

statistically significant at the p-value < 0.1 level. For any subsequent comparisons made at fish sizes, the magnitude of difference (MOD) between areas was calculated as:

$$MOD = (Exposure - Reference)/Reference \times 100,$$

where estimated mean values for PWNF and PWFF at varying fish sizes were substituted as *Exposure* depending on the model and PWREF was *Reference*, respectively. Differences in tissue mercury concentrations between areas was considered not to be biologically relevant, the result of random environmental stochasticity, if MODs were lower than the critical effect size (CES) of 25%. If a MOD value was larger than the CES, tissue mercury concentrations were considered to differ significantly and be potentially biologically relevant. This is analogous to CES found in MDMER technical guidance for other sublethal effects (EC, 2012).

To facilitate comparisons between areas within and across years, LMMs were fit using the above formula. LMMs were fit using *R*'s *rstanarm* v. 2.32.1's *stan_glmer* function using default parameters. This Bayesian approach allows incorporating uncertainty of the random effects into predictions better than frequentist approaches. Since there are no associated p-values, statistically significance was evaluated by observing whether the 95% credible intervals (CI) overlap 0, as is common practice. The proportion of variation in the dataset explained by the fixed effects was quantified as $R^2_{marginal}$ and the proportion explained by fixed effects and random effects was quantified as $R^2_{conditional}$ (i.e., whole model), following common terminology in the literature and *performance* 0.13.0's *r2* function. Additionally, proportion variation explained by individual random effects was quantified which can indicate different scales (i.e., Year or Areas within Years) where variability is highest which can be instructive for guiding future sampling efforts. This proportion as calculated as:

$$Proportion\ of\ Total\ Residual\ Variance = \frac{Variance\ of\ Random\ Effect}{Total\ Residual\ Variance}$$

Finally, tissue mercury concentration predictions were generated for each Area-Year combination for a 5 cm Fork Length fish (the average minimum size across all area and years), an 8 cm Fork Length fish (the average size across all areas and years), and a 11 cm Fork Length fish (the average maximum size across all areas and years). MODs were calculated using these predictions.

Together, these pairwise comparisons provide a reasonable accounting of the last six years for identifying trends. Although the number of pairwise comparisons are relatively small, this analysis approach is in the spirit of the Before-After-Control-Impact and Generalized Additive Model analysis approaches identified in AMEC (2016).

6.2.3 Central Mudminnow

A similar analysis was undertaken to that outlined in **6.2.2** for both the 2024 Central Mudminnow data (i.e., ANCOVA) and the 2022–2024 longer-term Central Mudminnow data (LMMs).

6.3 Results

6.3.1 Common Shiner

In 2024, Common Shiner mean tissue mercury concentrations at all Areas were below the consumption guidelines for sensitive populations of 0.5 mg/kg (MECP 2015) and 0.2 mg/kg fish-protective level (Beckvar et al., 2005). However, one individual of 50 (2%) at PWREF and three individuals of 41 (7%) were above 0.2 mg/kg (**Table 6-1**).

For the 2024 ANCOVA, one model was fit using all data, one model was fit removing influential outliers[1], and another model was fit using only the overlapping size range of sites because PWNF fish tended to be smaller during this sampling year. Upon evaluation based on fit and the potential exclusion of a large amount of data, it was determined most reasonable to use the model excluding the few outlier points.

For the 2024 ANCOVA, the model explained 45% of the variation in mercury concentrations. There was a statistically significant Area effect (F =16.9, p < 0.001), Fork Length effect (F = 34.8, p < 0.001), and interaction (F = 4.8, p = 0.011). Since there was an interaction, MOD comparisons were made at fish sizes of 4.8 cm (minimum overlapping sizes for PWNF and PWFF), 5.9 cm (minimum overlapping sizes of PWREF, PWNF, and PWFF), 6.8 cm (maximum overlapping sizes of PWREF, PWNF, and PWFF), and 9.2 cm (maximum overlapping sizes of PWREF and PWFF) (**Table 6-2** and **Figure 6-1**); comparisons were only made across areas having those size fish. At 4.8 cm, PWNF and PWFF were statistically similar. At 5.9 cm, PWNF had ~40% higher concentrations than PWREF fish and ~55% higher at 6.8 cm at PWREF and PWNF compared to PWREF. At 9.2 cm, PWREF and PWFF were statistically similar. Taken together, when comparing similar sized fish except for the smallest fish, PWNF tended to have statistically higher and biologically relevant (i.e., |>25%| MOD) concentrations of mercury (**Table 6-2** and **Figure 6-1**).

For the 2019–2024 LMM, the fixed and random effects collectively explained 76% of the total variability in mercury concentrations, with fixed effects of Area and Fork Length explaining 26% of the total variability (**Table 6-3**). On average, PWNF had statistically higher concentrations than PWREF (95% CI did not overlap 0) whereas there was no effect of Fork Length (95% CI overlapped 0). This was expected given the substantial variability in the Fork Length relationship year-to-year and across areas observed in past reports. This observation is also supported by the model – approximately 40% and 50% of the total residual variability (i.e., random effects + "noise") was related to the random intercept and random slope, respectively, representing deviation in the Fork Length relationship for different Area-Year combinations.

The 2019–2024 LMM was then used to generate Area:Year predictions for 5 cm, 8 cm, and 11 cm fish to determine average trends over time. As indicated in **Section 6.2.1**, predictions from the

[1] Cook's distance values exceeding 4/(n – k – 1) where n is the number of observations and k is the number of regression parameters per EC (2012).

model "borrow strength" from the model structure and data such that when little data is available per group, the predictions are closer to the average model; this generally avoids overfitting and leads to more reliable estimates when sample sizes are small. As in past reports, the magnitude of difference between sites varied year-to-year. On average, PWNF was 127% greater than PWREF (range: 22–231%) for 5 cm fish, 81% greater for 8 cm fish (range: 47–114%), and 86% greater for 11 cm fish (range: 39–148%). PWFF was 8% greater than PWREF for 5 cm fish (range: -26–43%), -5% for 8 cm fish (range: -38–19%), and -10% (range: -44–45%) for 12 cm fish (**Table 6-3** and **Figure 6-2**).

Across years, the PWNF > PWREF is the most consistent relationship for nearly all fish sizes and years, but it is still variable in strength year-to-year. Using the 8 cm fish as a representative example, the magnitude of difference was 37%, 96%, 106%, 43%, and 89% in years 2020, 2021, 2022, 2023, and 2024, respectively (**Table 6-3**). Despite this relative increase, predicted concentrations remain around or below the fish protective level of 0.2 mg/kg and below the consumption guideline 0.5 mg/kg level.

Table 6-1: Tissue mercury concentrations summary statistics for Common Shiners using 2019–2024 data.

Year	Area	N	Mean	SD	Minimum	Median	Maximum
2019[a]	PWREF	0	--	--	--	--	--
2019	PWNF	50	0.433	0.129	0.25	0.41	0.72
2019	PWFF	51	0.199	0.058	0.08	0.2	0.38
2020	PWREF	50	0.084	0.034	0.027	0.084	0.167
2020	PWNF	50	0.108	0.03	0.049	0.102	0.177
2020	PWFF	50	0.056	0.017	0.038	0.051	0.139
2021	PWREF	50	0.076	0.026	0.043	0.074	0.203
2021	PWNF	50	0.151	0.035	0.076	0.145	0.236
2021	PWFF	11	0.1	0.024	0.077	0.091	0.15
2022	PWREF	50	0.109	0.042	0.052	0.102	0.249
2022	PWNF	48	0.216	0.075	0.117	0.202	0.493
2022	PWFF	53	0.14	0.078	0.066	0.125	0.567
2023	PWREF	50	0.093	0.032	0.025	0.091	0.194
2023	PWNF	14	0.138	0.057	0.076	0.123	0.267
2023	PWFF	4	0.055	0.007	0.048	0.055	0.062
2024	PWREF	50	0.084	0.039	0.028	0.075	0.203
2024	PWNF	41	0.141	0.038	0.086	0.131	0.254
2024	PWFF	16	0.085	0.025	0.038	0.092	0.123

Notes:
N is number of samples.
SD is standard deviation.
-- indicates no data available.
a. PWREF 2019 samples were accidentally left out of freezer, subsequently degraded, and were not analyzed (Minnow 2019)

Table 6-2: Results of models comparing tissue mercury concentrations in Common Shiners from Pinewood River between PWREF, PWNF, and PWFF.

Model Parameters		Sample Size			Adj. R^2	Slopes Equal? Interaction Model		Areas Equal? Parallel Model		Comparisons			
										Length (cm)	Magnitude of Difference (MOD; %)		
Response	Covariate	PWREF	PWNF	PWFF		p	Equal?	p	Equal?		PWNF vs. PWREF	PWFF vs. PWREF	PWNF vs. PWFF
log_{10} Tissue Mercury	log_{10} Fork Length	45	40	13	0.43	0.01	No	--	--	4.8	--	--	N.S.
										5.9	43	N.S.	42
										6.8	54	N.S.	58
										9.2	--	N.S.	--

Notes:
a. "N.S." indicates not statistically significant.

Table 6-3: Comparison of LMMs with different fixed effects.

Fixed Effects	R^2marginal	R^2conditional	Variance Components (%)			
			Year	Area:Year	Fork Length in Area:Year	Residual
1. Area + Fork Length	0.262	0.749	9.0	38.1	49.4	3.5
2. Area	0.256	0.748	9.4	38.3	48.6	3.7
3. Fork Length	0.002	0.748	4.0	49.1	43.8	3.1

Table 6-4: Magnitude of difference results based on marginal concentrations at different fish sizes from 2019-2024 model 1 Table 6-3.

Year	5 cm			8 cm			11 cm		
	PWNF vs PWREF	PWFF vs PWREF	PWNF vs. PWFF	PWNF vs PWREF	PWFF vs PWREF	PWNF vs. PWFF	PWNF vs PWREF	PWFF vs PWREF	PWNF vs. PWFF
2019[a]	*164.05*	*-7.87*	186.60	*114.13*	*-3.50*	121.90	*87.66*	*0.21*	87.27
2020	174.62	20.92	127.10	37.78	-22.83	78.53	-15.04	-44.01	51.74
2021	231.01	42.93	131.59	96.40	14.83	71.04	37.92	-0.63	38.79
2022	21.72	-17.26	47.11	106.00	18.74	73.48	190.57	44.84	100.61
2023	64.62	-26.74	124.71	42.63	-28.64	99.88	33.15	-30.30	91.04
2024	107.95	35.14	53.87	89.56	-6.73	103.24	80.13	-27.32	147.83
Mean (2019-2024)	**127.33**	**7.86**	**111.83**	**81.08**	**-4.69**	**91.35**	**69.07**	**-9.53**	**86.21**

Notes:
Italicized data are model estimates as PWREF 2019 samples were accidentally left out of freezer, subsequently degraded, and were not analyzed (Minnow 2019)

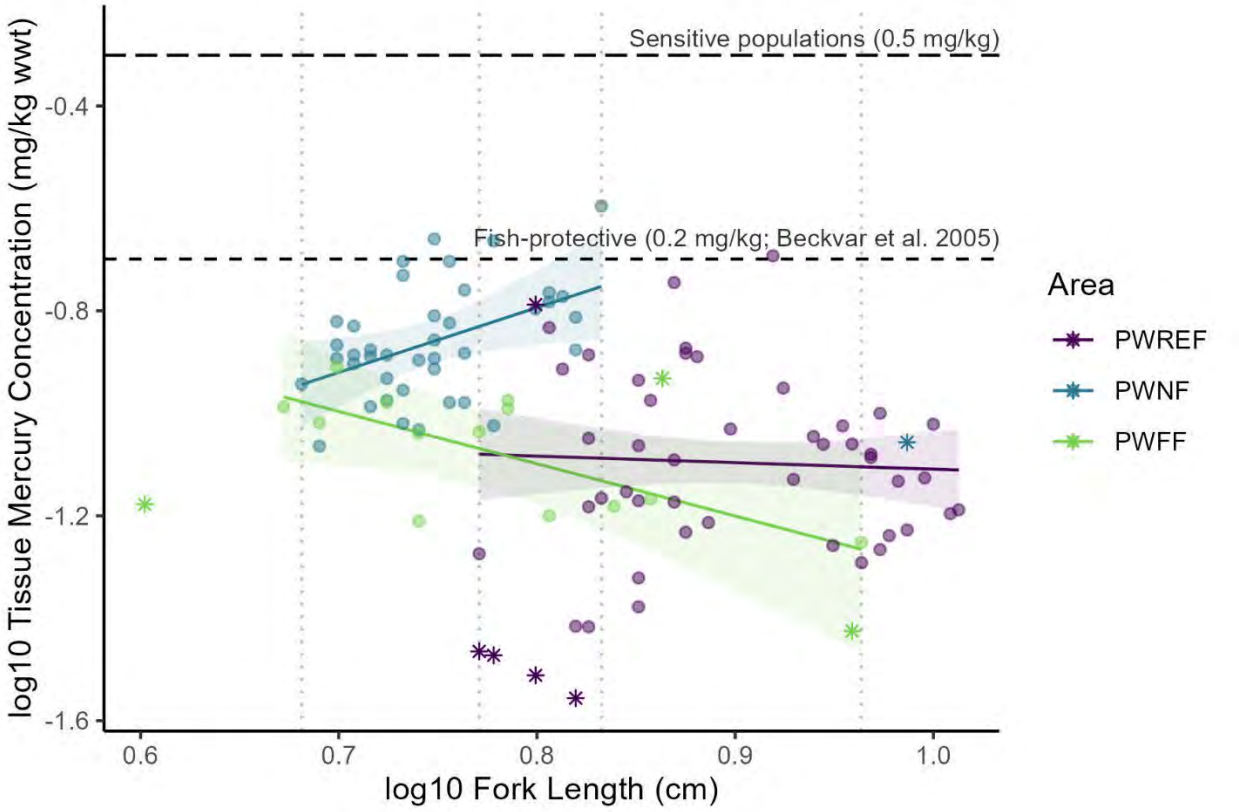

Figure 6-1: Log10 tissue mercury concentrations at log10 fork length for Common Shiner with predicted linear relationships by Area. Predicted relationships are estimated from model 1 Table 6-2. Points as stars indicate Cook's outliers removed from the dataset. Grey vertical lines are fork length values at which statistical comparisons were made.

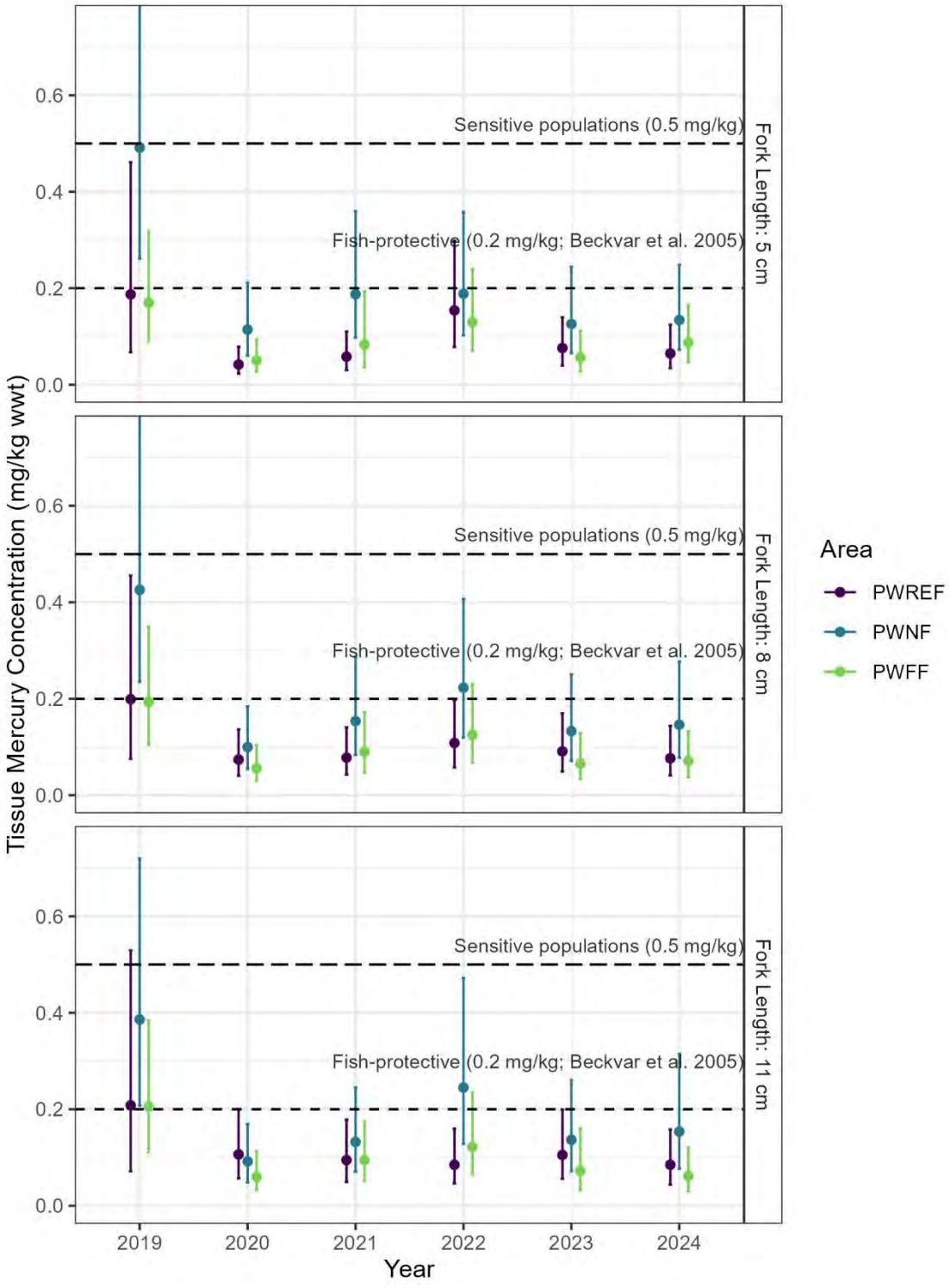

Figure 6-2: Posterior predictions (median) and 95% credible interval for tissue mercury concentrations for Common Shiner at PWREF, PWNF, and PWFF areas and years 2019–2024. Posterior predictions are estimated from model 1 Table 6-3 .

6.3.2 Central Mudminnow

In 2024, Central Mudminnow mean tissue mercury concentrations at all sites were below the consumption guidelines for sensitive populations of 0.5 mg/kg (MECP 2015) and the 0.2 mg/kg fish-protective level (**Table 6-5**; Beckvar et al., 2005). Similarly, no individual fish were above these benchmarks (**Figure 6-3**).

For the 2024 ANCOVA, the model explained 55% of the variation in mercury concentrations. There was no interaction between Fork Length and Area so it was removed from the model ($p > 0.10$). There was a statistically significant Area effect ($F = 27.8$, $p < 0.001$) and Fork Length effect ($F = 7.6$, $p = 0.008$). MOD comparisons at a common length of 7.8 cm indicated that PWNF had 61% higher and PWFF had 15% lower concentrations than PWREF, respectively, on average. PWNF had 89% higher concentrations and PWREF had 17% higher concentrations than PWFF, on average at the common length of 7.8 cm. Taken together, when comparing similar sized fish for CMM, PWNF tended to have statistically higher and biologically relevant (i.e., |>25%| MOD) concentrations of mercury (**Table 6-7** and **Figure 6-3**).

For the 2022–2024 LMM, the fixed and random effects collectively explained 50% of the total variability in mercury concentrations, with fixed effects of Area and Fork Length explaining 27% of the total variability (**Table 6-8**). On average, PWNF and PWFF did not differ from PWREF (95 CIs of the effect overlapped 0) but there was an effect of Fork Length. As with Common Shiners, there was a large amount of residual variability related to the random intercept and random slope (27% and 30% of the residual variability, respectively) indicating both area- and year-to-year variability in the concentration-fish size relationship.

The 2022–2024 LMM was also used to generate Area:Year predictions for 5 cm, 8 cm, and 11 cm fish to determine average trends over time. On average, PWNF was 33% greater than PWREF (range: 10–53%) for 5 cm fish, 35% greater for 8 cm fish (range: 8–57%), and 37% greater for 11 cm fish (range: 5–65%). PWFF was 0.8% greater than PWREF for 5 cm fish (range: -22–37%), 0.5% greater for 8 cm fish (range: -24–39%), and 0.9% greater (range: -25–42%) for 12 cm fish (**Table 6-9** and **Figure 6-4**).

Similar to Common Shiners, across years, the PWNF > PWREF is the most consistent relationship for nearly all fish sizes and years but it is still variable in strength year-to-year. Using the 8 cm fish as a representative example, the magnitude of difference was 39%, 8%, and 58% in years 2022, 2023, and 2024, respectively (**Table 6-9**). Despite this relative increase, predicted concentrations remain below the fish-protective level of 0.2 mg/kg.

Table 6-5: Tissue mercury concentration summary statistics for Central Mudminnow using 2022–2024 data.

Year	Area	N	Mean	SD	Minimum	Median	Maximum
2022	PWREF	5	0.067	0.01	0.052	0.066	0.08
2022	PWNF	5	0.102	0.022	0.067	0.107	0.121
2022	PWFF	2	0.094	0.007	0.089	0.094	0.098
2023	PWREF	10	0.106	0.035	0.059	0.096	0.165
2023	PWNF	10	0.102	0.017	0.081	0.1	0.136
2023	PWFF	4	0.069	0.011	0.058	0.068	0.082
2024	PWREF	24	0.071	0.015	0.039	0.072	0.101
2024	PWNF	20	0.114	0.032	0.061	0.111	0.168
2024	PWFF	7	0.060	0.016	0.034	0.066	0.073

Table 6-6: Results of models comparing tissue mercury concentrations in Central Mudminnows from Pinewood River between PWREF, PWNF, and PWFF.

Model Parameters		Sample Size			Adj. R^2	Slopes Equal? Interaction Model		Areas Equal? Parallel Model		Comparisons			
										Length (cm)	Magnitude of Difference (MOD; %)		
Response	Covariate	PWREF	PWNF	PWFF		p	Equal?	p	Equal?		PWNF vs. PWREF	PWFF vs. PWREF	PWNF vs. PWFF
log_{10} Tissue Mercury	log_{10} Fork Length	24	20	7	0.55	0.11	Yes	<0.001	No	7.8	61	-15	89

Notes:
a. MOD comparisons that are shaded indicate statistically significant differences.

Table 6-7: Comparison of LMMs with different fixed effects for Central Mudminnow

Fixed Effects	$R^2_{marginal}$	$R^2_{conditional}$	Random Effects Variance Components (%)			
			Year	Area:Year	Fork Length in Area:Year	Residual
Area + Fork Length	0.266	0.501	14.6	26.9	30.4	28.2
Area	0.462	0.246	12.6	23.3	40.6	23.5
Fork Length	0.065	0.499	13.9	25.2	35.9	25.0

Table 6-8: Magnitude of difference results based on marginal concentrations at different fish sizes from 2019-2023 model 2 Table 6-2.

Year	5 cm			8 cm			11 cm		
	PWNF vs PWREF	PWFF vs PWREF	PWNF vs. PWFF	PWNF vs PWREF	PWFF vs PWREF	PWNF vs. PWFF	PWNF vs PWREF	PWFF vs PWREF	PWNF vs. PWFF
2022	38.7	36.5	1.6	38.8	39.1	-0.2	40.9	41.6	-0.5
2023	9.6	-22.1	40.7	8.1	-23.8	42.0	4.9	-25.4	40.5
2024	52.5	-11.9	73.2	57.9	-13.7	82.9	64.8	-13.7	91.0
Mean (2022–2024)	**33.6**	**0.8**	**38.5**	**34.9**	**0.5**	**41.6**	**36.9**	**0.9**	**43.6**

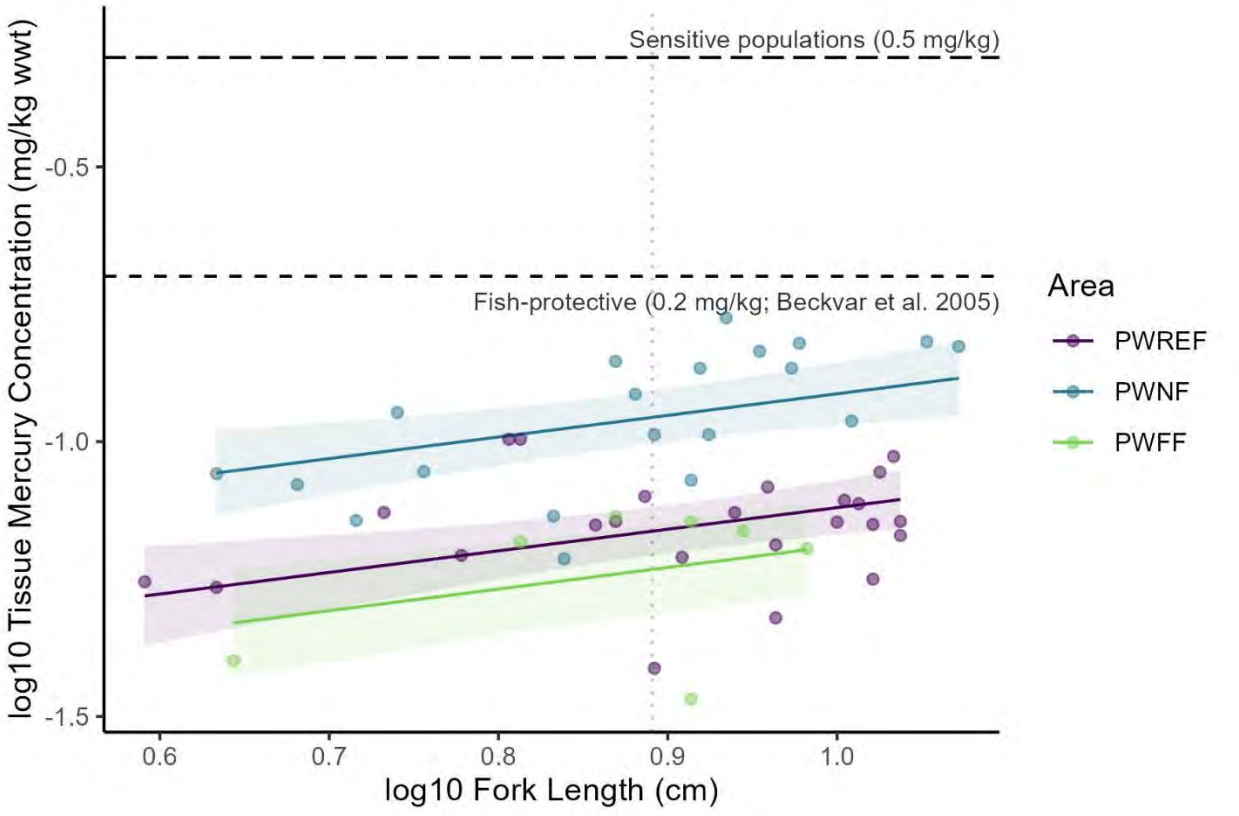

Figure 6-3: Log10 tissue mercury concentrations at log10 Total Length for Central Mudminnow. Grey vertical lines are fork length values at which statistical comparisons were made.

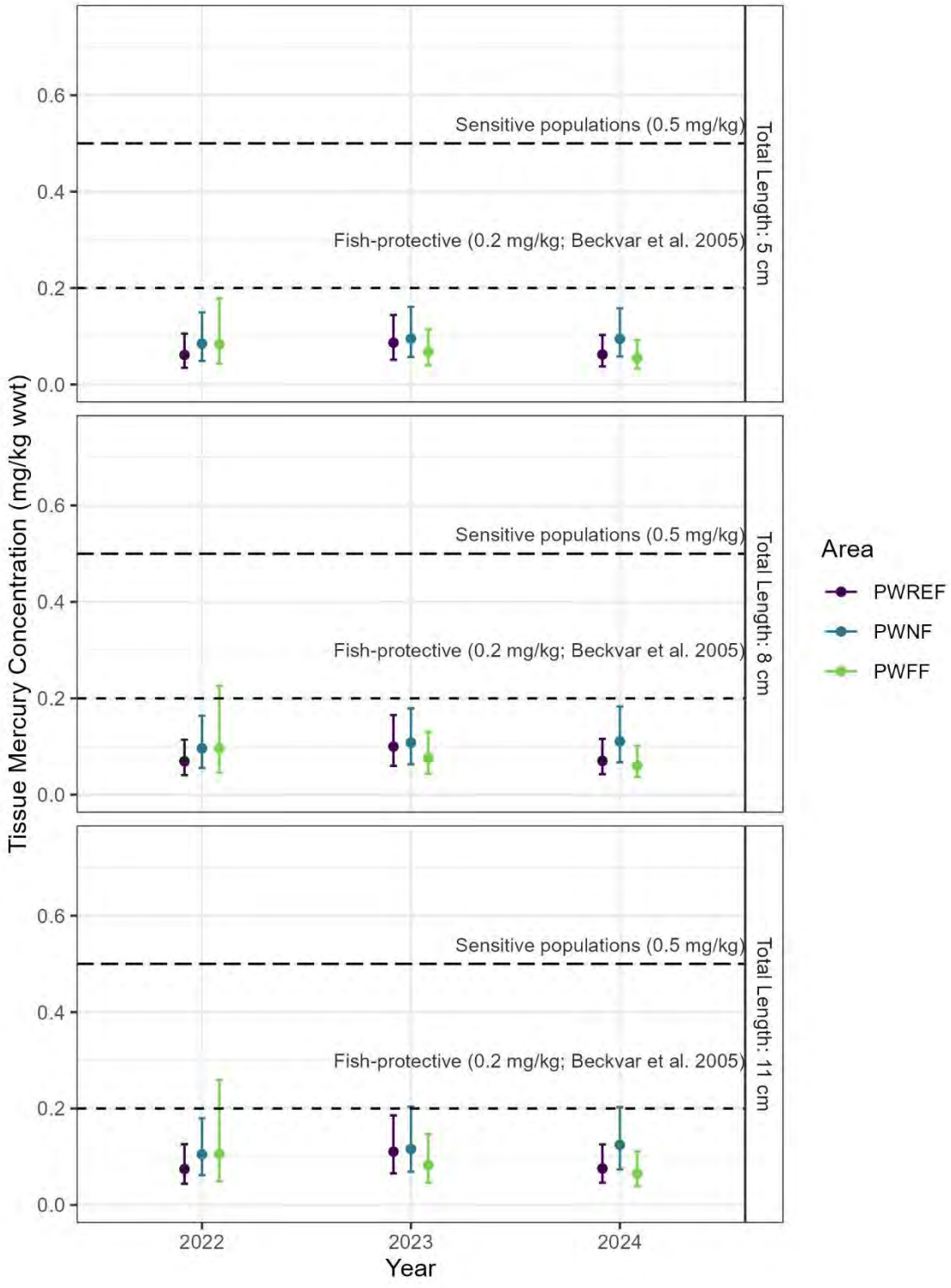

Figure 6-4: Estimated marginal mean and 95% confidence interval tissue mercury concentrations for Central Mudminnow at PWREF and PWNF areas and years 2022–2024.

7.0 Conclusions and Recommendations

7.1 Conclusions

The current study provided the following conclusions:

- Water level loggers indicate that Area 1–4 non-impounded and impounded habitats continue to exhibit seasonal differences in water level fluctuations mirroring precipitation variations in 2024 and over longer 2021–2024 periods. Area 3 tends to exhibit the highest variability in water level while Area 2 tends to have the highest water levels and lowest variability. Water levels and fluctuations continue to suggest no distinct pattern to suggest the impounded or non-impounded areas are affected by mine-related activities. Beaver activity along the Pinewood River has contributed to the pooling of water along sections of the river and is a possible factor influencing water levels in this vicinity.

- In 2024, mining is likely not a major contributing factor to surface water concentrations of mercury in the Pinewood River. Both site catchment and surface water total and dissolved mercury water concentrations tended to be below detection limits and Provincial Water Quality Objectives (PWQO) and Canadian Council of Ministers of the Environment (CCME) guidelines. The tailings management area site catchment water samples tended to have higher and more variable concentrations than other site catchments (e.g., sediment pond #1 and #2) but still below the PWQO.

- In 2024, site catchment and surface water methylmercury concentrations also continue to remain low and in most cases below the values observed at the reference locations. All concentrations were below CCME guidelines of 4 ng/L. An evaluation of the potential for enhanced methylation (>50% methylmercury:total mercury) revealed sampled site catchments tended to be <5 % and that surface water stations were more variable, tended to be >10% with none exceeding the 50% ratio.

- Total and dissolved mercury loads (i.e., kg/day) attributed to mine discharge and background water were proportional to discharge and background water flows, respectively, because median and 90th percentile concentrations were <DL in all samples.

- Sulfate loads (i.e., kg/day) attributed to mine discharge were higher than background during months of discharge. During months with discharge (12–31% of total river flow), mine-attributed loads were 98-100%.

- Sulfate concentrations in surface water at exposure sites began returning to reference levels in the months after discharge.

- Fish communities in the reference and exposure areas continue to be diverse with 11 to 17 species being identified and with various age classes present. Density and dominant species varied between areas and between years.

- In 2024, Common Shiner (*Luxilus cornutus*) and Central Mudminnow (*Umbra limi*) mean tissue concentrations at all areas were below the consumption guidelines for sensitive populations of 0.5 mg/kg (MECP 2015) and the 0.2 mg/kg fish-protective level (Beckvar et al. 2005). A small proportion of individual Common Shiner tissue results were above the fish-protective level.

- Common Shiner and Central Mudminnow fish tissue mercury concentrations were influenced by a combination of sample areas, length, and sample year. For both species, a large amount of residual variability, after accounting for sample location and length is attributed to Area-Year relationships. Despite being below the 0.5 mg/kg consumption guideline, PWNF has consistently higher mean tissue mercury concentrations than PWREF; its magnitude of difference (MOD) relative to PWREF tends to be above 25% based on multiple models (both 2024 models and models examining longer term trends). Continued monitoring in 2025 with more spatially explicit fish identification may serve useful in examining within-area variability and potential effect of mining activities on Common Shiner and Central Mudminnow at PWNF.

7.2 Recommendations

The below are suggestions to modify or improve the program:

- In 2024, it was identified that Area-Year combinations explain a large proportion of variability in fish mercury concentrations. In past reports, fish from various gear are pooled and then processed. In 2025, a more spatially explicit approach through fish tags that links tissue concentration with sampling gear and location may provide further insight into spatial variability in sites, particularly at PWNF.

- In 2025, more effort should be put into finding larger fish at PWNF which will allow for a wider range of fish sizes.

- Determine feasibility for obtaining lower detection limits for total and dissolved mercury (currently 5 ng/L or 0.000005 mg/L) to better align with detection limits of methylmercury (currently 0.02 ng/L although it tends to be higher due to sample matrix effects like chemical interference, colour, and turbidity). The terms of reference identified method detection limits of 0.1 ng/L as appropriate. This will make the calculation of the methylmercury:total mercury more accurate. If not possible, consider requesting non-censored analytical values (number produced by the analytical instruments) that could be used in a robust statistical framework for estimating summary statistics (e.g., regression-on-order-statistics for censored data) rather than simple substitution.

