Site C Clean Energy Project

Site C Reservoir Tributaries Fish Community and Spawning Monitoring Program (Mon-1b)

Task 2c – Site C Reservoir Tributaries Fish Population Indexing Survey

Construction Year 7 (2021)

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2021 Annual Report

Site C Reservoir Tributary Fish Population Indexing Survey (Mon-1b, Task 2c)

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Executive Summary

In accordance with Provincial Environmental Assessment Certificate Condition No. 7[1] and Federal Decision Statement Condition Nos. 8.4.3[2] and 8.4.4[3] for BC Hydro's Site C Clean Energy Project (the Project), BC Hydro has developed the Site C Fisheries and Aquatic Habitat Monitoring and Follow-up Program (FAHMFP[4]). The Site C Reservoir Tributaries Fish Community and Spawning Monitoring Program (Mon-1b) represents one component of the FAHMFP that is designed to monitor the responses, using before and after comparisons, of target Peace River fish populations to the construction and operation of the Project. Target species include Arctic Grayling (*Thymallus arcticus*), Bull Trout (*Salvelinus confluentus*), and Rainbow Trout (*Oncorhynchus mykiss*) because these species spend portions of their life cycle in Peace River tributaries and migrate past the Project to fulfill their life history requirements.

Under the Site C Reservoir Tributaries Fish Population Indexing Survey (Task 2c of Mon-1b), annual surveys are conducted to monitor target fish species, and in 2021, population assessments were conducted in the Moberly River for Arctic Grayling, the Chowade River and Cypress and Fiddes creeks for Bull Trout, and in Colt, Farrell, Kobes, and Maurice creeks for Rainbow Trout. Sampling conducted in 2021 represents the first year of sampling after the commencement of the river diversion phase of Project construction (3 October 2020).

Backpack electrofishing was the primary sampling method for all streams, except the Moberly River, where a combination of backpack electrofishing, small-fish boat electroshocking, and angling was used. In 2021, field methods, target species, and sampled streams were identical to the 2017, 2018, and 2019 surveys, with the addition of sampling for Rainbow Trout in Maurice Creek in 2020 and 2021. Tissue and ageing structure samples were also collected from select species at some locations for potential genetic and microchemistry analyses in support of the FAHMFP; however, these samples were not analyzed as part of the current study.

The primary objective of the study was to monitor the above three species; however, a secondary objective for sampling in the Chowade River and Cypress Creek was to implant passive integrated transponder (PIT) tags into Bull Trout. Tagged Bull Trout are also monitored by PIT detector arrays installed in the Chowade River and Cypress Creek as part of the Peace River Bull Trout Spawning Assessment (Mon-1b, Task 2b). To increase the likelihood of deploying more PIT tags into Bull Trout, the upstream areas of these streams were specifically targeted, as greater densities of immature Bull Trout were recorded in these areas during reconnaissance surveys conducted in 2016. Although multiple sites were sampled in the Chowade River and Cypress Creek, sampling in Fiddes Creek was limited to portions of the stream that were accessible by helicopter and assumed representative of Fiddes Creek. Key results from the 2021 survey are summarized as follows:

[1] The EAC Holder must develop a Fisheries and Aquatic Habitat Monitoring and Follow-up Program to assess the effectiveness of measures to mitigate Project effects on healthy fish populations in the Peace River and tributaries, and, if recommended by a QEP or FLNR, to assess the need to adjust those measures to adequately mitigate the Project's effects.

[2] "The plan shall include: an approach to monitor changes to fish and fish habitat baseline conditions in the Local Assessment Area."

[3] "The plan shall include: an approach to monitor and evaluate the effectiveness of mitigation or offsetting measures and to verify the accuracy of the predictions made during the environmental assessment on fish and fish habitat."

[4] Site C Fisheries and Aquatic Habitat Monitoring and Follow-up Program available at https://www.sitecproject.com/document-library/environmental-management-plans-and-reports.

Tributaries Targeting Bull Trout (Chowade River, Cypress and Fiddes creeks)

- A total of 840 Bull Trout were captured in the Chowade River, and Cypress and Fiddes creeks combined. Of this total, 567 Bull Trout were implanted with PIT tags, representing the highest number of PIT tags deployed in these streams in one year as part of the Mon-1b, Task 2c study. Captured Bull Trout included Young-of-the-Year (YOY), immature, and adult life stages. One immature Bull Trout captured in Fiddes Creek was initially captured in 2020. Inter-year recaptured Bull Trout were not encountered in 2021 in the Chowade River or Cypress Creek.
- When comparing Bull Trout catch rates in the Chowade River and Cypress Creek among years, catch per unit effort (CPUE) for YOY Bull Trout increased year-over-year between 2019 and 2021, and CPUE for immature Bull Trout increased year-over-year between 2018 and 2021. In Fiddes Creek, CPUE for YOY Bull Trout was greater in 2021 compared to 2019 and 2020; however, CPUE for YOY in 2021 was low compared to CPUE for immature Bull Trout. CPUE for immature Bull Trout in Fiddes Creek was higher in 2021 than in the three previous study years (2018 to 2020). Overall, the findings of 2021 indicate that Bull Trout successfully spawned within these systems in 2020, and recruitment to the immature Bull Trout population has been strong in the Chowade River and Cypress and Fiddes creeks in recent years.
- Consistent with results from 2017 to 2020, Arctic Grayling were not recorded in the Chowade River or in Cypress or Fiddes creeks. Rainbow Trout were recorded in Chowade River and Cypress and Fiddes creeks.

Tributaries Targeting Rainbow Trout (Colt, Farrell, Kobes, and Maurice creeks)

- A total of 308 Rainbow Trout were captured in Colt, Farrell, Kobes, and Maurice creeks combined. Of this total, 245 were implanted with PIT tags. Sixteen immature Rainbow Trout were captured in 2021 that were originally captured in 2020. All recaptured Rainbow Trout were encountered in Kobes and Maurice creeks and were found within approximately 200 m of their original capture location.
- In 2021, YOY Rainbow Trout were captured in Colt, Kobes, and Maurice creeks providing evidence of successful spawning within these tributaries in the spring of 2021. Immature Rainbow Trout were captured in all surveyed tributaries.
- YOY Rainbow Trout were not captured in Farrell Creek in 2020 or 2021, suggesting low recruitment in these years. This finding is consistent with previous years (2017 to 2019) where total catch of YOY Rainbow Trout in Farrell Creek has been low (range = 2 to 29).
- Whether Rainbow Trout from Farrell and Maurice creeks are a local resident population or are offspring of the Peace River Rainbow Trout population remains unknown. Since 2017, PIT tagged Rainbow Trout originally captured in Farrell or Maurice creeks have not been identified in the Peace River during the Peace River Large Fish Indexing Survey (Mon-2, Task 2a). Furthermore, Rainbow Trout originally PIT tagged in the Peace River have not been identified in Farrell or Maurice creeks. However, radio telemetry tagged adult Rainbow Trout have been detected as far as 95.5 km upstream in Farrell Creek and as far as 1.9 km upstream in Maurice Creek as part of the Site C Fish Movement Assessment (Mon-1b, Task 2d), indicating the use of these systems by the Peace River Rainbow Trout population.

Tributaries Targeting Arctic Grayling (Moberly River)

- A total of 42 Arctic Grayling were captured in the Moberly River in 2021. Of this total, 15 were implanted with PIT tags. One immature Arctic Grayling was previously captured in 2020, approximately 700 m upstream of its 2021 capture location. Captured Arctic Grayling included YOY, immature, and adult life stages.
- The majority of Arctic Grayling captured in 2021 were found in Sections 7 and 8, with the highest densities of Arctic Grayling occurring within a 3.4-km section of river between River Km 36.0 and 39.4. This section of the Moberly River is highly braided with multiple side channels and there is evidence of groundwater upwelling within some side channels. The high density of YOY Arctic Grayling within this small area of the Moberly River indicates that Arctic Grayling likely spawn at or near this location.
- In 2021, Bull Trout and Rainbow Trout were not captured in the Moberly River. While these species have been captured in previous years, overall abundance of these species in the Moberly River is low and likely limited to individuals using the stream for feeding purposes.

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Description
BTIPM	Bull Trout Integrated Population Model
CPUE	Catch per unit effort
EAC	Environmental Assessment Certificate
EIS	Environmental Impact Statement
FAHMFP	Fisheries and Aquatic Habitat Monitoring and Follow-up Program
FDX	Full-Duplex
FIDQ	Fisheries Inventory Data Queries
FL	Fork Length
GMSMON-2	Peace River Fish Index
HDX	Half-Duplex
Mon-1b	Site C Reservoir Tributaries Fish Community and Spawning Monitoring Program
Mon-2	Peace River Fish Community Monitoring Program
Mon-15	Site C Small Fish Translocation Monitoring Program
PCD	Peace Canyon Dam
PIT	Passive Integrated Transponder
Project	Site C Clean Energy Project
Task 2a	Peace River Large Fish Indexing Survey
Task 2b	Peace River Bull Trout Spawning Assessment
Task 2c	Site C Reservoir Tributaries Fish Population Indexing Survey
Task 2d	Site C Fish Movement Assessment
WLR	Water License Requirements
YOY	Young-of-the-year

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1.0 INTRODUCTION

In accordance with Provincial Environmental Assessment Certificate (EAC) Condition No. 7[5] and Federal Decision Statement Condition Nos. 8.4.3[6] and 8.4.4[7] for BC Hydro's Site C Clean Energy Project (the Project), BC Hydro developed the Site C Fisheries and Aquatic Habitat Monitoring and Follow-up Program (FAHMFP[8]). The Site C Reservoir Tributaries Fish Community and Spawning Monitoring Program (Mon-1b) represents one component of the FAHMFP that is designed to monitor Peace River fish populations that use tributaries in the future inundation zone of the Site C reservoir to fulfil portions of their life cycle. Most notably, these species include Arctic Grayling (*Thymallus arcticus*), Bull Trout (*Salvelinus confluentus*), and Rainbow Trout (*Oncorhynchus mykiss*). The Site C Reservoir Tributaries Fish Population Indexing Survey (Task 2c) is one component of Mon-1b that intends to monitor the populations of Arctic Grayling, Bull Trout, and Rainbow Trout that are known to spawn in Site C reservoir tributaries and how these populations are impacted by the construction and operation of the Project. This report summarizes the 2021 findings of Task 2c.

This is the sixth year of a multi-year study, and the data collected in 2021 represents the first year of sampling conducted after the Project entered the diversion phase of construction, which commenced on 3 October 2020. On this date, the entire flow of the Peace River was diverted into two tunnels routed along the left (looking downstream) bank of the Peace River, to allow for further construction activities associated with the Project. The diversion tunnels allow for downstream fish movement, but do not allow for upstream movement due to high water velocities within the tunnels. Upstream fish movement is facilitated by the temporary upstream fish passage facility operated by BC Hydro from 1 April to 31 October each year (McMillen and BC Hydro 2021). During periods when the TUF is not operating between April and October (e.g., shut down for maintenance work), or operating at reduced efficiency (e.g., high discharge reduces attracting flows), the TUF is supported by contingent boat electroshocking surveys (Golder 2022). During these surveys, fish situated immediately downstream of the Project are captured and transported to upstream release locations.