- Continue to ensure that site catchments and surface water locations are sampled at least monthly for methylmercury during the open water season to meet the terms of reference objectives.

- Continue to analyze fish mercury data using ANCOVA (using yearly data) and LMMs (for assessing general trends).

8.0 References

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Appendix A Detailed Data – Mercury and Sulfate Catchment and Surface Water Assessment and Loadings Assessment

Table 8-1: Select water chemistry parameters for site catchments, 2024

Site names are: Mine Rock Pond (MRP), Tailings Management Area (TMA), Sediment Pond 1 (SED1), Sediment Pond 2 (SED2), and Water Management Pond (WMP).

Site	Sample ID	Date	Mercury – Total (mg/L)	Mercury – Dissolved (mg/L)	Methylmercury – Total (ug/L)	Hardness (mg/L)	Sulfate – Total (mg/L)
MRP	MRP_EFF_20240110	10-Jan-2024	<0.0000050	<0.0000050	NA	1450	1350
MRP	MRP_EFF_20240214	14-Feb-2024	<0.0000050	<0.0000050	NA	1270	1170
MRP	MRP_EFF_20240313	13-Mar-2024	<0.0000050	<0.0000050	NA	774	710
MRP	MRP_EFF_20240320	21-Mar-2024	<0.0000050	<0.0000050	NA	819	698
MRP	MRP_EFF_20240327	30-Mar-2024	<0.0000050	<0.0000050	NA	1180	1030
MRP	MRP_EFF_20240410	10-Apr-2024	<0.0000050	<0.0000050	NA	517	418
MRP	MRP_EFF_20240417	17-Apr-2024	<0.0000050	<0.0000050	NA	649	545
MRP	MRP_EFF_20240424	24-Apr-2024	<0.0000050	<0.0000050	NA	708	617
MRP	MRP_EFF_20240501	01-May-2024	<0.0000050	<0.0000050	NA	808	663
MRP	MRP_EFF_20240508	08-May-2024	<0.0000050	<0.0000050	NA	777	689
MRP	MRP_EFF_20240508	08-May-2024	NA	NA	<0.000020	NA	NA
MRP	MRP_EFF_20240515	15-May-2024	<0.0000050	<0.0000050	NA	867	786
MRP	MRP_EFF_20240522	22-May-2024	<0.0000050	<0.0000050	NA	831	799
MRP	MRP_EFF_20240529	29-May-2024	<0.0000050	<0.0000050	NA	900	826
MRP	Cell2R_EFF_20240605	05-Jun-2024	NA	NA	<0.000020	NA	NA
MRP	MRP_EFF_2020605	05-Jun-2024	<0.0000050	<0.0000050	NA	994	872
MRP	MRP_EFF_20240605	06-Jun-2024	NA	NA	<0.000020	NA	NA
MRP	MRP_EFF_20240612	12-Jun-2024	<0.0000050	<0.0000050	NA	1100	908
MRP	MRP_EFF_20240619	19-Jun-2024	<0.0000050	<0.0000050	NA	1040	931
MRP	MRP_EFF_20240626	26-Jun-2024	<0.0000050	<0.0000050	NA	1240	938
MRP	MRP_EFF_20240703	02-Jul-2024	<0.0000050	<0.0000050	NA	1130	980
MRP	MRP_EFF_20240710	11-Jul-2024	<0.0000050	<0.0000050	NA	1110	862
MRP	MRP_EFF_20240710	11-Jul-2024	NA	NA	<0.000020	NA	NA
MRP	MRP_EFF_20240717	17-Jul-2024	<0.0000050	<0.0000050	NA	1020	910
MRP	MRP_EFF_20240731	31-Jul-2024	<0.0000050	<0.0000050	NA	1000	878
MRP	MRP_EFF_20240807	07-Aug-2024	<0.0000050	<0.0000050	NA	922	841
MRP	MRP_EFF_20240807	07-Aug-2024	NA	NA	<0.000020	NA	NA
MRP	MRP_EFF_20240814	14-Aug-2024	<0.0000050	<0.0000050	NA	1100	899
MRP	MRP_EFF_20240821	21-Aug-2024	<0.0000050	<0.0000050	NA	1150	867
MRP	MRP_EFF_20240828	28-Aug-2024	<0.0000050	<0.0000050	NA	1000	868
MRP	MRP_EFF_20240904	04-Sep-2024	<0.0000050	<0.0000050	NA	907	751
MRP	MRP_EFF_20240904	04-Sep-2024	NA	NA	<0.000020	NA	NA
MRP	MRP_EFF_20240911	11-Sep-2024	<0.0000050	<0.0000050	NA	761	484

Site	Sample ID	Date	Mercury – Total (mg/L)	Mercury – Dissolved (mg/L)	Methylmercury – Total (ug/L)	Hardness (mg/L)	Sulfate – Total (mg/L)
MRP	MRP_EFF_20240918	18-Sep-2024	<0.0000050	<0.0000050	NA	872	723
MRP	MRP_EFF_20241002	02-Oct-2024	NA	NA	<0.000020	NA	NA
MRP	MRP_EFF_20241008	08-Oct-2024	<0.0000050	<0.0000050	NA	790	771
MRP	MRP_EFF_20241016	16-Oct-2024	<0.0000050	<0.0000050	NA	852	792
MRP	MRP_EFF_20241023	24-Oct-2024	<0.0000050	<0.0000050	NA	788	755
MRP	MRP_EFF_20241030	30-Oct-2024	<0.0000050	<0.0000050	NA	743	649
MRP	MRP_EFF_20241106	06-Nov-2024	<0.0000050	<0.0000050	NA	859	776
MRP	MRP_EFF_20241113	14-Nov-2024	<0.0000050	<0.0000050	NA	867	822
MRP	MRP_EFF_20241127	27-Nov-2024	<0.0000050	<0.0000050	NA	602	441
MRP	MRP_EFF_20241211	11-Dec-2024	<0.0000050	<0.0000050	NA	900	818
SED1	SP1_EFF_20240110	10-Jan-2024	<0.0000050	<0.0000050	NA	206	56.7
SED1	SP1_EFF_20240313	13-Mar-2024	<0.0000050	<0.0000050	NA	106	29.2
SED1	SP1_EFF_20240320	21-Mar-2024	<0.0000050	<0.0000050	NA	157	40.7
SED1	SP1_EFF_20240410	10-Apr-2024	<0.0000050	<0.0000050	NA	180	39.3
SED1	SP1_EFF_20240417	17-Apr-2024	<0.0000050	<0.0000050	NA	183	35.6
SED1	SP1_EFF_20240424	24-Apr-2024	<0.0000050	<0.0000050	NA	177	41.4
SED1	SP1_EFF_20240501	01-May-2024	<0.0000050	<0.0000050	NA	186	33.7
SED1	SP1_EFF_20240508	08-May-2024	<0.0000050	<0.0000050	NA	172	34.7
SED1	SP1_EFF_20240508	08-May-2024	NA	NA	0.000077	NA	NA
SED1	SP1_EFF_20240515	15-May-2024	<0.0000050	<0.0000050	NA	176	33.1
SED1	SP1_EFF_20240522	22-May-2024	<0.0000050	<0.0000050	NA	166	32.4
SED1	SP1_EFF_20240529	29-May-2024	<0.0000050	<0.0000050	NA	166	27.0
SED1	SP1_EFF_20240605	05-Jun-2024	<0.0000050	<0.0000050	NA	166	25.0
SED1	SP1_EFF_20240605	05-Jun-2024	NA	NA	0.000146	NA	NA
SED1	SP1_EFF_20240612	12-Jun-2024	<0.0000050	<0.0000050	NA	154	23.6
SED1	SP1_EFF_20240619	19-Jun-2024	<0.0000050	<0.0000050	NA	136	25.9
SED1	SP1_EFF_20240626	26-Jun-2024	<0.0000050	<0.0000050	NA	132	23.0
SED1	SP1_EFF_20240703	02-Jul-2024	<0.0000050	<0.0000050	NA	125	31.3
SED1	SP1_EFF_20240710	11-Jul-2024	<0.0000050	<0.0000050	NA	115	23.3
SED1	SP1_MM_20240710	11-Jul-2024	NA	NA	0.000300	NA	NA
SED1	SP1_EFF_20240717	17-Jul-2024	<0.0000050	<0.0000050	NA	118	25.3
SED1	SP1_EFF_20240731	31-Jul-2024	<0.0000050	<0.0000050	NA	110	23.7
SED1	SP1_EFF_20240807	07-Aug-2024	<0.0000500	<0.0000500	NA	117	25.7
SED1	SP1_EFF_20240807	07-Aug-2024	NA	NA	0.000215	NA	NA
SED1	SP1_EFF_20240814	14-Aug-2024	<0.0000050	<0.0000050	NA	126	24.0
SED1	SP1_EFF_20240821	21-Aug-2024	<0.0000050	<0.0000050	NA	137	22.0
SED1	SP1_EFF_20240828	28-Aug-2024	<0.0000050	<0.0000050	NA	123	23.4
SED1	SP1_EFF_20240904	04-Sep-2024	<0.0000050	<0.0000050	NA	114	22.7
SED1	SP1_EFF_20240904	04-Sep-2024	NA	NA	0.000094	NA	NA
SED1	SP1_EFF_20240911	11-Sep-2024	<0.0000050	<0.0000050	NA	120	19.8

Site	Sample ID	Date	Mercury – Total (mg/L)	Mercury – Dissolved (mg/L)	Methylmercury – Total (ug/L)	Hardness (mg/L)	Sulfate – Total (mg/L)
SED1	SP1_EFF_20240918	18-Sep-2024	<0.0000050	<0.0000050	NA	125	23.2
SED1	SP1_EFF_20241002	02-Oct-2024	NA	NA	0.000134	NA	NA
SED1	SP1_EFF_20241008	08-Oct-2024	<0.0000050	<0.0000050	NA	133	26.9
SED1	SP1_EFF_20241016	16-Oct-2024	<0.0000050	<0.0000050	NA	144	29.2
SED1	SP1_EFF_20241023	24-Oct-2024	<0.0000050	<0.0000050	NA	142	28.2
SED1	SP1_EFF_20241030	30-Oct-2024	<0.0000050	<0.0000050	NA	144	27.8
SED1	SP1_EFF_20241106	06-Nov-2024	<0.0000050	<0.0000050	NA	152	29.8
SED1	SP1_EFF_20241113	14-Nov-2024	<0.0000050	<0.0000050	NA	152	30.8
SED1	SP1_EFF_20241127	27-Nov-2024	<0.0000050	<0.0000050	NA	172	34.5
SED1	SP1_EFF_20241211	11-Dec-2024	<0.0000050	<0.0000050	NA	180	38.5
SED2	SP2_EFF_20240110	10-Jan-2024	<0.0000050	<0.0000050	NA	435	321
SED2	SP2_EFF_20240214	14-Feb-2024	<0.0000050	<0.0000050	NA	272	214
SED2	SP2_EFF_20240313	13-Mar-2024	<0.0000050	<0.0000050	NA	366	262
SED2	SP2_EFF_20240320	21-Mar-2024	<0.0000050	<0.0000050	NA	210	152
SED2	SP2_EFF_2024037	31-Mar-2024	<0.0000050	<0.0000050	NA	153	105
SED2	SP2_EFF_20240410	10-Apr-2024	<0.0000050	<0.0000050	NA	73.7	56.4
SED2	SP2_EFF_20240417	17-Apr-2024	<0.0000050	<0.0000050	NA	433	310
SED2	SP2_EFF_20240424	24-Apr-2024	<0.0000050	<0.0000050	NA	418	342
SED2	SP2_EFF_20240508	08-May-2024	<0.0000050	<0.0000050	NA	420	313
SED2	SP2_EFF_20240508	08-May-2024	NA	NA	0.000067	NA	NA
SED2	SP2_EFF_20240605	06-Jun-2024	NA	NA	0.000511	NA	NA
SED2	SP2_EFF_20240703	02-Jul-2024	<0.0000050	<0.0000050	NA	385	267
SED2	SP2_EFF_20240710	11-Jul-2024	<0.0000050	<0.0000050	NA	419	277
SED2	SP2_MM_20240710	11-Jul-2024	NA	NA	0.000107	NA	NA
SED2	SP2_EFF_20240717	17-Jul-2024	<0.0000050	<0.0000050	NA	416	305
SED2	SP2_EFF_20240731	31-Jul-2024	<0.0000050	<0.0000050	NA	410	314
SED2	SP2_EFF_20240807	07-Aug-2024	<0.0000050	<0.0000050	NA	419	337
SED2	SP2_EFF_20240807	07-Aug-2024	NA	NA	0.000162	NA	NA
SED2	SP2_EFF_20240814	14-Aug-2024	<0.0000050	<0.0000050	NA	447	334
SED2	SP2_EFF_20240821	21-Aug-2024	<0.0000050	<0.0000050	NA	474	321
SED2	SP2_EFF_20240828	28-Aug-2024	<0.0000050	<0.0000050	NA	453	356
SED2	SP2_EFF_20240904	04-Sep-2024	<0.0000050	<0.0000050	NA	432	346
SED2	SP2_EFF_20240904	04-Sep-2024	NA	NA	0.000081	NA	NA
SED2	SP2_EFF_20240911	11-Sep-2024	<0.0000050	<0.0000050	NA	429	336
SED2	SP2_EFF_20240918	18-Sep-2024	<0.0000050	<0.0000050	NA	439	375
SED2	SP2_EFF_20241002	02-Oct-2024	NA	NA	0.000056	NA	NA
SED2	SP2_EFF_20241008	08-Oct-2024	<0.0000050	<0.0000050	NA	433	426
SED2	SP2_EFF_20241016	16-Oct-2024	<0.0000050	<0.0000050	NA	447	438
SED2	SP2_EFF_20241023	24-Oct-2024	<0.0000050	<0.0000050	NA	430	449
SED2	SP2_EFF_20241030	30-Oct-2024	<0.0000050	<0.0000050	NA	442	416

Site	Sample ID	Date	Mercury – Total (mg/L)	Mercury – Dissolved (mg/L)	Methylmercury – Total (ug/L)	Hardness (mg/L)	Sulfate – Total (mg/L)
SED2	SP2_EFF_20241106	06-Nov-2024	<0.0000050	<0.0000050	NA	444	436
SED2	SP2_EFF_20241113	14-Nov-2024	<0.0000050	<0.0000050	NA	447	441
SED2	SP2_EFF_20241127	27-Nov-2024	<0.0000050	<0.0000050	NA	442	440
SED2	SP2_EFF_20241211	11-Dec-2024	<0.0000050	<0.0000050	NA	475	462
TMA	TMA CELL 2_EFF_20240214	14-Feb-2024	0.0000164	0.0000073	NA	407	563
TMA	TMA CELL 2_EFF_20240410	10-Apr-2024	0.0000417	0.0000364	NA	481	773
TMA	CELL 2 RECLAIM_EFF_20240424	26-Apr-2024	0.0000660	0.0000652	NA	628	1010
TMA	CELL 2 RECLAIM_EFF_20240501	01-May-2024	0.0000545	0.0000518	NA	614	924
TMA	CELL 2 RECLAIM_EFF_20240508	08-May-2024	0.0000811	0.0000786	NA	571	994
TMA	TMA CELL 2_EFF_20240508	08-May-2024	0.0000595	0.0000565	NA	547	1000
TMA	CELL 2 RECLAIM_EFF_20240515	15-May-2024	0.0000679	0.0000667	NA	595	963
TMA	CELL 2 RECLAIM_EFF_20240522	22-May-2024	0.0000568	0.0000536	NA	531	972
TMA	TMA CELL 2_EFF_20240522	22-May-2024	0.0000596	0.0000618	NA	525	964
TMA	CELL 2 RECLAIM_EFF_20240529	29-May-2024	0.0000548	0.0000516	NA	567	981
TMA	CELL 2 RECLAIM_EFF_20240605	05-Jun-2024	0.0000587	0.0000617	NA	595	918
TMA	CELL 2 RECLAIM_EFF_20240612	12-Jun-2024	0.0000557	0.0000543	NA	622	909
TMA	CELL 2 RECLAIM_EFF_20240619	19-Jun-2024	0.0000576	0.0000509	NA	548	918
TMA	CELL 2 RECLAIM_EFF_20240626	26-Jun-2024	0.0000587	0.0000597	NA	620	884
TMA	CELL 2 RECLAIM_EFF_20240703	02-Jul-2024	0.0000541	0.0000460	NA	554	910
TMA	CELL 2 RECLAIM_EFF_20240710	11-Jul-2024	0.0000691	0.0000568	NA	592	853
TMA	CELL 2 RECLAIM_EFF_20240710	11-Jul-2024	NA	NA	0.000042	NA	NA
TMA	CELL 2 RECLAIM_EFF_20240717	17-Jul-2024	0.0000527	0.0000407	NA	564	877
TMA	CELL 2 RECLAIM_EFF_20240731	31-Jul-2024	0.0000431	0.0000288	NA	569	972
TMA	CELL 2 RECLAIM_EFF_20240807	07-Aug-2024	0.0000378	0.0000286	NA	548	990
TMA	CELL 2 RECLAIM_EFF_20240807	07-Aug-2024	NA	NA	<0.000160	NA	NA
TMA	CELL 2 RECLAIM_EFF_20240814	14-Aug-2024	0.0000322	0.0000267	NA	627	922
TMA	TMA CELL 2_EFF_20240814	14-Aug-2024	0.0000270	0.0000145	NA	641	928
TMA	CELL 2 RECLAIM_EFF_20240821	21-Aug-2024	0.0000273	0.0000212	NA	658	891
TMA	CELL 2 RECLAIM_EFF_20240828	28-Aug-2024	0.0000217	0.0000187	NA	634	965
TMA	CELL 2 RECLAIM_EFF_20240904	04-Sep-2024	0.0000189	0.0000155	NA	610	944
TMA	CELL 2 RECLAIM_EFF_20240911	11-Sep-2024	0.0000169	0.0000126	NA	619	875
TMA	TMA CELL 2_EFF_20240911	11-Sep-2024	0.0000160	0.0000160	NA	619	755
TMA	CELL 2 RECLAIM_EFF_20240918	18-Sep-2024	0.0000133	0.0000104	NA	621	1010
TMA	CELL 2 RECLAIM_EFF_20241002	02-Oct-2024	NA	NA	<0.000020	NA	NA
TMA	CELL 2 RECLAIM_EFF_20241008	08-Oct-2024	0.0000140	0.0000086	NA	605	1150
TMA	CELL 2 RECLAIM_EFF_20241016	16-Oct-2024	0.0000140	0.0000118	NA	634	1130
TMA	CELL 2 RECLAIM_EFF_20241023	24-Oct-2024	0.0000115	0.0000080	NA	587	1150
TMA	CELL 2 RECLAIM_EFF_20241030	30-Oct-2024	0.0000123	0.0000115	NA	619	1090
TMA	TMA CELL 2_EFF_20241106	06-Nov-2024	0.0000113	0.0000094	NA	579	1130
TMA	CELL 2 RECLAIM_EFF_20241113	13-Nov-2024	0.0000095	<0.0000050	NA	624	1140

Site	Sample ID	Date	Mercury – Total (mg/L)	Mercury – Dissolved (mg/L)	Methylmercury – Total (ug/L)	Hardness (mg/L)	Sulfate – Total (mg/L)
TMA	CELL 2 RECLAIM_EFF_20241127	27-Nov-2024	0.0000129	<0.0000050	NA	606	1110
TMA	CELL 2 RECLAIM_EFF_20241211	11-Dec-2024	0.0000123	0.0000069	NA	624	1240
WMP	WMP SURFACE_EFF_20240110	10-Jan-2024	<0.0000050	<0.0000050	NA	643	763
WMP	WMP SURFACE_EFF_20240214	14-Feb-2024	<0.0000050	<0.0000050	NA	498	624
WMP	WMP SURFACE_EFF_20240313	13-Mar-2024	<0.0000050	<0.0000050	NA	418	405
WMP	WMP SURFACE_EFF_20240320	21-Mar-2024	<0.0000050	<0.0000050	NA	551	598
WMP	WMP SURFACE_EFF_2024037	29-Mar-2024	<0.0000050	<0.0000050	NA	462	552
WMP	WMP SURFACE_EFF_20240410	10-Apr-2024	<0.0000050	<0.0000050	NA	23.2	28.5
WMP	WMP SURFACE_EFF_20240417	17-Apr-2024	<0.0000050	<0.0000050	NA	566	682
WMP	WMP SURFACE_EFF_20240424	24-Apr-2024	<0.0000050	<0.0000050	NA	542	783
WMP	WMP_EFF_20240508	08-May-2024	NA	NA	0.000021	NA	NA
WMP	WMP_EFF_20240605	05-Jun-2024	NA	NA	0.000028	NA	NA
WMP	WMP_P36_EFF_20240612	12-Jun-2024	<0.0000050	<0.0000050	NA	563	631
WMP	WMP_P36_EFF_20240619	19-Jun-2024	<0.0000050	<0.0000050	NA	494	657
WMP	WMP SURFACE_EFF_20240703	02-Jul-2024	<0.0000050	<0.0000050	NA	526	667
WMP	WMP SURFACE_EFF_20240710	11-Jul-2024	<0.0000050	<0.0000050	NA	536	603
WMP	WMP_MM_20240710	11-Jul-2024	NA	NA	0.000046	NA	NA
WMP	WMP_P36_EFF_20240717	17-Jul-2024	<0.0000050	<0.0000050	NA	522	628
WMP	WMP SURFACE_EFF_20240731	31-Jul-2024	<0.0000050	<0.0000050	NA	526	645
WMP	WMP SURFACE_EFF_20240807	07-Aug-2024	<0.0000050	<0.0000050	NA	545	657
WMP	WMP SURFACE_EFF_20240807	07-Aug-2024	NA	NA	0.000086	NA	NA
WMP	WMP SURFACE_EFF_20240814	14-Aug-2024	<0.0000050	<0.0000050	NA	578	648
WMP	WMP SURFACE_EFF_20240821	21-Aug-2024	<0.0000050	<0.0000050	NA	565	593
WMP	WMP SURFACE_EFF_20240828	28-Aug-2024	<0.0000050	<0.0000050	NA	540	712
WMP	WMP SURFACE_EFF_20240904	04-Sep-2024	<0.0000050	<0.0000050	NA	530	650
WMP	WMP SURFACE_EFF_20240904	04-Sep-2024	NA	NA	0.000120	NA	NA
WMP	WMP SURFACE_EFF_20240911	11-Sep-2024	<0.0000050	<0.0000050	NA	530	571
WMP	WMP SURFACE_EFF_20240918	18-Sep-2024	<0.0000050	<0.0000050	NA	554	639
WMP	WMP P36_EFF_20241002	02-Oct-2024	NA	NA	0.000137	NA	NA
WMP	WMP_P36_EFF_20241008	08-Oct-2024	<0.0000050	<0.0000050	NA	670	844
WMP	WMP_P36_EFF_20241016	16-Oct-2024	<0.0000050	<0.0000050	NA	562	747
WMP	WMP_P36_EFF_20241020	20-Oct-2024	<0.0000050	<0.0000050	NA	566	730
WMP	WMP_P36_EFF_20241023	23-Oct-2024	<0.0000050	<0.0000050	NA	534	739
WMP	WMP_P36_EFF_20241030	30-Oct-2024	<0.0000050	<0.0000050	NA	593	724
WMP	WMP_P36_EFF_20241211	11-Dec-2024	<0.0000050	<0.0000050	NA	585	784

Table 8-2: Select water chemistry parameters for surface water locations, 2017–2024

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
Teeple Culvert (Reference)	2017-07-26	0.000004	4	0.000004	4	0.00000088	0.88	-	-
Teeple Culvert (Reference)	2017-08-31	0.000002	2	0.000004	4	0.00000046	0.46	-	-
Teeple Culvert (Reference)	2017-09-29	0.000001	1	0.000004	4	0.00000034	0.34	-	-
Teeple Culvert (Reference)	2017-10-30	0.000001	1	0.000002	2	0.00000032	0.32	-	-
Teeple Culvert (Reference)	2018-05-10	0.000014	14	0.000002	2	0.00000045	0.45	-	-
Teeple Culvert (Reference)	2018-06-12	0.000001	1	0.000006	6	0.0000003	0.3	-	-
Teeple Culvert (Reference)	2018-07-17	<0.000001	<1	0.000002	2	0.00000097	0.97	-	-
Teeple Culvert (Reference)	2018-09-11	0.000002	2	0.000002	2	0.00000021	0.21	-	-
Teeple Culvert (Reference)	2018-10-16	0.000004	4	0.000005	5	0.0000001	0.1	-	-
Teeple Culvert (Reference)	2019-05-16	<0.000001	<1	<0.000001	<1	0.00000044	0.44	-	-
Teeple Culvert (Reference)	2019-06-11	0.00003	30	0.000005	5	0.00000095	0.95	-	-
Teeple Culvert (Reference)	2019-07-08	<0.000005	<5	<0.000005	<5	0.00000169	1.69	-	-
Teeple Culvert (Reference)	2019-08-13	<0.000005	<5	<0.000005	<5	0.00000052	0.52	9	-
Teeple Culvert (Reference)	2019-09-19	<0.000005	<5	<0.000005	<5	0.0000004	0.4	-	-
Teeple Culvert (Reference)	2019-10-08	<0.000005	<5	0.00001	10	0.00000034	0.34	-	-
Teeple Culvert (Reference)	2020-06-17	<0.00003	<30	<0.00003	<30	0.000000792	0.792	-	-
Teeple Culvert (Reference)	2020-07-07	0.000005	5	<0.00003	<30	0.00000152	1.52	-	-
Teeple Culvert (Reference)	2020-08-11	<0.00003	<30	<0.00003	<30	0.000000659	0.659	13	-
Teeple Culvert (Reference)	2020-09-15	-	-	-	-	0.00000035	0.35	-	-
Teeple Culvert (Reference)	2020-10-14	<0.00003	<30	<0.00003	<30	0.000000106	0.106	18	-
Teeple Culvert (Reference)	2021-05-11	<0.000005	<5	<0.000005	<5	0.000000706	0.706	19.1	-
Teeple Culvert (Reference)	2021-06-08	0.0000204	20.4	0.0000055	5.5	0.00000241	2.41	-	-
Teeple Culvert (Reference)	2021-10-20	<0.000005	<5	<0.00003	<30	0.000000609	0.609	23.3	-
Teeple Culvert (Reference)	2022-06-08	<0.000005	<5	<0.000005	<5	0.00000097	0.97	-	-
Teeple Culvert (Reference)	2022-07-05	<0.000005	<5	<0.000005	<5	0.00000110	1.1	-	-
Teeple Culvert (Reference)	2022-09-06	<0.000005	<5	<0.000005	<5	0.00000105	1.05	-	-
Teeple Culvert (Reference)	2022-10-04	<0.000005	<5	<0.000005	<5	0.00000046	0.455	5.09	-
Teeple	2023-05-02	<0.000005	<5	<0.000005	<5	0.000000191	0.191	7.2	-
Teeple	2023-06-09	0.000005	5	<0.000005	5	0.00000109	1.09	0.93	-
Teeple	2023-07-10	<0.000005	<5	<0.000005	<5	0.000000854	0.854	2	-
Teeple	2023-08-08	<0.000005	<5	<0.000005	<5	0.000000623	0.623	1.06	-
Teeple	2023-10-04	<0.000005	<5	<0.000005	<5	0.000000248	0.248	1.23	-
Teeple	2023-11-13	<0.000005	<5	<0.000005	<5	0.000000136	0.136	7.91	-
Teeple Culvert (Reference)	10-Jul-24	<0.000005	<5	<0.000005	<5	-	-	-	-
Teeple Culvert (Reference)	07-Aug-24	<0.000005	<5	<0.000005	<5	1.20E-06	1.19	0.52	-

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
Teeple Culvert (Reference)	03-Sep-24	<0.000005	<5	<0.000005	<5	6.00E-07	0.578	-	-
Teeple Culvert (Reference)	01-Oct-24	<0.000005	<5	<0.000005	<5	5.00E-07	0.513	1.17	-
Teeple Culvert (Reference)	04-Jun-24	<0.000005	<5	<0.000005	<5	6.00E-07	0.0571	2.3	-
Teeple Culvert (Reference)	2024-11-05	<0.000005	<5	<0.000005	<5	2.40E-07	0.241	-	-
SW20 (Reference)	2017-07-26	0.000004	4	0.000004	4	0.000001	1	2	-
SW20 (Reference)	2017-08-31	<0.000001	<1	0.000002	2	0.00000065	0.65	1	-
SW20 (Reference)	2017-09-29	<0.000001	<1	0.000004	4	0.00000019	0.19	15	-
SW20 (Reference)	2017-10-30	0.000004	4	0.000002	2	0.00000019	0.19	8	111
SW20 (Reference)	2018-05-10	0.000001	1	0.000004	4	0.00000024	0.24	8	-
SW20 (Reference)	2018-06-12	0.000004	4	0.000006	6	0.00000169	1.69	3	149
SW20 (Reference)	2018-07-17	<0.000001	<1	<0.000001	<1	0.00000047	0.47	1	191
SW20 (Reference)	2018-08-07	<0.000001	<1	<0.000001	<1	0.00000021	0.21	1	175
SW20 (Reference)	2018-09-11	<0.000001	<1	0.000002	2	0.00000024	0.24	5	211
SW20 (Reference)	2018-10-16	0.000004	4	0.000007	7	0.00000017	0.17	25	176
SW20 (Reference)	2019-05-14	<0.000001	<1	<0.000005	<5	0.00000042	0.42	9	113
SW20 (Reference)	2019-06-11	<0.000005	<5	0.000005	5	0.00000129	1.29	4	135
SW20 (Reference)	2019-07-08	<0.000005	<5	<0.000005	<5	0.00000136	1.36	1	166
SW20 (Reference)	2019-08-13	<0.000005	<5	<0.000005	<5	0.00000157	1.57	0	185
SW20 (Reference)	2019-09-18	<0.000005	<5	<0.000005	<5	0.0000004	0.4	4	139
SW20 (Reference)	2019-10-08	<0.000005	<5	<0.000005	<5	0.00000025	0.25	4	110
SW20 (Reference)	2020-01-09	<0.00003	<30	<0.00003	<30	-	-	5	158
SW20 (Reference)	2020-02-05	<0.00003	<30	<0.00003	<30	-	-	6	178
SW20 (Reference)	2020-03-10	<0.00003	<30	<0.00003	<30	-	-	8	179
SW20 (Reference)	2020-04-08	<0.00003	<30	0.000005	5	-	-	3	68
SW20 (Reference)	2020-05-12	<0.00003	<30	0.000005	5	-	-	4	123
SW20 (Reference)	2020-06-16	<0.00003	<30	<0.00003	<30	0.000000648	0.648	1	125
SW20 (Reference)	2020-07-07	<0.00003	<30	<0.00003	<30	0.00000131	1.31	2	166
SW20 (Reference)	2020-08-11	<0.00003	<30	<0.00003	<30	0.000000396	0.396	1	149
SW20 (Reference)	2020-09-15	<0.00003	<30	<0.00003	<30	0.000000176	0.176	3	185
SW20 (Reference)	2020-10-14	<0.00003	<30	<0.00003	<30	0.000000357	0.357	7	186
SW20 (Reference)	2020-11-04	<0.00003	<30	<0.00003	<30	-	-	10	162
SW20 (Reference)	2020-11-10	<0.00003	<30	<0.00003	<30	-	-	8	162
SW20 (Reference)	2020-12-15	<0.00003	<30	<0.00003	<30	-	-	6	164
SW20 (Reference)	2021-05-11	<0.00003	<30	<0.000005	<5	0.000000258	0.258	8.6	146
SW20 (Reference)	2021-06-08	<0.000005	<5	<0.000005	<5	0.000000929	0.929	1.9	184
SW20 (Reference)	2021-07-13	<0.000005	<5	<0.000005	<5	0.000000542	0.542	0.7	185
SW20 (Reference)	2021-09-14	<0.000005	<5	<0.000005	<5	0.000000151	0.151	3.35	185

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW20 (Reference)	2021-10-20	<0.000005	<5	<0.000005	<5	0.000000591	0.591	9.75	-
SW20 (Reference)	2022-01-11	<0.000005	<5	<0.000005	<5	-	-	4.6	120
SW20 (Reference)	2022-02-08	<0.000005	<5	<0.000005	<5	-	-	4.5	140
SW20 (Reference)	2022-03-08	<0.000005	<5	<0.000005	<5	-	-	3.75	125
SW20 (Reference)	2022-04-05	<0.000005	<5	<0.000005	<5	-	-	6.45	96.4
SW20 (Reference)	2022-05-03	<0.000005	<5	<0.000005	<5	-	-	1.95	49.6
SW20 (Reference)	2022-06-07	0.0000050	5	0.0000050	5	0.000000495	0.495	0.85	91.2
SW20 (Reference)	2022-09-06	<0.000005	<5	<0.000005	<5	0.000000873	0.873	0.8	157
SW20 (Reference)	2022-07-05	<0.000005	<5	<0.000005	<5	0.000000904	0.904	0.75	123
SW20 (Reference)	2022-08-09	<0.000005	<5	<0.000005	<5	-	-	0.55	125
SW20 (Reference)	2022-12-10	<0.000005	<5	<0.000005	<5	-	-	4.55	164
SW20 (Reference)	2022-10-04	<0.000005	<5	<0.000005	<5	-	-	1.00	156
SW20 (Reference)	2022-11-11	<0.000005	<5	<0.000005	<5	-	-	3.90	144
SW20 (Reference)	2023-01-07	<0.000005	<5	<0.000005	<5	-	-	3.30	139
SW20 (Reference)	2023-02-07	<0.000005	<5	<0.000005	<5	-	-	5.15	159
SW20 (Reference)	2023-03-07	<0.000005	<5	<0.000005	<5	-	-	9.70	185
SW20 (Reference)	2023-05-02	<0.000005	<5	<0.000005	<5	-	-	4.40	85.9
SW20 (Reference)	2023-05-02	-	-	-	-	0.000000124	0.124	-	-
SW20	2023-06-06	<0.000005	<5	<0.000005	<5	-	-	0.67	118
SW20	2023-06-09	-	-	-	-	0.000000975	0.975	-	-
SW20	2023-07-08	<0.000005	<5	<0.000005	<5	-	-	0.91	131
SW20	2023-07-08	-	-	-	-	0.000000413	0.413	-	-
SW20	2023-08-05	<0.000005	<5	<0.000005	<5	0.000000288	0.288	<0.30	158
SW20	2023-09-04	<0.000005	<5	<0.000005	<5	-	-	<0.30	175
SW20	2023-10-04	<0.000005	<5	<0.000005	<5	-	-	<0.30	179
SW20	2023-11-13	<0.000005	<5	<0.000005	<5	0.000000064	0.64	7.76	174
SW20	2023-12-09	<0.000005	<5	<0.000005	<5	-	-	9.36	180
SW20 (Reference)	07-May-24	<0.000005	<5	<0.000005	<5	-	-	4.31	90.6
SW20 (Reference)	04-Jun-24	<0.000005	<5	<0.000005	<5	-	-	1.17	114
SW20 (Reference)	10-Jul-24	<0.000005	<5	<0.000005	<5	-	-	0.3	120
SW20 (Reference)	07-Aug-24	<0.000005	<5	<0.000005	<5	-	-	<0.30	135
SW20 (Reference)	03-Sep-24	<0.000005	<5	<0.000005	<5	-	-	0.47	152
SW20 (Reference)	01-Oct-24	<0.000005	<5	<0.000005	<5	-	-	0.48	142
SW20 (Reference)	07-Aug-24	-	-	-	-	7.00E-07	0.662	-	-
SW20 (Reference)	03-Sep-24	-	-	-	-	2.00E-07	0.226	-	-
SW20 (Reference)	01-Oct-24	-	-	-	-	3.00E-07	0.341	-	-
SW20 (Reference)	2024-11-05	<0.000005	<5	<0.000005	<5	1.90E-07	0.19	2.02	147

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW20 (Reference)	2024-12-03	<0.000005	<5	<0.000005	<5	-	-	4.2	123
SW20 (Reference)	02-Jan-24	<0.000005	<5	<0.000005	<5	-	-	8.69	163
SW20 (Reference)	07-Feb-24	<0.000005	<5	<0.000005	<5	-	-	5.8	171
SW10	2017-07-26	<0.000002	<2	0.000008	8	0.00000052	0.52	1	-
SW10	2017-08-30	<0.000001	<1	<0.000001	<1	0.00000019	0.19	2	-
SW10	2017-09-29	<0.000001	<1	0.000004	4	0.00000029	0.29	4	-
SW10	2017-10-30	0.000002	2	0.000004	4	0.0000003	0.3	6	130
SW10	2018-05-09	<0.000001	<1	0.000008	8	0.00000044	0.44	6	109
SW10	2018-06-12	0.000002	2	0.000004	4	0.00000032	0.32	2	145
SW10	2018-07-17	0.000001	1	<0.000001	<1	0.00000057	0.57	2	214
SW10	2018-08-07	<0.000001	<1	<0.000001	<1	0.00000022	0.22	2	241
SW10	2018-09-11	<0.000001	<1	<0.000001	<1	0.00000014	0.14	5	268
SW10	2018-10-16	0.000005	5	0.000008	8	0.00000017	0.17	21	174
SW10	2019-05-14	<0.000001	<1	<0.000001	<1	0.00000067	0.67	6	103
SW10	2019-06-11	<0.000005	<5	<0.000005	<5	0.00000119	1.19	3	132
SW10	2019-07-08	<0.000005	<5	<0.000005	<5	0.00000122	1.22	1	185
SW10	2019-08-13	<0.000005	<5	<0.000005	<5	0.00000037	0.37	1	231
SW10	2019-09-18	<0.000005	<5	<0.000005	<5	0.00000061	0.61	5	133
SW10	2019-10-08	<0.000005	<5	<0.000005	<5	0.00000028	0.28	5	107
SW10	2020-01-09	<0.00003	<30	0.000005	5	-	-	5	176
SW10	2020-02-05	<0.00003	<30	0.000005	5	-	-	5	190
SW10	2020-03-10	<0.00003	<30	<0.00003	<30	-	-	8	203
SW10	2020-04-08	<0.00003	<30	0.000005	5	-	-	3	76
SW10	2020-05-14	<0.00003	<30	<0.00003	<30	-	-	4	113
SW10	2020-06-16	<0.00003	<30	<0.00003	<30	0.000000727	0.727	1	128
SW10	2020-07-07	<0.00003	<30	<0.00003	<30	0.000000829	0.829	1	148
SW10	2020-08-12	<0.00003	<30	<0.00003	<30	0.000000298	0.298	2	169
SW10	2020-09-15	<0.00003	<30	<0.00003	<30	0.000000174	0.174	2	199
SW10	2020-10-14	<0.00003	<30	<0.00003	<30	0.00000019	0.19	1	174
SW10	2020-11-10	<0.00003	<30	<0.00003	<30	-	-	10	162
SW10	2020-12-15	<0.00003	<30	<0.00003	<30	-	-	8	195
SW10	2021-05-11	<0.000005	<5	<0.000005	<5	0.000000353	0.353	6.75	144
SW10	2021-06-08	<0.00003	<30	<0.000005	<5	0.000000744	0.744	3.15	183
SW10	2021-07-13	<0.000005	<5	<0.000005	<5	0.000000289	0.289	2.65	224
SW10	2021-09-14	<0.000005	<5	<0.000005	<5	0.00000014	0.14	13.3	304
SW10	2021-10-20	<0.000005	<5	<0.000005	<5	0.000000687	0.687	7.95	-
SW10	2022-01-11	<0.000005	<5	<0.000005	<5	-	-	7.25	149
SW10	2022-02-08	<0.000005	<5	<0.000005	<5	-	-	6.2	157
SW10	2022-03-08	<0.000005	<5	<0.000005	<5	-	-	6.2	154
SW10	2022-04-05	<0.000005	<5	<0.000005	<5	-	-	4.95	88.7
SW10	2022-05-03	<0.000005	<5	<0.000005	<5	0.000000143	0.143	2.00	50.8

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW10	2022-06-07	0.0000050	5	0.0000050	5	0.000000453	0.453	17.7	88.7
SW10	2022-07-05	<0.000005	<5	<0.000005	<5	0.000000935	0.935	0.90	128
SW10	2022-08-09	<0.000005	<5	<0.000005	<5	-	-	0.75	124
SW10	2022-09-06	<0.000005	<5	<0.000005	<5	0.000000487	0.487	2.10	175
SW10	2022-10-04	-	-	-	-	0.000000	0.278	-	-
SW10	2022-10-03	<0.000005	<5	<0.000005	<5	-	-	3.05	171
SW10	2022-11-11	<0.000005	<5	<0.000005	<5	-	-	4.05	169
SW10	2023-01-07	<0.000005	<5	<0.000005	<5	-	-	4.65	165
SW10	2023-02-07	<0.000005	<5	<0.000005	<5	-	-	6.10	178
SW10	2023-03-07	<0.000005	<5	<0.000005	<5	-	-	9.80	226
SW10	2023-04-04	<0.000005	<5	<0.000005	<5	-	-	5.10	-
SW10	2023-05-02	<0.000005	<5	<0.000005	<5	-	-	4.15	144
SW10	2023-05-02	-	-	-	-	0.000000198	0.198	-	-
SW10	2023-06-06	<0.000005	<5	<0.000005	<5	-	-	1.56	101
SW10	2023-06-06	-	-	-	-	0.000000599	0.599	-	-
SW10	2023-07-08	<0.000005	<5	<0.000005	<5	-	-	1.89	131
SW10	2023-07-08	-	-	-	-	0.00000043	0.43	-	-
SW10	2023-08-05	<0.000005	<5	<0.000005	<5	0.000000529	0.529	2.36	178
SW10	2023-09-04	<0.000005	<5	<0.000005	<5	-	-	4.38	198
SW10	2023-10-04	<0.000005	<5	<0.000005	<5	-	-	3.1	190
SW10	2023-10-04	-	-	-	-	0.000000244	0.244	-	-
SW10	2023-11-12	<0.000005	<5	<0.000005	<5	0.00000008	0.8	10.2	160
SW10	2023-12-09	<0.000005	<5	<0.000005	<5	-	-	7.26	165
SW10	02-Jan-24	<0.000005	<5	<0.000005	<5	-	-	9.58	166
SW10	06-Mar-24	<0.000005	<5	<0.000005	<5	-	-	4.42	108
SW10	07-May-24	<0.000005	<5	<0.000005	<5	-	-	3.53	89
SW10	04-Jun-24	<0.000005	<5	<0.000005	<5	-	-	1.41	104
SW10	10-Jul-24	<0.000005	<5	<0.000005	<5	-	-	0.6	113
SW10	07-Aug-24	<0.000005	<5	<0.000005	<5	-	-	0.87	134
SW10	03-Sep-24	<0.000005	<5	<0.000005	<5	-	-	2.52	162
SW10	07-Aug-24	-	-	-	-	5.00E-07	0.533	-	-
SW10	03-Sep-24	-	-	-	-	3.00E-07	0.298	-	-
SW10	01-Oct-24	-	-	-	-	5.00E-07	0.474	-	-
SW10	01-Oct-24	<0.000005	<5	<0.000005	<5	-	-	1.71	136
SW10	2024-11-05	<0.000005	<5	<0.000005	<5	2.40E-07	0.24	3.03	141
SW10	2024-12-03	<0.000005	<5	<0.000005	<5	-	-	3.86	123
SW10	04-Jun-24	-	-	-	-	0.000000497	0.497	-	-
SW10	07-May-24	-	-	-	-	0.000000146	0.146	-	-
SW22A	2017-07-26	0.000004	4	0.000004	4	0.000004000	4	14	-
SW22A	2017-08-30	0.000004	4	0.000004	4	0.000004000	4	3	-
SW22A	2017-09-29	0.000002	2	0.000004	4	0.000004000	4	73	-

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW22A	2017-10-27	0.000002	2	0.000002	2	0.000002000	2	36	-
SW22A	2018-05-09	0.000001	1	0.000001	1	0.00000045	0.45	12	-
SW22A	2018-06-12	0.000001	1	0.000002	2	0.00000083	0.83	16	210
SW22A	2018-07-17	<0.000001	<1	<0.000001	<1	0.0000005	0.5	22	240
SW22A	2018-08-09	<0.000001	<1	<0.000001	<1	-	-	9	238
SW22A	2018-09-11	<0.000001	<1	<0.000001	<1	0.00000039	0.39	34	291
SW22A	2018-10-16	0.000005	5	0.000005	5	0.00000023	0.23	51	239
SW22A	2019-05-15	<0.000001	<1	<0.000001	<1	0.00000047	0.47	12	134
SW22A	2019-06-11	<0.000005	<5	<0.000005	<5	0.0000005	0.5	13	151
SW22A	2019-07-08	<0.000005	<5	<0.000005	<5	0.00000047	0.47	12	183
SW22A	2019-08-13	<0.000005	<5	<0.000005	<5	0.00000078	0.78	5	216
SW22A	2019-09-19	<0.000005	<5	<0.000005	<5	0.0000006	0.6	44	225
SW22A	2019-10-08	<0.000005	<5	<0.000005	<5	0.00000035	0.35	19	140
SW22A	2020-01-09	<0.00003	<30	<0.00003	<30	-	-	8	204
SW22A	2020-02-05	<0.00003	<30	<0.00003	<30	-	-	5	198
SW22A	2020-03-11	<0.00003	<30	<0.00003	<30	-	-	10	229
SW22A	2020-04-09	<0.00003	<30	0.000005	5	-	-	5	95
SW22A	2020-05-13	<0.00003	<30	0.000005	5	-	-	10	149
SW22A	2020-06-17	0.000015	15	<0.00003	<30	0.00000192	1.92	8	166
SW22A	2020-07-10	<0.00003	<30	<0.00003	<30	0.00000126	1.26	36	210
SW22A	2020-08-11	<0.00003	<30	0.000005	5	0.000000785	0.785	17	180
SW22A	2020-09-15	<0.00003	<30	<0.00003	<30	0.000000595	0.595	12	224
SW22A	2020-10-19	<0.00003	<30	<0.00003	<30	0.000000508	0.508	286	330
SW22A	2020-11-04	<0.00003	<30	<0.00003	<30	-	-	332	342
SW22A	2020-11-10	<0.00003	<30	<0.00003	<30	-	-	345	330
SW22A	2020-12-16	<0.00003	<30	<0.00003	<30	-	-	71	278
SW22A	2021-05-12	<0.000005	<5	<0.000005	<5	0.000000209	0.209	45.6	206
SW22A	2021-06-08	<0.00003	<30	<0.00003	<30	0.00000191	1.91	58.5	240
SW22A	2021-09-15	<0.000005	<5	<0.000005	<5	0.000000356	0.356	223	390
SW22A	2021-10-20	<0.000005	<5	<0.000005	<5	0.000000527	0.527	144	-
SW22A	2022-01-11	<0.000005	<5	<0.000005	<5	-	-	13.6	196
SW22A	2022-02-16	<0.000005	<5	<0.000005	<5	-	-	7.45	195
SW22A	2022-03-08	<0.000005	<5	<0.000005	<5	-	-	7.75	202
SW22A	2022-04-05	<0.000005	<5	<0.000005	<5	-	-	7.05	105
SW22A	2022-05-04	<0.000005	<5	<0.000005	<5	-	-	34.4	4:48
SW22A	2022-06-07	0.0000050	5	0.0000050	5	<0.00000002	<0.02	33.4	180
SW22A	2022-07-06	<0.000005	<5	<0.000005	<5	0.000000743	0.743	-	-
SW22A	2022-07-12	<0.000005	<5	<0.000005	<5	-	-	3.64	134
SW22A	2022-08-10	<0.000005	<5	<0.000005	<5	-	-	5.5000000	150.0000000
SW22A	2022-09-07	<0.000005	<5	<0.000005	<5	0.000000451	0.451	5.20	197
SW22A	2022-10-04	<0.000005	<5	<0.000005	<5	0.000000226	0.226	49.3	217

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW22A	2022-11-11	<0.000005	<5	<0.000005	<5	-	-	50.7	194
SW22A	2022-12-11	<0.000005	<5	<0.000005	<5	-	-	5.45	201
SW22A	2023-02-07	<0.000005	<5	<0.000005	<5	-	-	4.90	217
SW22A	2023-03-07	<0.000005	<5	<0.000005	<5	-	-	5.00	246
SW22A	2023-04-04	<0.000005	<5	<0.000005	<5	-	-	9.40	-
SW22A	2023-05-02	<0.000005	<5	<0.000005	<5	-	-	171	243
SW22A	2023-05-02	-	-	-	-	0.000000232	0.232	-	-
SW22A	2023-06-06	<0.000005	<5	<0.000005	<5	-	-	204	256
SW22A	2023-06-07	-	-	-	-	0.00000155	1.55	-	-
SW22A	2023-07-08	<0.000005	<5	<0.000005	<5	-	-	3.68	147
SW22A	2023-07-08	-	-	-	-	0.000000496	0.496	-	-
SW22A	2023-08-05	<0.000005	<5	<0.000005	<5	0.000000738	0.738	11.2	211
SW22A	2023-09-06	<0.000005	<5	<0.000005	<5	-	-	2.56	187
SW22A	2023-09-06	-	-	-		0.000000479	0.479		
SW22A	2023-10-04	<0.000005	<5	<0.000005	<5	-	-	17.2	238
SW22A	2023-10-04	-	-	-	-	0.000000364	0.364	-	-
SW22A	2023-11-07	<0.000005	<5	<0.000005	<5	-	-	282	334
SW22A	2023-11-12	<0.000005	5	<0.000005	<5	0.000000044	0.000044	358	370
SW22A	2023-12-11	<0.000005	<5	<0.000005	<5	-	-	13.6	220
SW22A	04-Jan-24	<0.000005	<5	<0.000005	<5	-	-	10.4	183
SW22A	06-Mar-24	<0.000005	<5	<0.000005	<5	-	-	6.34	147
SW22A	03-Apr-24	<0.000005	<5	<0.000005	<5	-	-	9.3	121
SW22A	07-May-24	<0.000005	<5	<0.000005	<5	-	-	116	182
SW22A	04-Jun-24	<0.000005	<5	<0.000005	<5	-	-	73.5	205
SW22A	10-Jul-24	<0.000005	<5	<0.000005	<5	-	-	1.3	140
SW22A	07-Aug-24	<0.000005	<5	<0.000005	<5	-	-	1	167
SW22A	04-Sep-24	<0.000005	<5	<0.000005	<5	-	-	1.17	162
SW22A	01-Oct-24	<0.000005	<5	<0.000005	<5	-	-	1.21	169
SW22A	07-Aug-24	-	-	-	-	7.00E-07	0.746	-	-
SW22A	04-Sep-24	-	-	-	-	3.00E-07	0.344	-	-
SW22A	01-Oct-24	-	-	-	-	3.00E-07	0.338	-	-
SW22A	2024-11-05	<0.000005	<5	<0.000005	<5	3.10E-07	0.308	3.04	153
SW22A	2024-12-03	<0.000005	<5	<0.000005	<5	-	-	9.91	164
SW22A	07-May-24	-	-	-	-	0.00000014	0.14	-	-
SW22A	04-Jun-24	-	-	-	-	0.000000395	0.395	-	-
SW03	2017-07-26	0.000002	2	0.000008	8	0.000000290	0.29	15	-
SW03	2017-08-29	<0.000001	<1	0.000004	4	0.000000230	0.23	5	-
SW03	2017-09-29	<0.000001	<1	0.000004	4	0.000000290	0.29	72	-
SW03	2017-10-27	0.000002	2	0.000002	2	0.000000240	0.24	35	-
SW03	2018-05-09	0.000001	1	0.000004	4	0.00000038	0.38	10	129
SW03	2018-06-12	0.000002	2	0.000004	4	0.00000037	0.37	8	160

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW03	2018-07-17	<0.000001	<1	0.000001	1	0.00000032	0.32	14	193
SW03	2018-08-07	<0.000001	<1	0.000001	1	0.00000025	0.25	15	202
SW03	2018-09-11	0.00001	10	0.000003	3	0.00000028	0.28	33	228
SW03	2018-10-16	0.000004	4	0.000007	7	0.00000021	0.21	50	235
SW03	2019-05-15	0.000001	1	0.000001	1	0.00000063	0.63	11	129
SW03	2019-06-11	<0.000005	<5	0.000005	5	0.00000057	0.57	15	151
SW03	2019-07-08	<0.000005	<5	<0.000005	<5	0.00000057	0.57	5	169
SW03	2019-08-13	<0.000005	<5	<0.000005	<5	0.00000016	0.16	16	208
SW03	2019-09-18	<0.000005	<5	<0.000005	<5	0.00000056	0.56	33	187
SW03	2019-10-08	<0.000005	<5	<0.000005	<5	0.00000039	0.39	17	133
SW03	2020-01-09	<0.00003	<30	<0.00003	<30	-	-	7	190
SW03	2020-02-04	<0.00003	<30	0.000005	5	-	-	6	201
SW03	2020-03-10	<0.00003	<30	0.000005	5	-	-	9	225
SW03	2020-04-07	<0.00003	<30	<0.00003	<30	-	-	5	96
SW03	2020-05-12	<0.000005	<5	<0.000005	<5	-	-	<0.3	117
SW03	2020-06-17	<0.000005	<5	<0.000005	<5	0.000000966	0.966	6	146
SW03	2020-07-07	<0.00003	<30	<0.00003	<30	0.000000493	0.493	32	203
SW03	2020-08-11	<0.00003	<30	<0.00003	<30	0.000000154	0.154	15	164
SW03	2020-09-15	<0.00003	<30	<0.00003	<30	0.000000151	0.151	18	194
SW03	2020-10-14	<0.00003	<30	<0.00003	<30	0.000000364	0.364	13	170
SW03	2020-11-10	<0.00003	<30	<0.00003	<30	-	-	251	303
SW03	2020-12-15	<0.00003	<30	<0.00003	<30	-	-	86	291
SW03	2021-05-11	<0.000005	<5	<0.000005	<5	0.000000282	0.282	41.5	180
SW03	2021-06-08	<0.00003	<30	<0.00003	<30	0.00000162	1.62	30.3	216
SW03	2021-07-13	<0.000005	<5	<0.000005	<5	0.000000916	0.916	9.15	186
SW03	2021-08-10	<0.000005	<5	<0.00003	<30	0.000000406	0.406	14.1	187
SW03	2021-10-20	<0.000005	<5	<0.000005	<5	0.000000595	0.595	86.3	-
SW03	2022-03-08	<0.000005	<5	<0.000005	<5	-	-	6.65	197
SW03	2022-01-11	<0.000005	<5	<0.000005	<5	-	-	14.9	208
SW03	2022-04-05	<0.000005	<5	<0.000005	<5	-	-	7.40	106
SW03	2022-05-03	<0.000005	<5	<0.000005	<5	-	-	17.7	86.4
SW03	2022-06-07	<0.000005	<5	<0.000005	<5	0.000000101	0.101	68.6	150
SW03	2022-07-05	<0.000005	<5	<0.000005	<5	-	-	21.0	149
SW03	2022-08-10	<0.000005	<5	<0.000005	<5	-	-	12.8	149
SW03	2022-09-06	<0.000005	<5	<0.000005	<5	0.000000676	0.676	4.85	188
SW03	2022-10-04	<0.000005	<5	<0.000005	<5	-	-	9.90	197
SW03	2022-11-12	<0.000005	<5	<0.000005	<5	-	-	121	240
SW03	2023-01-07	<0.000005	<5	<0.000005	<5	-	-	4.65	218
SW03	2023-02-07	<0.000005	<5	<0.000005	<5	-	-	5.10	210
SW03	2023-03-07	<0.000005	<5	<0.000005	<5	-	-	4.70	246
SW03	2023-05-02	<0.000005	<5	<0.000005	<5	-	-	128	203

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW03	2023-05-02	-	-	-	-	0.000000201	0.201	-	-
SW03	2023-06-06	<0.000005	<5	<0.000005	<5	-	-	131	223
SW03	2023-06-06	-	-	-	-	0.00000112	1.12	-	-
SW03	2023-07-09	<0.000005	<5	<0.000005	<5	-	-	<0.30	143
SW03	2023-07-09	-	-	-	-	0.00000063	0.63	-	-
SW03	2023-08-06	<0.000005	<5	<0.000005	<5	0.00000146	1.46	2.31	177
SW03	2023-09-05	<0.000005	<5	<0.000005	<5	-	-	3.48	199
SW03	2023-10-03	<0.000005	<5	<0.000005	<5	-	-	6.61	222
SW03	2023-10-04	<0.000005	<5	<0.000005	<5	0.00000166	1.66	5.5	-
SW03	2023-11-12	<0.000005	<5	<0.000005	<5	0.000000068	0.000068	281	322
SW03	2023-12-08	<0.000005	<5	<0.000005	<5	-	-	27.6	218
SW03	02-Jan-24	<0.000005	<5	<0.000005	<5	-	-	13.5	184
SW03	06-Feb-24	<0.000005	<5	<0.000005	<5	-	-	9.36	222
SW03	07-May-24	<0.000005	<5	<0.000005	<5	-	-	91.8	160
SW03	04-Jun-24	<0.000005	<5	<0.000005	<5	-	-	46.6	172
SW03	09-Jul-24	<0.000005	<5	<0.000005	<5	-	-	1.88	127
SW03	06-Aug-24	<0.000005	<5	<0.000005	<5	-	-	1.86	157
SW03	03-Sep-24	<0.000005	<5	<0.000005	<5	-	-	3.34	168
SW03	07-Aug-24	-	-	-	-	9.00E-07	0.939	-	-
SW03	03-Sep-24	-	-	-	-	6.00E-07	0.575	-	-
SW03	01-Oct-24	-	-	-	-	4.00E-07	0.393	-	-
SW03	01-Oct-24	<0.000005	<5	<0.000005	<5	-	-	3.02	172
SW03	2024-11-05	<0.000005	<5	<0.000005	<5	3.30E-07	0.33	2.96	157
SW03	2024-12-03	<0.000005	<5	<0.000005	<5	-	-	36.4	178
SW03	04-Jun-24	-	-	-	-	0.000000395	0.395	-	-
SW03	07-May-24	-	-	-	-	0.000000123	0.123	-	-
SW24	2017-07-26	-	-	-	-	0.000000370	0.37	-	-
SW24	2017-08-29	-	-	-	-	0.000000270	0.27	-	-
SW24	2017-09-29	-	-	-	-	0.000000350	0.35	-	-
SW24	2017-10-27	-	-	-	-	0.000000370	0.37	-	-
SW24	2018-05-09	<0.000001	<1	0.000004	4	0.00000034	0.34	7	-
SW24	2018-06-12	0.000004	4	0.000006	6	0.0000006	0.6	4	210
SW24	2018-07-17	0.000003	3	0.000007	7	0.00000038	0.38	3	240
SW24	2018-08-07	<0.000001	<1	0.000003	3	0.00000057	0.57	3	238
SW24	2018-09-11	0.000003	3	0.000006	6	0.00000066	0.66	6	291
SW24	2018-10-16	0.000005	5	0.000007	7	0.00000017	0.17	29	239
SW24	2019-05-15	<0.000001	<1	0.00001	10	0.00000047	0.47	8	134
SW24	2019-06-11	0.00001	10	0.000005	5	0.00000075	0.75	7	151
SW24	2019-07-08	<0.000005	5	<0.000005	<5	0.00000053	0.53	2	183
SW24	2019-08-13	<0.000005	5	<0.000005	<5	0.00000053	0.53	2	216
SW24	2019-09-20	<0.000005	5	<0.000005	<5	0.00000052	0.52	13	225

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW24	2019-10-08	<0.000005	5	<0.000005	<5	0.00000044	0.44	8	140
SW24	2020-01-09	<0.00003	<30	<0.00003	<30	-	-	4	170
SW24	2020-02-04	<0.00003	<30	0.000005	5	-	-	4	180
SW24	2020-03-10	<0.00003	<30	<0.00003	<30	-	-	7	216
SW24	2020-04-07	<0.00003	<30	0.000005	5	-	-	4	87
SW24	2020-05-12	<0.00003	<30	0.00001	10	-	-	85	168
SW24	2020-06-17	0.000005	5	<0.00003	<30	0.000000995	0.995	3	116
SW24	2020-07-07	0.000005	5	<0.00003	<30	0.000000693	0.693	10	155
SW24	2020-08-11	<0.00003	<30	<0.00003	<30	0.000000166	0.166	109	230
SW24	2020-09-15	0.000005	5	<0.00003	<30	0.000000471	0.471	3	139
SW24	2020-10-14	<0.00003	<30	<0.00003	<30	0.000000326	0.326	275	261
SW24	2020-11-04	<0.00003	<30	<0.00003	<30	-	-	343	313
SW24	2020-11-10	<0.00003	<30	<0.00003	<30	-	-	312	296
SW24	2020-12-16	<0.00003	<30	<0.00003	<30	-	-	51	224
SW24	2021-05-11	<0.000005	<5	<0.000005	<5	0.000000415	0.415	16.7	131
SW24	2021-06-08	<0.000005	<5	<0.00003	<30	0.000000726	0.726	13.1	179
SW24	2021-07-13	<0.000005	<5	<0.000005	<5	0.00000088	0.88	8.4	214
SW24	2021-10-20	<0.000005	<5	<0.000005	<5	0.000000555	0.555	156	-
SW24	2022-02-08	<0.000005	<5	<0.000005	<5	-	-	7.75	110
SW24	2022-03-08	<0.000005	<5	<0.000005	<5	-	-	5.7	201
SW24	2022-05-03	<0.000005	<5	<0.000005	<5	-	-	12	61.9
SW24	2022-06-07	<0.000005	<5	<0.000005	<5	0.000000392	0.392	24.2	134
SW24	2022-07-05	<0.000005	<5	<0.000005	<5	-	-	13	139
SW24	2022-09-06	<0.000005	<5	<0.000005	<5	0.000000430	0.43	2.55	176
SW24	2022-08-09	<0.000005	<5	<0.000005	<5	-	-	12	149
SW24	2022-10-04	<0.000005	<5	<0.000005	<5	-	-	3.1	170
SW24	2022-11-08	<0.000005	<5	<0.000005	<5	-	-	294	337
SW24	2023-01-08	<0.000005	<5	<0.000005	<5	-	-	3.65	201
SW24	2023-02-07	<0.000005	<5	<0.000005	<5	-	-	3.9	200
SW24	2023-03-07	<0.000005	<5	<0.000005	<5	-	-	3.4	241
SW24	2023-05-02	-	-	-	-	0.000000162	0.162	-	-
SW24	2023-05-02	<0.000005	<5	<0.000005	<5	-	-	108	171
SW24	2023-06-06	<0.000005	<5	<0.000005	<5	-	-	103	188
SW24	2023-06-06	-	-	-	-	0.000000557	0.557	-	-
SW24	2023-07-09	<0.000005	<5	<0.000005	<5	-	-	2.41	117
SW24	2023-07-09	-	-	-	-	0.000000053	0.53	-	-
SW24	2023-08-05	0.0000055	5.5	<0.000005	<5	0.000000388	0.388	3.27	157
SW24	2023-09-05	<0.000005	<5	<0.000005	<5	-	-	1.83	169
SW24	2023-10-03	<0.000005	<5	<0.000005	<5	-	-	1.62	173
SW24	2023-10-04	<0.000005	<5	<0.000005	<5	0.000000438	0.438	1.39	-
SW24	2023-11-08	<0.000005	<5	<0.000005	<5	-	-	263	294

Area	Date	Dissolved Mercury (mg/L)	Dissolved Mercury (ng/L)	Total Mercury (mg/L)	Total Mercury (ng/L)	Total Methylmercury (mg/L)	Total Methylmercury (ng/L)	Sulfate (SO4) (mg/L)	Hardness (mg/L)
SW24	2023-11-12	<0.000005	<5	<0.000005	<5	0.00000053	0.53	340	346
SW24	2023-12-08	<0.000005	<5	<0.000005	<5	-	-	24.30	185
SW24	06-Feb-24	<0.000005	<5	<0.000005	<5	-	-	7.07	215
SW24	07-May-24	<0.000005	<5	<0.000005	<5	-	-	93.6	154
SW24	04-Jun-24	<0.000005	<5	<0.000005	<5	-	-	21.2	130
SW24	09-Jul-24	<0.000005	<5	<0.000005	<5	-	-	1	106
SW24	06-Aug-24	<0.000005	<5	<0.000005	<5	-	-	0.66	122
SW24	03-Sep-24	<0.000005	<5	<0.000005	<5	-	-	2.23	146
SW24	01-Oct-24	<0.000005	<5	<0.000005	<5	-	-	1.79	156
SW24	07-Aug-24	-	-	-	-	8.00E-07	0.759	-	-
SW24	03-Sep-24	-	-	-	-	5.00E-07	0.454	-	-
SW24	01-Oct-24	-	-	-	-	3.00E-07	0.331	-	-
SW24	2024-11-05	<0.000005	<5	<0.000005	<5	1.70E-07	0.166	288	297
SW24	2024-12-03	<0.000005	<5	<0.000005	<5	-	-	121	203
SW24	04-Jun-24	-	-	-	-	0.000000381	0.381	-	-
SW24	07-May-24	-	-	-	-	0.00000012	0.12	-	-
SW29 - Reference	2023-11-12	< 0.0000050	<5	< 0.0000050	<5	-	-	3.90	119
SW29 - Reference	2023-12-08	< 0.0000050	<5	< 0.0000050	<5	-	-	3.38	135
SW29 - Reference	2024-01-02	< 0.0000050	<5	< 0.0000050	<5	-	-	4.61	143
SW29 - Reference	2024-02-06	< 0.0000050	<5	< 0.0000050	<5	-	-	3.08	174
SW29 - Reference	2024-03-05	< 0.0000050	<5	< 0.0000050	<5	-	-	2.77	170
SW29 - Reference	2024-04-02	< 0.0000050	<5	< 0.0000050	<5	-	-	1.94	146
SW29 - Reference	2024-05-07	< 0.0000050	<5	< 0.0000050	<5	-	-	3.78	81.1
SW29 - Reference	2024-06-04	< 0.0000050	<5	< 0.0000050	<5	-	-	0.79	107
SW29 - Reference	2024-07-09	< 0.0000050	<5	< 0.0000050	<5	-	-	< 0.30	116
SW29 - Reference	2024-08-06	< 0.0000500	<5	< 0.0000500	<5	-	-	< 0.30	124
SW29 - Reference	2024-09-03	< 0.0000050	<5	< 0.0000050	<5	-	-	< 0.30	145
SW29 - Reference	2024-10-01	< 0.0000050	<5	< 0.0000050	<5	-	-	< 0.30	156
SW29 - Reference	2024-11-05	< 0.0000050	<5	< 0.0000050	<5	-	-	0.41	109
SW29 - Reference	2024-12-03	< 0.0000050	<5	< 0.0000050	<5	-	-	1.62	114
SW29 - Reference	2025-01-07	< 0.0000050	<5	< 0.0000050	<5	-	-	1.34	167

Table 8-3: Select water chemistry parameters for discharge locations, 2024.

Site	Sample ID	Date	Mercury – Total (mg/L)	Mercury – Dissolved (mg/L)	Methylmercury – Total (ug/L)	Hardness (mg/L)	Sulfate – Total (mg/L)
EDL-1	EDL1_EFF_20240414	15-Apr-24	<0.0000050	<0.0000050	--	601	733
EDL-2	EDL2_EFF_20240414	15-Apr-24	<0.0000050	<0.0000050	--	615	727
SED2	SP2 DISCHARGE_EFF_20240414	15-Apr-24	<0.0000050	<0.0000050	--	425	306
EDL-1	EDL1_EFF_20240422_219	22-Apr-24	<0.0000050	<0.0000050	--	541	728
EDL-2	EDL2_EFF_20240422_220	22-Apr-24	<0.0000050	<0.0000050	--	536	720
SED2	SP2 DISCHARGE_EFF_20240422_223	22-Apr-24	<0.0000050	<0.0000050	--	427	330
EDL-2	EDL2_EFF_20240429	29-Apr-24	<0.0000050	<0.0000050	--	574	722
EDL-1	EDL1_EFF_20240429	29-Apr-24	<0.0000050	<0.0000050	--	577	722
SED2	SP2 DISCHARGE_EFF_20240429	29-Apr-24	<0.0000050	<0.0000050	--	459	331
EDL-1	EDL1_EFF_20240506	06-May-24	<0.0000050	<0.0000050	--	522	723
EDL-2	EDL2_EFF_20240506	06-May-24	<0.0000050	<0.0000050	--	534	739
SED2	SP2 DISCHARGE_EFF_20240506	06-May-24	<0.0000050	<0.0000050	--	431	330
EDL-1	EDL1_EFF_20240513	13-May-24	<0.0000050	<0.0000050	--	565	694
EDL-2	EDL2_EFF_20240513	13-May-24	<0.0000050	<0.0000050	--	574	665
SED2	SP2 DISCHARGE_EFF_20240513	13-May-24	<0.0000050	<0.0000050	--	449	312
EDL-1	EDL1_EFF_20240520	20-May-24	<0.0000050	<0.0000050	--	555	692
EDL-2	EDL2_EFF_20240520	20-May-24	<0.0000050	<0.0000050	--	562	694
SED2	SP2_EFF_20240520	20-May-24	<0.0000050	<0.0000050	--	376	267
EDL-2	EDL2_EFF_20240605	05-Jun-24	<0.0000050	<0.0000050	--	559	650
EDL-1	EDL1_EFF_20240605	05-Jun-24	<0.0000050	<0.0000050	--	566	646
SED2	SP2_EFF_20240527	27-May-24	<0.0000050	<0.0000050	--	332	211
EDL-2	EDL2_EFF_20240527	27-May-24	<0.0000050	<0.0000050	--	524	631
EDL-1	EDL1_EFF_20240527	27-May-24	<0.0000050	<0.0000050	--	514	621
SED2	SP2_EFF_20240610	10-Jun-24	<0.0000050	<0.0000050	--	398	249
SED2	SP2 DISCHARGE_EFF_20240603_237	03-Jun-24	<0.0000050	<0.0000050	--	380	234
SED2	SP2 DISCHARGE_EFF_20240617	17-Jun-24	<0.0000050	<0.0000050	--	398	249
SED2	SP2_EFF_20240610	10-Jun-24	<0.0000050	<0.0000050	--	398	249
SED2	SP2 DISCHARGE_EFF_20240624	24-Jun-24	<0.0000050	<0.0000050	--	398	284
EDL-1	EDL1_EFF_20241111	11-Nov-24	<0.0000050	<0.0000050	--	571	747
EDL-1	EDL1_EFF_20241118	18-Nov-24	<0.0000050	<0.0000050	--	562	739
EDL-2	EDL2_EFF_20241119_255	19-Nov-24	<0.0000050	<0.0000050	--	552	729
EDL-1	EDL1_EFF_20241125	25-Nov-24	<0.0000050	<0.0000050	--	605	704
EDL-2	EDL2_EFF_20241125	25-Nov-24	<0.0000050	<0.0000050	--	627	714
SED2	SP2_EFF_20240508	08-May-24	--	--	0.000067	--	--
SED1	SP1_EFF_20240508	08-May-24	--	--	0.000077	--	--
SED2	SP2_EFF_20240605	06-Jun-24	--	--	0.000511	--	--
SED1	SP1_EFF_20240605	05-Jun-24	--	--	0.000146	--	--
SED2	SP2_MM_20240710	11-Jul-24	--	--	0.000107	--	--
SED1	SP1_MM_20240710	11-Jul-24	--	--	0.0003	--	--
SED2	SP2_EFF_20240807	07-Aug-24	--	--	0.000162	--	--
SED1	SP1_EFF_20240807	07-Aug-24	--	--	0.000215	--	--

Appendix B Detailed Data – Fish Community Survey

Table 8-4: Fishing effort locations for the Pinewood River, July 2024.