During Task 2c's 2016 survey, reconnaissance surveys were conducted that consisted of a broad spatial scope within each of the sampled tributaries (Golder 2017). During the 2017 to 2021 surveys (Golder 2018, 2019, 2020a, 2021a), methods were similar and focused on key areas that were identified during the 2016 reconnaissance surveys.

1.1 Bull Trout

A key uncertainty identified in the Project's Environmental Impact Statement (EIS) relates to the movement of Peace River Bull Trout during and after construction of the Project, which in turn, influences the number of spawning Bull Trout expected to be present in the Halfway River[9]. The Halfway River is known to be an important watershed for spawning by Peace River Bull Trout (Geraldes and Taylor 2020; Putt et al. 2021; AMEC and LGL 2008a, 2008b, 2010a, 2010b; BC MELP 2000; Burrows et al. 2001; Pattenden et al. 1991). The objective of the Peace River Bull Trout Spawning Assessment (Mon-1b, Task 2b) is to monitor Bull Trout spawner and redd abundance in select tributaries of the Halfway River watershed to monitor the population's response to the

[5] The EAC Holder must develop a Fisheries and Aquatic Habitat Monitoring and Follow-up Program to assess the effectiveness of measures to mitigate Project effects on healthy fish populations in the Peace River and tributaries, and, if recommended by a QEP or FLNR, to assess the need to adjust those measures to adequately mitigate the Project's effects.

[6] The plan shall include: an approach to monitor changes to fish and fish habitat baseline conditions in the Local Assessment Area.

[7] The plan shall include: an approach to monitor and evaluate the effectiveness of mitigation or offsetting measures and to verify the accuracy of the predictions made during the environmental assessment on fish and fish habitat.

[8] Site C Fisheries and Aquatic Habitat Monitoring and Follow-up Program available at https://www.sitecproject.com/document-library/environmental-management-plans-and-reports.

[9] Site C Clean Energy Project Environmental Impact Statement, Volume 2, Appendix Q3.

construction and operation of the Project (Putt et al. 2021). The abundance of adult Bull Trout in the Halfway River watershed, as monitored under Task 2b, may be influenced by changes in the abundance of immature Bull Trout in tributaries of the Halfway River and by changes in the abundance of the Halfway River's resident Bull Trout population. Therefore, Task 2c is designed, in part, to monitor immature Bull Trout abundance in Halfway River tributaries to test Hypothesis #3 within the Site C Reservoir Tributaries Fish Community and Spawning Monitoring Program:

H_3: Bull Trout juvenile abundance in the Halfway River will not decline relative to baseline estimates.

A program dedicated to monitoring immature Bull Trout abundance in the Halfway River watershed had not been implemented prior to 2016, although incidental catches were noted during some studies (e.g., Mainstream 2009a, 2010, 2011a, 2013). Although the current year (2021) represented the first year of the study since river diversion occurred, the young-of-the-year (YOY) Bull Trout captured in 2021 would have been the offspring of adult Bull Trout that migrated into the Halfway River watershed in the late summer of 2020 (i.e., prior to the commencement of river diversion). Therefore, for the purposes of testing the above hypothesis, data collected during 2016 through 2021 should serve as the baseline dataset, and data collected from 2022 onward should be compared to the baseline dataset to test the above hypothesis during future study years.

The objective of the current study was to deploy passive integrated transponder (PIT) tags into captured immature Bull Trout. The data collected from PIT-tagged immature Bull Trout will be incorporated (along with data from other FAHMFP studies) into the Bull Trout Integrated Population Model (BTIPM; ESSA et al. 2020) to evaluate juvenile-to-adult survival and to generate population abundance estimates. The outputs from the BTIPM will be used to monitor changes in the Halfway River Bull Trout population over time and address the above uncertainty. Furthermore, the movements of PIT-tagged Bull Trout will be monitored using PIT detector arrays installed in the Chowade River and Cypress Creek (Appendix A, Figure A1) as a component of Mon-1b, Task 2b (Ramos-Espinoza et al. 2018, 2019; Putt et al. 2020, 2021). Having a thorough understanding of the movement patterns of both adult and immature Bull Trout in the study area will provide insight into this species' life history characteristics. Most notably, movement data will help confirm the presence or absence of resident populations, the timing of both pre- and post-spawn movements by adults, the residence time of immature life stages, the timing of downstream immature dispersal, and the extent of skipped-spawning by adults.

The portions of the Chowade River and Cypress and Fiddes creeks that were sampled in 2021 were selected based on locations sampled in previous years where catches of Bull Trout were greatest (Golder 2017, 2018, 2019, 2020a, 2021a) and sections previously identified as important for spawning Bull Trout (Euchner and Mainstream 2013). Sampling effort from 2017 to 2021 focused on the portions of each tributary where densities of immature Bull Trout were expected to be high and densities of adult, pre-spawning Bull Trout that would be sensitive to capture and handling were expected to be low.

1.2 Rainbow Trout

The Project's EIS identified uncertainties regarding the continued use of Maurice and Lynx creeks for spawning and rearing by Peace River Rainbow Trout populations. Sampling in Maurice Creek was not conducted under Task 2c from 2017 to 2019 due to site access limitations associated with sampling crew safety and security. Sampling in Lynx Creek was not conducted under Task 2c during any study year due to ongoing high turbidity

levels[10] precluding fish sampling. Landslides in the Lynx Creek watershed have reduced the quality of Rainbow Trout spawning and rearing habitat through increased sediment deposition. Based on these factors, Lynx Creek was not considered as a candidate index stream for monitoring the long-term status of the Peace River Rainbow Trout population.

Prior to 2017, Farrell, Colt, and Kobes creeks were selected, in consultation with BC Hydro[11], as alternative tributaries to monitor local Rainbow Trout populations. The sites established in Farrell, Colt, and Kobes creeks in 2017 were replicated in study years 2018 to 2021. In 2020, sampling was conducted in Maurice Creek for the first time under the FAHMFP. Sampling in Maurice Creek was repeated at the same locations in 2021.

Farrell Creek and Maurice Creek both flow directly into the Peace River. Farrell Creek flows into the Peace River approximately 23.5 km downstream of Peace Canyon Dam (PCD) and Maurice Creek flows into the Peace River approximately 7 km downstream of PCD. Sampling in Farrell Creek and Maurice Creek provides data to test Hypothesis #3 from the Site C Reservoir Tributaries Fish Community and Spawning Monitoring Program:

H_3: Rainbow Trout from Site C Reservoir will continue to spawn and rear in Maurice and Lynx creeks upstream of the Site C Reservoir inundation zone.

To test the above hypothesis, the baseline dataset consists of study years 2017 to 2020. The presence of YOY Rainbow Trout in Farrell and Maurice creeks during summer surveys would be taken as confirmation that Rainbow Trout spawned in the system in the spring of the same year. Furthermore, the subsequent detection of Rainbow Trout, that were initially tagged as YOY or immature fish in Farrell or Maurice creeks, in the Peace River mainstem will provide confirmation that these systems are used for spawning by the Peace River Rainbow Trout population.

Rainbow Trout populations in Kobes and Colt creeks were also assessed in 2021. Kobes Creek is a tributary to the Halfway River, flowing into the Halfway River at River Km 76, as measured upstream from the Halfway River's confluence with the Peace River. Colt Creek is a tributary to the Graham River, flowing into the Graham River at River Km 11.5, as measured upstream from the Graham River's confluence with the Halfway River. The Graham River flows into the Halfway River 90 km upstream from the Halfway River's confluence with the Peace River. Rainbow Trout data from Colt and Kobes creeks will be used to provide an index of relative Rainbow Trout abundance and to gather information regarding movements between sites and between study years in the Halfway River watershed.

1.3 Arctic Grayling

The Project's EIS describes key uncertainties for the Peace River Arctic Grayling population upstream of the Project[12]. These include the species' ability to overwinter in the Moberly River and its response to the Project's creation of reservoir habitat. Annual sampling in the Moberly River under Task 2c between 2016 and 2020 was conducted to add to the existing baseline dataset (e.g., Mainstream 2013) to further describe the fish community

[10] The source of the high turbidity in Lynx Creek has been associated with an upstream landslide in Brenot Creek, a tributary to Lynx Creek.: https://hudsonshope.ca/district-office/public-works/water-services/water-advisories/.

[11] BC Hydro also reviewed with the Project's Fisheries and Aquatic Habitat Mitigation and Monitoring Technical Committee the streams to sample for Rainbow Trout.

[12] Site C Clean Energy Project Environmental Impact Statement, Volume 2, Appendix Q3.

located within and upstream of the Site C reservoir inundation zone and improve understanding of the Moberly River Arctic Grayling population. The current study year provides additional data to test Hypothesis #5 from the Site C Reservoir Tributaries Fish Community and Spawning Monitoring Program:

H_5: A self-sustained population of Arctic Grayling will remain in the Moberly River.

To test the above hypothesis, the baseline dataset consists of study years 2017 to 2020 (2016 is not considered part of the baseline dataset for hypothesis testing since was considered a reconnaissance year to refine sampling methods and timing). The presence of YOY Arctic Grayling in the Moberly River during the summer surveys would be taken as confirmation that Arctic Grayling spawned in the system in the spring of the same year, and that a self-sustained population of Arctic Grayling remains in the Moberly River.

2.0 METHODS

2.1 Study Area

The Task 2c study area includes tributaries that were previously identified as having key habitats for migratory Peace River Bull Trout, Rainbow Trout, and Arctic Grayling populations (Appendix A, Figures A1 to A10). Sections of each tributary that were sampled depended on sampling logistics and the species-specific hypotheses being tested. Results from the five previous years of the survey (2016 to 2020) were used to guide sample site selection with a focus on reaches and habitat types with higher densities of the target fish species. Target fish species within the tributaries sampled in 2021 are summarized in Table 1.

Table 1: Summary of target species by watershed for the Site C Reservoir Tributaries Fish Population Indexing Survey, 2021.

Species	Watershed							
	Chowade River	Cypress Creek	Fiddes Creek	Colt Creek	Farrell Creek	Kobes Creek	Maurice Creek	Moberly River
Arctic Grayling	-	-	-	o	o	o	-	x
Bull Trout	x	x	x	o	-	o	-	-
Rainbow Trout	o	o	-	x	x	x	x	-

"x" denotes main target species for the tributary; "o" denotes secondary target species for the tributary; "-" denotes not a target species for the tributary.

River Km values presented in this report were based on the Government of Canada's CanVec series of hydrograph features[13]. For each tributary, the different line segments of the same stream were merged into a single line feature. River Km 0.0 (i.e., the tributary's confluence) was set at the lowest elevation of the line feature, and 1 km intervals were established along the line feature using the Create Station Points tool (ArcGIS© extension ET GeoWizards).