Sample Type	GearID	Latitude (decimal degrees)	Longitude (decimal degrees)
Electrofishing	PWREFEF01	48.818568	-93.940117
	PWREFEF02	48.817853	-93.942001
	PWREFEF03	48.818466	-93.940254
	PWFFEF01	48.79861	94.18572
	PWFFEF02	48.79837	94.18643
	PWFFEF03	48.81123	94.15267
	PWFFEF04	48.81115	94.15011
	PWFFEF05	48.81124	94.15143
	PWFFEF06	48.80883	94.16441
	PWFFEF07	48.80826	94.16415
	PWFFEF08	48.81162	94.153303
	PWNFEF01	48.820096	-94.097505
	PWNFEF02	48.820873	-94.091007
	PWNFEF03	48.819946	-94.094203
	PWNFEF04	48.820012	-94.094185
	PWNFEF05	48.820463	-94.095436
Minnow Trap	PWREFMT01	48.818481	-93.944829
	PWREFMT02	48.81817	-93.944245
	PWREFMT03	48.818113	93.944617
	PWREFMT04	48.818187	93.940771
	PWREFMT05	48.818591	93.940031
	PWFFMT01	48.79857	94.18596
	PWFFMT02	48.798879	94.18318
	PWFFMT03	48.80980	94.16203
	PWFFMT04	48.80982	94.16343
	PWFFMT05	48.81146	94.15199
	PWFFMT06	48.81071	94.15045
	PWFFMT07	48.79853	94.18565
	PWFFMT08	48.81071	94.15045
	PWFFMT09	48.81146	94.15199
	PWFFMT10	48.81071	94.15045
	PWFFMT11	48.81146	94.15199
	PWFFMT12	48.81146	94.15199
	PWFFMT13	48.81071	94.15045
	PWFFMT14	48.81146	94.15199
	PWFFMT15	48.81071	94.15045
	PWNFMT01	48.820546	-94.090755
	PWNFMT02	48.819988	94.093932
	PWNFMT03	48.820008	-94.096065
	PWNFMT04	48.820722	-94.091302
	PWNFMT05	48.819988	-94.097583
	PWNFMT06	48.82072	-94.09071
Gill Net	PWREFGN01	48.818485	-93.94478
	PWREFGN02	48.817867	-93.943975
	PWREFGN03	48.817867	-93.943973
	PWREFGN04	48.817595	-93.943689
	PWREFGN05	48.817779	93.942912
	PWREFGN06	48.818196	-93.940602
	PWFFGN01	48.81096	94.15138
	PWFFGN02	48.81150	94.15249
	PWFFGN03	48.81050	94.16218
	PWFFGN04	48.81019	94.16311
	PWFFGN05	48.79859	94.18572
	PWFFGN06	48.79846	94.18635
	PWNFGN01	48.820202	-94.096161
	PWNFGN02	48.819997	-94.097616
	PWNFGN03	48.820441	-94.095693
	PWNFGN04	48.820872	-94.096522
	PWNFGN05	48.820645	-94.090771
	PWNFGN06	48.820701	-94.09271
Seine Net	PWREFSN01	48.817853	-93.943900
	PWREFSN02	48.817815	-93.941880
	PWREFSN03	48.817582	-93.942065
	PWREFSN04	48.817783	-93.942897
	PWREFSN05	48.817785	-93.94168
	PWREFSN06	48.817729	93.942367
	PWREFSN07	48.817921	-93.944075
	PWREFSN08	48.817670	-93.942537

Sample Type	GearID	Latitude (decimal degrees)	Longitude (decimal degrees)
	PWREFSN09	48.817768	-93.942042
	PWFFSN01	48.81126	94.15148
	PWFFSN02	48.81123	94.1526
	PWFFSN03	48.81115	94.15011
	PWFFSN04	48.7985	94.18561
	PWFFSN05	48.8107	94.15049
	PWFFSN06	48.81161	94.15304
	PWFFSN07	48.81070	94.15540
	PWFFSN08	48.81163	94.15900
	PWFFSN09	48.80867	94.16383
	PWFFSN10	48.81161	94.15304
	PWFFSN11	48.81167	94.15585
	PWFFSN12	48.8113	94.15025
	PWFFSN13	48.8113	94.15025
	PWNFSN01	48.81958	-94.09835
	PWNFSN02	48.820358	-94.0989
	PWNFSN03	48.81988	94.09832
	PWNFSN04	48.82061	94.09734
	PWNFSN05	48.820028	-94.09385
	PWNFSN06	48.820594	-94.094961
	PWNFSN07	48.820314	-94.094626
	PWNFSN08	48.82035	-94.09618
	PWNFSN09	48.819957	-94.09401
	PWNFSN10	48.82001	94.09400

Table 8-5: Detailed electrofishing data for the Pinewood River, July 2024.

Location	GearID	Date	Effort (sec)	CPUE	BB	BM	BNM	BSB	BSD	CC	CMM	CS	FHM	FSD	GS	HHC	JD	NP	NPD	NRBD	RB	SG	STS	TP	WS	YOY	Total
PWREF	PWREFEF01	7/28/2024	1058	4.76	0	2	0	23	0	10	13	10	0	22	0	0	1	0	0	2	0	0	1	0	0	0	84
	PWREFEF02	7/28/2024	1007	3.04	0	2	0	15	2	9	8	1	0	10	0	0	0	0	0	0	0	0	0	0	4	0	51
	PWREFEF03	7/29/2024	1006	3.4	0	11	0	13	0	0	11	4	0	17	0	0	0	0	0	0	0	0	0	0	1	0	57
	Total		**3,071**	**3.75**	**0**	**15**	**0**	**51**	**2**	**19**	**32**	**15**	**0**	**49**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**5**	**0**	**192**
PWNF	PWNFEF01	7/30/2024	1050	0.34	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6
	PWNFEF02	7/31/2024	1315	0.41	0	0	0	0	1	0	4	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	9
	PWNFEF03	7/31/2024	701	0.77	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
	PWNFEF04	7/31/2024	500	0.48	0	0	0	0	1	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
	PWNFEF05	7/31/2024	2412	0.42	0	0	0	0	3	0	11	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	17
	Total		**5,978**	**0.45**	**0**	**0**	**0**	**0**	**7**	**0**	**29**	**0**	**0**	**1**	**1**	**0**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**45**
PWFF	PWFFEF01	7/28/2024	445	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFEF02	7/28/2024	538	0.22	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
	PWFFEF03	7/28/2024	345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFEF04	7/29/2024	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFEF05	7/29/2024	560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFEF06	7/29/2024	500	0.12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	PWFFEF07	7/29/2024	500	0.12	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	PWFFEF08	7/31/2024	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total		**3,618**	**0.07**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**

Fish Species are: Brown Bullhead (BB), Brassy Minnow (BM), Brook Stickleback (BSB), Blacksided Darter (BSD), Creek Chub (CC), Central Mudminnow (CMM), Common Shiner (CS), Fathead Minnow (FHM), Finescale Dace (FSD), Golden Shiner (GS), Hornyhead Chub (HHC), Johnny Darter (JD), Northern Pike (NP), Northern Pearl Dace (NPD), Northern Redbelly Dace (NRBD), Rock Bass (RB), Sauger (SG), Spottail Shiner (STS), Trout Perch (TP), White Sucker (WS), Cyprinid YOY (YOY).

Table 8-6: Detailed gill net data in Pinewood River, July 2024.

Location	GearID	Set Date	Set Time	Lift Date	Lift Time	Effort (hours)	CPUE	BB	BM	BNM	BSB	BSD	CC	CMM	CS	FHM	FSD	GS	HHC	JD	NP	NPD	NRBD	RB	SG	STS	TP	WS	YOY	Total
PWREF	PWREFGN01	7/26/2024	17:20	7/27/2024	9:15	15.9	0.69	0	0	0	0	0	3	1	4	0	1	0	1	0	0	1	0	0	0	0	0	0	0	11
	PWREFGN02	7/26/2024	17:30	7/27/2024	9:40	16.2	0.25	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4
	PWREFGN03	7/26/2024	17:45	7/27/2024	13:00	19.2	0.57	0	1	1	0	0	2	2	3	0	0	1	0	0	0	0	0	0	0	0	0	1	0	11
	PWREFGN04	7/26/2024	17:50	7/27/2024	13:30	19.7	0.56	0	3	0	0	0	2	1	2	0	0	0	0	0	0	2	0	0	0	0	0	1	0	11
	PWREFGN05	7/26/2024	18:10	7/27/2024	14:00	19.8	0.45	0	0	0	0	0	0	2	2	0	0	0	1	0	0	3	0	0	0	0	0	1	0	9
	PWREFGN06	7/26/2024	18:20	7/27/2024	14:20	20	0.6	0	1	0	0	0	1	2	2	0	0	0	0	0	0	5	0	0	0	0	0	1	0	12
	Total					**110.8**	**0.52**	**0**	**5**	**1**	**0**	**0**	**10**	**9**	**13**	**0**	**1**	**1**	**2**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**58**
PWNF	PWNFGN01	7/29/2024	16:15	7/30/2024	13:30	21.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWNFGN02	7/29/2024	16:20	7/30/2024	13:45	21.4	0.19	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	4
	PWNFGN03	7/29/2024	16:40	7/30/2024	14:15	21.6	0.19	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	0	0	0	0	4
	PWNFGN04	7/29/2024	17:30	7/30/2024	17:40	24.2	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2
	PWNFGN05	7/29/2024	17:50	7/30/2024	16:50	23	0.22	0	0	0	0	0	0	0	1	0	0	3	0	0	1	0	0	0	0	0	0	0	0	5
	PWNFGN06	7/29/2024	18:00	7/30/2024	17:00	23	0.17	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
	Total					**134.4**	**0.14**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**10**	**0**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**19**
PWFF	PWFFGN01	7/28/2024	16:15	7/29/2024	10:50	18.6	0.22	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0	4
	PWFFGN02	7/28/2024	16:25	7/29/2024	11:18	18.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFGN03	7/28/2024	17:10	7/29/2024	12:15	19.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFGN04	7/28/2024	17:15	7/29/2024	12:00	18.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFGN05	7/28/2024	17:55	7/29/2024	9:15	15.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFGN06	7/28/2024	18:05	7/29/2024	8:55	14.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total					**105.5**	**0.04**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**

Fish Species are: Brown Bullhead (BB), Brassy Minnow (BM), Brook Stickleback (BSB), Blacksided Darter (BSD), Creek Chub (CC), Central Mudminnow (CMM), Common Shiner (CS), Fathead Minnow (FHM), Finescale Dace (FSD), Golden Shiner (GS), Hornyhead Chub (HHC), Johnny Darter (JD), Northern Pike (NP), Northern Pearl Dace (NPD), Northern Redbelly Dace (NRBD), Rock Bass (RB), Sauger (SG), Spottail Shiner (STS), Trout Perch (TP), White Sucker (WS), Cyprinid YOY (YOY).

Table 8-7: Detailed seine net in Pinewood River, July 2024.

Location	GearID	Date	Effort # hauls	CPUE	BB	BM	BNM	BSB	BSD	CC	CMM	CS	FHM	FSD	GS	HHC	JD	NP	NPD	NRBD	RB	SG	STS	TP	WS	YOY	Total
PWREF	PWREFSN01	7/29/2024	1	10	0	0	1	8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10
	PWREFSN02	7/29/2024	1	28	0	0	0	2	0	2	1	22	0	0	0	0	0	0	0	0	0	0	0	0	1	0	28
	PWREFSN03	7/29/2024	1	35	0	3	0	8	0	7	4	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	35
	PWREFSN04	7/29/2024	1	25	0	5	0	0	0	1	0	17	0	2	0	0	0	0	0	0	0	0	0	0	0	0	25
	PWREFSN05	7/30/2024	1	14	0	0	0	3	1	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
	PWREFSN06	7/30/2024	1	35	0	3	0	6	0	9	1	12	0	4	0	0	0	0	0	0	0	0	0	0	0	0	35
	PWREFSN07	7/30/2024	1	8	0	2	0	4	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	8
	PWREFSN08	7/30/2024	1	30	0	3	0	9	1	2	0	11	0	4	0	0	0	0	0	0	0	0	0	0	0	0	30
	PWREFSN09	7/30/2024	1	16	0	0	0	3	0	3	1	8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	16
	Total		**9**	**22.33**	**0**	**16**	**1**	**43**	**2**	**25**	**7**	**81**	**0**	**24**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**201**
PWNF	PWNFSN01	7/29/2024	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	PWNFSN02	7/30/2024	1	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	PWNFSN03	7/30/2024	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
	PWNFSN04	7/30/2024	1	13	0	0	0	0	6	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	13
	PWNFSN05	7/30/2024	1	102	1	0	0	0	0	0	0	19	0	0	13	0	0	0	0	0	0	0	0	0	0	69	102
	PWNFSN06	7/31/2024	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
	PWNFSN07	7/31/2024	1	15	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	11	15
	PWNFSN08	7/31/2024	1	11	0	0	0	0	0	0	3	3	0	1	2	0	0	1	0	0	0	0	0	0	0	1	11
	PWNFSN09	7/31/2024	1	3	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	3
	PWNFSN10	7/31/2024	1	75	9	0	0	0	0	0	2	23	0	0	2	0	0	0	0	0	0	0	0	0	0	39	75
	Total		**10**	**22.2**	**11**	**0**	**0**	**0**	**7**	**0**	**6**	**47**	**0**	**1**	**18**	**0**	**8**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**120**	**222**
PWFF	PWFFSN01	7/26/2024	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
	PWFFSN02	7/26/2024	1	8	0	0	0	0	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
	PWFFSN03	7/26/2024	1	5	0	0	0	0	1	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	5
	PWFFSN04	7/27/2024	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
	PWFFSN05	7/28/2024	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
	PWFFSN06	7/29/2024	1	20	0	0	0	0	0	0	0	7	0	2	4	0	1	0	0	0	0	0	0	2	4	0	20
	PWFFSN07	7/29/2024	1	10	0	0	0	0	0	0	0	2	0	0	7	0	0	0	0	0	0	0	0	0	0	1	10
	PWFFSN08	7/29/2024	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
	PWFFSN09	7/29/2024	1	7	0	0	0	0	0	0	0	4	0	0	3	0	0	0	0	0	0	0	0	0	0	0	7
	PWFFSN10	7/31/2024	1	10	0	0	0	0	0	0	1	1	0	0	2	0	4	0	0	0	0	0	0	0	2	0	10
	PWFFSN11	7/31/2024	1	5	0	0	0	0	1	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5
	PWFFSN12	7/31/2024	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	PWFFSN13	7/31/2024	1	12	0	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	7	12
	Total		**13**	**6.46**	**0**	**0**	**0**	**0**	**4**	**1**	**2**	**29**	**0**	**5**	**16**	**0**	**5**	**4**	**0**	**0**	**0**	**0**	**0**	**2**	**6**	**10**	**84**

Fish Species are: Brown Bullhead (BB), Brassy Minnow (BM), Brook Stickleback (BSB), Blacksided Darter (BSD), Creek Chub (CC), Central Mudminnow (CMM), Common Shiner (CS), Fathead Minnow (FHM), Finescale Dace (FSD), Golden Shiner (GS), Hornyhead Chub (HHC), Johnny Darter (JD), Northern Pike (NP), Northern Pearl Dace (NPD), Northern Redbelly Dace (NRBD), Rock Bass (RB), Sauger (SG), Spottail Shiner (STS), Trout Perch (TP), White Sucker (WS), Cyprinid YOY (YOY).

Table 8-8: Detailed minnow trap data in Pinewood River, July 2024.

Location	GearID	Set Date	Set Time	Lift Date	Lift Time	Traps (No.)	Total Effort	CPUE	BB	BM	BNM	BSB	BSD	CC	CMM	CS	FHM	FSD	GS	HHC	JD	NP	NPD	NRBD	RB	SG	STS	TP	WS	YOY	Total
PWREF	PWREFMT01	7/26/2024	12:10	7/27/2024	16:10	5	140	1.93	0	49	2	9	0	2	10	120	0	69	0	0	0	0	0	9	0	0	0	0	0	0	270
	PWREFMT02	7/26/2024	12:30	7/27/2024	16:15	5	138.75	6.95	2	175	1	16	2	67	1	500	5	78	0	0	0	0	72	0	0	0	0	0	46	0	965
	PWREFMT03	7/26/2024	12:45	7/27/2024	16:25	5	138.33	3.12	0	136	0	6	0	1	12	132	0	129	0	0	0	0	10	6	0	0	0	0	0	0	432
	PWREFMT04	7/26/2024	13:20	7/27/2024	16:45	5	137.08	8.16	0	289	4	4	0	41	0	709	0	42	0	9	0	0	8	13	0	0	0	0	0	0	1,119
	PWREFMT05	7/26/2024	13:30	7/27/2024	16:50	5	136.67	1.38	6	33	0	1	0	22	0	93	0	6	0	2	0	0	22	1	0	0	2	0	0	0	188
	Total					**25**	**690.83**	**0.86**	**8**	**682**	**7**	**36**	**2**	**133**	**23**	**1554**	**5**	**324**	**0**	**11**	**0**	**0**	**112**	**29**	**0**	**0**	**2**	**0**	**46**	**0**	**2,974**
PWNF	PWNFMT01	7/28/2024	10:50	7/29/2024	17:45	5	154.58	0.01	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	PWNFMT02	7/28/2024	11:00	7/29/2024	18:00	5	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWNFMT03	7/28/2024	11:05	7/29/2024	16:45	5	148.33	0.01	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	PWNFMT04	7/28/2024	11:30	7/29/2024	16:30	5	145	0.01	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	PWNFMT05	7/28/2024	11:45	7/29/2024	16:00	5	141.25	0.02	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	PWNFMT06	7/30/2024	16:55	7/31/2024	10:55	8	144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total					**33**	**888.16**	**0.0013**	**5**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**
PWFF	PWFFMT01	7/26/2024	11:30	7/27/2024	11:30	5	120	0.01	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	PWFFMT02	7/26/2024	11:50	7/27/2024	13:10	5	126.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFMT03	7/26/2024	12:30	7/27/2024	14:05	5	127.92	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	PWFFMT04	7/26/2024	12:45	7/27/2024	13:55	5	125.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFMT05	7/26/2024	13:40	7/27/2024	14:45	5	125.42	0.01	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	PWFFMT06	7/26/2024	14:40	7/27/2024	14:35	5	119.58	0.01	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	PWFFMT07	7/27/2024	11:45	7/28/2024	12:55	4	100.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFMT08	7/27/2024	14:40	7/28/2024	15:05	4	97.67	0.02	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	PWFFMT09	7/27/2024	14:50	7/28/2024	14:55	4	96.33	0.02	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
	PWFFMT10	7/28/2024	16:10	7/29/2024	11:50	4	78.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFMT11	7/28/2024	16:30	7/29/2024	11:45	4	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFMT12	7/29/2024	18:30	7/30/2024	10:40	4	64.67	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	PWFFMT13	7/29/2024	18:35	7/30/2024	10:35	4	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFMT14	7/30/2024	10:40	7/31/2024	9:00	3	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PWFFMT15	7/30/2024	10:40	7/31/2024	9:00	4	89.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total					**65**	**1,480.76**	**0.00041**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**9**

Fish Species are: Brown Bullhead (BB), Brassy Minnow (BM), Brook Stickleback (BSB), Blacksided Darter (BSD), Creek Chub (CC), Central Mudminnow (CMM), Common Shiner (CS), Fathead Minnow (FHM), Finescale Dace (FSD), Golden Shiner (GS), Hornyhead Chub (HHC), Johnny Darter (JD), Northern Pike (NP), Northern Pearl Dace (NPD), Northern Redbelly Dace (NRBD), Rock Bass (RB), Sauger (SG), Spottail Shiner (STS), Trout Perch (TP), White Sucker (WS), Cyprinid YOY (YOY).

Table 8-9: Community fish measurements for all areas, 2024.

F Fish Species are: Brown Bullhead (BB), Brassy Minnow (BM), Brook Stickleback (BSB), Blacksided Darter (BSD), Creek Chub (CC), Central Mudminnow (CMM), Common Shiner (CS), Fathead Minnow (FHM), Finescale Dace (FSD), Golden Shiner (GS), Hornyhead Chub (HHC), Johnny Darter (JD), Northern Pike (NP), Northern Pearl Dace (NPD), Northern Redbelly Dace (NRBD), Rock Bass (RB), Sauger (SG), Spottail Shiner (STS), Trout Perch (TP), White Sucker (WS), Cyprinid YOY (YOY).

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFEF01	BSB	NA	3.8	0.7
PWREF	PWREFEF01	BSB	NA	3.5	0.3
PWREF	PWREFEF01	BSB	NA	3.7	0.4
PWREF	PWREFEF01	BSB	NA	2.9	0.5
PWREF	PWREFEF01	BSB	NA	2.7	0.3
PWREF	PWREFEF01	BSB	NA	2.8	0.3
PWREF	PWREFEF01	BSB	NA	4.1	0.8
PWREF	PWREFEF01	BSB	NA	4.5	0.7
PWREF	PWREFEF01	BSB	NA	4	0.8
PWREF	PWREFEF01	BSB	NA	3.9	1.3
PWREF	PWREFEF01	BSB	NA	3.4	0.5
PWREF	PWREFEF01	BSB	NA	3.6	0.6
PWREF	PWREFEF01	BSB	NA	3.3	0.3
PWREF	PWREFEF01	BSB	NA	2.9	0.3
PWREF	PWREFEF01	BSB	NA	4.8	0.8
PWREF	PWREFEF01	BSB	NA	4	1.6
PWREF	PWREFEF01	BSB	NA	3.1	0.1
PWREF	PWREFEF01	BSB	NA	4.7	1
PWREF	PWREFEF01	BSB	NA	4.1	0.3
PWREF	PWREFEF01	BSB	NA	3.5	0.3
PWREF	PWREFEF01	BSB	NA	4	0.5
PWREF	PWREFEF01	BSB	NA	3.9	0.5
PWREF	PWREFEF01	BSB	NA	3.9	0.4
PWREF	PWREFEF01	CC	3.8	NA	1
PWREF	PWREFEF01	CC	3.7	NA	1.6
PWREF	PWREFEF01	CC	5.7	NA	3.1
PWREF	PWREFEF01	CC	8.2	NA	5.8
PWREF	PWREFEF01	CC	3.5	NA	0.4
PWREF	PWREFEF01	CC	3.7	NA	0.5
PWREF	PWREFEF01	CC	4.6	NA	1.5
PWREF	PWREFEF01	CC	4.4	NA	1.8
PWREF	PWREFEF01	CC	5.7	NA	2.1
PWREF	PWREFEF01	CC	6.2	NA	3
PWREF	PWREFEF01	CMM	NA	11.8	18.5
PWREF	PWREFEF01	CMM	NA	5.3	1.4
PWREF	PWREFEF01	CMM	NA	7.8	4.7
PWREF	PWREFEF01	CMM	NA	5.9	3.9
PWREF	PWREFEF01	CMM	NA	7.5	5.1
PWREF	PWREFEF01	CMM	NA	9.9	10.2
PWREF	PWREFEF01	CMM	NA	7.6	4.8
PWREF	PWREFEF01	CMM	NA	6.8	3.4
PWREF	PWREFEF01	CMM	NA	7.2	4.2
PWREF	PWREFEF01	CMM	NA	7.4	4.9
PWREF	PWREFEF01	CMM	NA	10.8	15
PWREF	PWREFEF01	CMM	NA	9.4	8.8
PWREF	PWREFEF01	CMM	NA	7.3	2.6
PWREF	PWREFEF01	JD	NA	3.2	0.2
PWREF	PWREFEF01	NRBD	5.3	NA	1.4
PWREF	PWREFEF01	STS	4.9	NA	1.3
PWREF	PWREFEF02	BSB	NA	4.1	0.8
PWREF	PWREFEF02	BSB	NA	3.2	0.2

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFEF02	BSB	NA	3.5	0.2
PWREF	PWREFEF02	BSB	NA	4.2	0.4
PWREF	PWREFEF02	BSB	NA	4.3	0.7
PWREF	PWREFEF02	BSB	NA	4	0.4
PWREF	PWREFEF02	BSB	NA	4.4	0.7
PWREF	PWREFEF02	BSB	NA	3.2	0.2
PWREF	PWREFEF02	BSB	NA	3.9	0.3
PWREF	PWREFEF02	BSB	NA	3.2	0.2
PWREF	PWREFEF02	BSB	NA	2.9	0.2
PWREF	PWREFEF02	BSB	NA	5	1.1
PWREF	PWREFEF02	BSB	NA	4.2	0.3
PWREF	PWREFEF02	BSB	NA	4.6	1
PWREF	PWREFEF02	BSB	NA	2.8	0.2
PWREF	PWREFEF02	BSB	NA	3.3	0.6
PWREF	PWREFEF02	BSD	3.9	NA	0.5
PWREF	PWREFEF02	CC	16.1	NA	59.8
PWREF	PWREFEF02	CC	11.1	NA	17.1
PWREF	PWREFEF02	CC	4.1	NA	0.5
PWREF	PWREFEF02	CC	10.7	NA	16.4
PWREF	PWREFEF02	CC	9.2	NA	9.8
PWREF	PWREFEF02	CC	4.2	NA	0.7
PWREF	PWREFEF02	CC	14.2	NA	36.4
PWREF	PWREFEF02	CC	7.2	NA	4.8
PWREF	PWREFEF02	CC	3.8	NA	0.5
PWREF	PWREFEF02	CMM	NA	7.3	4.4
PWREF	PWREFEF02	CMM	NA	7.5	5.4
PWREF	PWREFEF02	CMM	NA	4.3	0.9
PWREF	PWREFEF02	CMM	NA	9.5	9.6
PWREF	PWREFEF02	CMM	NA	10.6	12.3
PWREF	PWREFEF02	CMM	NA	8.1	5.1
PWREF	PWREFEF02	CMM	NA	9	8.2
PWREF	PWREFEF02	CMM	NA	10.8	14.5
PWREF	PWREFEF02	WS	10.4	NA	14.8
PWREF	PWREFEF02	WS	14.4	NA	39.5
PWREF	PWREFEF02	WS	13.2	NA	28.5
PWREF	PWREFEF02	WS	8.6	NA	7.6
PWREF	PWREFEF03	BSB	NA	3.2	0.4
PWREF	PWREFEF03	BSB	NA	4.6	0.7
PWREF	PWREFEF03	BSB	NA	4.3	0.7
PWREF	PWREFEF03	BSB	NA	4.1	0.5
PWREF	PWREFEF03	BSB	NA	4.5	0.7
PWREF	PWREFEF03	BSB	NA	3.4	0.2
PWREF	PWREFEF03	BSB	NA	4.2	0.6
PWREF	PWREFEF03	BSB	NA	3.3	0.5
PWREF	PWREFEF03	BSB	NA	4.1	0.7
PWREF	PWREFEF03	BSB	NA	3.5	0.5
PWREF	PWREFEF03	BSB	NA	5	1
PWREF	PWREFEF03	BSB	NA	4	0.5
PWREF	PWREFEF03	BSB	NA	3.4	0.2
PWREF	PWREFEF03	CMM	NA	8.2	7
PWREF	PWREFEF03	CMM	NA	7.7	4.5
PWREF	PWREFEF03	CMM	NA	8	6
PWREF	PWREFEF03	CMM	NA	7.7	5.7
PWREF	PWREFEF03	CMM	NA	8.8	7.2
PWREF	PWREFEF03	CMM	NA	6.6	3.3

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFEF03	CMM	NA	9.6	9.8
PWREF	PWREFEF03	CMM	NA	7.6	4.9
PWREF	PWREFEF03	CMM	NA	4.7	1
PWREF	PWREFEF03	CMM	NA	7.2	3.9
PWREF	PWREFEF03	CMM	NA	9	8
PWREF	PWREFEF03	WS	12.3	NA	25.1
PWREF	PWREFGN01	CC	11.3	11.6	20.5
PWREF	PWREFGN01	CC	10	10.7	12.7
PWREF	PWREFGN01	CC	10.6	11.4	14
PWREF	PWREFGN01	CMM	NA	10.9	13.3
PWREF	PWREFGN01	CS	NA	10.8	13.2
PWREF	PWREFGN01	CS	10.4	11.4	16.4
PWREF	PWREFGN01	CS	10.6	11	12.8
PWREF	PWREFGN01	CS	NA	9.6	8.8
PWREF	PWREFGN01	FSD	10.5	11.2	14.2
PWREF	PWREFGN01	HHC	10.6	11.3	17.2
PWREF	PWREFGN01	NPD	10	10.7	11.2
PWREF	PWREFGN02	CC	10.4	11	14.3
PWREF	PWREFGN02	CC	10.6	11.3	14.2
PWREF	PWREFGN02	CMM	NA	10.4	14.6
PWREF	PWREFGN02	WS	10.5	11.2	15.7
PWREF	PWREFGN03	BM	10.6	11.3	15.8
PWREF	PWREFGN03	BNM	11.3	12	17.8
PWREF	PWREFGN03	CC	10.4	11.1	14.3
PWREF	PWREFGN03	CC	10.1	10.6	14.3
PWREF	PWREFGN03	CMM	NA	10.3	11.7
PWREF	PWREFGN03	CMM	NA	10.9	18
PWREF	PWREFGN03	CS	10	11	13.6
PWREF	PWREFGN03	CS	8.9	9.9	10.7
PWREF	PWREFGN03	CS	9.7	10.5	10.4
PWREF	PWREFGN03	GS	8.4	9.4	8.4
PWREF	PWREFGN03	WS	10.3	10.9	14.4
PWREF	PWREFGN04	BM	10	10.6	13.1
PWREF	PWREFGN04	BM	9.9	10.5	9.5
PWREF	PWREFGN04	BM	9.4	9.8	11.6
PWREF	PWREFGN04	CC	10	10.6	15.2
PWREF	PWREFGN04	CC	10.3	10.9	15
PWREF	PWREFGN04	CMM	NA	10.7	14.7
PWREF	PWREFGN04	CS	9.8	10.7	12.4
PWREF	PWREFGN04	CS	10.2	11.1	14.1
PWREF	PWREFGN04	NPD	11.3	12	17.5
PWREF	PWREFGN04	NPD	11.7	12.5	19
PWREF	PWREFGN04	WS	10.3	10.8	13.2
PWREF	PWREFGN05	CMM	NA	10.2	12.6
PWREF	PWREFGN05	CMM	NA	10.7	13.3
PWREF	PWREFGN05	CS	9.4	10.2	10.7
PWREF	PWREFGN05	CS	9.4	10.5	11.5
PWREF	PWREFGN05	HHC	10.4	11.1	14.7
PWREF	PWREFGN05	NPD	9.6	10.4	11.7
PWREF	PWREFGN05	NPD	10.8	11.5	14.6
PWREF	PWREFGN05	NPD	11.1	11.8	15.8
PWREF	PWREFGN05	WS	10.3	11.4	15.5
PWREF	PWREFGN06	BM	9.2	9.6	11
PWREF	PWREFGN06	CC	11.4	12.1	20.5
PWREF	PWREFGN06	CMM	NA	10.2	14.3

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFGN06	CMM	NA	9.5	10
PWREF	PWREFGN06	CS	9.2	10	10.8
PWREF	PWREFGN06	CS	9.9	10.8	11.7
PWREF	PWREFGN06	NPD	11.6	12.3	16.5
PWREF	PWREFGN06	NPD	12	12.7	19.5
PWREF	PWREFGN06	NPD	10.7	11.3	15.3
PWREF	PWREFGN06	NPD	10.6	11.1	14.2
PWREF	PWREFGN06	NPD	11.7	12.5	20.4
PWREF	PWREFGN06	WS	11.6	12.3	17.7
PWREF	PWREFMT01	BNM	6.6	NA	3.2
PWREF	PWREFMT01	BSB	NA	5.7	1.5
PWREF	PWREFMT01	BSB	NA	6	1.6
PWREF	PWREFMT01	BSB	NA	4.3	0.9
PWREF	PWREFMT01	BSB	NA	5.1	1.2
PWREF	PWREFMT01	BSB	NA	5.6	1.4
PWREF	PWREFMT01	BSB	NA	5.5	1.8
PWREF	PWREFMT01	BSB	NA	4.9	1
PWREF	PWREFMT01	BSB	NA	4.6	0.9
PWREF	PWREFMT01	BSB	NA	5.2	1.3
PWREF	PWREFMT01	BSB	NA	6.7	2.7
PWREF	PWREFMT01	CC	9.6	NA	10.6
PWREF	PWREFMT01	CC	5.7	NA	1.7
PWREF	PWREFMT01	CMM	NA	10.9	15.278
PWREF	PWREFMT01	CMM	NA	8.7	8.49
PWREF	PWREFMT01	CMM	NA	9.1	8.79
PWREF	PWREFMT01	CMM	NA	9.2	9.02
PWREF	PWREFMT01	CMM	NA	7.7	5.51
PWREF	PWREFMT01	CMM	NA	7.8	5.27
PWREF	PWREFMT01	CMM	NA	7.4	4.7
PWREF	PWREFMT01	CMM	NA	8.1	5.83
PWREF	PWREFMT01	CMM	NA	10.3	12.02
PWREF	PWREFMT01	CMM	NA	7.2	4.15
PWREF	PWREFMT01	FSD	5.4	NA	1.8
PWREF	PWREFMT01	FSD	4.5	NA	1.1
PWREF	PWREFMT01	FSD	5	NA	1.4
PWREF	PWREFMT01	FSD	4.9	NA	1.2
PWREF	PWREFMT01	FSD	5.4	NA	1.7
PWREF	PWREFMT01	FSD	4.6	NA	1.2
PWREF	PWREFMT01	FSD	4.7	NA	1.4
PWREF	PWREFMT01	FSD	4.7	NA	1.2
PWREF	PWREFMT01	FSD	5.6	NA	1.7
PWREF	PWREFMT01	FSD	5.6	NA	1.8
PWREF	PWREFMT01	FSD	5.3	NA	1.6
PWREF	PWREFMT01	FSD	4.9	NA	1.1
PWREF	PWREFMT01	FSD	4.7	NA	1.1
PWREF	PWREFMT01	FSD	5.8	NA	2.4
PWREF	PWREFMT01	FSD	4.6	NA	1.1
PWREF	PWREFMT01	FSD	4.9	NA	1.3
PWREF	PWREFMT01	FSD	4.9	NA	1.2
PWREF	PWREFMT01	FSD	5.1	NA	1.3
PWREF	PWREFMT01	FSD	4.3	NA	0.8
PWREF	PWREFMT01	FSD	5.6	NA	1.7
PWREF	PWREFMT01	FSD	5.2	NA	1.7
PWREF	PWREFMT01	FSD	4.8	NA	1.2
PWREF	PWREFMT01	FSD	4.7	NA	1.1