2.1.1 Tributaries Targeting Bull Trout

Tributaries sampled in 2021 included the Chowade River and Cypress and Fiddes creeks (Table 1). Sampling in the Chowade River was conducted between River Km 25.2 and River Km 49.4, as measured upstream from the Chowade River's confluence with the Halfway River (Appendix A, Figure A4). For Cypress Creek, sampling was conducted between River Km 28.2 and River Km 38.8, as measured upstream from Cypress Creek's confluence with the Halfway River (Appendix A, Figure A3). Sampling in 2021 within Fiddes Creek was conducted between River Km 5.5 and River Km 7.9 as measured upstream from Fiddes Creek's confluence with the Halfway River (Appendix A, Figure A2).

[13] Available for download at https://open.canada.ca/data/en/dataset/9d96e8c9-22fe-4ad2-b5e8-94a6991b744b.

UTMs of sample site locations in the Chowade River, and Cypress and Fiddes creeks are provided in Appendix A, Table A1. Individual sites were identified during an aerial survey conducted at the start of the field program. This survey allowed the crew to identify sites within potentially suitable immature Bull Trout habitat that were close to safe landing locations.

2.1.1.1 PIT Detector Arrays on Tributaries Targeting Bull Trout

In addition to the identification of recaptured fish within and among study years, fish implanted with PIT tags as part of the current survey (Mon-1b, Task 2c) were also intended to be detected by the Chowade River and Cypress Creek PIT detector arrays installed as part of Mon-1b, Task 2b (Appendix A, Figure A1) (Putt et al. 2021). These arrays were also intended to detect fish captured and implanted with PIT tags deployed during additional FAHMFP studies including:

- Peace River Large Fish Indexing Survey (Mon-2, Task 2a; e.g., Golder 2021b)
- Offset Effectiveness Monitoring (Mon-2, Task 2d; e.g., Golder 2020b)
- Fish Composition and Abundance Survey (Mon-2, Task 2b; Triton 2021)
- Operation of the temporary upstream fish passage facility (McMillen and BC Hydro 2021)
- Site C Contingent Boat Electroshocking (Golder 2022)

Summaries of fish movements based on PIT tag detections at the Chowade River and Cypress Creek PIT detector arrays are not presented in this report; however, these data are provided in Putt et al. 2022.

2.1.2 Tributaries Targeting Rainbow Trout

Sample locations within Farrell Creek (Appendix A, Figure A7) were at locations previously established by Mainstream (2011a) and Golder (2018) to allow comparisons with historical data when possible. To maintain a consistent site-naming convention between tributaries within Task 2c, Mainstream Site FA03 was renamed FAC63.3, Site FA04 was renamed FAC65.7, and Site FA05 was renamed FAC102.1.

Sample locations within Colt Creek (Appendix A, Figure A5) and Kobes Creek (Appendix A, Figure A6) were established in 2017 (Golder 2018) based on ease of access and the quality of fish habitat available (i.e., expected use by immature Rainbow Trout). Sampling was conducted at the same locations in Colt and Kobes creeks each year from 2018 to 2021.

Sampling locations within Maurice Creek (Appendix A, Figure A8) were established during the 2020 survey (Golder 2021a). Eight sampling locations were assessed between River Km 0.6 and River Km 2.0 as measured upstream from Maurice Creek's confluence with the Peace River. The sample locations were selected based on the quality of fish habitat available. Four of the sites were established upstream of the expected inundation zone of the reservoir and four of the sites were established downstream of the expected inundation zone of the reservoir. Sampling was conducted at the same sites in Maurice Creek in 2020 and 2021.

UTMs of sample site locations in Farrell, Colt, Kobes, and Maurice creeks are provided in Appendix A, Table A1.

2.1.3 Moberly River

The Moberly River study area was defined as the portion of the Moberly River from the outlet of Moberly Lake (River Km 123 as measured upstream from the Moberly River's confluence with the Peace River) downstream to the Moberly River confluence (River Km 0.0; Appendix A, Figures A9 and A10).

Previous baseline studies (e.g., Mainstream 2011b) delineated river sections within the Moberly River; these section breaks were implemented in 2021 to maintain consistency with these baseline datasets (Appendix A, Table A2). The habitat classifications used by Mainstream (2011b) to delineate individual sections were as follows:

1) Irregular meanders; frequent riffle complexes interspersed with extended runs with some flats; and
2) Tortuous meanders dominated by low water velocities; flats with few riffle sections.

UTMs of sample site locations in the Moberly River are provided in Appendix A, Table A1.

2.2 Study Period

In 2021, 27 days of sampling were conducted from mid July to early August (all watersheds combined; Table 2). Previous studies had documented a downstream migration of immature Bull Trout out of the Halfway River watershed in mid-August (R.L.&L. 1995); therefore, to facilitate capture of immature Bull Trout prior to the onset of their downstream migration, sampling in the Chowade River and Cypress Creek was conducted over six days between 24 and 30 July. On 25 and 28 July, sampling in the Chowade River and Cypress Creek was attempted; however, due to low clouds and fog, the helicopter was not able to access the river. One day of sampling was conducted in Fiddes Creek on 31 July. The 2021 study periods for the Chowade River and Cypress and Fiddes creeks surveys were similar to the timing of the 2016 to 2020 study periods.

Farrell, Colt, Kobes, and Maurice creeks were sampled over 10 days between 17 July and 8 August (Table 2).

The Moberly River was sampled over 10 days from 21 to 30 July (Table 2). Rather than aligning with historical surveys conducted on the Moberly River (e.g., Mainstream 2011b; Golder 2017, 2018, 2019, 2020a, 2021a) or a specific calendar date, the 2021 survey aligned with appropriate flow conditions for the sampling methods to increase the likelihood of encountering Arctic Grayling.

Table 2: Sampling schedule by tributary for the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Tributary	Sample Dates	Number of Sampling Days
Chowade River	24 and 26 July	3
Cypress Creek	27, 29, and 30 July	3
Fiddes Creek	31 July	1
Farrell Creek	17, 18 and 23 July	3
Colt Creek	21 to 22 July	2
Kobes Creek	23 July and 7 and 8 August	3
Maurice Creek	28 July and 3 August	2
Moberly River	21 to 30 July	10

2.3 Discharge

Discharge data are not available for the Chowade River or Colt, Cypress, Farrell, Fiddes, Kobes, or Maurice creeks. The Water Survey of Canada's Halfway River Above Graham River station (Station Number 07FA003)[14] is located approximately 0.5 km upstream of the Graham River's confluence with the Halfway River. Data from this station were considered representative of tributaries in the Halfway River drainage and the general region based on correlations of station data and Chowade River water surface elevation data collected by Putt et al. (2022).

Discharge data for the Moberly River are from the Water Survey of Canada's Moberly River station (Station Number 07FB008)[15], which is located approximately 2.5 km upstream of the North Monias Road bridge near River Km 45.0 (Appendix A; Figure A10).

Unless stated otherwise, discharge values are daily average values presented in cubic metres per second (m^3/s). Daily averages from 2021 were plotted with descriptive statistics (mean, minimum, and maximum) of daily average discharge from all historical years when data were available for the two gauging stations described above.

2.4 Fish Capture

2.4.1 Halfway River Watershed and Farrell and Maurice Creeks

Backpack electrofishing was used to capture fish in the Chowade River and Colt, Cypress, Farrell, Fiddes, Kobes, and Maurice creeks. All sampling consisted of a single pass in open sites except for two sites on Kobes Creek (KOC-EF-055.5 and KOC-EF-046.7) where block nets were set up at the downstream end of the site to increase the likelihood of catching YOY Rainbow Trout that may have drifted downstream during sampling.

For the Chowade River and Cypress and Fiddes creeks, where Bull Trout were the primary target species, sites were located in wadeable areas where immature Bull Trout densities were expected to be high. These areas were typically located in side-channels or braided sections of the stream that had abundant physical cover, channel widths less than approximately 5 m, mean water depths less than 0.7 m, and water velocities less than 1.0 m/s.

[14] https://wateroffice.ec.gc.ca/report/real_t2ime_e.html?stn=07FA003.

[15] https://wateroffice.ec.gc.ca/report/real_time_e.html?stn=07FB008.

Most sites in the Chowade River and Cypress and Fiddes creeks were dominated by cobble and gravel substrates providing abundant interstitial habitat. Within each site, sampling effort was also focused on areas where the capture of immature Bull Trout was expected to be greatest (e.g., crews focused additional effort around root wads or large boulders if they were present in a site). Backpack electrofishing sites ranged in length from approximately 100 to 300 m. Differences in water elevations and habitat suitability at specific locations among study years reduced the feasibility of repeatedly sampling the same locations year-over-year; however, in some situations, crews were able to sample the same locations as previous study years.

In Farrell, Colt, and Kobes creeks, where Rainbow Trout were the primary target species, the sites sampled in 2021 were also sampled in study years 2017 to 2020. Three of the four sites (FAC63.3, FAC65.7, and FAC102.1) situated on Farrell Creek were previously sampled by Mainstream (2011b). All sites on Farrell, Colt, and Kobes creeks were in mainstem high quality habitats that were conducive for backpack electrofishing, and where Rainbow Trout densities were expected to be high. The sites sampled on Maurice Creek in 2021, were also sampled in 2020. These sites were selected based on the quality of fish habitat available and were situated upstream and downstream of the expected reservoir inundation level.

Backpack electrofishing was conducted with one person operating the electrofisher and one person netting fish. Electrofishing occurred with each crew walking in an upstream direction. Captured fish were netted and transferred to 20 L water-filled buckets equipped with battery-operated aerators (Marine Metal, Clearwater, Florida, USA) that were positioned on the shoreline along the length of the site. Smith-Root™ Model 12, Model 12B, and LR24 backpack electrofishers (Smith-Root, Vancouver, WA, USA) were used, depending on the crew. Electrofisher settings were adjusted as needed to minimize injuries to fish while efficiently capturing the target size and species. Voltage ranged from 100 to 400 V, frequency was set at 60 Hz, and pulse width was 6 ms.

Habitat variables recorded at each site in 2021 (Table 3) were consistent with previous study years (Golder 2017, 2018, 2019, 2020a, 2021a) and baseline studies (e.g., Mainstream 2011b) and were primarily collected to identify differences in sampling conditions and habitat types sampled within and among study years.

The type and amount of instream cover for fish were qualitatively estimated at all sites. Water velocities were visually estimated and categorized at each site as low (less than 0.5 m/s), medium (0.5 to 1.0 m/s), or high (greater than 1.0 m/s). Where water depths were adequate, water clarity was estimated using a “Secchi Bar” that was manufactured based on the description provided by Mainstream and Gazey (2014). Most sites (73%) had low turbidity at the time of sampling and Secchi depths were greater than the maximum water depths encountered. Mean and maximum sample depths were visually estimated at each site.

Table 3: Habitat variables recorded at each site sampled as part of the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Variable	Description
Date	The date the site was sampled
Time	The time the site was sampled
Air Temp	Air temperature at the time of sampling (to the nearest 1°C)
Water Temp	Water temperature at the time of sampling (to the nearest 0.1°C)
Conductivity	Water conductivity at the time of sampling (to the nearest 10 µS/cm)
Secchi Bar Depth	The Secchi Bar depth recorded at the time of sampling (to the nearest 0.1 m)
Cloud Cover	A categorical ranking of cloud cover (Clear = 0-10% cloud cover; Partly Cloudy = 10-50% cloud cover; Mostly Cloudy = 50-90% cloud cover; Overcast = 90-100% cloud cover)
Weather	A general description of the weather at the time of sampling (e.g., comments regarding wind, rain, smoke, or fog)
Electrofisher Model	The model of electrofisher used during sampling
Percent	The estimated duty cycle (as a percent) used during sampling
Amperes	The average amperes used during sampling
Mode	The mode (AC or DC) and frequency (in Hz) of current used during sampling
Volts	The voltage (V) used during sampling
Length Sampled	The length of shoreline sampled (to the nearest 1 m)
Time Sampled	The duration of electrofisher operation (to the nearest 1 second)
Mean Depth	The mean water depth sampled (to the nearest 0.1 m)
Maximum Depth	The maximum water depth sampled (to the nearest 0.1 m)
Instream Velocity	A categorical ranking of water velocity (High = greater than 1.0 m/s; Medium = 0.5 to 1.0 m/s; Low = less than 0.5 m/s)
Instream Cover	The type (i.e., Interstices; Woody Debris; Cutbank; Turbulence; Flooded Terrestrial Vegetation; Aquatic Vegetation; Shallow Water; Deep Water) and amount (as a percent) of available cover
Crew	The field crew that conducted the sampling
Sample Comments	Any additional comments regarding the sample site or sampling conditions

2.4.2 Moberly River

The study plan for the Moberly River survey consisted of crews travelling by inflatable boats down the length of the Moberly River from Moberly Lake to the river's confluence with the Peace River. The six-person team worked as three separate crews: an angling crew, a small-fish boat electroshocking crew, and a backpack electrofishing crew. Immediately prior to the survey, water levels in the Moberly River were decreasing rapidly causing shallow water in the downstream braided sections of the Moberly River (i.e., Sections MR-S7 to MR-S10), thereby reducing navigability of the river. To mitigate the potential of water levels becoming too low to effectively navigate

the survey started at the North Monias Road bridge (River Km 45.0), and crews travelled downstream over five days to the Moberly River's confluence (River Km 0.0). On 26 July crews took out at the Moberly River confluence and transferred all boats and sampling equipment to Moberly Lake Provincial Park (River Km 123.0). From there, crews travelled downstream for an additional five days to the takeout at the North Monias Road bridge. Over the 10-day trip, sampling was conducted in Sections MR-S1A to MR-S10 (Appendix A, Table A2). In 2021, sampling in Section MR-S7 was prioritized since crews identified groundwater-fed side channels in this section during the 2020 survey (Golder 2021a), which provide valuable rearing habitat for YOY Arctic Grayling.

Small-fish boat electroshocking was conducted out of a white-water-style raft (Avon™ 13 Pathmaker; 4 m long by 1.75 m wide; AVON Marine, Port Moody, BC, Canada). Sites were located in main channel habitats where water depths were great enough, and channel widths were wide enough to allow the crew to effectively maneuver the boat. The raft was equipped with a Smith-Root™ 2.5 Generated Powered Pulsator (GPP 2.5; Smith-Root, Vancouver, WA, USA) and a generator contained in a waterproof tub. The electroshocker was connected to a cathode array curtain placed on the stern of the raft and two anode pole arrays extended approximately 1.5 m in front of the raft. The anode poles were angled between 20° and 40° off either side of the bow. While sampling, a single crew member was positioned at the bow of the boat. This crew member netted stunned fish and transferred them to a water-filled holding tank equipped with an aerator positioned behind the bow but in front of the rower. The netter attempted to capture all stunned fish, but priority was given to Arctic Grayling if more than one species was observed at the same time. The rower sat in an elevated chair behind the holding tank and maneuvered the boat with oars braced in oar locks. Electroshocker settings were adjusted at each site, depending on local conditions and the size and species of fish observed, to minimize injury to fish. The electroshocker was operated at 30 Hz pulsed direct current (PDC) and the high output voltage range (50-1000 V) was selected during sampling. The output voltage and pulse width were adjusted by the operator using the Percent of Power control to attain the desired response in fish, which was galvanotaxis (forced swimming) without immediate tetany. The response typically corresponded to a Percent of Power between 35% and 60%. Habitat conditions, as summarized in Table 3, were recorded at each site. Small-fish boat electroshocking sites ranged between 40 and 1600 m in length. The above methods were similar to those employed during the 2017 to 2020 surveys (Golder 2018, 2019, 2020a, 2021a).

Backpack electrofishing was used in locations where water depths were shallow enough and water velocities were low enough to allow safe wading and efficient fish capture using this technique. These sites were often side channel or braided areas. Electrofishing was conducted using a Smith-Root™ Model LR24 (Smith-Root, Vancouver, WA, USA), and settings were adjusted as needed to minimize injuries to fish while allowing efficient capture of the target size and species. Voltage ranged from 120 to 450 V, frequency was 60 Hz, and pulse width ranged from 2 to 4 ms. Backpack electrofishing was conducted with one person operating the electrofisher and one person netting fish. Captured fish were netted and transferred to 20 L buckets of water equipped with aerators and set along the side of the sample site. Habitat conditions, as summarized in Table 3, were recorded at each site. Backpack electrofishing sites ranged in length from 20 to 320 m. The above methods were similar to those employed during the 2016 to 2020 surveys (Golder 2017, 2018, 2019, 2020a, 2021a).

Angling occurred at sites where fish were observed feeding on the surface of the water or other habitats that looked suitable for Arctic Grayling (i.e., upstream/downstream of riffles, near tributary inflows, along eddy lines, and near submerged woody debris). Both spin-casting and fly-fishing equipment were used, and tackle (primarily small spinners and dry flies) was selected to target Arctic Grayling. To potentially increase the catch of target species, angling also occurred opportunistically while the boats travelled between sites and any fish that were

captured while in transit were processed at the site of capture. During each angling effort, total time spent angling was recorded and multiplied by the number of anglers to calculate total angling effort in angler-minutes. Angling effort per site ranged from 4 to 127 angler-minutes.

2.5 Fish Processing

All captured fish were identified to species, counted, weighed to the nearest 1 g, and measured for fork length (FL) to the nearest 1 mm. Total lengths (TL) were recorded for Burbot (*Lota lota*) and sculpin species to the nearest 1 mm. When catches of species other than Arctic Grayling, Bull Trout, or Rainbow Trout exceeded 30 individuals per site, only the first 30 individuals of each species were measured; all other individuals were enumerated and released. Arctic Grayling, Burbot, Bull Trout, Rainbow Trout, and Northern Pike in good condition following processing were implanted with half-duplex (HDX) PIT tags (ISO 11784/11785 compliant) (Oregon RFID, Portland, OR, USA). Tags were implanted within the left axial muscle below the dorsal fin origin and oriented parallel with the anteroposterior axis of the fish. Tagging criteria are summarized as follows:

- Fish between 80 and 199 mm FL received 12 mm long HDX PIT tags (12.0 mm x 2.12 mm HDX+)
- Fish between 200 and 299 mm FL received 23 mm long HDX PIT tags (23.0 mm x 3.65 mm HDX+)
- Fish greater than 300 mm FL received 32 mm long HDX PIT tags (32.0 mm x 3.65 mm HDX+)

After processing, all fish were released at the downstream end of their capture site.

Scale samples were collected from all captured Arctic Grayling and Rainbow Trout. Scales were collected from above the lateral line and posterior to the dorsal fin. The first leading fin ray of the left pectoral fin was collected from all Bull Trout longer than 120 mm FL. Scale and fin ray samples were stored in appropriately labelled coin envelopes.

Small sections of fin tissue were collected for DNA analysis from Arctic Grayling, Bull Trout, and Rainbow Trout that the crew deemed large enough to not be adversely affected by the collection procedure. Tissue samples were also collected from Longnose Dace (*Rhinichthys cataractae*), Redside Shiner (*Richardsonius balteatus*), and Slimy Sculpin (*Cottus cognatus*) captured in the Moberly River to support the Site C Small Fish Translocation Monitoring Program (Mon-15) (Geraldes and Taylor 2020, 2021). Samples were preserved in 95% non-denatured ethyl alcohol and provided to BC Hydro. The samples were not analyzed as part of the current study.

Fin rays (and otoliths from individuals that succumbed to sampling) were collected from a subset of Rainbow Trout, Arctic Grayling, and Bull Trout. A selection of these samples were submitted to BC Hydro for potential microchemistry analysis (Trich Analytics in prep). The findings of these analyses are not presented in this report.

2.6 Fish Ageing

All Rainbow Trout and Arctic Grayling were aged by scale analysis. Scales were aged by counting the number of growth annuli present on the fish scale following methods outlined in Mackay et al. (1990) and RISC (1997). Scales were temporarily mounted between two slides and examined using a trinocular microscope equipped with a digital camera. If needed, several scales were examined, and the highest quality scale was photographed using the integrated 3.1-megapixel digital macro camera and saved as a JPEG-type picture file. All scales were examined independently by two experienced individuals (i.e., “agers”) and ages assigned. For each scale sample,

the agers had access to the species and the date of capture but no other information about the sampled fish (e.g., fork length or capture history). If the two assigned ages did not agree, a third ager assigned an age. If two out of three agers agreed on the age, then this age was used for analysis. If two out of three agers did not agree on an age, then the sample was not used for analysis purposes.

The scale age estimates for Rainbow Trout were cross-checked with the separation of modes in length-frequency histograms of all Rainbow Trout captured in each stream. When the scale age estimates were compared to length-frequency histograms it became apparent that for Rainbow Trout captured in Farrell, Colt, and Kobes creeks, the agers were commonly unable to recognize the first annulus. As a result, the scale age estimates for these systems were generally one year younger than what the length-frequency histograms would indicate. To rectify this discrepancy, the scale age estimates from these streams were increased by one. Rainbow Trout scale age estimates from Maurice Creek were not adjusted, as the estimates generally aligned with the length-frequency histogram.

Bull Trout were aged based on fork lengths and the separation of modes in length-frequency histograms of all fish captured in each stream. This methodology was first implemented during the 2020 study year (Golder 2021a).

2.7 Data Analysis

All data collected during field surveys were entered and stored in a custom MS-Access© database that conforms to BC Hydro's established Site C data standards. Data on field sheets were entered into an MS-Excel spreadsheet, which were then verified by a second person before being uploaded to the database. Before data analysis, a Quality Control / Quality Assurance (QA/QC) review of the database was conducted to identify possible errors. The database QA/QC used histograms and bivariate plots to check the range and format of all variables. Once identified, outliers and erroneous data were reviewed and either corrected or removed from the database. Error screening and data proofing were conducted using both Excel® and the statistical environment R, v. 4.0.3 (R Core Team 2020). Data analyses and tabular data summaries were performed in R. Graphical plots were produced in R using the package ggplot2 (Wickham 2009).