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT01	FSD	5.1	NA	1.3
PWREF	PWREFMT01	FSD	5	NA	1.4
PWREF	PWREFMT01	FSD	5	NA	1.2
PWREF	PWREFMT01	FSD	4.6	NA	1
PWREF	PWREFMT01	FSD	5.2	NA	1.2
PWREF	PWREFMT01	FSD	4.9	NA	1.1
PWREF	PWREFMT01	FSD	5.6	NA	2.2
PWREF	PWREFMT01	FSD	4.9	NA	1.3
PWREF	PWREFMT01	FSD	5.4	NA	1.9
PWREF	PWREFMT01	FSD	5.1	NA	1.4
PWREF	PWREFMT01	FSD	4.9	NA	1.2
PWREF	PWREFMT01	FSD	4.9	NA	1.3
PWREF	PWREFMT01	FSD	5.4	NA	1.5
PWREF	PWREFMT01	FSD	5.2	NA	1.3
PWREF	PWREFMT01	FSD	4.5	NA	0.9
PWREF	PWREFMT01	FSD	5.5	NA	1.8
PWREF	PWREFMT01	FSD	5.7	NA	1.9
PWREF	PWREFMT01	FSD	5.6	NA	1.5
PWREF	PWREFMT01	FSD	5	NA	1.3
PWREF	PWREFMT01	FSD	5.6	NA	1.9
PWREF	PWREFMT01	FSD	5.7	NA	2
PWREF	PWREFMT01	FSD	5.2	NA	1.3
PWREF	PWREFMT01	FSD	6	NA	2.6
PWREF	PWREFMT01	FSD	5.4	NA	1.5
PWREF	PWREFMT01	FSD	4.9	NA	1.1
PWREF	PWREFMT01	FSD	4.5	NA	0.9
PWREF	PWREFMT01	FSD	5.4	NA	1.7
PWREF	PWREFMT01	FSD	5.1	NA	1.2
PWREF	PWREFMT01	FSD	5.2	NA	1.3
PWREF	PWREFMT01	FSD	5.3	NA	1.6
PWREF	PWREFMT01	FSD	5.3	NA	1.6
PWREF	PWREFMT01	FSD	6.3	NA	2.6
PWREF	PWREFMT01	FSD	5.6	NA	2.1
PWREF	PWREFMT01	FSD	4.8	NA	2.2
PWREF	PWREFMT01	FSD	5.7	NA	1.3
PWREF	PWREFMT01	FSD	5.4	NA	1.9
PWREF	PWREFMT01	FSD	5.4	NA	1.8
PWREF	PWREFMT01	FSD	5.2	NA	1.4
PWREF	PWREFMT01	FSD	6.3	NA	2.4
PWREF	PWREFMT01	FSD	5.4	NA	1.4
PWREF	PWREFMT01	FSD	4.6	NA	1
PWREF	PWREFMT01	FSD	6.5	NA	2.7
PWREF	PWREFMT01	FSD	5.3	NA	1.6
PWREF	PWREFMT01	FSD	5.5	NA	1.9
PWREF	PWREFMT01	FSD	5.6	NA	1.7
PWREF	PWREFMT01	FSD	5.3	NA	1.4
PWREF	PWREFMT01	FSD	5.5	NA	1.6
PWREF	PWREFMT01	FSD	5	NA	1.3
PWREF	PWREFMT01	FSD	5.2	NA	1.6
PWREF	PWREFMT01	FSD	4.9	NA	1.4
PWREF	PWREFMT01	FSD	5.4	NA	2
PWREF	PWREFMT01	NRBD	5.5	NA	1.8
PWREF	PWREFMT01	NRBD	5.1	NA	1.1
PWREF	PWREFMT01	NRBD	4.7	NA	1
PWREF	PWREFMT01	NRBD	5.2	NA	1.4

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT01	NRBD	5.2	NA	1.1
PWREF	PWREFMT01	NRBD	5.3	NA	1.5
PWREF	PWREFMT01	NRBD	5.3	NA	1.7
PWREF	PWREFMT01	NRBD	5.1	NA	1.3
PWREF	PWREFMT01	NRBD	5.8	NA	2
PWREF	PWREFMT04	BM	10.8	NA	13.8
PWREF	PWREFMT04	BM	8.6	NA	8
PWREF	PWREFMT04	BM	8.4	NA	6.7
PWREF	PWREFMT04	BM	8.4	NA	6.5
PWREF	PWREFMT04	BM	7.5	NA	4.9
PWREF	PWREFMT04	BM	9.4	NA	9
PWREF	PWREFMT04	BM	7.4	NA	4.1
PWREF	PWREFMT04	BM	10.8	NA	14
PWREF	PWREFMT04	BM	6.6	NA	2.9
PWREF	PWREFMT04	BM	7.2	NA	3.9
PWREF	PWREFMT04	BM	7.6	NA	3.8
PWREF	PWREFMT04	BM	6.4	NA	2.3
PWREF	PWREFMT04	BM	6.1	NA	2.1
PWREF	PWREFMT04	BM	10.4	NA	12.6
PWREF	PWREFMT04	BM	7.4	NA	3.9
PWREF	PWREFMT04	BM	6.4	NA	2.8
PWREF	PWREFMT04	BM	7.2	NA	3
PWREF	PWREFMT04	BM	8.5	NA	6.2
PWREF	PWREFMT04	BM	9.8	NA	9.7
PWREF	PWREFMT04	BM	8.4	NA	6.6
PWREF	PWREFMT04	BM	8.4	NA	6.9
PWREF	PWREFMT04	BM	5.7	NA	2.2
PWREF	PWREFMT04	BM	5.2	NA	1.4
PWREF	PWREFMT04	BM	6.4	NA	2.5
PWREF	PWREFMT04	BM	6.3	NA	2.5
PWREF	PWREFMT04	BM	6.2	NA	2
PWREF	PWREFMT04	BM	6.3	NA	2.6
PWREF	PWREFMT04	BM	6.4	NA	2.9
PWREF	PWREFMT04	BM	6.4	NA	2.6
PWREF	PWREFMT04	BM	6.1	NA	2.2
PWREF	PWREFMT04	BM	6.7	NA	3.3
PWREF	PWREFMT04	BM	6.3	NA	2.4
PWREF	PWREFMT04	BM	5.3	NA	1.7
PWREF	PWREFMT04	BM	4.7	NA	1.1
PWREF	PWREFMT04	BM	6.2	NA	2.4
PWREF	PWREFMT04	BM	7.4	NA	3.9
PWREF	PWREFMT04	BM	5.5	NA	1.6
PWREF	PWREFMT04	BM	6.6	NA	2.5
PWREF	PWREFMT04	BM	6.6	NA	2.2
PWREF	PWREFMT04	BM	6.6	NA	2.6
PWREF	PWREFMT04	BM	6.7	NA	3
PWREF	PWREFMT04	BM	6.3	NA	2.3
PWREF	PWREFMT04	BM	6.4	NA	2.8
PWREF	PWREFMT04	BM	5.4	NA	3.2
PWREF	PWREFMT04	BM	5.5	NA	1.7
PWREF	PWREFMT04	BM	6.5	NA	2.8
PWREF	PWREFMT04	BM	5.6	NA	2
PWREF	PWREFMT04	BM	5.2	NA	1.6
PWREF	PWREFMT04	BM	4.8	NA	1.1
PWREF	PWREFMT04	BM	5.4	NA	1.7

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT04	BM	5.8	NA	2.6
PWREF	PWREFMT04	BM	7.8	NA	4.4
PWREF	PWREFMT04	BM	5.1	NA	1.4
PWREF	PWREFMT04	BM	4.8	NA	1.3
PWREF	PWREFMT04	BM	5.3	NA	1.7
PWREF	PWREFMT04	BM	6.1	NA	2
PWREF	PWREFMT04	BM	5.9	NA	2.2
PWREF	PWREFMT04	BM	5.8	NA	1.9
PWREF	PWREFMT04	BM	5.3	NA	1.5
PWREF	PWREFMT04	BM	5.1	NA	1.3
PWREF	PWREFMT04	BM	4.6	NA	0.9
PWREF	PWREFMT04	BM	4.4	NA	1.1
PWREF	PWREFMT04	BM	10.1	NA	11
PWREF	PWREFMT04	BM	5.2	NA	1.3
PWREF	PWREFMT04	BM	8.2	NA	5.9
PWREF	PWREFMT04	BM	11.6	NA	21.6
PWREF	PWREFMT04	BM	13.3	NA	20.2
PWREF	PWREFMT04	BM	5.6	NA	2.1
PWREF	PWREFMT04	BM	4.4	NA	0.9
PWREF	PWREFMT04	BM	4.6	NA	1.2
PWREF	PWREFMT04	BM	4.8	NA	1.2
PWREF	PWREFMT04	BM	4.8	NA	1.1
PWREF	PWREFMT04	BM	4.5	NA	1.1
PWREF	PWREFMT04	BM	4.4	NA	0.9
PWREF	PWREFMT04	BM	4.4	NA	0.8
PWREF	PWREFMT04	BM	4.4	NA	1.2
PWREF	PWREFMT04	BM	4.5	NA	1.1
PWREF	PWREFMT04	BM	11.8	NA	20.4
PWREF	PWREFMT04	BM	8	NA	6.6
PWREF	PWREFMT04	BM	5.9	NA	2
PWREF	PWREFMT04	BM	5.2	NA	1.5
PWREF	PWREFMT04	BM	5.2	NA	1.5
PWREF	PWREFMT04	BM	4.8	NA	1.3
PWREF	PWREFMT04	BM	4.6	NA	1
PWREF	PWREFMT04	BM	4.8	NA	1.3
PWREF	PWREFMT04	BM	5.4	NA	1.6
PWREF	PWREFMT04	BM	5.4	NA	1.6
PWREF	PWREFMT04	BM	4.8	NA	1.3
PWREF	PWREFMT04	BM	4.8	NA	1.1
PWREF	PWREFMT04	BM	6.7	NA	3.6
PWREF	PWREFMT04	BM	5.4	NA	1.6
PWREF	PWREFMT04	BM	6.8	NA	3.4
PWREF	PWREFMT04	BM	5.6	NA	1.7
PWREF	PWREFMT04	BM	5.4	NA	1.8
PWREF	PWREFMT04	BM	4.7	NA	1.1
PWREF	PWREFMT04	BM	5	NA	1.5
PWREF	PWREFMT04	BM	5.3	NA	1.5
PWREF	PWREFMT04	BM	5.1	NA	1.3
PWREF	PWREFMT04	BM	4.8	NA	1.3
PWREF	PWREFMT04	BM	4.9	NA	1.3
PWREF	PWREFMT04	BM	4.6	NA	1.1
PWREF	PWREFMT04	BM	5.2	NA	1.4
PWREF	PWREFMT04	BM	4.4	NA	0.9
PWREF	PWREFMT04	BM	5.4	NA	1.7
PWREF	PWREFMT04	BM	9.6	NA	11.5

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT04	BM	5.1	NA	1.4
PWREF	PWREFMT04	BM	5.6	NA	2.2
PWREF	PWREFMT04	BM	5.4	NA	1.7
PWREF	PWREFMT04	BM	5.2	NA	1.3
PWREF	PWREFMT04	BM	4.9	NA	1.4
PWREF	PWREFMT04	BNM	5.4	NA	3.3
PWREF	PWREFMT04	BNM	5.7	NA	2.3
PWREF	PWREFMT04	BNM	5.7	NA	2.2
PWREF	PWREFMT04	BNM	6.4	NA	3.4
PWREF	PWREFMT04	BSB	NA	5.8	1.7
PWREF	PWREFMT04	BSB	NA	6.1	2
PWREF	PWREFMT04	BSB	NA	6.4	2.4
PWREF	PWREFMT04	BSB	NA	5.6	1.7
PWREF	PWREFMT04	CC	12.1	NA	22.9
PWREF	PWREFMT04	CC	9.1	NA	8.3
PWREF	PWREFMT04	CC	8.9	NA	8.3
PWREF	PWREFMT04	CC	11.5	NA	14.5
PWREF	PWREFMT04	CC	7.7	NA	4.6
PWREF	PWREFMT04	CC	5.1	NA	1.1
PWREF	PWREFMT04	CC	4.8	NA	1.1
PWREF	PWREFMT04	CC	5.1	NA	1.7
PWREF	PWREFMT04	CC	4.4	NA	1.8
PWREF	PWREFMT04	CC	5.2	NA	1.5
PWREF	PWREFMT04	CC	7.3	NA	4.3
PWREF	PWREFMT04	CC	6.8	NA	2
PWREF	PWREFMT04	CC	5.4	NA	1.7
PWREF	PWREFMT04	CC	8.1	NA	7
PWREF	PWREFMT04	CC	8.1	NA	5.8
PWREF	PWREFMT04	CC	7.7	NA	5.3
PWREF	PWREFMT04	CC	5.1	NA	1.4
PWREF	PWREFMT04	CC	5.4	NA	1.6
PWREF	PWREFMT04	CC	4.8	NA	0.9
PWREF	PWREFMT04	CC	7.8	NA	5.6
PWREF	PWREFMT04	CC	5.2	NA	1.4
PWREF	PWREFMT04	CC	8.8	NA	8
PWREF	PWREFMT04	CC	7.8	NA	5.5
PWREF	PWREFMT04	CC	4.5	NA	1
PWREF	PWREFMT04	CC	5.8	NA	2.2
PWREF	PWREFMT04	CC	5.9	NA	2.3
PWREF	PWREFMT04	CC	4.7	NA	1.5
PWREF	PWREFMT04	CC	6.2	NA	2.6
PWREF	PWREFMT04	CC	5.3	NA	1.6
PWREF	PWREFMT04	CC	8.1	NA	6.7
PWREF	PWREFMT04	CC	8.7	NA	7.6
PWREF	PWREFMT04	CC	8	NA	5.5
PWREF	PWREFMT04	CC	5.6	NA	1.9
PWREF	PWREFMT04	CC	5.7	NA	2.1
PWREF	PWREFMT04	CC	6.8	NA	2.3
PWREF	PWREFMT04	CC	8.2	NA	6.7
PWREF	PWREFMT04	CC	4.8	NA	1.2
PWREF	PWREFMT04	CC	4.7	NA	1.3
PWREF	PWREFMT04	CC	4.8	NA	1.1
PWREF	PWREFMT04	CC	5.2	NA	1.7
PWREF	PWREFMT04	CC	4.4	NA	1
PWREF	PWREFMT04	CC	5.4	NA	2.1

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT04	CC	13.7	NA	31.2
PWREF	PWREFMT04	CS	8.6	NA	7
PWREF	PWREFMT04	CS	9.3	NA	10.3
PWREF	PWREFMT04	CS	7.8	NA	4.3
PWREF	PWREFMT04	CS	7	NA	3.5
PWREF	PWREFMT04	CS	9.3	NA	9.9
PWREF	PWREFMT04	CS	6.6	NA	2.6
PWREF	PWREFMT04	CS	6.8	NA	3.3
PWREF	PWREFMT04	CS	6.8	NA	3.5
PWREF	PWREFMT04	CS	6.9	NA	3.5
PWREF	PWREFMT04	CS	6.3	NA	2.5
PWREF	PWREFMT04	CS	7.6	NA	3.9
PWREF	PWREFMT04	CS	8.7	NA	8.2
PWREF	PWREFMT04	CS	7.2	NA	3.8
PWREF	PWREFMT04	CS	8.4	NA	6.3
PWREF	PWREFMT04	CS	7.5	NA	4.7
PWREF	PWREFMT04	CS	6.3	NA	2.4
PWREF	PWREFMT04	CS	6.5	NA	3.2
PWREF	PWREFMT04	CS	7.3	NA	3.7
PWREF	PWREFMT04	CS	6.3	NA	2.7
PWREF	PWREFMT04	CS	8.1	NA	6.7
PWREF	PWREFMT04	CS	7.3	NA	4.1
PWREF	PWREFMT04	CS	8.1	NA	4.6
PWREF	PWREFMT04	CS	9.3	NA	9.5
PWREF	PWREFMT04	CS	7.4	NA	4.8
PWREF	PWREFMT04	CS	7.3	NA	4.5
PWREF	PWREFMT04	CS	7.6	NA	5.5
PWREF	PWREFMT04	CS	6.6	NA	3.6
PWREF	PWREFMT04	CS	10.2	NA	12.4
PWREF	PWREFMT04	CS	7.8	NA	6.1
PWREF	PWREFMT04	CS	7.3	NA	7.7
PWREF	PWREFMT04	CS	7.3	NA	4.6
PWREF	PWREFMT04	CS	7.9	NA	6
PWREF	PWREFMT04	CS	7.1	NA	4.2
PWREF	PWREFMT04	CS	7	NA	3.3
PWREF	PWREFMT04	CS	6.3	NA	2.6
PWREF	PWREFMT04	CS	6.9	NA	3.6
PWREF	PWREFMT04	CS	6.3	NA	2.4
PWREF	PWREFMT04	CS	7	NA	3.6
PWREF	PWREFMT04	CS	7	NA	3.4
PWREF	PWREFMT04	CS	6.1	NA	2.6
PWREF	PWREFMT04	CS	6.5	NA	2.7
PWREF	PWREFMT04	CS	7.1	NA	3.4
PWREF	PWREFMT04	CS	6.1	NA	2.3
PWREF	PWREFMT04	CS	7.3	NA	4
PWREF	PWREFMT04	CS	6.4	NA	2.8
PWREF	PWREFMT04	CS	6.6	NA	3
PWREF	PWREFMT04	CS	7.8	NA	4.4
PWREF	PWREFMT04	CS	6.7	NA	2.9
PWREF	PWREFMT04	CS	6.9	NA	3.4
PWREF	PWREFMT04	CS	7.4	NA	4
PWREF	PWREFMT04	CS	7	NA	4
PWREF	PWREFMT04	CS	6.4	NA	3
PWREF	PWREFMT04	CS	5.9	NA	2.1
PWREF	PWREFMT04	CS	7.4	NA	4

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT04	FSD	5.3	NA	1.5
PWREF	PWREFMT04	FSD	5.3	NA	1.7
PWREF	PWREFMT04	FSD	5.8	NA	2.1
PWREF	PWREFMT04	FSD	5.4	NA	1.6
PWREF	PWREFMT04	FSD	5.3	NA	1.3
PWREF	PWREFMT04	FSD	6.6	NA	2.6
PWREF	PWREFMT04	FSD	4.6	NA	1.1
PWREF	PWREFMT04	FSD	4.6	NA	1.4
PWREF	PWREFMT04	FSD	5.7	NA	1.9
PWREF	PWREFMT04	FSD	5.3	NA	1.6
PWREF	PWREFMT04	FSD	6.8	NA	NA
PWREF	PWREFMT04	FSD	5.5	NA	1.4
PWREF	PWREFMT04	FSD	5.7	NA	1.7
PWREF	PWREFMT04	FSD	5.4	NA	1.8
PWREF	PWREFMT04	FSD	5.1	NA	1.6
PWREF	PWREFMT04	FSD	5.3	NA	1.4
PWREF	PWREFMT04	FSD	5	NA	1
PWREF	PWREFMT04	FSD	5.3	NA	1.4
PWREF	PWREFMT04	FSD	5.2	NA	1.4
PWREF	PWREFMT04	FSD	4.8	NA	1.1
PWREF	PWREFMT04	FSD	5.6	NA	1.6
PWREF	PWREFMT04	FSD	5.4	NA	1.5
PWREF	PWREFMT04	FSD	5.9	NA	2
PWREF	PWREFMT04	FSD	5.5	NA	1.5
PWREF	PWREFMT04	FSD	6.1	NA	1.9
PWREF	PWREFMT04	FSD	5.7	NA	1.9
PWREF	PWREFMT04	FSD	5.7	NA	1.9
PWREF	PWREFMT04	FSD	5.7	NA	1.8
PWREF	PWREFMT04	FSD	5.8	NA	1.9
PWREF	PWREFMT04	FSD	5.4	NA	1.5
PWREF	PWREFMT04	FSD	5.4	NA	1.6
PWREF	PWREFMT04	FSD	5.7	NA	1.6
PWREF	PWREFMT04	FSD	5.5	NA	1.8
PWREF	PWREFMT04	FSD	5.4	NA	1.7
PWREF	PWREFMT04	FSD	5.2	NA	1.5
PWREF	PWREFMT04	FSD	5.2	NA	1.6
PWREF	PWREFMT04	FSD	5.3	NA	1.5
PWREF	PWREFMT04	FSD	4.3	NA	0.9
PWREF	PWREFMT04	FSD	5.7	NA	1.4
PWREF	PWREFMT04	FSD	5.2	NA	1.4
PWREF	PWREFMT04	FSD	4.6	NA	1.1
PWREF	PWREFMT04	FSD	5.4	NA	1.4
PWREF	PWREFMT04	FSD	5.4	NA	1.6
PWREF	PWREFMT04	FSD	6	NA	2.6
PWREF	PWREFMT04	HHC	7.5	NA	5.3
PWREF	PWREFMT04	HHC	10.9	NA	14.4
PWREF	PWREFMT04	HHC	9	NA	9.8
PWREF	PWREFMT04	HHC	8.5	NA	8.2
PWREF	PWREFMT04	HHC	10.8	NA	16.8
PWREF	PWREFMT04	HHC	8.6	NA	6.2
PWREF	PWREFMT04	HHC	8.6	NA	8.6
PWREF	PWREFMT04	HHC	8.4	NA	8.6
PWREF	PWREFMT04	HHC	8.7	NA	10
PWREF	PWREFMT04	NPD	8.5	NA	7.1
PWREF	PWREFMT04	NPD	7.8	NA	5

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT04	NPD	9.1	NA	8.8
PWREF	PWREFMT04	NPD	9.1	NA	8.5
PWREF	PWREFMT04	NPD	8.5	NA	7.6
PWREF	PWREFMT04	NPD	8.1	NA	6.4
PWREF	PWREFMT04	NPD	8.6	NA	8.7
PWREF	PWREFMT04	NPD	8.2	NA	6.3
PWREF	PWREFMT04	NPD	10.3	NA	11.5
PWREF	PWREFMT04	NRBD	5.1	NA	2.3
PWREF	PWREFMT04	NRBD	4.8	NA	1.3
PWREF	PWREFMT04	NRBD	4.8	NA	1.2
PWREF	PWREFMT04	NRBD	5.2	NA	1.8
PWREF	PWREFMT04	NRBD	5.3	NA	1.7
PWREF	PWREFMT04	NRBD	4.9	NA	1.3
PWREF	PWREFMT04	NRBD	5.7	NA	2
PWREF	PWREFMT04	NRBD	5.2	NA	1
PWREF	PWREFMT04	NRBD	6.2	NA	2.1
PWREF	PWREFMT04	NRBD	5.8	NA	1.7
PWREF	PWREFMT04	NRBD	5.1	NA	1.3
PWREF	PWREFMT04	NRBD	6	NA	2
PWREF	PWREFMT04	NRBD	5.4	NA	1.7
PWREF	PWREFMT05	BB	NA	8.1	7.3
PWREF	PWREFMT05	BB	NA	7.6	6.2
PWREF	PWREFMT05	BB	NA	7.9	6.8
PWREF	PWREFMT05	BB	NA	9.9	13
PWREF	PWREFMT05	BB	NA	9.1	10.8
PWREF	PWREFMT05	BB	NA	7.8	5.6
PWREF	PWREFMT05	BM	10.1	NA	12.3
PWREF	PWREFMT05	BM	9.1	NA	9.4
PWREF	PWREFMT05	BM	9.2	NA	9.1
PWREF	PWREFMT05	BSB	NA	5	1
PWREF	PWREFMT05	CC	11.7	NA	20.8
PWREF	PWREFMT05	CC	11.5	NA	18.7
PWREF	PWREFMT05	CC	10.4	NA	12.6
PWREF	PWREFMT05	CC	10.7	NA	14
PWREF	PWREFMT05	CC	12.3	NA	20.8
PWREF	PWREFMT05	CC	9.4	NA	10.5
PWREF	PWREFMT05	CC	12.7	NA	23.7
PWREF	PWREFMT05	CC	10.2	NA	11.5
PWREF	PWREFMT05	CC	10.2	NA	12
PWREF	PWREFMT05	CC	12.4	NA	21.6
PWREF	PWREFMT05	CC	12.3	NA	20.9
PWREF	PWREFMT05	CC	10.9	NA	16.6
PWREF	PWREFMT05	CC	7.9	NA	6.2
PWREF	PWREFMT05	CC	11.9	NA	19.3
PWREF	PWREFMT05	CC	9.9	NA	12.8
PWREF	PWREFMT05	CC	9.3	NA	9.9
PWREF	PWREFMT05	CC	9.2	NA	9.2
PWREF	PWREFMT05	CC	8.2	NA	6.7
PWREF	PWREFMT05	CC	8.2	NA	6.6
PWREF	PWREFMT05	CC	9.3	NA	9
PWREF	PWREFMT05	CC	8.2	NA	7.1
PWREF	PWREFMT05	CC	7.9	NA	6.4
PWREF	PWREFMT05	CS	9.4	NA	9.8
PWREF	PWREFMT05	CS	9.2	NA	9.1
PWREF	PWREFMT05	CS	8.7	NA	8.3

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT05	CS	10.8	NA	11.2
PWREF	PWREFMT05	CS	6.3	NA	3.3
PWREF	PWREFMT05	CS	8.8	NA	8.7
PWREF	PWREFMT05	CS	9.5	NA	11.4
PWREF	PWREFMT05	CS	8.1	NA	7.3
PWREF	PWREFMT05	CS	7.6	NA	5.7
PWREF	PWREFMT05	CS	7.4	NA	5
PWREF	PWREFMT05	CS	6.9	NA	4.4
PWREF	PWREFMT05	CS	9.1	NA	9.7
PWREF	PWREFMT05	CS	8.7	NA	8.7
PWREF	PWREFMT05	CS	9.1	NA	10
PWREF	PWREFMT05	CS	7.2	NA	5.1
PWREF	PWREFMT05	CS	8.1	NA	6.1
PWREF	PWREFMT05	CS	6.4	NA	3.2
PWREF	PWREFMT05	CS	6.4	NA	3.5
PWREF	PWREFMT05	CS	7.1	NA	4.4
PWREF	PWREFMT05	CS	8.7	NA	8.1
PWREF	PWREFMT05	CS	7.8	NA	6.3
PWREF	PWREFMT05	CS	7.5	NA	5.7
PWREF	PWREFMT05	CS	9.3	NA	10.9
PWREF	PWREFMT05	CS	7.2	NA	4.5
PWREF	PWREFMT05	CS	7.7	NA	6.3
PWREF	PWREFMT05	CS	6.8	NA	3.7
PWREF	PWREFMT05	CS	6.9	NA	3.8
PWREF	PWREFMT05	CS	6.2	NA	2.7
PWREF	PWREFMT05	CS	8.9	NA	9.2
PWREF	PWREFMT05	CS	7.3	NA	4.1
PWREF	PWREFMT05	CS	8.3	NA	7.5
PWREF	PWREFMT05	CS	6.8	NA	2.6
PWREF	PWREFMT05	CS	8.1	NA	7
PWREF	PWREFMT05	CS	8.7	NA	8.9
PWREF	PWREFMT05	CS	9.1	NA	9.3
PWREF	PWREFMT05	CS	6.5	NA	3
PWREF	PWREFMT05	CS	6.2	NA	2.6
PWREF	PWREFMT05	CS	8.6	NA	7.8
PWREF	PWREFMT05	CS	7.8	NA	6.7
PWREF	PWREFMT05	CS	6.4	NA	3.6
PWREF	PWREFMT05	CS	8.6	NA	7.7
PWREF	PWREFMT05	CS	7.1	NA	4.6
PWREF	PWREFMT05	CS	6.8	NA	4.5
PWREF	PWREFMT05	CS	6.1	NA	3
PWREF	PWREFMT05	CS	5.5	NA	1.7
PWREF	PWREFMT05	CS	6.7	NA	3.6
PWREF	PWREFMT05	CS	6.5	NA	3.1
PWREF	PWREFMT05	CS	7.4	NA	5.1
PWREF	PWREFMT05	CS	6.2	NA	3
PWREF	PWREFMT05	CS	7.8	NA	6.1
PWREF	PWREFMT05	HHC	13.1	NA	25.3
PWREF	PWREFMT05	HHC	9.7	NA	13.5
PWREF	PWREFMT05	NPD	8.8	NA	7.2
PWREF	PWREFMT05	NPD	9.5	NA	10.9
PWREF	PWREFMT05	NPD	7.4	NA	4.2
PWREF	PWREFMT05	NPD	9	NA	8.3
PWREF	PWREFMT05	NPD	7.8	NA	5.7
PWREF	PWREFMT05	NPD	8.7	NA	8.2

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFMT05	NPD	7.8	NA	5.7
PWREF	PWREFMT05	NPD	9.3	NA	9.9
PWREF	PWREFMT05	NPD	7.8	NA	5.5
PWREF	PWREFMT05	NPD	8.6	NA	7.1
PWREF	PWREFMT05	NPD	8.3	NA	6.4
PWREF	PWREFMT05	NPD	9.3	NA	9.8
PWREF	PWREFMT05	NPD	9.2	NA	8.7
PWREF	PWREFMT05	NPD	9.6	NA	10.8
PWREF	PWREFMT05	NPD	8.4	NA	6.6
PWREF	PWREFMT05	NPD	6.8	NA	3.7
PWREF	PWREFMT05	NPD	8.8	NA	7.7
PWREF	PWREFMT05	NPD	8.7	NA	7.3
PWREF	PWREFMT05	NPD	7.8	NA	5.4
PWREF	PWREFMT05	NPD	7.6	NA	5.1
PWREF	PWREFMT05	NPD	7.7	NA	5.1
PWREF	PWREFMT05	NPD	8.3	NA	6.7
PWREF	PWREFMT05	NRBD	5.3	NA	1.4
PWREF	PWREFMT05	STS	9.9	NA	11.8
PWREF	PWREFMT05	STS	8.9	NA	8.7
PWREF	PWREFSN01	BNM	5.5	5.8	1.8
PWREF	PWREFSN01	BSB	NA	4.3	0.7
PWREF	PWREFSN01	BSB	NA	3.4	0.4
PWREF	PWREFSN01	BSB	NA	3.9	0.4
PWREF	PWREFSN01	BSB	NA	3.9	0.6
PWREF	PWREFSN01	BSB	NA	4.4	0.8
PWREF	PWREFSN01	BSB	NA	4	0.6
PWREF	PWREFSN01	BSB	NA	4.2	0.7
PWREF	PWREFSN01	BSB	NA	3.6	0.2
PWREF	PWREFSN01	FSD	3.8	4	0.6
PWREF	PWREFSN02	BSB	NA	3.2	0.4
PWREF	PWREFSN02	BSB	NA	3.9	0.5
PWREF	PWREFSN02	BSB	NA	3.6	0.4
PWREF	PWREFSN02	CMM	NA	7.3	3.9
PWREF	PWREFSN02	WS	13.6	NA	28.2
PWREF	PWREFSN03	BSB	NA	3.7	0.5
PWREF	PWREFSN03	BSB	NA	2.9	0.2
PWREF	PWREFSN03	BSB	NA	3.4	0.2
PWREF	PWREFSN03	BSB	NA	4.3	0.9
PWREF	PWREFSN03	BSB	NA	3.6	0.4
PWREF	PWREFSN03	BSB	NA	3.8	0.4
PWREF	PWREFSN03	BSB	NA	4.1	0.5
PWREF	PWREFSN03	BSB	NA	3.1	0.3
PWREF	PWREFSN03	CMM	NA	6.3	3.8
PWREF	PWREFSN03	CMM	NA	3.3	0.4
PWREF	PWREFSN03	CMM	NA	3.6	0.4
PWREF	PWREFSN03	CMM	NA	3.2	0.3
PWREF	PWREFSN05	BSB	NA	5	1.1
PWREF	PWREFSN05	BSB	NA	3.5	0.4
PWREF	PWREFSN05	BSB	NA	4	0.5
PWREF	PWREFSN05	BSD	7.3	NA	4
PWREF	PWREFSN06	BSB	NA	4.5	0.4
PWREF	PWREFSN06	BSB	NA	4.3	0.5
PWREF	PWREFSN06	BSB	NA	3.5	0.3
PWREF	PWREFSN06	BSB	NA	2.3	0.1
PWREF	PWREFSN06	BSB	NA	4.1	0.5