Catch was summarized by sample method, species, life stage, watercourse, and section (where applicable) and presented in tabular format. Catch per unit effort (CPUE) for electrofishing was calculated by dividing the summed total number of fish in a stream captured at all sites by the sum of effort at all sites. Sampling effort was measured in seconds of electrofisher operation, and CPUE was expressed as the number of fish per hour. Length of site was not used to represent sampling effort for CPUE because sampling in the Chowade River and Cypress Creek focused only on optimal habitats and the amount of habitat available and site length sampled was dependent on sampling conditions.

Length-frequency histograms were plotted for the three target species (Bull Trout, Rainbow Trout, and Arctic Grayling) by tributary. Length-frequency histograms were also plotted for Burbot and Mountain Whitefish (*Prosopium williamsoni*) for the Moberly River.

Fish were assigned a life stage of YOY, immature, or adult based on their length. The maximum length for the YOY class was determined for each species based on the difference between the first and second modes in the species' length-frequency distribution. These assignments were corroborated with scale age data where applicable. The immature life stage included fish larger than the YOY group up to 249 mm FL. Fish larger than or equal to 250 mm FL were classified as adult for all target species. Although some individuals larger than

250 mm FL for some species were likely not mature adults and some individuals smaller than 250 mm FL for some species were likely mature adults, 250 mm FL was used as a consistent cut-off to summarize data by length-class.

Backpack electrofishing was the only capture method used in the Halfway River watershed and Farrell and Maurice creeks and is more effective at capturing small-bodied fish than large-bodied fish. As such, incidental catches of adult Bull Trout and adult Rainbow Trout were not considered reliable indicators of adult abundance in these streams.

3.0 RESULTS

Sampling conducted in tributaries to the Peace and Halfway rivers in 2021 was initiated in late July when a gradual decrease in the hydrograph in each drainage was expected. Flows generally decreased within all systems throughout the sampling period and were considered adequate for sampling.

3.1 Tributaries Targeting Bull Trout

3.1.1 Halfway River Discharge and Temperature

An aerial reconnaissance of the study area in the Halfway River watershed and its tributaries was conducted on 14 July prior to the start of sampling. During the reconnaissance, the discharge in the Halfway River was 38 m³/s and approximately 55% below the historical mean discharge level (84 m³/s; 1977-1995, 2012-2014, and 2018-2020) (Figure 1). When sampling began in the Halfway River watershed (24 July 2021), the discharge in the Halfway River had decreased to 30 m^3/s. Flows continued to decrease throughout the sample period and on the last day of sampling, discharge in the Halfway River was 21 m^3/s. Throughout the study period, flows were below the historical average (range = 65 to 81 m^3/s). Average water temperatures at the time of sampling were higher in Cypress Creek (10.7ºC) than in the Chowade River (8.6ºC) and Fiddes Creek (8.7ºC) (Appendix C, Table C1).

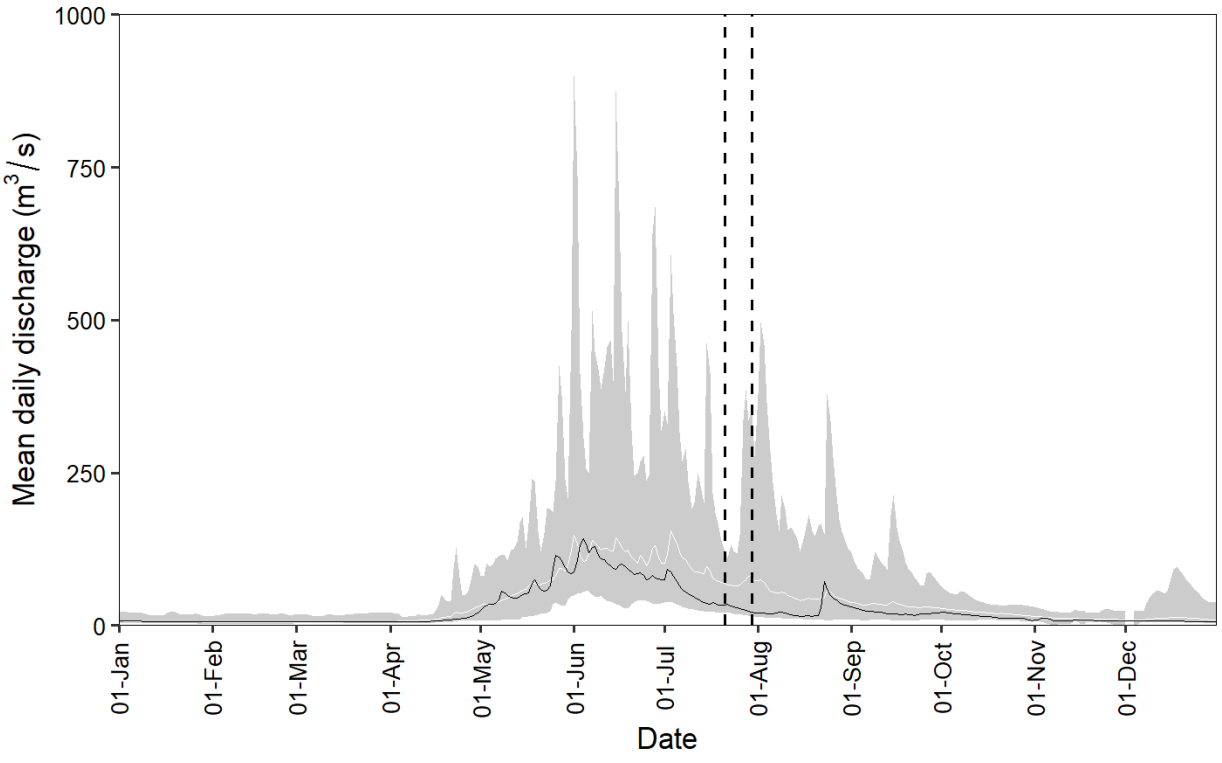

Figure 1: Mean daily discharge in the Halfway River above the Graham River (station 07FA003) in 2021 (black line). The white line shows the mean daily discharge, and the grey ribbon shows the range of minimum to maximum from historical daily discharge data (1977–1995, 2012–2014, and 2018–2020). The vertical dashed lines represent the timing of 2021 study period.

3.1.2 Sample Effort

In total, 40 sites were surveyed in tributaries targeting Bull Trout, including 24 sites in the Chowade River, 12 sites in Cypress Creek, and 4 sites in Fiddes Creek. Approximately 17 hours of backpack electrofishing effort was conducted over 7,681 m of habitat (Table 4). A detailed summary of effort is provided in Appendix B, Table B1.

Table 4: Summary of backpack electrofishing effort employed to target Bull Trout in Halfway River tributaries during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Tributary	Number of Sites	Electrofishing Effort (s)	Electrofishing Effort (h)	Length of Survey (m)
Chowade River	24	29,230	8.1	4,405
Cypress Creek	12	24,175	6.7	2,511
Fiddes Creek	4	7,654	2.1	765
Total	**40**	**61,059**	**16.9**	**7,681**

3.1.3 Catch and Life History

Of the 840 Bull Trout captured in the Chowade River and Cypress and Fiddes creeks combined (Appendix B, Table B4), 567 fish (68%) were implanted with new PIT tags, one was a recapture that was originally tagged in 2020. All remaining Bull Trout (*n* = 273) were not tagged because they were either too small to receive a PIT tag (i.e., less than 80 mm FL; *n* = 261), incidental mortalities (*n* = 7), or unhealthy (i.e., unlikely to survive the tagging process; *n* = 4) (Table 5).

One immature Bull Trout captured in Fiddes Creek was a recapture that was originally captured and tagged in 2020 in Fiddes Creek. In 2020, this Bull Trout was captured at River Km 7.1 and measured 83 mm FL (age-1). In 2021, this same Bull Trout was captured at River Km 7.9 and measured 121 mm FL (age-2).

One adult Bull Trout was captured in Cypress Creek and measured 642 mm FL. This fish was recorded and implanted with a PIT tag; however, this individual was excluded from most analyses because the program does not specifically target this life stage. Adult Bull Trout were not recorded in the Chowade River or Fiddes Creek.

Table 5: Number of fish caught and tagged by life stage, and corresponding CPUE (number of fish per hour), in the Chowade River and Cypress and Fiddes creeks recorded during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Species[a]	Life Stage[b]	Chowade River			Cypress Creek			Fiddes Creek			Total		
		# Caught	# Tagged	CPUE (#/h)	# Caught	# Tagged	CPUE (#/h)	# Caught	# Tagged	CPUE (#/h)	# Caught	# Tagged	CPUE (#/h)
Bull Trout	Adult	0	0	-	1	1	0.1	0	0	-	1	1	<0.1
	Immature	247	216	30.4	241	224	35.9	139	127	65.4	627	567	37.1
	YOY	144	0	17.7	64	0	9.5	4	0	1.9	212	0	12.5
Rainbow Trout	Adult	1	1	0.1	1	1	0.1	1	1	0.5	3	3	0.2
	Immature	6	6	0.7	5	4	0.7	0	0	-	11	10	0.7
	YOY	0	0	-	0	0	-	0	0	-	0	0	-

[a] Table excludes 50 Slimy Sculpin captured in the Chowade River and 59 Slimy Sculpin captured in Cypress Creek.
[b] Life stage was assigned based on fork length. Fish were classified as adult when longer than 249 mm FL, and immature when less than 250 mm FL but greater than the maximum size of YOY. The maximum size of YOY fish varied by species and location and was selected based on modes observed in length-frequency histograms and corroborated with length-at-age data when possible.

Bull Trout YOY (fish with fork lengths less than approximately 70 mm FL) were recorded in all three systems. The CPUE of YOY Bull Trout was highest in the Chowade River (17.7 fish/h), followed by Cypress Creek (9.5 fish/h; Table 7). The CPUE of immature Bull Trout (fish with fork lengths larger than approximately 70 mm FL) was highest in Fiddes Creek (65.4 fish/h) followed by Cypress Creek (35.9 fish/h) and Chowade River (30.4 fish/h).

Length-frequency histograms for Bull Trout (Figure 2) show a mode between approximately 30 and 70 mm FL, and between approximately 80 and 115 mm FL, which correspond to the age-0 (YOY) and age-1 cohorts, respectively. These two modes were evident in all three of the sampled tributaries. A third mode from approximately 120 to 200 mm FL likely corresponds to age-2 and older fish. The length-frequency histograms indicate that age-1 and age-2 Bull Trout are generally larger in Cypress Creek compared to the Chowade River and Fiddes Creek. This apparent growth difference corresponds with warmer water temperatures throughout June and July in Cypress Creek compared to Chowade River and Fiddes Creek (Golder 2022b). Consistent with previous study years (Golder 2021a), Bull Trout larger than 120 mm FL (i.e., likely age-2) were more abundant in Fiddes Creek than in the Chowade River and Cypress Creek.

Of all Bull Trout captured and tagged in 2021, 98.2% were less than 200 mm FL and were implanted with a 12 mm PIT tag (n = 558). The remaining Bull Trout were either tagged with a 23 mm PIT tag (n = 8) or a 32 mm PIT tag (n = 1).

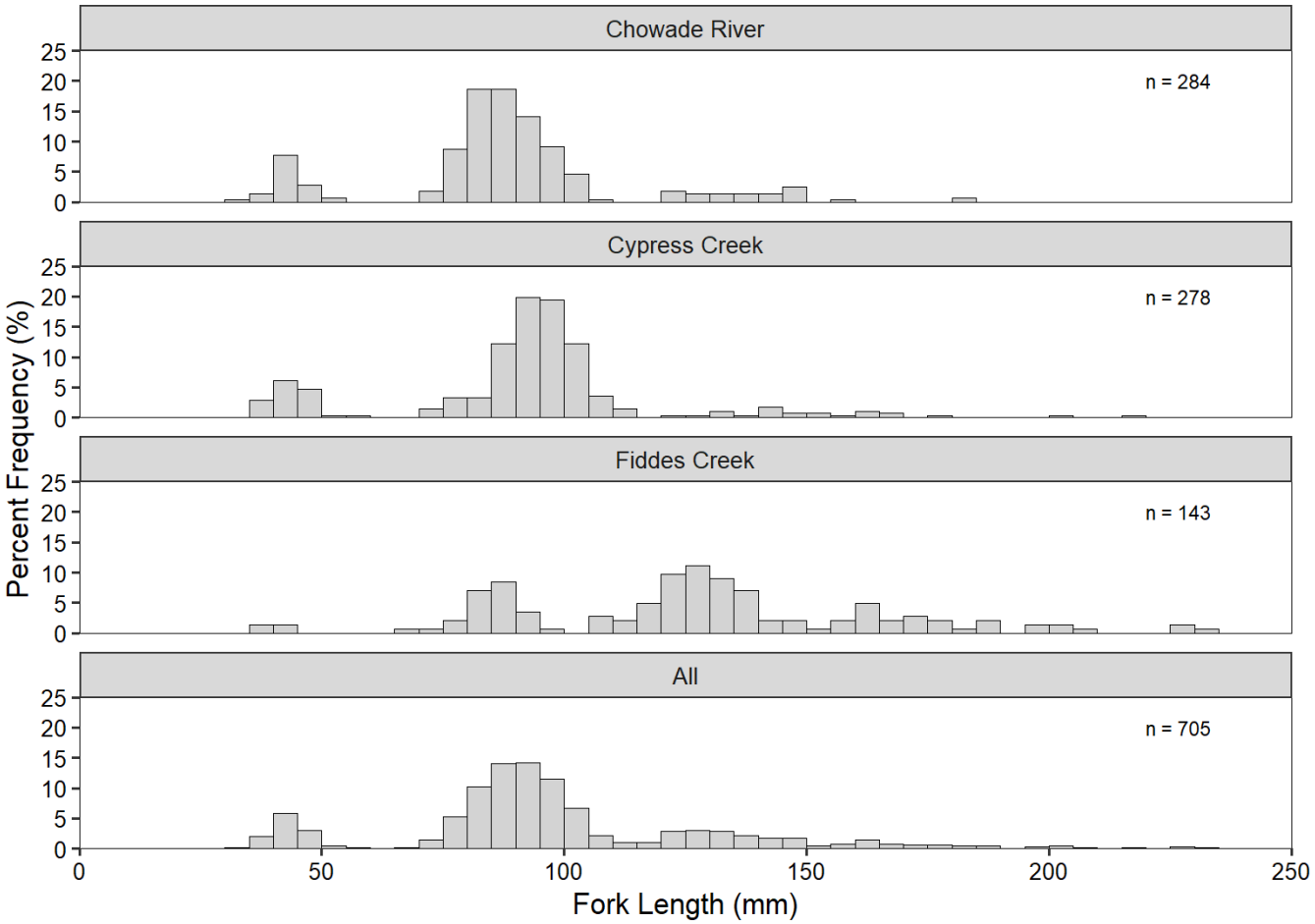

Figure 2: Length-frequency distribution for Bull Trout captured by backpack electrofishing in the Chowade River and Cypress and Fiddes creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021. Analysis does not include Bull Trout that were captured, but not processed, and does not include one adult (i.e., greater than 250 mm FL) Bull Trout captured in Cypress Creek.

In 2021, 704 Bull Trout were assigned ages based on their fork lengths (Figure 3 and Table 6). Age-1 comprised 66% of all Bull Trout assigned ages. The low number of older Bull Trout in the catch was expected and can be attributed to two main reasons: 1) the study specifically targeted immature life stages through backpack electrofishing; and 2) based on the life history of Bull Trout, it is expected that most individuals migrate downstream and out of the study area by age-2 to age-3 [16].

[16] Site C Clean Energy Project Environmental Impact Statement, Volume 2, Appendix Q3.

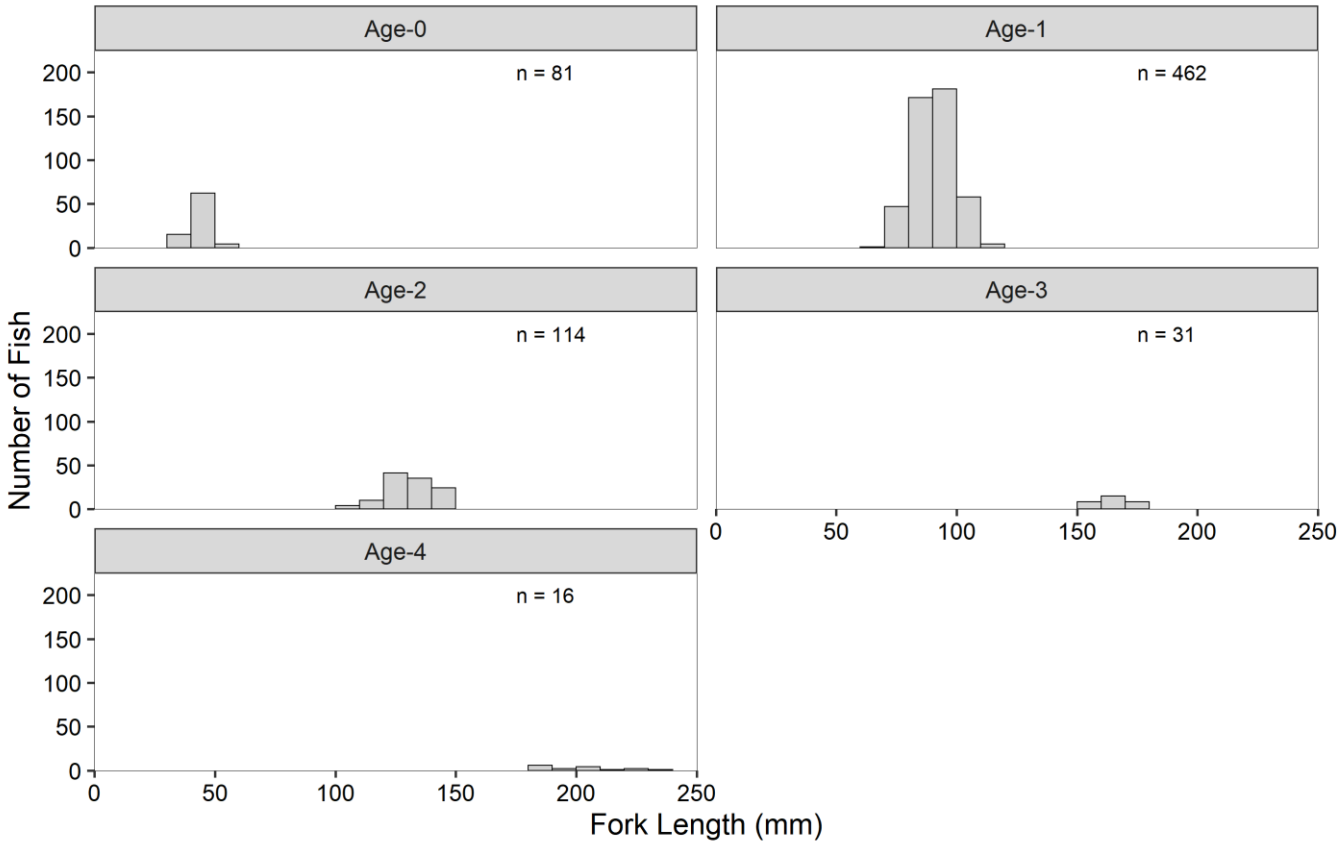

Figure 3: Length-frequency distribution by age class for Bull Trout captured in the Chowade River and Cypress and Fiddes creeks combined, during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Table 6: Descriptive statistics of fork length by age for Bull Trout captured in the Chowade River and Cypress and Fiddes creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021. Ages were assigned based on fork length.

Age	Chowade River			Cypress Creek			Fiddes Creek		
	Average FL ± SD (mm)	Range (mm)	*n*	Average FL ± SD (mm)	Range (mm)	*n*	Average FL ± SD (mm)	Range (mm)	*n*
0	43 ± 3	33 - 52	37	44 ± 4	36 - 55	40	40 ± 2	38 - 43	4
1	87 ± 7	73 - 108	216	94 ± 8	71 - 112	213	84 ± 6	69 - 96	33
2	136 ± 9	121 - 148	28	137 ± 7	123 - 146	13	127 ± 10	105 - 148	73
3	159	n/a	1	162 ± 8	153 - 179	9	166 ± 8	150 - 178	21
4	184	n/a	1	208 ± 10	201 - 215	2	203 ± 17	182 - 231	12

One adult and six immature Rainbow Trout were captured in the Chowade River in 2021 (Table 5). The single adult Rainbow Trout had a length of 274 mm FL and was age-4 based on scale ageing. The six immature Rainbow Trout had lengths that ranged between 102 to 202 mm FL and were assigned either age-1 or age-2 based on their scales.

One adult and five immature Rainbow Trout were captured in Cypress Creek in 2021 (Table 5). The single adult Rainbow Trout had a length of 266 mm FL and was age-4 based on scale ageing. The five immature Rainbow Trout had lengths that ranged between 183 and 213 mm FL and were all age-2 based on an analysis of their scale samples.

A single adult Rainbow Trout with a length of 349 mm FL was captured in Fiddes Creek in 2021 (Table 5). Based on its scale sample, this fish was age-4. All Rainbow Trout captured in the Chowade River, and Cypress and Fiddes creeks in 2021 were implanted with a PIT tag, except for a single individual that was captured in Cypress Creek that succumbed to sampling.