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWREF	PWREFSN06	BSB	NA	3.7	0.5
PWREF	PWREFSN06	CMM	NA	4.6	0.8
PWREF	PWREFSN07	BSB	NA	3.7	0.5
PWREF	PWREFSN07	BSB	NA	4	0.6
PWREF	PWREFSN07	BSB	NA	4.4	0.7
PWREF	PWREFSN07	BSB	NA	4.5	0.7
PWREF	PWREFSN08	BSB	NA	3.4	0.3
PWREF	PWREFSN08	BSB	NA	3.5	0.4
PWREF	PWREFSN08	BSB	NA	3.2	0.3
PWREF	PWREFSN08	BSB	NA	3.6	0.4
PWREF	PWREFSN08	BSB	NA	3.8	0.5
PWREF	PWREFSN08	BSB	NA	4	0.5
PWREF	PWREFSN08	BSB	NA	3.7	0.4
PWREF	PWREFSN08	BSB	NA	4.6	0.8
PWREF	PWREFSN08	BSB	NA	3.4	0.3
PWREF	PWREFSN08	BSD	4	NA	0.5
PWREF	PWREFSN09	BSB	NA	4.1	0.4
PWREF	PWREFSN09	BSB	NA	4.4	0.3
PWREF	PWREFSN09	BSB	NA	4.2	0.6
PWREF	PWREFSN09	CMM	9.9	NA	11.1
PWREF	PWREFSN09	HHC	8.9	NA	8.5
PWNF	PWNFEF01	BSD	3.4	NA	0.4
PWNF	PWNFEF01	BSD	6.9	NA	3.3
PWNF	PWNFEF01	CMM	4.1	NA	4.2
PWNF	PWNFEF01	CMM	8.1	NA	6.5
PWNF	PWNFEF01	CMM	5.3	NA	1.8
PWNF	PWNFEF01	WS	19.5	NA	89.2
PWNF	PWNFEF02	BSD	4.2	NA	0.5
PWNF	PWNFEF02	CMM	3.6	NA	0.5
PWNF	PWNFEF02	CMM	7.4	NA	4.4
PWNF	PWNFEF02	CMM	5	NA	1.2
PWNF	PWNFEF02	CMM	5.5	NA	1.6
PWNF	PWNFEF02	FSD	NA	NA	NA
PWNF	PWNFEF02	GS	6.9	NA	3.6
PWNF	PWNFEF02	JD	3.1	NA	0.2
PWNF	PWNFEF02	NP	13	NA	11.8
PWNF	PWNFEF03	CMM	11.3	NA	17.9
PWNF	PWNFEF03	CMM	11.8	NA	17.7
PWNF	PWNFEF03	CMM	9.5	NA	8.7
PWNF	PWNFEF03	CMM	6.9	NA	3.6
PWNF	PWNFEF03	CMM	10.1	NA	12.6
PWNF	PWNFEF03	CMM	7.7	NA	4.3
PWNF	PWNFEF03	CMM	8.8	NA	7.3
PWNF	PWNFEF03	CMM	4.6	NA	0.9
PWNF	PWNFEF03	CMM	4	NA	0.7
PWNF	PWNFEF04	BSD	4.1	NA	0.5
PWNF	PWNFEF04	CMM	3.6	NA	0.5
PWNF	PWNFEF04	CMM	9.2	NA	8
PWNF	PWNFEF04	NP	11.4	NA	9.8
PWNF	PWNFEF05	BSD	5	NA	0.8
PWNF	PWNFEF05	BSD	4	NA	0.5
PWNF	PWNFEF05	BSD	4.3	NA	0.7
PWNF	PWNFEF05	CMM	7.8	NA	4.4
PWNF	PWNFEF05	CMM	7.8	NA	4.6
PWNF	PWNFEF05	CMM	5.8	NA	1.9

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWNF	PWNFEF05	CMM	5.3	NA	1.3
PWNF	PWNFEF05	CMM	5.1	NA	1.2
PWNF	PWNFEF05	CMM	4.5	NA	0.8
PWNF	PWNFEF05	CMM	8.3	NA	5.4
PWNF	PWNFEF05	CMM	7	NA	3.6
PWNF	PWNFEF05	CMM	9.5	NA	8.7
PWNF	PWNFEF05	CMM	7.8	NA	5.4
PWNF	PWNFEF05	CMM	7.3	NA	4
PWNF	PWNFEF05	JD	5.8	NA	1.4
PWNF	PWNFEF05	NP	11.5	NA	10.4
PWNF	PWNFEF05	WS	8.9	NA	9.2
PWNF	PWNFGN01	NFC	NA	NA	NA
PWNF	PWNFGN02	BB	9	NA	0.2
PWNF	PWNFGN02	NP	43.3	NA	630
PWNF	PWNFGN02	NP	46.8	NA	740
PWNF	PWNFGN02	RB	13.4	NA	62.6
PWNF	PWNFGN03	NP	29.7	NA	2.5
PWNF	PWNFGN03	NP	36.8	NA	370
PWNF	PWNFGN03	RB	13.1	NA	65.6
PWNF	PWNFGN03	SG	29.4	NA	225
PWNF	PWNFGN04	NP	35.6	38	350
PWNF	PWNFGN04	WS	22.1	23.5	180
PWNF	PWNFGN05	CS	9.6	10.8	12.1
PWNF	PWNFGN05	GS	8.6	9.7	9.3
PWNF	PWNFGN05	GS	8.7	9.6	9.2
PWNF	PWNFGN05	GS	9.4	10.5	10.7
PWNF	PWNFGN05	NP	39.4	42	460
PWNF	PWNFGN06	NP	41.2	44.1	595
PWNF	PWNFGN06	NP	NA	33.9	225
PWNF	PWNFGN06	NP	31.4	33.6	235
PWNF	PWNFGN06	NP	37	40	430
PWNF	PWNFMT01	BB	10	NA	13.8
PWNF	PWNFMT02	NFC	NA	NA	NA
PWNF	PWNFMT03	CMM	4.7	NA	1
PWNF	PWNFMT03	CMM	8.3	NA	5.9
PWNF	PWNFMT04	BB	8.4	NA	7.1
PWNF	PWNFMT05	BB	8.9	NA	9.7
PWNF	PWNFMT05	BB	7.3	NA	5.1
PWNF	PWNFMT05	BB	8.5	NA	8.6
PWNF	PWNFMT06	NFC	NA	NA	NA
PWNF	PWNFSN01	NP	9.3	NA	5.2
PWNF	PWNFSN02	BB	9.9	NA	9.5
PWNF	PWNFSN02	CMM	5.6	NA	2.1
PWNF	PWNFSN03	NFC	NA	NA	NA
PWNF	PWNFSN04	BSD	3.4	NA	0.4
PWNF	PWNFSN04	BSD	4	NA	0.5
PWNF	PWNFSN04	BSD	3.6	NA	0.5
PWNF	PWNFSN04	BSD	4	NA	0.5
PWNF	PWNFSN04	BSD	3.7	NA	0.5
PWNF	PWNFSN04	BSD	2.8	NA	0.2
PWNF	PWNFSN04	JD	3.2	NA	0.3
PWNF	PWNFSN04	JD	3.7	NA	0.5
PWNF	PWNFSN04	JD	2.3	NA	0.1
PWNF	PWNFSN04	JD	2.8	NA	0.2
PWNF	PWNFSN04	JD	3.4	NA	0.3

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWNF	PWNFSN04	JD	2.8	NA	0.2
PWNF	PWNFSN04	JD	3.6	NA	0.3
PWNF	PWNFSN05	BB	2.8	NA	0.5
PWNF	PWNFSN05	CS	5.6	NA	2
PWNF	PWNFSN05	CS	5.4	NA	2.2
PWNF	PWNFSN05	CS	5.1	NA	1.5
PWNF	PWNFSN05	CS	3.9	NA	0.7
PWNF	PWNFSN05	CS	6.3	NA	3
PWNF	PWNFSN05	CS	5.1	NA	1.4
PWNF	PWNFSN05	CS	5.7	NA	1.9
PWNF	PWNFSN05	CS	5	NA	1.7
PWNF	PWNFSN05	CS	5.4	NA	1.6
PWNF	PWNFSN05	CS	5.1	NA	1.6
PWNF	PWNFSN05	CS	4.9	NA	1.7
PWNF	PWNFSN05	CS	5.6	NA	1.9
PWNF	PWNFSN05	CS	6	NA	2.6
PWNF	PWNFSN05	CS	4.6	NA	1.1
PWNF	PWNFSN05	CS	5.6	NA	1.9
PWNF	PWNFSN05	CS	5.2	NA	1.5
PWNF	PWNFSN05	CS	6.3	NA	2.8
PWNF	PWNFSN05	CS	6.4	NA	2.8
PWNF	PWNFSN05	CS	5.6	NA	2.3
PWNF	PWNFSN05	CS	5.3	NA	1.6
PWNF	PWNFSN05	GS	6	NA	2.4
PWNF	PWNFSN05	GS	6	NA	2.6
PWNF	PWNFSN05	GS	6.3	NA	3.4
PWNF	PWNFSN05	GS	5.5	NA	2.3
PWNF	PWNFSN05	GS	5.1	NA	1.7
PWNF	PWNFSN05	GS	5.8	NA	2.3
PWNF	PWNFSN05	GS	6.8	NA	3.3
PWNF	PWNFSN05	GS	6.1	NA	2.5
PWNF	PWNFSN05	GS	7.3	NA	4.4
PWNF	PWNFSN05	GS	5.2	NA	1.6
PWNF	PWNFSN05	GS	6.5	NA	3.4
PWNF	PWNFSN05	GS	9.6	NA	12.7
PWNF	PWNFSN05	YOY	2.5	NA	0.1
PWNF	PWNFSN05	YOY	3	NA	0.3
PWNF	PWNFSN05	YOY	1.8	NA	0.1
PWNF	PWNFSN05	YOY	3.5	NA	0.9
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN05	YOY	2	NA	0.1
PWNF	PWNFSN06	NFC	NA	NA	NA
PWNF	PWNFSN07	BSD	3.5	NA	0.4
PWNF	PWNFSN07	CS	3.8	NA	0.5
PWNF	PWNFSN07	JD	3.1	NA	0.2
PWNF	PWNFSN07	NP	13.4	NA	15.9

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWNF	PWNFSN07	YOY	3.1	NA	0.2
PWNF	PWNFSN07	YOY	2.8	NA	0.1
PWNF	PWNFSN07	YOY	2.8	NA	0.2
PWNF	PWNFSN07	YOY	2.6	NA	0.1
PWNF	PWNFSN07	YOY	2.9	NA	0.2
PWNF	PWNFSN07	YOY	2.4	NA	0.1
PWNF	PWNFSN07	YOY	2.9	NA	0.2
PWNF	PWNFSN07	YOY	2.9	NA	0.2
PWNF	PWNFSN07	YOY	2.9	NA	0.2
PWNF	PWNFSN07	YOY	2.9	NA	0.1
PWNF	PWNFSN07	YOY	2.1	NA	0.1
PWFF	PWFFEF01	NFC	NA	NA	NA
PWFF	PWFFEF02	CS	5	NA	1.7
PWFF	PWFFEF02	RB	5.4	NA	3.4
PWFF	PWFFEF03	NFC	NA	NA	NA
PWFF	PWFFEF04	NFC	NA	NA	NA
PWFF	PWFFEF05	NFC	NA	NA	NA
PWFF	PWFFEF06	NP	12.1	NA	11
PWFF	PWFFEF07	CMM	7.2	NA	2.9
PWFF	PWFFEF08	NFC	NA	NA	NA
PWFF	PWFFGN01	CS	9.6	10.3	14.4
PWFF	PWFFGN01	NP	41.4	43.9	500
PWFF	PWFFGN01	NP	28.6	30.6	190
PWFF	PWFFGN01	NP	30.5	32.2	230
PWFF	PWFFGN02	NFC	NA	NA	NA
PWFF	PWFFGN03	NFC	NA	NA	NA
PWFF	PWFFGN04	NFC	NA	NA	NA
PWFF	PWFFGN05	NFC	NA	NA	NA
PWFF	PWFFGN06	NFC	NA	NA	NA
PWFF	PWFFMT01	JD	NA	NA	NA
PWFF	PWFFMT02	NFC	NA	NA	NA
PWFF	PWFFMT03	RB	7	NA	6.5
PWFF	PWFFMT04	NFC	NA	NA	NA
PWFF	PWFFMT05	CMM	7.4	NA	4.012
PWFF	PWFFMT06	CS	7.2	NA	4.327
PWFF	PWFFMT07	NFC	NA	NA	NA
PWFF	PWFFMT08	CMM	8.2	NA	6.6
PWFF	PWFFMT08	CMM	9.6	NA	9.8
PWFF	PWFFMT09	CMM	8.6	NA	6.8
PWFF	PWFFMT09	TP	8.5	NA	7.5
PWFF	PWFFMT10	NFC	NA	NA	NA
PWFF	PWFFMT11	NFC	NA	NA	NA
PWFF	PWFFMT12	WS	9.3	NA	9.8
PWFF	PWFFMT13	NFC	NA	NA	NA
PWFF	PWFFMT14	NFC	NA	NA	NA
PWFF	PWFFMT15	NFC	NA	NA	NA
PWFF	PWFFSN01	CS	2.2	NA	0.1
PWFF	PWFFSN01	YOY	3.1	NA	0.2
PWFF	PWFFSN02	BSD	6.8	NA	3.7
PWFF	PWFFSN02	CS	3.2	NA	0.3
PWFF	PWFFSN02	CS	3.2	NA	0.2
PWFF	PWFFSN02	CS	2.8	NA	0.1
PWFF	PWFFSN02	CS	4.1	NA	1.1
PWFF	PWFFSN02	CS	4	NA	0.6
PWFF	PWFFSN02	CS	3.8	NA	0.8

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWFF	PWFFSN02	CS	3.6	NA	0.7
PWFF	PWFFSN03	BSD	3.6	NA	0.4
PWFF	PWFFSN03	CC	3.1	NA	0.3
PWFF	PWFFSN03	CS	2.9	NA	0.2
PWFF	PWFFSN03	NP	8.7	NA	4.5
PWFF	PWFFSN03	NP	11.6	NA	12.1
PWFF	PWFFSN04	CS	6	NA	2.1
PWFF	PWFFSN04	YOY	2.4	NA	0.2
PWFF	PWFFSN05	NFC	NA	NA	NA
PWFF	PWFFSN06	CS	6.3	NA	2.3
PWFF	PWFFSN06	CS	7.3	NA	4.2
PWFF	PWFFSN06	CS	9.2	NA	11
PWFF	PWFFSN06	CS	6.2	NA	2.9
PWFF	PWFFSN06	CS	4.3	NA	0.9
PWFF	PWFFSN06	CS	5.5	NA	2
PWFF	PWFFSN06	CS	5.2	NA	1.3
PWFF	PWFFSN06	FSD	2.1	NA	0.1
PWFF	PWFFSN06	FSD	2.6	NA	0.1
PWFF	PWFFSN06	GS	8.4	NA	7.8
PWFF	PWFFSN06	GS	6.6	NA	3.4
PWFF	PWFFSN06	GS	6.5	NA	3.3
PWFF	PWFFSN06	GS	8	NA	5.2
PWFF	PWFFSN06	JD	3.1	NA	0.3
PWFF	PWFFSN06	TP	6.6	NA	2.8
PWFF	PWFFSN06	WS	8.6	NA	8.3
PWFF	PWFFSN06	WS	8.8	NA	8.4
PWFF	PWFFSN06	WS	8.7	NA	8
PWFF	PWFFSN06	WS	8.6	NA	7.4
PWFF	PWFFSN07	CS	6.8	NA	3.6
PWFF	PWFFSN07	CS	4.6	NA	1.1
PWFF	PWFFSN07	GS	6.7	NA	3.6
PWFF	PWFFSN07	GS	5.6	NA	2.1
PWFF	PWFFSN07	GS	6	NA	2.5
PWFF	PWFFSN07	GS	7.6	NA	5.3
PWFF	PWFFSN07	GS	5.6	NA	2.2
PWFF	PWFFSN07	GS	7	NA	3.8
PWFF	PWFFSN07	GS	5.2	NA	2.1
PWFF	PWFFSN07	YOY	2.9	NA	0.3
PWFF	PWFFSN08	FSD	2	NA	0.1
PWFF	PWFFSN08	NP	9.3	NA	5
PWFF	PWFFSN09	CS	5.9	NA	8.3
PWFF	PWFFSN09	CS	5.5	NA	1.8
PWFF	PWFFSN09	CS	4.7	NA	1.4
PWFF	PWFFSN09	CS	3.4	NA	0.5
PWFF	PWFFSN09	GS	6	NA	2.8
PWFF	PWFFSN09	GS	5.6	NA	2.1
PWFF	PWFFSN09	GS	5.6	NA	1.9
PWFF	PWFFSN10	CMM	4.2	NA	0.8
PWFF	PWFFSN10	CS	4.8	NA	1.3
PWFF	PWFFSN10	GS	7	NA	4.2
PWFF	PWFFSN10	GS	5.8	NA	2.6
PWFF	PWFFSN10	JD	2.8	NA	0.2
PWFF	PWFFSN10	JD	2.9	NA	0.2
PWFF	PWFFSN10	JD	2.8	NA	0.2
PWFF	PWFFSN10	JD	2.7	NA	0.1

Area	GearID	Species	Fork Length (cm)	Total Length (cm)	Body Weight (g)
PWFF	PWFFSN10	WS	8.6	NA	7.6
PWFF	PWFFSN10	WS	8.6	NA	7.5
PWFF	PWFFSN11	BSD	3.4	NA	0.5
PWFF	PWFFSN11	CS	3.4	NA	0.2
PWFF	PWFFSN11	CS	3.3	NA	0.2
PWFF	PWFFSN11	CS	3.2	NA	0.2
PWFF	PWFFSN11	NP	12.3	NA	11.9
PWFF	PWFFSN12	CMM	8	NA	6
PWFF	PWFFSN13	BSD	3.8	NA	0.5
PWFF	PWFFSN13	CS	3.6	NA	0.4
PWFF	PWFFSN13	CS	4.2	NA	0.6
PWFF	PWFFSN13	FSD	3.6	NA	0.4
PWFF	PWFFSN13	FSD	3.2	NA	0.3
PWFF	PWFFSN13	YOY	3	NA	0.2
PWFF	PWFFSN13	YOY	2.5	NA	0.1
PWFF	PWFFSN13	YOY	2.5	NA	0.1
PWFF	PWFFSN13	YOY	3	NA	0.3
PWFF	PWFFSN13	YOY	2.6	NA	0.1
PWFF	PWFFSN13	YOY	2.7	NA	0.2
PWFF	PWFFSN13	YOY	3	NA	0.2

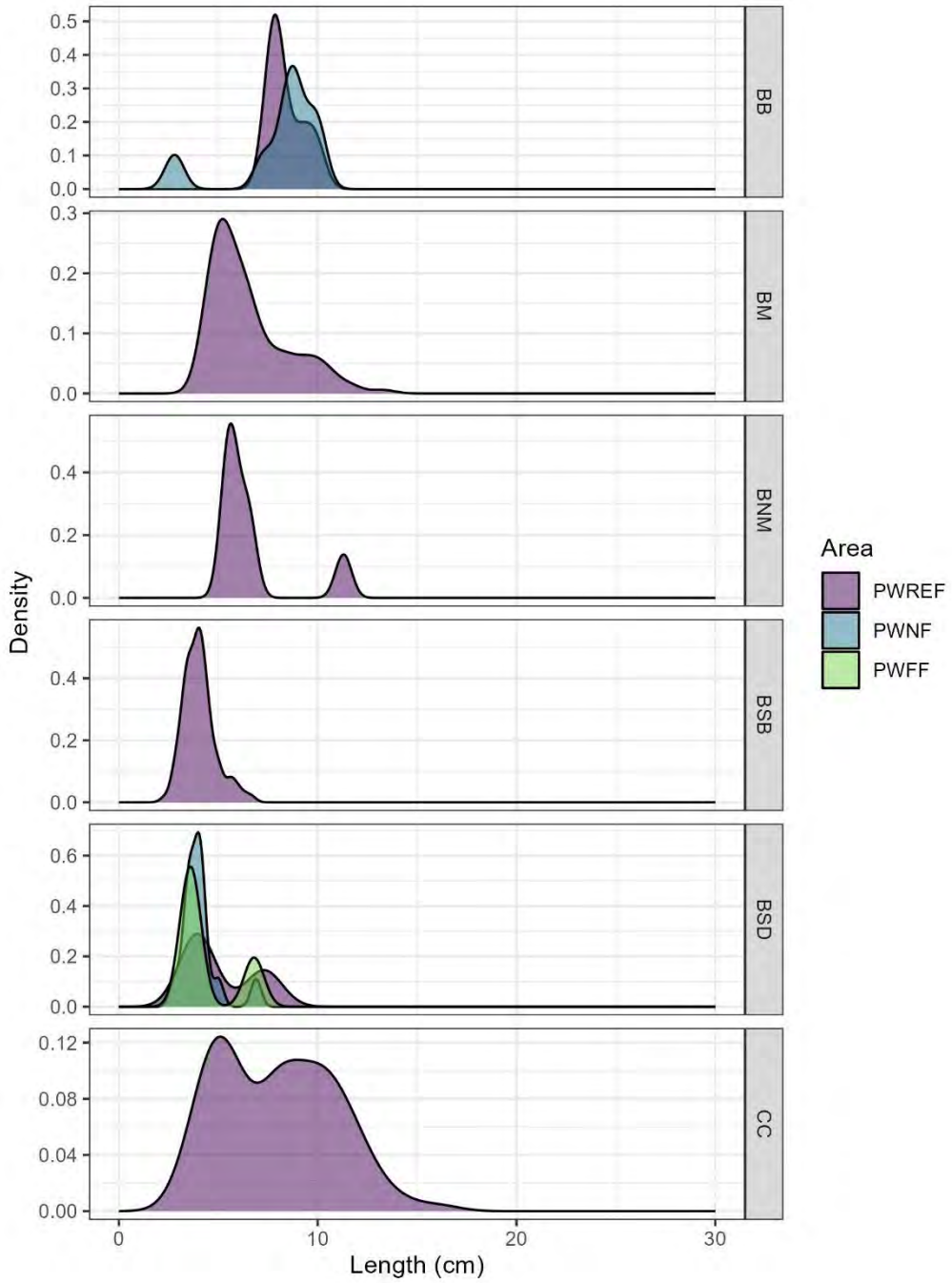

Figure B–1: Density-length plots of species length (total or fork length, species dependent) at PWREF, PWNF, PWFF in 2024. The curve represents the proportion of the data in each range. Fish species are: Brown Bullhead (BB), Brassy Minnow (BM), Bluntnose Minnow (BNM), Brook Stickleback (BSB), Blacksided Darter (BSD), and Creek Chub (CC).

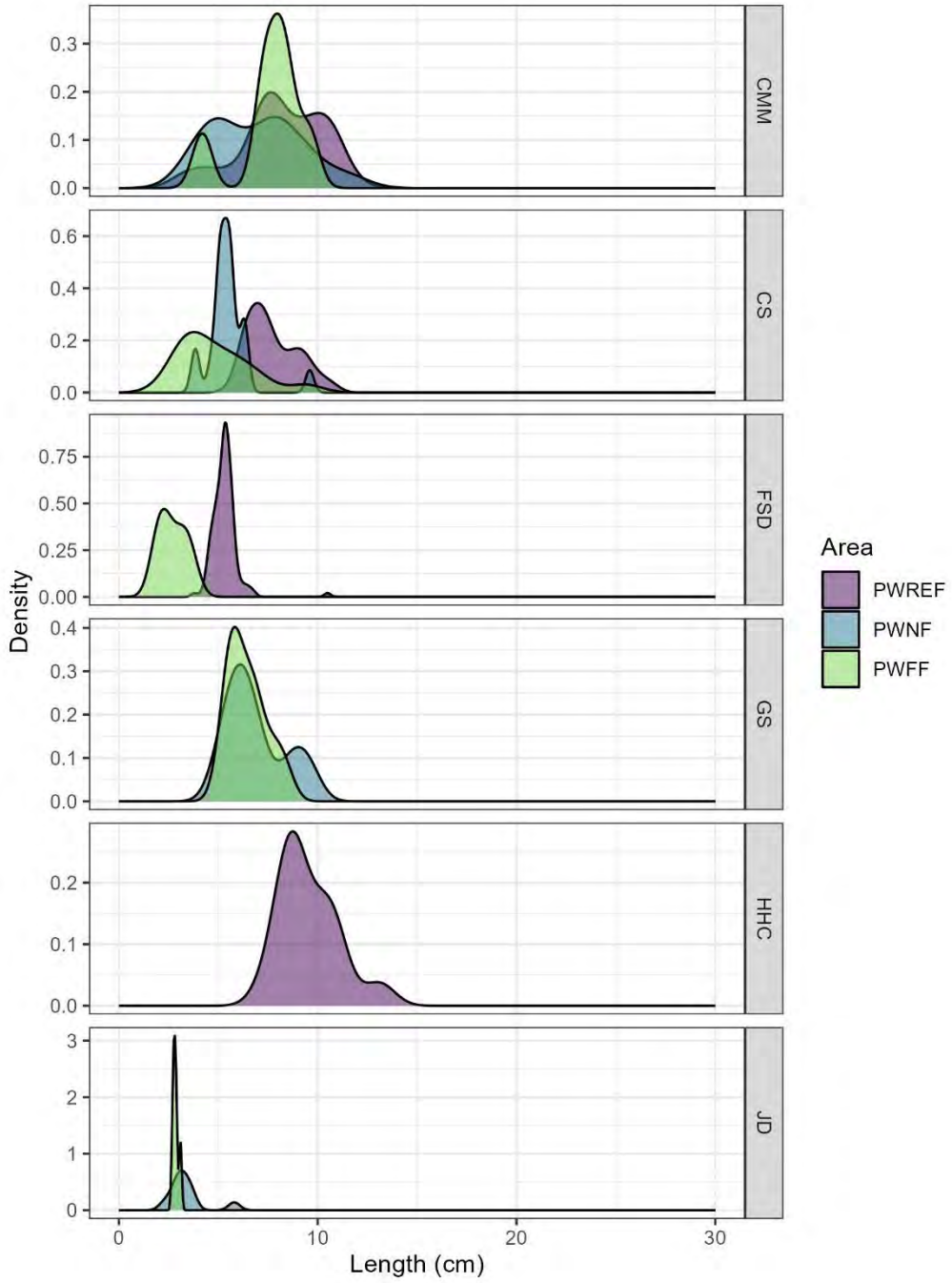

Figure B–2: Density-length plots of species length (total or fork length, species dependent) at PWREF, PWNF, PWFF in 2024. The curve represents the proportion of the data in each range. Species are: Central Mudminnow (CMM), Common Shiner (CS), Finescale Dace (FSD), Golden Shiner (GS), Hornyhead Chub (HHC), and Johnny Darter (JD).

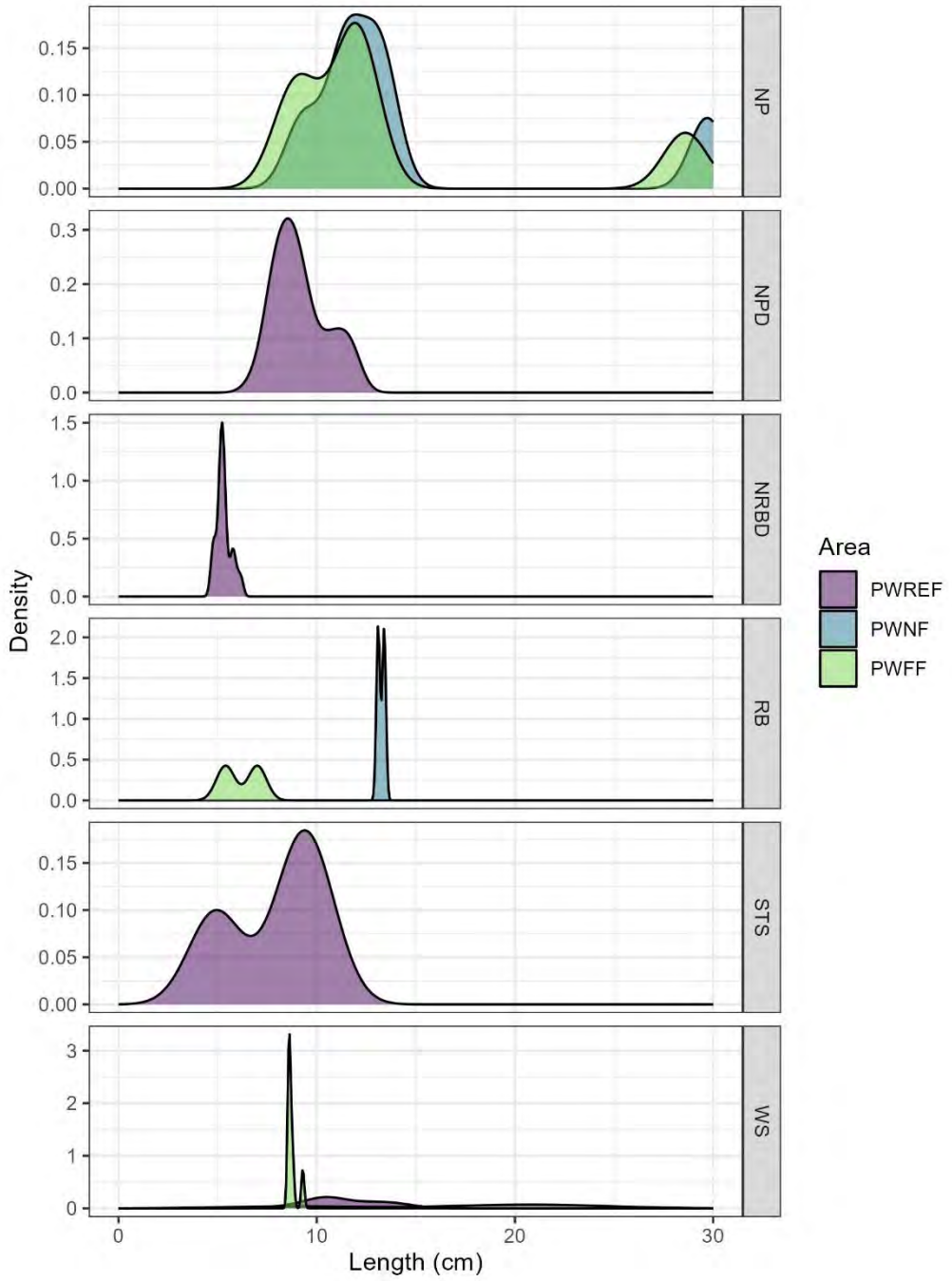

Figure B–3: Density-length plots of species length (total or fork length, species dependent) at PWREF, PWNF, PWFF in 2024. The curve represents the proportion of the data in each range. Species are: Northern Pike (NP), Northern Pearl Dace (NPD), Northern Redbelly Dace (NRBD), Rock Bass (RB), Spottail Shiner (STS), and White Sucker (WS). Species not presented because their sample size were low are Sauger (SG) and Trout Perch (TP) and juvenile Cyprinid YOY (YOY).

Appendix C Detailed Data – Fish Tissue Analysis

Table C-1: Fish measurements for tissue analysis, 2019–2024.

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2019	PWFF	PW-FF-CS-01	6.9	7.6	3.481	2	0.09
CS	2019	PWFF	PW-FF-CS-02	9	9.9	9.855	3	0.26
CS	2019	PWFF	PW-FF-CS-03	9.6	10.5	11.768	2	0.19
CS	2019	PWFF	PW-FF-CS-04	7.4	8.2	4.953	2	0.22
CS	2019	PWFF	PW-FF-CS-05	9.5	10.5	13.46	3	0.17
CS	2019	PWFF	PW-FF-CS-06	6.9	7.6	3.872	1	0.18
CS	2019	PWFF	PW-FF-CS-07	7.5	8.2	5.159	2	0.34
CS	2019	PWFF	PW-FF-CS-08	9.8	11.2	12.674	3	0.17
CS	2019	PWFF	PW-FF-CS-09	9	9.9	9.07	2	0.23
CS	2019	PWFF	PW-FF-CS-10	6	6.5	2.115	2	0.08
CS	2019	PWFF	PW-FF-CS-11	10.9	11.9	20.305	3	0.21
CS	2019	PWFF	PW-FF-CS-12	8.6	9.4	8.316	2	0.17
CS	2019	PWFF	PW-FF-CS-13	8.4	9.2	7.64	2	0.17
CS	2019	PWFF	PW-FF-CS-14	7.4	8	4.854	2	0.3
CS	2019	PWFF	PW-FF-CS-15	7.6	8.9	6.079	2	0.2
CS	2019	PWFF	PW-FF-CS-16	9.4	10.2	13.036	2	0.15
CS	2019	PWFF	PW-FF-CS-17	8.2	9	3.26	2	0.17
CS	2019	PWFF	PW-FF-CS-18	10.2	11.7	15.954	2	0.2
CS	2019	PWFF	PW-FF-CS-19	9.5	10.2	12.563	1	0.19
CS	2019	PWFF	PW-FF-CS-20	8.2	9.1	7.615	2	0.27
CS	2019	PWFF	PW-FF-CS-21	9	9.7	10.515	2	0.16
CS	2019	PWFF	PW-FF-CS-22	9	9.8	11.084	2	0.2
CS	2019	PWFF	PW-FF-CS-23	5.5	5.8	1.675	2	0.3
CS	2019	PWFF	PW-FF-CS-24	6.1	6.5	2.774	2	0.16
CS	2019	PWFF	PW-FF-CS-25	5.9	6.5	2.275	2	0.38
CS	2019	PWFF	PW-FF-CS-26	6.7	7.4	3.666	2	0.2
CS	2019	PWFF	PW-FF-CS-27	5.3	5.6	1.42	1	0.11
CS	2019	PWFF	PW-FF-CS-28	5.3	5.7	1.625	2	0.19
CS	2019	PWFF	PW-FF-CS-29	5.3	5.9	1.682	1	0.23
CS	2019	PWFF	PW-FF-CS-30	6	6.4	2.127	2	0.21
CS	2019	PWFF	PW-FF-CS-31	11	12	8.821	3	0.2
CS	2019	PWFF	PW-FF-CS-32	10	11.4	6.552	3	0.17
CS	2019	PWFF	PW-FF-CS-33	8.2	9	7.175	2	0.23
CS	2019	PWFF	PW-FF-CS-34	5.8	6.2	2.118	2	0.1
CS	2019	PWFF	PW-FF-CS-35	9	9.7	9.7	2	0.21
CS	2019	PWFF	PW-FF-CS-36	7.8	8.5	5.277	2	0.16
CS	2019	PWFF	PW-FF-CS-37	11.2	11.7	16.245	2	0.22
CS	2019	PWFF	PW-FF-CS-38	10	11	13.869	2	0.19
CS	2019	PWFF	PW-FF-CS-39	5.6	5.9	1.843	1	0.09
CS	2019	PWFF	PW-FF-CS-40	7.3	8.1	4.843	2	0.21
CS	2019	PWFF	PW-FF-CS-41	8.5	9.4	7.972	2	0.18
CS	2019	PWFF	PW-FF-CS-42	7.3	8	4.859	2	0.25
CS	2019	PWFF	PW-FF-CS-43	5.8	6.2	2.066	2	0.18
CS	2019	PWFF	PW-FF-CS-44	9.2	10	9.695	2	0.24
CS	2019	PWFF	PW-FF-CS-45	11	11.7	15.46	3	0.26
CS	2019	PWFF	PW-FF-CS-46	9	9.8	9.572	2	0.18
CS	2019	PWFF	PW-FF-CS-47	7.9	8.6	6.664	2	0.24
CS	2019	PWFF	PW-FF-CS-48	9.1	10	9.711	2	0.16
CS	2019	PWFF	PW-FF-CS-49	8.1	8.9	6.284	2	0.2