In 2021, captured non-target species included 15 Mountain Whitefish, 302 Slimy Sculpin, and 7 sculpin that were not identified to species (Appendix B, Table B4). Non-target species were only captured in the Chowade River and Cypress Creek.

3.1.4 Interannual Comparison

A comparison of YOY and immature Bull Trout CPUE from 2017 to 2021 indicated similar trends in both the Chowade River and Cypress Creek (Figure 4). In both systems, CPUE for YOY Bull Trout was highest in 2018, followed by low CPUE values in 2019; however, over the past three years (2019 to 2021) CPUE for YOY Bull Trout in the Chowade River and Cypress Creek increased year-over-year. Similarly, the CPUE for immature Bull Trout in both systems increased year-over-year between 2018 and 2021. In 2021, the CPUE for immature Bull Trout in the Chowade River (30.4 fish/h) and Cypress Creek (35.9 fish/h) was higher than all previous study years.

In Fiddes Creek, the CPUE recorded for YOY Bull Trout in 2021 (1.9 fish/h) was higher than in 2019 (0.41 fish/h) and 2020 (0.0 fish/h). In 2021, the CPUE for immature Bull Trout (65.4 fish/h) was higher than the previous three years (2018 to 2020), which ranged between 24.3 and 49.9 fish/h. During all previous sample years, CPUE for YOY Bull Trout has been lower than CPUE for immature Bull Trout in Fiddes Creek.

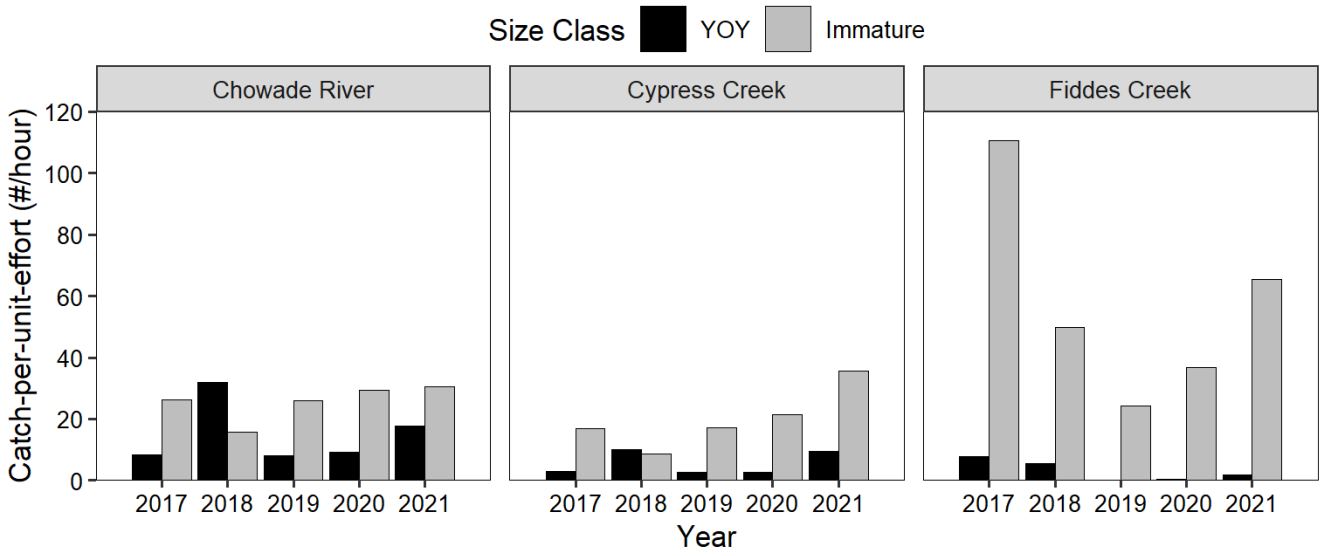

Figure 4: Interannual comparison of catch per unit effort (fish/h) for Bull Trout captured by backpack electrofishing in the Chowade River and Cypress and Fiddes creeks, during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2017–2021.

3.2 Tributaries Targeting Rainbow Trout

3.2.1 Sample Effort

In 2021, targeted sampling for Rainbow Trout was conducted at 30 index sites distributed between Colt Creek (8 sites), Farrell Creek (6 sites), Kobes Creek (8 sites), and Maurice Creek (8 sites). Approximately 15 hours of backpack electrofishing effort were conducted over 5,981 m of habitat. A summary of backpack electrofishing effort by the number of sites surveyed, length of habitat sampled, and seconds of backpack electrofisher operation is provided for each tributary in Table 7 and in Appendix B, Table B1.

Table 7: Summary of backpack electrofishing effort employed in Colt, Farrell, Kobes, and Maurice creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Stream	Number of Sites	Electrofishing Effort (s)	Electrofishing Effort (h)	Length of Survey (m)
Colt Creek	8	13,308	3.7	1,600
Farrell Creek	6	11,219	3.1	1,181
Kobes Creek	8	16,242	4.5	1,600
Maurice Creek	8	12,877	3.6	1,600
Total	**30**	**53,646**	**14.9**	**5,981**

3.2.2 Catch and Life History

The Rainbow Trout populations in Colt and Kobes creeks are suspected resident populations, while Farrell and Maurice creeks are suspected recruitment sources for the Peace River Rainbow Trout population (Mainstream 2012). Of the 308 Rainbow Trout captured in Colt, Farrell, Kobes, and Maurice creeks combined, 245 fish (89%) were implanted with new PIT tags, and 16 were recaptures that were implanted with PIT tags during a previous study year (Table 8; Appendix B, Table B5). Rainbow Trout that were not tagged (*n* = 47) were either too small to receive a PIT tag (i.e., less than 80 mm FL; *n* = 2), incidental mortalities (*n* = 18), or were unhealthy and unlikely to survive the tagging process (*n* = 4).

In 2021, as in previous years, immature Rainbow Trout were the dominant size class, accounting for 89% of all Rainbow Trout captured (Table 8). YOY Rainbow Trout were captured in all streams except Farrell Creek.

Table 8: Number of fish caught and tagged in Colt, Farrell, Kobes, and Maurice creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Species	Life Stage[a]	Colt Creek			Farrell Creek			Kobes Creek			Maurice Creek			Total		
		# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)
Target Species																
Arctic Grayling	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Imm.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	YOY	-	-	-	-	-	-	6	0	1.3	-	-	-	6	0	0.4
Bull Trout	Adult	1	1	0.3	-	-	-	-	-	-	-	-	-	1	1	<0.1
	Imm.	9	8	2.4	-	-	-	-	-	-	3	2	0.8	12	10	0.8
	YOY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rainbow Trout	Adult	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Imm.	46	45	12.4	78	75	25.0	98	91	21.7	52	50	14.5	274	261	18.4
	YOY	7	0	1.9	-	-	-	26	0	5.8	1	0	0.3	34	0	2.3
Non-Target Species																
Lake Chub	All	-	-	-	27	-	8.7	38	-	8.4	-	-	-	65	-	4.4
Largescale Sucker	All	-	-	-	17	-	5.5	10	-	2.2	-	-	-	27	-	1.8
Longnose Dace	All	8	-	2.2	68	-	21.8	31	-	6.9	153	-	42.8	260	-	17.4
Longnose Sucker	All	17	-	4.6	21	-	6.7	9	-	2.0	25	-	7.0	72	-	4.8

Species	Life Stage[a]	Colt Creek			Farrell Creek			Kobes Creek			Maurice Creek			Total		
		# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)	# Captured	# Tagged	CPUE (#/h)
Mountain Whitefish	All	23	-	6.2	-	-	-	9	-	2.0	3	-	0.8	35	-	2.4
Northern Pikeminnow	All	-	-	-	4	-	1.3	-	-	-	-	-	-	4	-	0.3
Prickly Sculpin	All	-	-	-	-	-	-	-	-	-	43	-	12.0	43	-	2.9
Redside Shiner	All	-	-	-	117	-	37.5	40	-	8.9	4	-	1.1	161	-	10.8
Slimy Sculpin	All	72	-	19.5	30	-	9.6	83	-	18.4	31	-	8.7	216	-	14.5
Sculpin Unidentified	All	18	-	4.9	7	-	2.2	-	-	-	3	-	0.8	28	-	1.9
Sucker Species	All	-	-	-	25	-	8.0	3	-	0.7	2	-	0.6	30	-	2.0
Trout-perch	All	-	-	-	7	-	2.2	-	-	-	-	-	-	7	-	0.5
White Sucker	All	-	-	-	-	-	-	-	-	-	1	-	0.3	1	-	<0.1

[a] Life stage was assigned based on fork length. Fish were classified as adult when longer than 249 mm FL, and immature when less than 250 mm FL and larger than the YOY maximum size. YOY maximum size was approximately 50 mm FL based on Rainbow Trout captured in previous sample years (Golder 2018, 2019, 2020a, 2021a).

All 16 Rainbow Trout recaptured in 2021 were originally captured in 2020 (Table 9). Recaptured Rainbow Trout were from Kobes and Maurice creeks, and all individuals were recaptured within approximately 200 m of their original capture location in 2020. All recaptured fish were age-2 and ranged between 126 and 158 mm FL in Kobes Creek and ranged between 161 and 195 mm FL in Maurice Creek.

Table 9: Details of recaptured Rainbow Trout from Colt, Farrell, Kobes, and Maurice creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

PIT tag number	Original Capture Details					Recapture Details				
	Date of Original Capture (mm-dd-yyyy)	Stream	River Km	FL	Age	Date of Recapture (mm-dd-yyyy)	Stream	River Km	FL	Age
900226001617144	08-13-2020	Kobes Creek	55.3	96	1	08-01-2021	Kobes Creek	55.5	148	2
900226001617227	08-13-2020		55.5	86	1	08-01-2021		55.5	148	2
900226001617138	08-13-2020		55.3	102	1	08-01-2021		55.5	158	2
900226001617010	08-13-2020		55.5	86	1	08-01-2021		55.5	129	2
900226001617080	08-13-2020		46.9	96	1	08-01-2021		46.7	145	2
900226001617162	08-13-2020		55.3	87	1	08-01-2021		55.3	133	2
900226001617038	08-13-2020		55.3	94	1	08-01-2021		55.3	151	2
900226001617174	08-13-2020		55.3	87	1	08-01-2021		55.3	147	2
900226001617075	08-13-2020		55.3	87	1	08-01-2021		55.3	152	2
900226001617026	08-13-2020		55.3	96	1	08-01-2021		55.3	151	2
900226001617241	08-13-2020		55.3	87	1	08-01-2021		55.3	126	2
900226001617035	08-13-2020		55.3	90	1	08-01-2021		55.3	140	2
900226001617021	08-07-2020	Maurice Creek	1.3	113	1	07-28-2021	Maurice Creek	1.5	171	2
900226001617178	08-07-2020		1.7	105	1	07-28-2021		1.5	161	2
900226000980730	08-06-2020		0.8	176	1	07-28-2021		0.6	195	2
900226001039516	08-06-2020		0.8	106	1	07-28-2021		1.0	188	2

Length-frequency histograms for Rainbow Trout (Figure 5) showed distinct modes for different age cohorts. In Colt, Kobes, and Maurice creeks, there were modes present between 20 and 50 mm FL corresponding to age-0 (YOY) fish. The capture of these individuals provides evidence of successful recruitment for the 2021 cohort. Age-0 fish were not captured in Farrell Creek in 2021.