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2019	PWFF	PW-FF-CS-50	7.2	8.5	4.116	2	0.16
CS	2019	PWFF	PW-FF-CS-51	6.7	7.4	3.669	1	0.21
CS	2019	PWNF	PW-NF-CS-01	9.3	10.1	8.587	3	0.7
CS	2019	PWNF	PW-NF-CS-02	11.8	12.6	23.534	3	0.28
CS	2019	PWNF	PW-NF-CS-03	9.6	10.3	11.007	2	0.49
CS	2019	PWNF	PW-NF-CS-04	10.6	11.5	16.536	3	0.27
CS	2019	PWNF	PW-NF-CS-05	8.7	9.5	9.148	1	0.37
CS	2019	PWNF	PW-NF-CS-06	9.7	10.5	11.136	1	0.41
CS	2019	PWNF	PW-NF-CS-07	10	10.7	13.476	2	0.48
CS	2019	PWNF	PW-NF-CS-08	7	7.7	3.671	1	0.45
CS	2019	PWNF	PW-NF-CS-09	9.9	10.8	11.175	1	0.47
CS	2019	PWNF	PW-NF-CS-10	8.4	9.2	6.815	1	0.43
CS	2019	PWNF	PW-NF-CS-11	6.5	7.2	3.328	1	0.3
CS	2019	PWNF	PW-NF-CS-12	8.3	9.2	6.993	1	0.3
CS	2019	PWNF	PW-NF-CS-13	10.9	11.7	17.377	2	0.33
CS	2019	PWNF	PW-NF-CS-14	9.9	10.6	11.755	2	0.36
CS	2019	PWNF	PW-NF-CS-15	9.8	10.5	10.293	3	0.59
CS	2019	PWNF	PW-NF-CS-16	6.3	6.7	2.88	1	0.53
CS	2019	PWNF	PW-NF-CS-17	9.3	10.1	11.191	2	0.36
CS	2019	PWNF	PW-NF-CS-18	11	11.8	19	3	0.37
CS	2019	PWNF	PW-NF-CS-19	10.2	11.1	15.072	2	0.32
CS	2019	PWNF	PW-NF-CS-20	10.2	11.1	14.977	3	0.53
CS	2019	PWNF	PW-NF-CS-21	9.8	10.2	12.138	2	0.46
CS	2019	PWNF	PW-NF-CS-22	6.6	7.1	3.69	1	0.56
CS	2019	PWNF	PW-NF-CS-23	12.9	13.5	24.25	4	0.35
CS	2019	PWNF	PW-NF-CS-24	8.8	9.6	8.656	3	0.67
CS	2019	PWNF	PW-NF-CS-25	6.9	7.7	4.241	2	0.32
CS	2019	PWNF	PW-NF-CS-26	11.1	12.1	18.9	3	0.33
CS	2019	PWNF	PW-NF-CS-27	11.6	12.5	21.25	3	0.25
CS	2019	PWNF	PW-NF-CS-28	11.6	12.5	22	3	0.27
CS	2019	PWNF	PW-NF-CS-29	6	6.7	2.608	2	0.6
CS	2019	PWNF	PW-NF-CS-30	11.2	12.1	20.043	3	0.44
CS	2019	PWNF	PW-NF-CS-31	9.5	10.4	11.787	3	0.62
CS	2019	PWNF	PW-NF-CS-32	11.7	12.4	26.96	3	0.37
CS	2019	PWNF	PW-NF-CS-33	9.1	9.7	10.143	3	0.57
CS	2019	PWNF	PW-NF-CS-34	6.3	6.8	2.848	1	0.38
CS	2019	PWNF	PW-NF-CS-35	7.3	8.6	6.148	2	0.41
CS	2019	PWNF	PW-NF-CS-36	6.7	7.4	3.519	2	0.59
CS	2019	PWNF	PW-NF-CS-37	8.7	9	7.261	2	0.63
CS	2019	PWNF	PW-NF-CS-38	8.3	9	7.439	1	0.33
CS	2019	PWNF	PW-NF-CS-39	7.1	7.8	4.099	2	0.5
CS	2019	PWNF	PW-NF-CS-40	10.1	11	14.307	3	0.38
CS	2019	PWNF	PW-NF-CS-41	9.8	10.7	11.835	1	0.41
CS	2019	PWNF	PW-NF-CS-42	10.6	11.5	13.364	3	0.72
CS	2019	PWNF	PW-NF-CS-43	9.7	10.2	12.057	3	0.54
CS	2019	PWNF	PW-NF-CS-44	9.5	10.5	10.469	2	0.62
CS	2019	PWNF	PW-NF-CS-45	11	11.3	16.355	3	0.25
CS	2019	PWNF	PW-NF-CS-46	9.6	10.4	11.143	3	0.48
CS	2019	PWNF	PW-NF-CS-47	9.9	10.9	14.602	2	0.27
CS	2019	PWNF	PW-NF-CS-48	10.6	11.3	20.683	2	0.34
CS	2019	PWNF	PW-NF-CS-49	11.2	12.3	22.442	3	0.29
CS	2019	PWNF	PW-NF-CS-50	7.7	8.3	6.172	2	0.34
CS	2019	PWREF	PW-REF-CS-01	7.5	8.3	5.42	1	NA
CS	2019	PWREF	PW-REF-CS-02	6.4	6.8	1.93	1	NA
CS	2019	PWREF	PW-REF-CS-03	5.5	5.9	1.84	0	NA

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2019	PWREF	PW-REF-CS-04	5.7	6.2	1.85	1	NA
CS	2019	PWREF	PW-REF-CS-05	3.6	3.9	0.46	0	NA
CS	2019	PWREF	PW-REF-CS-06	3.8	4	0.4	0	NA
CS	2019	PWREF	PW-REF-CS-07	5.3	5.8	1.53	1	NA
CS	2019	PWREF	PW-REF-CS-08	7.1	7.6	3.85	1	NA
CS	2019	PWREF	PW-REF-CS-09	7.8	8.2	4.77	1	NA
CS	2019	PWREF	PW-REF-CS-10	5.8	6.2	1.67	1	NA
CS	2019	PWREF	PW-REF-CS-11	5.8	6.1	1.86	1	NA
CS	2019	PWREF	PW-REF-CS-12	7.6	8.2	4.55	2	NA
CS	2019	PWREF	PW-REF-CS-13	7	7.6	3.93	1	NA
CS	2019	PWREF	PW-REF-CS-14	8	8.6	5.9	2	NA
CS	2019	PWREF	PW-REF-CS-15	7.8	8.5	5.96	2	NA
CS	2019	PWREF	PW-REF-CS-16	7.4	8	4.3	2	NA
CS	2019	PWREF	PW-REF-CS-17	7	7.5	3.79	2	NA
CS	2019	PWREF	PW-REF-CS-18	7.2	7.6	4.25	1	NA
CS	2019	PWREF	PW-REF-CS-19	7	7.6	3.99	2	NA
CS	2019	PWREF	PW-REF-CS-20	6.8	7.2	3.77	2	NA
CS	2019	PWREF	PW-REF-CS-21	6.9	7.4	3.57	2	NA
CS	2019	PWREF	PW-REF-CS-22	8	8.5	6.04	1	NA
CS	2019	PWREF	PW-REF-CS-23	7	7.7	4.36	1	NA
CS	2019	PWREF	PW-REF-CS-24	6.8	7.3	3.95	2	NA
CS	2019	PWREF	PW-REF-CS-25	7.7	8.2	4.41	2	NA
CS	2019	PWREF	PW-REF-CS-26	7.2	7.7	4.29	2	NA
CS	2019	PWREF	PW-REF-CS-27	7	7.7	4.14	1	NA
CS	2019	PWREF	PW-REF-CS-28	7	7.4	4.13	3	NA
CS	2019	PWREF	PW-REF-CS-29	6.9	7.4	3.46	2	NA
CS	2019	PWREF	PW-REF-CS-30	7	7.7	3.93	2	NA
CS	2019	PWREF	PW-REF-CS-31	6.4	6.8	2.46	2	NA
CS	2019	PWREF	PW-REF-CS-32	7.5	8.1	4.88	1	NA
CS	2019	PWREF	PW-REF-CS-33	7.1	7.6	3.27	2	NA
CS	2019	PWREF	PW-REF-CS-34	7.4	7.9	3.91	2	NA
CS	2019	PWREF	PW-REF-CS-35	6.8	7.3	2.97	2	NA
CS	2019	PWREF	PW-REF-CS-36	7.4	7.8	4.03	1	NA
CS	2019	PWREF	PW-REF-CS-37	7	7.5	3.91	3	NA
CS	2019	PWREF	PW-REF-CS-38	7.5	7.9	6.25	1	NA
CS	2019	PWREF	PW-REF-CS-39	8	8.5	4.47	2	NA
CS	2019	PWREF	PW-REF-CS-40	7	7.4	4.19	2	NA
CS	2019	PWREF	PW-REF-CS-41	7.8	8.4	6.09	2	NA
CS	2019	PWREF	PW-REF-CS-42	6.3	6.7	2.31	2	NA
CS	2019	PWREF	PW-REF-CS-43	7.4	7.8	4.04	1	NA
CS	2019	PWREF	PW-REF-CS-44	7.1	7.5	3.62	1	NA
CS	2019	PWREF	PW-REF-CS-45	7.9	8.3	5.83	2	NA
CS	2019	PWREF	PW-REF-CS-46	7	7.5	3.51	3	NA
CS	2019	PWREF	PW-REF-CS-47	6.8	7.3	3.44	1	NA
CS	2019	PWREF	PW-REF-CS-48	5	5.3	1.09	1	NA
CS	2019	PWREF	PW-REF-CS-49	7	7.8	3.86	2	NA
CS	2019	PWREF	PW-REF-CS-50	7.7	8.2	5.14	2	NA
CS	2020	PWFF	PRFF-CS-01	5.3	5.8	1.526	1	0.0406
CS	2020	PWFF	PRFF-CS-02	5.6	6.2	1.901	2	0.0543
CS	2020	PWFF	PRFF-CS-03	4.7	5.3	1.164	1	0.0476
CS	2020	PWFF	PRFF-CS-04	4.9	5.8	1.487	2	0.058
CS	2020	PWFF	PRFF-CS-05	5.2	5.6	1.4	2	0.0521
CS	2020	PWFF	PRFF-CS-06	5.5	6.2	1.677	2	0.0491
CS	2020	PWFF	PRFF-CS-07	5.8	6.6	1.982	2	0.0444
CS	2020	PWFF	PRFF-CS-08	5	5.5	1.284	1	0.0663

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2020	PWFF	PRFF-CS-09	4.9	5.6	1.281	1	0.0576
CS	2020	PWFF	PRFF-CS-10	5.9	6.5	2.245	2	0.0482
CS	2020	PWFF	PRFF-CS-11	4.1	4.6	0.731	1	0.0539
CS	2020	PWFF	PRFF-CS-12	8.3	9	7.808	2	0.0684
CS	2020	PWFF	PRFF-CS-13	8.9	9.7	9.805	2	0.0526
CS	2020	PWFF	PRFF-CS-14	10	10.9	13.91	2	0.054
CS	2020	PWFF	PRFF-CS-15	9.6	10.4	11.905	2	0.0513
CS	2020	PWFF	PRFF-CS-16	7.9	8.4	5.838	2	0.0432
CS	2020	PWFF	PRFF-CS-17	6.2	7	2.335	1	0.048
CS	2020	PWFF	PRFF-CS-18	5.9	6.5	2.145	1	0.0385
CS	2020	PWFF	PRFF-CS-19	NA	14	33.96	2	0.0435
CS	2020	PWFF	PRFF-CS-20	NA	16.3	53.376	3	0.0594
CS	2020	PWFF	PRFF-CS-21	6.9	7.5	4.028	3	0.139
CS	2020	PWFF	PRFF-CS-22	8.3	9	9.344	2	0.0851
CS	2020	PWFF	PRFF-CS-23	12.1	13.3	26.865	2	0.0655
CS	2020	PWFF	PRFF-CS-24	10.5	11.4	14.876	2	0.0573
CS	2020	PWFF	PRFF-CS-25	9.3	10.1	9.989	3	0.0473
CS	2020	PWFF	PRFF-CS-26	7.9	8.6	5.499	2	0.0478
CS	2020	PWFF	PRFF-CS-27	5	5.4	1.193	1	0.0569
CS	2020	PWFF	PRFF-CS-28	6.6	7.3	3.337	2	0.0469
CS	2020	PWFF	PRFF-CS-29	7.1	8	4.218	2	0.0467
CS	2020	PWFF	PRFF-CS-30	6.4	8.2	2.182	2	0.038
CS	2020	PWFF	PRFF-CS-31	7.5	8.3	5.262	2	0.044
CS	2020	PWFF	PRFF-CS-32	7.8	8.6	5.976	1	0.0494
CS	2020	PWFF	PRFF-CS-33	5.8	6.3	2.2	1	0.0566
CS	2020	PWFF	PRFF-CS-34	6.4	7	2.793	1	0.049
CS	2020	PWFF	PRFF-CS-35	7.5	8.3	4.884	2	0.0477
CS	2020	PWFF	PRFF-CS-36	5.6	6.1	1.963	1	0.0471
CS	2020	PWFF	PRFF-CS-37	5.5	6.3	2.051	1	0.0416
CS	2020	PWFF	PRFF-CS-38	6.1	6.8	2.471	2	0.0627
CS	2020	PWFF	PRFF-CS-39	8.6	9.1	7.217	2	0.112
CS	2020	PWFF	PRFF-CS-40	9.9	10.9	12.935	2	0.0736
CS	2020	PWFF	PRFF-CS-41	7.5	8.1	4.634	2	0.0575
CS	2020	PWFF	PRFF-CS-42	7	7.4	3.715	2	0.0552
CS	2020	PWFF	PRFF-CS-43	9.9	10.6	11.749	3	0.062
CS	2020	PWFF	PRFF-CS-44	5	5.8	1.358	2	0.0501
CS	2020	PWFF	PRFF-CS-45	6.6	7.3	3.315	2	0.0469
CS	2020	PWFF	PRFF-CS-46	9.5	10.4	12.477	2	0.0499
CS	2020	PWFF	PRFF-CS-47	6.4	7.3	2.975	2	0.0498
CS	2020	PWFF	PRFF-CS-48	7.4	8.1	4.567	2	0.0544
CS	2020	PWFF	PRFF-CS-49	5.9	6.4	2.159	2	0.0573
CS	2020	PWFF	PRFF-CS-50	7.4	8.3	5.495	2	0.0469
CS	2020	PWNF	PRNF-CS-01	9.9	10.7	12.224	2	0.075
CS	2020	PWNF	PRNF-CS-02	9.9	10.5	12.668	2	0.055
CS	2020	PWNF	PRNF-CS-03	10.6	11	16.309	2	0.052
CS	2020	PWNF	PRNF-CS-04	5.8	6.3	1.179	2	0.076
CS	2020	PWNF	PRNF-CS-05	8.1	8.8	6.496	2	0.089
CS	2020	PWNF	PRNF-CS-06	4.9	5.3	1.215	1	0.085
CS	2020	PWNF	PRNF-CS-07	4.9	5.3	1.201	2	0.09
CS	2020	PWNF	PRNF-CS-08	6.1	6.6	2.349	2	0.134
CS	2020	PWNF	PRNF-CS-09	8.9	9.8	8.71	3	0.085
CS	2020	PWNF	PRNF-CS-10	5.4	5.6	2.163	1	0.105
CS	2020	PWNF	PRNF-CS-11	8.4	9.2	8.143	2	0.134
CS	2020	PWNF	PRNF-CS-12	9.9	10.4	16.035	2	0.1
CS	2020	PWNF	PRNF-CS-13	10	11.1	13.736	3	0.073

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2020	PWNF	PRNF-CS-14	11.6	12.7	22.273	2	0.089
CS	2020	PWNF	PRNF-CS-15	10.6	11.6	17.318	2	0.084
CS	2020	PWNF	PRNF-CS-16	11.1	12.1	20.534	3	0.127
CS	2020	PWNF	PRNF-CS-17	10.8	11.8	17.706	2	0.082
CS	2020	PWNF	PRNF-CS-18	10.2	10.9	13.798	2	0.092
CS	2020	PWNF	PRNF-CS-19	8.1	9	7.829	2	0.119
CS	2020	PWNF	PRNF-CS-20	6.9	7.7	4.718	1	0.09
CS	2020	PWNF	PRNF-CS-21	7.8	8.7	7.423	2	0.099
CS	2020	PWNF	PRNF-CS-22	8	9.1	8.029	2	0.145
CS	2020	PWNF	PRNF-CS-23	7.7	8.6	6.295	1	0.087
CS	2020	PWNF	PRNF-CS-24	8.1	8.9	6.662	2	0.11
CS	2020	PWNF	PRNF-CS-25	7	7.9	4.35	1	0.086
CS	2020	PWNF	PRNF-CS-26	7	1.1	4.206	1	0.125
CS	2020	PWNF	PRNF-CS-27	6.9	7.6	4.128	1	0.117
CS	2020	PWNF	PRNF-CS-28	7.5	8.2	5.425	2	0.089
CS	2020	PWNF	PRNF-CS-29	8.5	9.3	7.087	2	0.093
CS	2020	PWNF	PRNF-CS-30	9	9.9	9.702	3	0.177
CS	2020	PWNF	PRNF-CS-31	9	9.8	9.023	2	0.144
CS	2020	PWNF	PRNF-CS-32	7.3	7.9	4.658	2	0.099
CS	2020	PWNF	PRNF-CS-33	6.1	6.7	2.636	2	0.105
CS	2020	PWNF	PRNF-CS-34	6.5	7	3.424	1	0.123
CS	2020	PWNF	PRNF-CS-35	5.1	5.6	1.354	1	0.049
CS	2020	PWNF	PRNF-CS-36	5.7	6.4	2.246	1	0.111
CS	2020	PWNF	PRNF-CS-37	5.9	6.6	2.558	1	0.104
CS	2020	PWNF	PRNF-CS-38	6.4	7.2	3.027	1	0.094
CS	2020	PWNF	PRNF-CS-39	5.5	6.1	1.797	1	0.107
CS	2020	PWNF	PRNF-CS-40	4.5	5.1	0.988	1	0.098
CS	2020	PWNF	PRNF-CS-41	4.2	4.6	0.896	1	0.132
CS	2020	PWNF	PRNF-CS-42	5.6	6.3	2.144	2	0.144
CS	2020	PWNF	PRNF-CS-43	5.5	6.1	1.927	1	0.164
CS	2020	PWNF	PRNF-CS-44	5.4	6	1.857	1	0.153
CS	2020	PWNF	PRNF-CS-45	5.9	6.6	2.112	2	0.078
CS	2020	PWNF	PRNF-CS-46	4.9	5.5	1.242	1	0.146
CS	2020	PWNF	PRNF-CS-47	4.8	5.2	1.249	1	0.105
CS	2020	PWNF	PRNF-CS-48	4.5	5	0.884	1	0.142
CS	2020	PWNF	PRNF-CS-49	4	4.3	0.585	1	0.159
CS	2020	PWNF	PRNF-CS-50	4.7	5.3	1.008	2	0.154
CS	2020	PWREF	PRREF-CS-01	7.9	8.4	6.37	3	0.0829
CS	2020	PWREF	PRREF-CS-02	8.9	9.6	9.27	2	0.0976
CS	2020	PWREF	PRREF-CS-03	9.9	10.8	12.48	2	0.119
CS	2020	PWREF	PRREF-CS-04	11.4	12.3	21.05	3	0.109
CS	2020	PWREF	PRREF-CS-05	10.5	11.4	14.22	3	0.112
CS	2020	PWREF	PRREF-CS-06	7.1	7.7	3.95	2	0.114
CS	2020	PWREF	PRREF-CS-07	8.6	9.3	6.95	2	0.0634
CS	2020	PWREF	PRREF-CS-08	7.7	8.3	5.92	2	0.115
CS	2020	PWREF	PRREF-CS-09	8	8.9	6.9	3	0.161
CS	2020	PWREF	PRREF-CS-10	10.1	11	13.63	3	0.0725
CS	2020	PWREF	PRREF-CS-11	11	11.8	13.44	3	0.0979
CS	2020	PWREF	PRREF-CS-12	9.1	10	9.97	2	0.0756
CS	2020	PWREF	PRREF-CS-13	7.2	7.9	5.08	2	0.0983
CS	2020	PWREF	PRREF-CS-14	8.9	9.6	8.6	2	0.0913
CS	2020	PWREF	PRREF-CS-15	13.4	14.2	36.65	3	0.104
CS	2020	PWREF	PRREF-CS-16	9.9	10.8	13.01	3	0.104
CS	2020	PWREF	PRREF-CS-17	9.9	10.9	12.62	3	0.118
CS	2020	PWREF	PRREF-CS-18	9.9	10.5	12.56	3	0.0905

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2020	PWREF	PRREF-CS-19	9	9.8	8.56	3	0.097
CS	2020	PWREF	PRREF-CS-20	9.2	10.3	8.51	3	0.0673
CS	2020	PWREF	PRREF-CS-21	9.5	10.3	11.12	3	0.0877
CS	2020	PWREF	PRREF-CS-22	8.9	9.8	9.17	2	0.0731
CS	2020	PWREF	PRREF-CS-23	9.8	10.7	11.03	2	0.0795
CS	2020	PWREF	PRREF-CS-24	12.8	13.8	30.54	3	0.167
CS	2020	PWREF	PRREF-CS-25	12.9	14.1	31.03	5	0.143
CS	2020	PWREF	PRREF-CS-26	10.3	11.1	13.82	4	0.1
CS	2020	PWREF	PRREF-CS-27	8.9	9.7	7.64	3	0.0706
CS	2020	PWREF	PRREF-CS-28	NA	10.4	10.1	3	0.0833
CS	2020	PWREF	PRREF-CS-29	9.7	10.5	10.83	3	0.0855
CS	2020	PWREF	PRREF-CS-30	4.9	5.7	1.34	2	0.0364
CS	2020	PWREF	PRREF-CS-31	9.7	10.5	11.28	3	0.0824
CS	2020	PWREF	PRREF-CS-32	9.2	9.9	8.99	3	0.0592
CS	2020	PWREF	PRREF-CS-33	11.4	12.4	19.18	4	0.128
CS	2020	PWREF	PRREF-CS-34	11.9	12	16.05	4	0.114
CS	2020	PWREF	PRREF-CS-35	6.1	6.7	2.75	2	0.0396
CS	2020	PWREF	PRREF-CS-36	5.4	5.8	1.76	2	0.0384
CS	2020	PWREF	PRREF-CS-37	5.5	5.9	1.84	1	0.0391
CS	2020	PWREF	PRREF-CS-38	6	6.4	2.23	2	0.0457
CS	2020	PWREF	PRREF-CS-39	5.4	5.8	1.96	1	0.0293
CS	2020	PWREF	PRREF-CS-40	5.8	6.1	2.17	1	0.0449
CS	2020	PWREF	PRREF-CS-41	6.3	6.8	2.96	2	0.0815
CS	2020	PWREF	PRREF-CS-42	5.5	6.1	2.1	1	0.0274
CS	2020	PWREF	PRREF-CS-43	5.7	6.2	1.95	1	0.0401
CS	2020	PWREF	PRREF-CS-44	5.5	5.9	1.83	1	0.039
CS	2020	PWREF	PRREF-CS-45	5.4	5.8	1.61	2	0.0448
CS	2020	PWREF	PRREF-CS-46	4.3	4.8	0.91	1	0.0525
CS	2020	PWREF	PRREF-CS-47	6.5	7.1	2.96	2	0.0451
CS	2020	PWREF	PRREF-CS-48	10.7	11.7	15.44	3	0.133
CS	2020	PWREF	PRREF-CS-49	9.8	10.5	11.48	3	0.102
CS	2020	PWREF	PRREF-CS-50	9.3	9.9	9.1	3	0.1
CS	2021	PWFF	1	9.8	10.2	10.655	4	0.0854
CS	2021	PWFF	10	9.9	10.7	12.451	3	0.15
CS	2021	PWFF	11	12.3	13.5	26.179	5	0.0909
CS	2021	PWFF	2	11.9	13	24.073	5	0.0767
CS	2021	PWFF	3	11.3	12.2	23.977	5	0.122
CS	2021	PWFF	4	12	13.1	27.474	5	0.084
CS	2021	PWFF	5	12.3	13.2	29.788	5	0.0914
CS	2021	PWFF	6	10.4	11.4	16.464	3	0.113
CS	2021	PWFF	7	11.4	12.4	23.958	3	0.0849
CS	2021	PWFF	8	10.5	11.5	18.567	5	0.0767
CS	2021	PWFF	9	10.6	11.7	16.067	5	0.124
CS	2021	PWNF	1	10.4	11.2	14.729	4	0.132
CS	2021	PWNF	10	7.5	8.2	4	3	0.164
CS	2021	PWNF	11	9	9.9	8.969	3	0.236
CS	2021	PWNF	12	9.1	9.9	9.253	3	0.125
CS	2021	PWNF	13	7.7	8.5	5.489	3	0.135
CS	2021	PWNF	14	7.8	8.6	5.688	3	0.178
CS	2021	PWNF	15	8.3	9	6.086	3	0.215
CS	2021	PWNF	16	7.9	8.6	5.575	3	0.13
CS	2021	PWNF	17	7.9	8.7	5.424	3	0.201
CS	2021	PWNF	18	8.3	9	6.171	4	0.21
CS	2021	PWNF	19	8.9	9.8	8.358	3	0.14
CS	2021	PWNF	2	10.8	11.9	18.81	5	0.151

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2021	PWNF	20	7.6	8.3	4.57	3	0.126
CS	2021	PWNF	21	8.3	9.1	6.377	3	0.205
CS	2021	PWNF	22	7.5	8.3	4.916	3	0.12
CS	2021	PWNF	23	7.1	7.9	4.08	3	0.157
CS	2021	PWNF	24	7.7	8.5	5.232	4	0.18
CS	2021	PWNF	25	7.4	8.2	4.83	4	0.213
CS	2021	PWNF	26	7.8	8.5	5.145	3	0.176
CS	2021	PWNF	27	7.5	8.2	4.436	3	0.157
CS	2021	PWNF	28	7.1	7.9	4.094	3	0.145
CS	2021	PWNF	29	7.7	8.6	5.16	4	0.166
CS	2021	PWNF	3	10.8	11.8	18.299	5	0.133
CS	2021	PWNF	30	7.1	7.7	3.885	3	0.195
CS	2021	PWNF	31	6.9	7.6	3.697	3	0.186
CS	2021	PWNF	32	7.3	8.2	4.347	3	0.156
CS	2021	PWNF	33	7	7.8	3.45	3	0.19
CS	2021	PWNF	34	7.7	8.5	4.904	3	0.175
CS	2021	PWNF	35	7.3	8	4.198	3	0.137
CS	2021	PWNF	36	7.1	7.8	3.848	3	0.154
CS	2021	PWNF	37	7.7	8.5	5.016	3	0.145
CS	2021	PWNF	38	8.8	9.7	7.271	3	0.12
CS	2021	PWNF	39	10.6	11.5	15.297	4	0.14
CS	2021	PWNF	4	10.5	11.4	16.07	4	0.0764
CS	2021	PWNF	40	10.8	11.7	14.605	4	0.125
CS	2021	PWNF	41	9.2	10	9.505	3	0.0941
CS	2021	PWNF	42	10.5	11.3	13.311	4	0.0962
CS	2021	PWNF	43	10.8	11.8	14.947	5	0.157
CS	2021	PWNF	44	10.3	11.3	13.787	4	0.127
CS	2021	PWNF	45	9	9.9	7.957	3	0.121
CS	2021	PWNF	46	11.1	12	16.641	NA	0.144
CS	2021	PWNF	47	9.4	10.3	9.173	3	0.119
CS	2021	PWNF	48	11.4	12.5	18.915	5	0.126
CS	2021	PWNF	49	8.7	9.5	7.892	4	0.161
CS	2021	PWNF	5	10	10.9	13.407	3	0.118
CS	2021	PWNF	50	11.2	12.2	19.653	4	0.131
CS	2021	PWNF	6	9.8	10.8	12.816	3	0.201
CS	2021	PWNF	7	10.4	11.3	14.597	4	0.136
CS	2021	PWNF	8	10.4	11.4	14.947	4	0.0951
CS	2021	PWNF	9	11.3	12.2	18.041	4	0.138
CS	2021	PWREF	1	10.4	11.3	11.513	5	0.0631
CS	2021	PWREF	10	7.7	8.5	5.653	3	0.203
CS	2021	PWREF	11	6.2	6.5	2.749	2	0.0491
CS	2021	PWREF	12	7.7	8.2	4.952	4	0.0869
CS	2021	PWREF	13	7.3	7.7	4.47	3	0.0853
CS	2021	PWREF	14	7.3	7.7	4.677	3	0.0709
CS	2021	PWREF	15	7	7.4	3.808	3	0.0437
CS	2021	PWREF	16	7	7.4	3.567	3	0.0553
CS	2021	PWREF	17	6.7	7.1	3.241	3	0.0842
CS	2021	PWREF	18	7.2	7.5	3.877	3	0.0868
CS	2021	PWREF	19	7.1	7.6	3.786	3	0.068
CS	2021	PWREF	2	9.8	10.7	6.747	4	0.0581
CS	2021	PWREF	20	7.2	7.5	4.173	2	0.0691
CS	2021	PWREF	21	7.1	7.5	3.8	4	0.081
CS	2021	PWREF	22	7.5	7.8	4.446	3	0.0672
CS	2021	PWREF	23	6.5	6.9	2.922	2	0.0806
CS	2021	PWREF	24	6.6	6.9	3.038	2	0.0432

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2021	PWREF	25	6.6	6.9	3.134	3	0.0505
CS	2021	PWREF	26	6.7	7.1	3.403	3	0.0748
CS	2021	PWREF	27	7	7.4	3.679	4	0.0774
CS	2021	PWREF	28	6.7	7.1	3.004	3	0.0551
CS	2021	PWREF	29	6.6	7	3.137	4	0.0565
CS	2021	PWREF	3	12.2	13.3	23.365	NA	0.12
CS	2021	PWREF	30	6.8	7.3	3.311	3	0.0497
CS	2021	PWREF	31	7.2	7.6	4.136	4	0.0684
CS	2021	PWREF	32	6.8	7.3	3.622	2	0.0517
CS	2021	PWREF	33	6.8	7.7	4.093	4	0.076
CS	2021	PWREF	34	11.7	12.7	22.309	4	0.143
CS	2021	PWREF	35	7.1	7.5	3.821	3	0.0907
CS	2021	PWREF	36	7.1	7.7	4.016	4	0.0785
CS	2021	PWREF	37	6.6	7	3.373	3	0.0665
CS	2021	PWREF	38	7.7	8.1	4.668	4	0.112
CS	2021	PWREF	39	7.7	8.2	4.942	5	0.0921
CS	2021	PWREF	4	7.6	8.1	4.696	3	0.0604
CS	2021	PWREF	40	8.1	8.5	5.501	4	0.0669
CS	2021	PWREF	41	7.4	7.8	4.244	3	0.101
CS	2021	PWREF	42	7	7.4	3.847	4	0.0749
CS	2021	PWREF	43	6.6	7	3.448	3	0.0768
CS	2021	PWREF	44	7.6	8.1	4.776	3	0.0755
CS	2021	PWREF	45	7.2	7.5	4.352	3	0.0663
CS	2021	PWREF	46	7.3	7.7	4.555	3	0.0632
CS	2021	PWREF	47	7.2	7.7	3.988	3	0.0746
CS	2021	PWREF	48	7.3	7.7	4.463	3	0.0782
CS	2021	PWREF	49	6.6	6.9	3.602	4	0.0656
CS	2021	PWREF	5	7	7.4	3.789	3	0.0786
CS	2021	PWREF	50	7.5	7.8	4.061	4	0.0825
CS	2021	PWREF	6	7.3	7.7	4.018	3	0.0624
CS	2021	PWREF	7	6.7	7.3	3.928	3	0.091
CS	2021	PWREF	8	6.8	7.7	4.186	3	0.0724
CS	2021	PWREF	9	6.8	7.2	3.276	3	0.0616
CS	2022	PWFF	PRFF-CS01	9.6	10.4	5.7	3	0.0721
CS	2022	PWFF	PRFF-CS02	6.3	6.9	3.17	2	0.121
CS	2022	PWFF	PRFF-CS13	6.2	6.8	2.599	2	0.0945
CS	2022	PWFF	PRFF-CS14	5.3	5.8	1.626	1	0.162
CS	2022	PWFF	PRFF-CS15	5.6	6.1	1.918	1	0.151
CS	2022	PWFF	PRFF-CS16	6.9	7.5	3.653	2	0.252
CS	2022	PWFF	PRFF-CS17	5.7	6.3	2.226	1	0.109
CS	2022	PWFF	PRFF-CS18	5.3	6	1.589	1	0.114
CS	2022	PWFF	PRFF-CS19	5.5	6.1	1.739	1	0.126
CS	2022	PWFF	PRFF-CS20	6.5	7.2	3.405	2	0.0923
CS	2022	PWFF	PRFF-CS21	5.9	6.6	2.279	1	0.206
CS	2022	PWFF	PRFF-CS22	7.3	8.1	4.217	1	0.101
CS	2022	PWFF	PRFF-CS23	7	7.7	4.202	2	0.0708
CS	2022	PWFF	PRFF-CS24	7.5	8.2	4.839	3	0.135
CS	2022	PWFF	PRFF-CS26	5	5.5	1.326	1	0.0771
CS	2022	PWFF	PRFF-CS27	9.7	10.6	10.006	3	0.0658
CS	2022	PWFF	PRFF-CS28	5.4	5.9	1.776	1	0.143
CS	2022	PWFF	PRFF-CS29	5.2	5.9	1.513	1	0.0964
CS	2022	PWFF	PRFF-CS30	5.1	5.6	1.339	1	0.125
CS	2022	PWFF	PRFF-CS31	6.3	7	2.772	2	0.115
CS	2022	PWFF	PRFF-CS32	9.9	10.7	10.948	3	0.38
CS	2022	PWFF	PRFF-CS33	7.6	8.5	NA	2	0.147

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2022	PWFF	PRFF-CS34	6.5	7	NA	2	0.11
CS	2022	PWFF	PRFF-CS35	6.6	7.1	NA	1	0.114
CS	2022	PWFF	PRFF-CS36	5.3	5.9	NA	1	0.13
CS	2022	PWFF	PRFF-CS38	5.1	5.8	1.36	1	0.118
CS	2022	PWFF	PRFF-CS39	7.4	8.2	4.231	2	0.138
CS	2022	PWFF	PRFF-CS40	9.5	10.6	11.155	2	0.0751
CS	2022	PWFF	PRFF-CS41	8.2	8.9	5.695	2	0.107
CS	2022	PWFF	PRFF-CS42	6.1	6.9	2.529	2	0.173
CS	2022	PWFF	PRFF-CS43	7.7	8.3	5.339	3	0.567
CS	2022	PWFF	PRFF-CS44	6.7	7.3	3.463	1	0.0846
CS	2022	PWFF	PRFF-CS45	6.2	6.9	2.44	1	0.139
CS	2022	PWFF	PRFF-CS46	6.6	7.3	3.077	1	0.145
CS	2022	PWFF	PRFF-CS47	6.9	7.9	3.842	2	0.119
CS	2022	PWFF	PRFF-CS48	5.3	6	1.697	1	0.152
CS	2022	PWFF	PRFF-CS49	5.8	6.4	2.503	2	0.156
CS	2022	PWFF	PRFF-CS50	4.9	5.4	1.447	1	0.108
CS	2022	PWFF	PRFF-CS51	6.9	7.7	3.217	1	0.182
CS	2022	PWFF	PRFF-CS52	6.3	7	2.952	1	0.111
CS	2022	PWFF	PRFF-CS53	5.4	6.3	1.735	1	0.102
CS	2022	PWFF	PRFF-CS54	5.2	5.9	1.632	1	0.15
CS	2022	PWFF	PRFF-CS55	7.6	8.3	4.578	2	0.129
CS	2022	PWFF	PRFF-CS57	7.8	8.8	5.211	1	0.119
CS	2022	PWFF	PRFF-CS58	7.3	8.1	4.236	3	0.137
CS	2022	PWFF	PRFF-CS59	7.3	8.3	4.659	NA	0.143
CS	2022	PWFF	PRFF-CS61	5.6	6.4	2.101	1	0.195
CS	2022	PWFF	PRFF-CS62	7.9	8.6	5.414	3	0.126
CS	2022	PWFF	PRFF-CS63	9.3	10.2	8.544	3	0.109
CS	2022	PWFF	PRFF-CS64	10.6	9.5	9.81	2	0.101
CS	2022	PWFF	PRFF-CS65	5.5	6.2	1.646	1	0.164
CS	2022	PWFF	PRFF-CS66	10.9	12.1	16.471	3	0.142
CS	2022	PWFF	PRFF-CS67	10	10.8	10.948	2	0.0997
CS	2022	PWNF	PRNF-CS01	9.8	10.7	13.635	NA	0.455
CS	2022	PWNF	PRNF-CS02	9.6	10.5	12.848	NA	0.153
CS	2022	PWNF	PRNF-CS03	5.7	5.1	1.189	2	0.181
CS	2022	PWNF	PRNF-CS04	5.9	6.7	2.241	2	0.208
CS	2022	PWNF	PRNF-CS05	6.4	7.2	2.89	2	0.199
CS	2022	PWNF	PRNF-CS06	8.3	9.3	6.43	2	0.427
CS	2022	PWNF	PRNF-CS07	6.8	7.6	3.248	2	0.179
CS	2022	PWNF	PRNF-CS08	9.9	11.2	12.773	3	0.117
CS	2022	PWNF	PRNF-CS09	7.8	8.8	6.018	1	0.222
CS	2022	PWNF	PRNF-CS10	9.5	10.6	9.618	2	0.226
CS	2022	PWNF	PRNF-CS11	6.9	7.6	3.549	1	0.192
CS	2022	PWNF	PRNF-CS12	7.4	8.1	4.196	2	0.167
CS	2022	PWNF	PRNF-CS13	6.4	7.2	2.785	2	0.215
CS	2022	PWNF	PRNF-CS14	6.3	7.1	3.042	2	0.176
CS	2022	PWNF	PRNF-CS15	6.1	6.8	2.018	NA	0.184
CS	2022	PWNF	PRNF-CS16	5.5	6.3	1.63	2	0.162
CS	2022	PWNF	PRNF-CS17	5.6	6.3	1.867	1	0.181
CS	2022	PWNF	PRNF-CS23	6.1	6.7	2.446	1	0.15
CS	2022	PWNF	PRNF-CS24	5.9	6.6	2.362	1	0.214
CS	2022	PWNF	PRNF-CS26	5.3	6	1.652	0	0.19
CS	2022	PWNF	PRNF-CS27	5.4	6	1.769	2	0.126
CS	2022	PWNF	PRNF-CS28	6.5	7.3	3.057	2	0.208
CS	2022	PWNF	PRNF-CS29	6.3	7	2.791	3	0.23
CS	2022	PWNF	PRNF-CS30	9	9.9	8.256	2	0.493

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2022	PWNF	PRNF-CS31	6	6.8	2.646	1	0.205
CS	2022	PWNF	PRNF-CS32	5.9	6.6	2.143	1	0.226
CS	2022	PWNF	PRNF-CS33	6.4	6.8	NA	2	0.174
CS	2022	PWNF	PRNF-CS34	6.6	7.6	3.536	1	0.186
CS	2022	PWNF	PRNF-CS35	5.3	6.4	1.985	1	0.245
CS	2022	PWNF	PRNF-CS36	4.9	5.7	1.339	2	0.185
CS	2022	PWNF	PRNF-CS37	6.3	7	2.98	2	0.274
CS	2022	PWNF	PRNF-CS38	6	7	2.603	2	0.165
CS	2022	PWNF	PRNF-CS39	6.6	7.3	3.242	1	0.182
CS	2022	PWNF	PRNF-CS40	6.8	7.6	3.334	2	0.187
CS	2022	PWNF	PRNF-CS41	7.8	8.6	5.245	3	0.269
CS	2022	PWNF	PRNF-CS42	10.1	11	10.925	2	0.148
CS	2022	PWNF	PRNF-CS43	5.3	5.9	1.709	1	0.218
CS	2022	PWNF	PRNF-CS44	5.4	6	1.68	2	0.215
CS	2022	PWNF	PRNF-CS45	4.6	5.2	0.941	1	0.223
CS	2022	PWNF	PRNF-CS46	5.8	6.5	2.054	1	0.213
CS	2022	PWNF	PRNF-CS47	4.9	5.5	1.183	2	0.199
CS	2022	PWNF	PRNF-CS48	5.7	6.5	1.984	2	0.179
CS	2022	PWNF	PRNF-CS49	6.4	7.4	3.049	3	0.166
CS	2022	PWNF	PRNF-CS50	7.4	8.2	4.347	3	0.207
CS	2022	PWNF	PRNF-CS51	6.1	6.6	2.198	2	0.206
CS	2022	PWNF	PRNF-CS52	9	10.2	7.996	NA	0.283
CS	2022	PWNF	PRNF-CS53	7.7	8.6	5.044	NA	0.356
CS	2022	PWNF	PRNF-CS54	7.7	8.7	4.734	NA	0.21
CS	2022	PWREF	PRREF-CS01	11.6	12.4	25.561	3	0.0519
CS	2022	PWREF	PRREF-CS02	12.8	13.7	35.319	3	0.0887
CS	2022	PWREF	PRREF-CS03	12.7	14	35.773	4	0.101
CS	2022	PWREF	PRREF-CS04	9.4	10.3	12.777	2	0.0936
CS	2022	PWREF	PRREF-CS05	9.8	10.5	15.153	2	0.0782
CS	2022	PWREF	PRREF-CS06	10	10.9	15.16	3	0.0966
CS	2022	PWREF	PRREF-CS07	8.6	9.4	8.864	2	0.0848
CS	2022	PWREF	PRREF-CS08	8.4	9.2	9.2	3	0.102
CS	2022	PWREF	PRREF-CS09	10.2	11.2	16.911	3	0.103
CS	2022	PWREF	PRREF-CS10	10.5	11.3	22.658	3	0.0785
CS	2022	PWREF	PRREF-CS11	8.1	8.9	7.982	2	0.0586
CS	2022	PWREF	PRREF-CS12	8.7	9.8	10.022	2	0.0605
CS	2022	PWREF	PRREF-CS13	8.2	9.1	9.018	3	0.122
CS	2022	PWREF	PRREF-CS14	10.3	11.2	18.076	3	0.053
CS	2022	PWREF	PRREF-CS15	10.3	11.3	17.092	3	0.126
CS	2022	PWREF	PRREF-CS16	9.2	10	11.916	2	0.111
CS	2022	PWREF	PRREF-CS17	8.6	9.6	9.98	2	0.126
CS	2022	PWREF	PRREF-CS18	8.4	9.3	8.105	3	0.148
CS	2022	PWREF	PRREF-CS19	8.3	9.1	8.571	2	0.0803
CS	2022	PWREF	PRREF-CS20	7.6	8.4	7.098	2	0.107
CS	2022	PWREF	PRREF-CS21	9.9	10.8	15.645	3	0.0986
CS	2022	PWREF	PRREF-CS22	9.9	10.9	17.157	2	0.0646
CS	2022	PWREF	PRREF-CS23	9.7	10.6	14.769	2	0.0897
CS	2022	PWREF	PRREF-CS24	8.9	9.8	12.465	2	0.0627
CS	2022	PWREF	PRREF-CS25	9.8	10.7	14.484	3	0.0715
CS	2022	PWREF	PRREF-CS26	8.9	9.7	10.735	2	0.0967
CS	2022	PWREF	PRREF-CS27	9.3	10.2	13.291	3	0.0622
CS	2022	PWREF	PRREF-CS28	7.6	8.3	5.692	2	0.0981
CS	2022	PWREF	PRREF-CS29	9.2	10.1	12.927	2	0.137
CS	2022	PWREF	PRREF-CS30	8.6	9.3	10.133	2	0.0679
CS	2022	PWREF	PRREF-CS31	7.2	7.9	5.494	2	0.114

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2022	PWREF	PRREF-CS32	8	8.9	7.452	2	0.143
CS	2022	PWREF	PRREF-CS33	8.4	9.3	9.504	2	0.067
CS	2022	PWREF	PRREF-CS34	7.8	8.6	6.389	2	0.152
CS	2022	PWREF	PRREF-CS35	8.4	9.2	9.767	3	0.151
CS	2022	PWREF	PRREF-CS36	8	8.7	7.562	2	0.154
CS	2022	PWREF	PRREF-CS37	7.1	7.8	5.693	2	0.0779
CS	2022	PWREF	PRREF-CS38	7.1	7.9	6.023	2	0.113
CS	2022	PWREF	PRREF-CS39	7.1	7.9	5.693	3	0.109
CS	2022	PWREF	PRREF-CS40	7.1	7.8	5.803	2	0.249
CS	2022	PWREF	PRREF-CS41	7	7.8	4.834	2	0.139
CS	2022	PWREF	PRREF-CS42	7.3	8	5.296	2	0.086
CS	2022	PWREF	PRREF-CS43	6.4	7	3.511	NA	0.145
CS	2022	PWREF	PRREF-CS44	6.4	6.9	3.658	3	0.168
CS	2022	PWREF	PRREF-CS45	9.5	10.2	11.838	3	0.0883
CS	2022	PWREF	PRREF-CS46	7.5	8.3	6.438	2	0.12
CS	2022	PWREF	PRREF-CS47	8.3	9.1	8.123	4	0.131
CS	2022	PWREF	PRREF-CS48	7.9	8.6	7.376	2	0.236
CS	2022	PWREF	PRREF-CS49	8.2	9.1	8.093	2	0.173
CS	2022	PWREF	PRREF-CS50	7.2	8.1	5.2	2	0.125
CS	2023	PWFF	PINRFF CS-1	7.6	NA	5.65	1	0.0618
CS	2023	PWFF	PINRFF CS-2	5.2	NA	1.593	1	0.0476
CS	2023	PWFF	PINRFF CS-3	4.7	NA	1.2	0	0.0507
CS	2023	PWFF	PINRFF CS-4	7.8	NA	5.29	1	0.0587
CS	2023	PWNF	PINRNF CS-1	8.6	NA	7.25	2	0.0759
CS	2023	PWNF	PINRNF CS-10	11.8	NA	19.975	3	0.106
CS	2023	PWNF	PINRNF CS-11	5.5	NA	1.877	0	0.131
CS	2023	PWNF	PINRNF CS-12	5.2	NA	1.392	1	0.132
CS	2023	PWNF	PINRNF CS-13	12.6	NA	27.238	3	0.119
CS	2023	PWNF	PINRNF CS-14	10.7	NA	15.56	NA	0.267
CS	2023	PWNF	PINRNF CS-2	4.8	NA	1.103	1	0.147
CS	2023	PWNF	PINRNF CS-3	7.1	NA	4.389	2	0.0996
CS	2023	PWNF	PINRNF CS-4	9.4	NA	10.622	3	0.0871
CS	2023	PWNF	PINRNF CS-5	4.8	NA	1.109	0	0.127
CS	2023	PWNF	PINRNF CS-6	7.3	NA	4.301	1	0.103
CS	2023	PWNF	PINRNF CS-7	6.6	NA	3.482	1	0.105
CS	2023	PWNF	PINRNF CS-8	8.6	NA	7.505	2	0.213
CS	2023	PWNF	PINRNF CS-9	9.7	NA	10.539	3	0.224
CS	2023	PWREF	PINRREF CS-1	9.6	NA	13.85	4	0.11
CS	2023	PWREF	PINRREF CS-10	6.2	NA	2.52	1	0.104
CS	2023	PWREF	PINRREF CS-11	9.7	NA	11.158	2	0.128
CS	2023	PWREF	PINRREF CS-12	5.2	NA	1.824	0	0.057
CS	2023	PWREF	PINRREF CS-13	9.7	NA	11.526	3	0.111
CS	2023	PWREF	PINRREF CS-14	10.4	NA	14.806	2	0.0914
CS	2023	PWREF	PINRREF CS-15	6.8	NA	3.273	1	0.174
CS	2023	PWREF	PINRREF CS-16	6.1	NA	2.968	1	0.0482
CS	2023	PWREF	PINRREF CS-18	5.5	NA	2.413	1	0.0665
CS	2023	PWREF	PINRREF CS-19	6.8	NA	4.03	1	0.126
CS	2023	PWREF	PINRREF CS-2	5.1	NA	1.66	1	0.071
CS	2023	PWREF	PINRREF CS-20	4.9	NA	1.367	1	NA
CS	2023	PWREF	PINRREF CS-22	10.9	NA	16.644	2	0.104
CS	2023	PWREF	PINRREF CS-23	6.2	NA	2.565	1	0.136
CS	2023	PWREF	PINRREF CS-24	6.1	NA	2.953	1	0.0696
CS	2023	PWREF	PINRREF CS-25	4.9	NA	1.346	1	0.0878
CS	2023	PWREF	PINRREF CS-27	6.4	NA	3.075	1	0.194
CS	2023	PWREF	PINRREF CS-28	10.4	NA	19.228	3	0.103

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2023	PWREF	PINRREF CS-29	5.2	NA	1.879	1	0.0593
CS	2023	PWREF	PINRREF CS-3	9.1	NA	11.231	2	0.105
CS	2023	PWREF	PINRREF CS-30	6.5	NA	3.941	1	0.165
CS	2023	PWREF	PINRREF CS-31	5.6	NA	2.342	1	0.0803
CS	2023	PWREF	PINRREF CS-32	5.7	NA	2.277	1	0.0864
CS	2023	PWREF	PINRREF CS-33	5.7	NA	2.938	1	0.0509
CS	2023	PWREF	PINRREF CS-34	5.5	NA	2.061	1	0.0955
CS	2023	PWREF	PINRREF CS-35	6.2	NA	3.308	1	0.0911
CS	2023	PWREF	PINRREF CS-36	6	NA	2.649	1	0.0249
CS	2023	PWREF	PINRREF CS-37	9.4	NA	17.575	2	0.071
CS	2023	PWREF	PINRREF CS-38	5.4	NA	1.92	1	0.0976
CS	2023	PWREF	PINRREF CS-39	5.2	NA	1.651	1	0.0635
CS	2023	PWREF	PINRREF CS-4	5.4	NA	2.061	1	0.0901
CS	2023	PWREF	PINRREF CS-40	5.3	NA	1.755	1	0.0575
CS	2023	PWREF	PINRREF CS-41	5.3	NA	1.873	1	0.0669
CS	2023	PWREF	PINRREF CS-42	5.2	NA	1.898	1	0.0629
CS	2023	PWREF	PINRREF CS-43	5.1	NA	1.738	1	0.102
CS	2023	PWREF	PINRREF CS-44	5.4	NA	2.238	1	0.053
CS	2023	PWREF	PINRREF CS-45	5	NA	1.772	1	0.0977
CS	2023	PWREF	PINRREF CS-46	5.6	NA	2.191	1	0.121
CS	2023	PWREF	PINRREF CS-47	6.9	NA	4.488	1	0.0646
CS	2023	PWREF	PINRREF CS-48	5.6	NA	2.222	1	0.0729
CS	2023	PWREF	PINRREF CS-49	5.4	NA	1.978	1	0.0685
CS	2023	PWREF	PINRREF CS-51	5.4	NA	1.974	1	0.0938
CS	2023	PWREF	PINRREF CS-52	12.8	NA	27.965	3	0.127
CS	2023	PWREF	PINRREF CS-53	11	NA	18.436	2	0.0971
CS	2023	PWREF	PINRREF CS-54	11.4	NA	19.622	2	0.0985
CS	2023	PWREF	PINRREF CS-55	12.5	NA	26.792	3	0.102
CS	2023	PWREF	PINRREF CS-56	12.7	NA	28.194	3	0.122
CS	2023	PWREF	PINRREF CS-6	7.2	NA	4.343	1	0.101
CS	2023	PWREF	PINRREF CS-7	5.9	NA	2.33	1	0.0911
CS	2023	PWREF	PINRREF CS-8	9.2	NA	9.226	5	0.0764
CS	2023	PWREF	PINRREF CS-9	9.8	NA	12.083	2	0.09
CS	2024	PWFF	PWFF-CS-1	6.1	6.8	2.285	2	0.106
CS	2024	PWFF	PWFF-CS-10	6.1	6.9	2.795	2	0.102
CS	2024	PWFF	PWFF-CS-11	5.5	6.1	2.137	1	0.0616
CS	2024	PWFF	PWFF-CS-12	6.4	6.9	3.305	1	0.0631
CS	2024	PWFF	PWFF-CS-13	9.2	10.6	10.166	4	0.056
CS	2024	PWFF	PWFF-CS-14	6.9	7.6	3.83	3	0.0658
CS	2024	PWFF	PWFF-CS-15	4	4.4	0.864	0	0.0664
CS	2024	PWFF	PWFF-CS-16	4.9	5.6	1.516	1	0.0958
CS	2024	PWFF	PWFF-CS-2	7.2	8	4.327	3	0.068
CS	2024	PWFF	PWFF-CS-3	5	5.6	1.553	1	0.123
CS	2024	PWFF	PWFF-CS-4	9.1	10.3	14.21	3	0.0376
CS	2024	PWFF	PWFF-CS-5	5.9	6.5	2.511	2	0.0921
CS	2024	PWFF	PWFF-CS-6	4.7	5.3	1.442	1	0.103
CS	2024	PWFF	PWFF-CS-7	7.3	8.2	4.773	2	0.117
CS	2024	PWFF	PWFF-CS-8	5.3	5.8	1.633	1	0.105
CS	2024	PWFF	PWFF-CS-9	5.5	6.1	2.019	2	0.0915
CS	2024	PWNF	PWNF-CS-1	9.7	10.8	12.25	2	0.0878
CS	2024	PWNF	PWNF-CS-10	5.6	6.2	2.281	1	0.139
CS	2024	PWNF	PWNF-CS-11	6	6.8	2.649	2	0.217
CS	2024	PWNF	PWNF-CS-12	6.4	7.3	3.04	2	0.165
CS	2024	PWNF	PWNF-CS-13	5.7	6.3	2.167	2	0.105
CS	2024	PWNF	PWNF-CS-14	5.7	6.3	2.001	1	0.198

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2024	PWNF	PWNF-CS-15	4.9	NA	1.68	1	0.0863
CS	2024	PWNF	PWNF-CS-16	5.3	5.9	1.61	1	0.106
CS	2024	PWNF	PWNF-CS-17	5.1	5.5	1.706	2	0.13
CS	2024	PWNF	PWNF-CS-18	5.1	5.6	1.593	2	0.125
CS	2024	PWNF	PWNF-CS-19	6.6	7.3	4.059	2	0.154
CS	2024	PWNF	PWNF-CS-2	5.4	6.1	2.019	1	0.111
CS	2024	PWNF	PWNF-CS-20	6.4	7	2.878	2	0.172
CS	2024	PWNF	PWNF-CS-21	6.3	7.1	3.191	2	0.16
CS	2024	PWNF	PWNF-CS-22	6.6	7.5	3.482	3	0.133
CS	2024	PWNF	PWNF-CS-23	5.2	5.8	1.783	1	0.129
CS	2024	PWNF	PWNF-CS-24	5.8	6.5	2.387	2	0.105
CS	2024	PWNF	PWNF-CS-25	5.8	6.4	2.355	2	0.131
CS	2024	PWNF	PWNF-CS-26	5.6	6.4	2.007	1	0.219
CS	2024	PWNF	PWNF-CS-27	5.6	6.3	2.043	2	0.122
CS	2024	PWNF	PWNF-CS-28	5.5	6.3	2.132	2	0.127
CS	2024	PWNF	PWNF-CS-29	6.8	7.5	4.158	2	0.254
CS	2024	PWNF	PWNF-CS-3	6.5	7.2	3.223	2	0.169
CS	2024	PWNF	PWNF-CS-30	5.3	5.9	1.844	2	0.117
CS	2024	PWNF	PWNF-CS-31	6	6.7	2.914	1	0.0946
CS	2024	PWNF	PWNF-CS-32	5.6	6.1	1.873	1	0.155
CS	2024	PWNF	PWNF-CS-33	5.4	5.9	1.793	1	0.198
CS	2024	PWNF	PWNF-CS-34	5.5	6.1	1.964	2	0.0929
CS	2024	PWNF	PWNF-CS-35	5.8	6.5	2.375	2	0.174
CS	2024	PWNF	PWNF-CS-36	5.4	6	1.772	2	0.0955
CS	2024	PWNF	PWNF-CS-37	5	5.6	1.286	1	0.136
CS	2024	PWNF	PWNF-CS-38	5.4	6	1.787	2	0.186
CS	2024	PWNF	PWNF-CS-39	4.8	5.4	1.215	2	0.114
CS	2024	PWNF	PWNF-CS-4	5.1	5.4	1.733	2	0.148
CS	2024	PWNF	PWNF-CS-40	5	5.5	1.214	1	0.151
CS	2024	PWNF	PWNF-CS-41	5	5.6	1.513	2	0.128
CS	2024	PWNF	PWNF-CS-5	5.3	5.9	1.77	2	0.13
CS	2024	PWNF	PWNF-CS-6	5.6	6.2	1.874	2	0.128
CS	2024	PWNF	PWNF-CS-7	5.2	5.8	1.555	1	0.133
CS	2024	PWNF	PWNF-CS-8	5.2	5.8	1.679	2	0.103
CS	2024	PWNF	PWNF-CS-9	5.7	6.5	2.38	2	0.15
CS	2024	PWREF	PWREF-CS-1	9.5	10.8	13.321	4	0.0577
CS	2024	PWREF	PWREF-CS-10	9.4	9.9	11.171	3	0.1
CS	2024	PWREF	PWREF-CS-11	8.8	9.6	9.498	3	0.087
CS	2024	PWREF	PWREF-CS-12	8.7	9.5	10.765	2	0.0901
CS	2024	PWREF	PWREF-CS-13	10.2	11	13.963	3	0.0637
CS	2024	PWREF	PWREF-CS-14	6.6	7	2.882	2	0.0384
CS	2024	PWREF	PWREF-CS-15	6.5	7.3	4.288	3	0.122
CS	2024	PWREF	PWREF-CS-16	9.3	10.2	10.704	3	0.0832
CS	2024	PWREF	PWREF-CS-17	6.6	7.2	3.727	2	0.0278
CS	2024	PWREF	PWREF-CS-18	6.7	7.4	3.958	2	0.0894
CS	2024	PWREF	PWREF-CS-19	6.7	7.4	4.085	2	0.0657
CS	2024	PWREF	PWREF-CS-2	9.2	10.6	13.586	3	0.0511
CS	2024	PWREF	PWREF-CS-20	7.1	7.6	3.833	4	0.0675
CS	2024	PWREF	PWREF-CS-21	8.3	9.1	6.702	3	0.203
CS	2024	PWREF	PWREF-CS-22	8.4	9.2	7.397	3	0.112
CS	2024	PWREF	PWREF-CS-23	7.1	7.7	4.202	2	0.0865
CS	2024	PWREF	PWREF-CS-24	6.3	6.7	3.019	2	0.163
CS	2024	PWREF	PWREF-CS-25	7.5	8	4.963	4	0.134
CS	2024	PWREF	PWREF-CS-26	7.2	7.9	4.703	3	0.106
CS	2024	PWREF	PWREF-CS-27	7.6	8.4	6.484	3	0.129

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CS	2024	PWREF	PWREF-CS-28	6.7	7.2	3.529	2	0.0383
CS	2024	PWREF	PWREF-CS-29	7.7	8.1	4.544	3	0.0612
CS	2024	PWREF	PWREF-CS-3	9.4	10.1	9.958	3	0.0542
CS	2024	PWREF	PWREF-CS-30	5.9	6.5	2.685	2	0.0343
CS	2024	PWREF	PWREF-CS-31	7.1	7.6	4.148	3	0.0477
CS	2024	PWREF	PWREF-CS-32	8.5	9.3	8.691	3	0.0743
CS	2024	PWREF	PWREF-CS-33	7.9	8.8	6.839	3	0.0932
CS	2024	PWREF	PWREF-CS-34	5.9	6.4	2.439	1	0.0532
CS	2024	PWREF	PWREF-CS-35	6.8	7.3	3.451	2	0.0683
CS	2024	PWREF	PWREF-CS-36	7.4	7.8	4.124	2	0.0671
CS	2024	PWREF	PWREF-CS-37	7.4	7.8	4.243	2	0.0811
CS	2024	PWREF	PWREF-CS-38	7.5	8.3	4.967	2	0.0586
CS	2024	PWREF	PWREF-CS-39	6.3	6.6	2.853	2	0.0308
CS	2024	PWREF	PWREF-CS-4	9.3	10.4	11.562	3	0.082
CS	2024	PWREF	PWREF-CS-40	7.1	7.7	4.39	3	0.0419
CS	2024	PWREF	PWREF-CS-41	10	10.9	13.311	3	0.0952
CS	2024	PWREF	PWREF-CS-42	9.1	9.7	10.172	2	0.0871
CS	2024	PWREF	PWREF-CS-43	9	9.9	10.025	3	0.0945
CS	2024	PWREF	PWREF-CS-44	7.1	7.9	4.858	2	0.116
CS	2024	PWREF	PWREF-CS-45	6.7	7.2	3.455	2	0.13
CS	2024	PWREF	PWREF-CS-46	7	7.4	3.509	2	0.0703
CS	2024	PWREF	PWREF-CS-47	6.4	7.1	3.711	3	0.147
CS	2024	PWREF	PWREF-CS-48	7.5	8.4	6.347	2	0.131
CS	2024	PWREF	PWREF-CS-49	6	6.4	2.608	2	0.0337
CS	2024	PWREF	PWREF-CS-5	9.9	10.8	11.463	3	0.0748
CS	2024	PWREF	PWREF-CS-50	7.4	8.2	5.609	3	0.18
CS	2024	PWREF	PWREF-CS-6	8.9	9.5	9.127	3	0.0552
CS	2024	PWREF	PWREF-CS-7	10.3	11.3	15.571	3	0.0648
CS	2024	PWREF	PWREF-CS-8	9.6	10.7	12.48	3	0.0737
CS	2024	PWREF	PWREF-CS-9	9.7	10.8	13.442	3	0.0592
CMM	2022	PWFF	PRFF-CMM01	NA	NA	NA	1	0.0888
CMM	2022	PWFF	PRFF-CMM02	NA	2.4	0.1	1	0.0982
CMM	2022	PWNF	PRNF-CMM10	NA	8.6	7.85	1	0.0948
CMM	2022	PWNF	PRNF-CMM2	NA	10.3	11.911	1	0.0673
CMM	2022	PWNF	PRNF-CMM28	NA	8	6.497	2	0.121
CMM	2022	PWNF	PRNF-CMM34	NA	NA	NA	1	0.107
CMM	2022	PWNF	PRNF-CMM6	NA	9.9	11.859	1	0.118
CMM	2022	PWREF	PRREF-CMM12	NA	7.8	5.195	2	0.0517
CMM	2022	PWREF	PRREF-CMM19	NA	8	6.719	2	0.0661
CMM	2022	PWREF	PRREF-CMM21	NA	8.7	7.309	2	0.066
CMM	2022	PWREF	PRREF-CMM22	NA	8.6	6.602	NA	0.074
CMM	2022	PWREF	PRREF-CMM31	NA	9.1	8.271	NA	0.0795
CMM	2023	PWFF	PINRFF CMM-1	NA	6	2.333	0	0.0816
CMM	2023	PWFF	PINRFF CMM-2	NA	5.7	2.08	0	0.0584
CMM	2023	PWFF	PINRFF CMM-3	NA	5.7	2.101	0	0.0744
CMM	2023	PWFF	PINRFF CMM-4	NA	5.1	1.453	0	0.0609
CMM	2023	PWNF	PINRNF CMM-1	NA	5.8	2.296	0	0.081
CMM	2023	PWNF	PINRNF CMM-10	NA	5.6	2.203	0	0.0893
CMM	2023	PWNF	PINRNF CMM-11	NA	5	1.362	0	0.0842
CMM	2023	PWNF	PINRNF CMM-3	NA	7.3	4.564	1	0.0897
CMM	2023	PWNF	PINRNF CMM-4	NA	5.7	2.175	0	0.0938
CMM	2023	PWNF	PINRNF CMM-5	NA	5	1.409	0	0.117
CMM	2023	PWNF	PINRNF CMM-6	NA	5.5	1.705	0	0.107
CMM	2023	PWNF	PINRNF CMM-7	NA	5.3	1.471	0	0.136
CMM	2023	PWNF	PINRNF CMM-8	NA	10.6	13.253	3	0.107

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CMM	2023	PWNF	PINRNF CMM-9	NA	8.4	6.436	1	0.114
CMM	2023	PWREF	PINRREF CMM-10	NA	5.7	2.743	0	0.0832
CMM	2023	PWREF	PINRREF CMM-11	NA	9.4	9.843	2	0.165
CMM	2023	PWREF	PINRREF CMM-12	NA	7.8	5.187	1	0.086
CMM	2023	PWREF	PINRREF CMM-13	NA	9.6	9.141	3	0.135
CMM	2023	PWREF	PINRREF CMM-14	NA	8.1	5.733	1	0.0587
CMM	2023	PWREF	PINRREF CMM-3	NA	8.5	6.885	2	0.0828
CMM	2023	PWREF	PINRREF CMM-5	NA	5.9	2.558	0	0.0849
CMM	2023	PWREF	PINRREF CMM-7	NA	8.6	8.452	3	0.156
CMM	2023	PWREF	PINRREF CMM-8	NA	7.3	4.756	1	0.106
CMM	2023	PWREF	PINRREF CMM-9	NA	6.4	3.42	0	0.105
CMM	2024	PWFF	PWFF-CMM-1	NA	7.4	4.012	1	0.073
CMM	2024	PWFF	PWFF-CMM-2	NA	8.8	6.594	2	0.0688
CMM	2024	PWFF	PWFF-CMM-3	NA	8.2	6.699	1	0.034
CMM	2024	PWFF	PWFF-CMM-4	NA	9.6	9.438	2	0.0639
CMM	2024	PWFF	PWFF-CMM-5	NA	6.5	2.933	1	0.0657
CMM	2024	PWFF	PWFF-CMM-6	NA	4.4	0.891	0	0.0399
CMM	2024	PWFF	PWFF-CMM-7	NA	8.2	5.854	2	0.0715
CMM	2024	PWNF	PWNF-CMM-1	NA	4.8	0.977	0	0.0835
CMM	2024	PWNF	PWNF-CMM-10	NA	8.6	7.412	1	0.168
CMM	2024	PWNF	PWNF-CMM-11	NA	10.2	12.234	1	0.109
CMM	2024	PWNF	PWNF-CMM-12	NA	7.8	5.526	1	0.103
CMM	2024	PWNF	PWNF-CMM-13	NA	8.2	5.288	1	0.0851
CMM	2024	PWNF	PWNF-CMM-14	NA	11.8	17.246	1	0.149
CMM	2024	PWNF	PWNF-CMM-15	NA	6.8	3.428	0	0.0732
CMM	2024	PWNF	PWNF-CMM-16	NA	9	7.722	1	0.146
CMM	2024	PWNF	PWNF-CMM-17	NA	5.2	1.557	0	0.0719
CMM	2024	PWNF	PWNF-CMM-18	NA	9.5	8.486	2	0.151
CMM	2024	PWNF	PWNF-CMM-19	NA	7.6	4.644	0	0.122
CMM	2024	PWNF	PWNF-CMM-2	NA	8.4	5.996	1	0.103
CMM	2024	PWNF	PWNF-CMM-20	NA	7.4	4.318	0	0.14
CMM	2024	PWNF	PWNF-CMM-3	NA	8.3	6.492	1	0.136
CMM	2024	PWNF	PWNF-CMM-4	NA	5.7	2.005	1	0.0882
CMM	2024	PWNF	PWNF-CMM-5	NA	5.5	1.743	1	0.113
CMM	2024	PWNF	PWNF-CMM-6	NA	4.3	0.803	0	0.0874
CMM	2024	PWNF	PWNF-CMM-7	NA	6.9	3.533	1	0.0612
CMM	2024	PWNF	PWNF-CMM-8	NA	11.3	17.087	4	0.152
CMM	2024	PWNF	PWNF-CMM-9	NA	9.4	8.556	1	0.136
CMM	2024	PWREF	PWREF-CMM-1	NA	10.5	13.205	3	0.0707
CMM	2024	PWREF	PWREF-CMM-10	NA	8.7	8.497	1	0.0743
CMM	2024	PWREF	PWREF-CMM-11	NA	9.1	8.786	2	0.0827
CMM	2024	PWREF	PWREF-CMM-12	NA	9.2	9.019	1	0.0478
CMM	2024	PWREF	PWREF-CMM-13	NA	7.7	5.51	1	0.0795
CMM	2024	PWREF	PWREF-CMM-14	NA	7.8	5.272	1	0.0387
CMM	2024	PWREF	PWREF-CMM-15	NA	7.4	4.699	2	0.0716
CMM	2024	PWREF	PWREF-CMM-16	NA	8.1	5.483	2	0.0616
CMM	2024	PWREF	PWREF-CMM-17	NA	10.3	12.02	1	0.0771
CMM	2024	PWREF	PWREF-CMM-18	NA	7.2	4.153	1	0.0705
CMM	2024	PWREF	PWREF-CMM-19	NA	3.9	0.723	0	0.0556
CMM	2024	PWREF	PWREF-CMM-2	NA	10.8	14.462	1	0.094
CMM	2024	PWREF	PWREF-CMM-20	NA	6	3.043	1	0.0621
CMM	2024	PWREF	PWREF-CMM-21	NA	5.4	1.864	0	0.0743
CMM	2024	PWREF	PWREF-CMM-22	NA	6.5	2.358	2	0.101
CMM	2024	PWREF	PWREF-CMM-23	NA	6.4	3.278	1	0.101
CMM	2024	PWREF	PWREF-CMM-24	NA	4.3	0.789	0	0.0543

Species	Year	Location	FishID	Fork Length (cm)	Total Length (cm)	Body Weight (g)	Age (years)	Tissue Mercury (mg/kg)
CMM	2024	PWREF	PWREF-CMM-3	NA	9.2	9.892	2	0.0649
CMM	2024	PWREF	PWREF-CMM-4	NA	10.9	14.008	1	0.0716
CMM	2024	PWREF	PWREF-CMM-5	NA	10	12.414	2	0.0714
CMM	2024	PWREF	PWREF-CMM-6	NA	10.6	18.238	4	0.088
CMM	2024	PWREF	PWREF-CMM-7	NA	10.5	14.268	2	0.0562
CMM	2024	PWREF	PWREF-CMM-8	NA	10.1	12.787	2	0.0782
CMM	2024	PWREF	PWREF-CMM-9	NA	10.9	15.278	4	0.0675