Modes for immature Rainbow Trout were also apparent in the length-frequency histograms; however, these modes differed between tributaries, indicating different growth rates between creeks. In Colt and Farrell creeks, modes appear similar but suggest slower growth rates for immature Rainbow Trout compared to Kobes and Maurice creeks. In Colt Creek, a single Rainbow Trout was captured with a fork length of 72 mm. This fish is likely age-1, as it corresponds to a mean length at age-1 (70 mm FL in Colt Creek) from the previous study year (Golder 2021a). In Colt Creek, a mode between approximately 100 and 150 mm FL, likely corresponds to age-2 individuals, which generally aligns with a distinct mode in Farrell Creek (range = 90 to 150 mm FL). The length for age-2 Rainbow Trout in Farrell Creek is supported by the findings of the previous year (2020), when age-1 Rainbow Trout in Farrell ranged from 66 to 98 mm FL (Golder 2021a).

In Kobes Creek, a mode for age-1 Rainbow Trout was evident between approximately 70 and 120 mm FL, and a mode for age-2 Rainbow Trout was evident between approximately 120 and 170 mm FL. In Maurice Creek, a mode for age-1 Rainbow Trout was evident between approximately 70 and 130 mm FL.

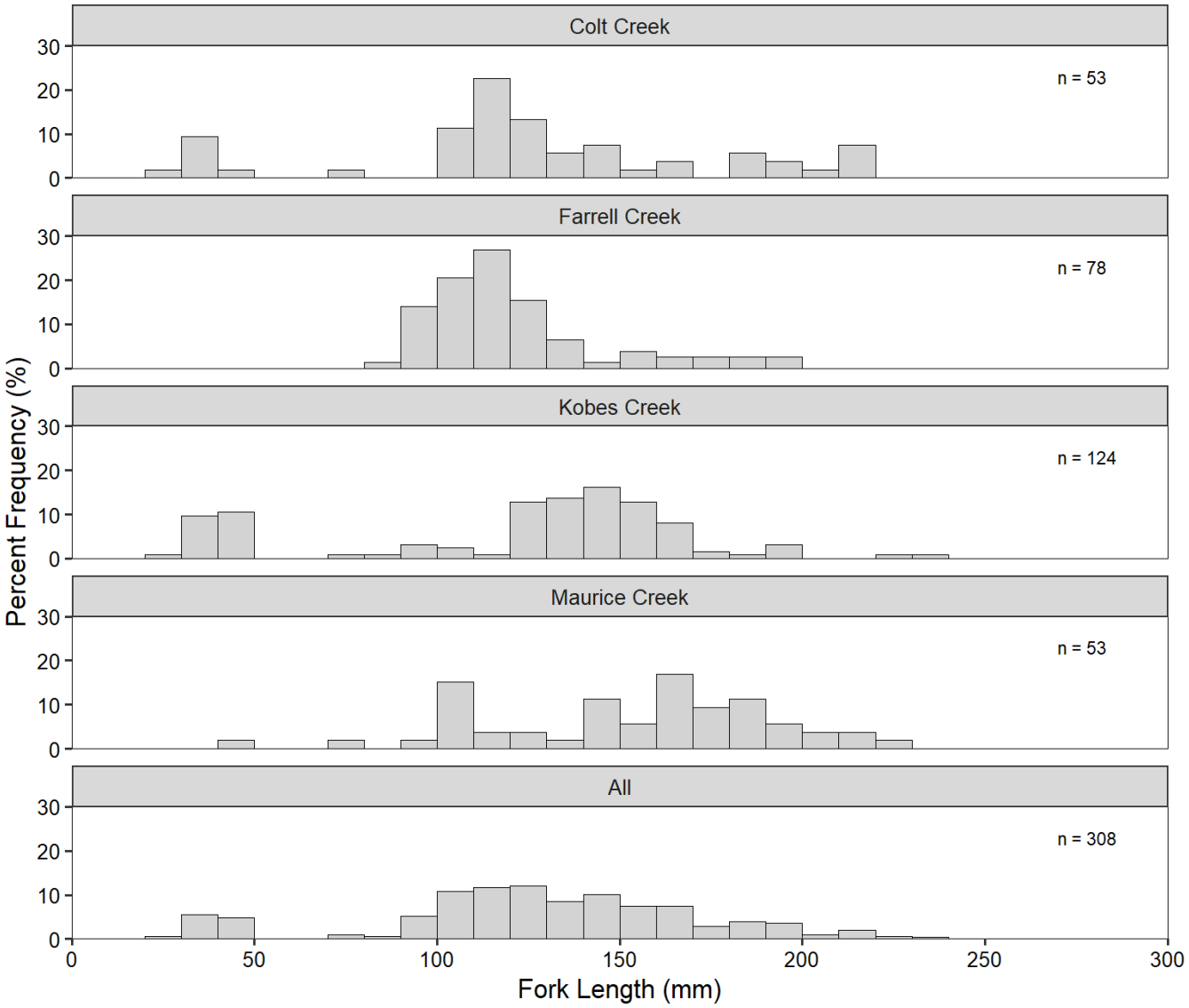

Figure 5: Length-frequency distribution for Rainbow Trout captured by backpack electrofishing in Colt, Farrell, Kobes, and Maurice creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Ages were assigned to 300 of the 308 Rainbow Trout captured in 2021 (Table 10). These fish ranged in age from age-0 to age-4 and were included in all age-related analyses (Figure 6 and Table 10). The first annuli were not consistently visible on Rainbow Trout scales from Colt, Farrell, and Kobes creeks, which resulted in most individuals from these streams being assigned to younger age-classes by the agers. Ages from fish captured in these streams were adjusted by one year, which aligned more accurately with distinct modes in the

length-frequency histograms. Furthermore, encounter history data for recaptured individuals were used to correct ages when possible. Given apparent differing growth rates for Rainbow Trout among streams (Figure 5), overlapping length distributions were apparent for all age-classes greater than age-0 (Figure 6). There was less overlap in length distributions by age-class within individual streams (Table 10).

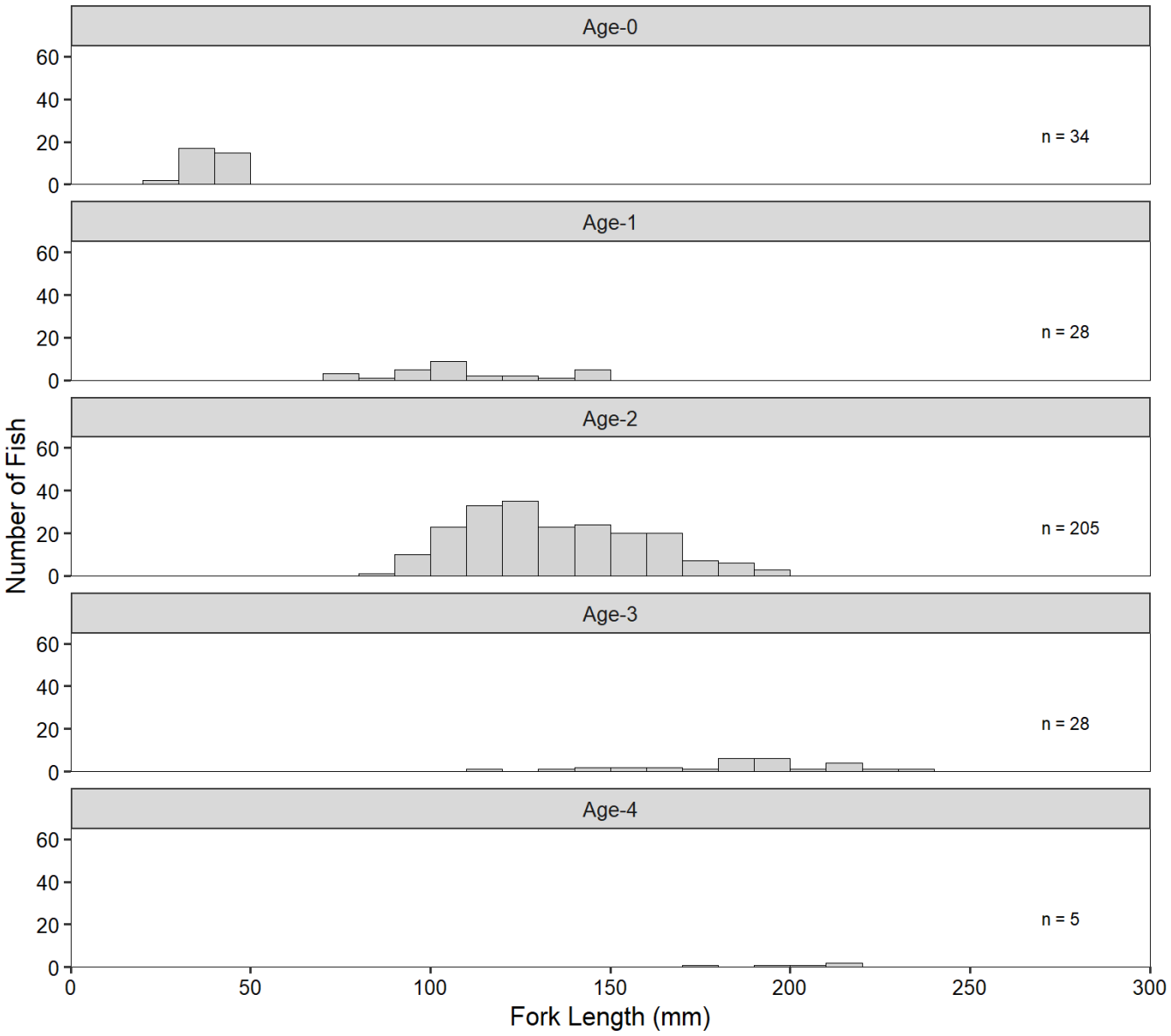

Figure 6: Length-frequency by age-class for Rainbow Trout captured in Colt, Farrell, Kobes, and Maurice creeks combined during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Table 10: Descriptive statistics of fork length by age for Rainbow Trout captured in Colt, Farrell, Kobes, and Maurice creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Age	Colt Creek			Farrell Creek			Kobes Creek			Maurice Creek		
	Mean FL ± SD	Range	*n*	Mean FL ± SD	Range	*n*	Mean FL ± SD	Range	*n*	Mean FL ± SD	Range	*n*
0	32 ± 4	28 – 41	7	-	-	-	40 ± 6	26 - 49	26	44	n/a	1
1	72	n/a	1	-	-	-	94 ± 9	79 - 109	7	117 ± 20	75 - 148	20
2	122 ± 15	101 - 168	34	115 ± 17	89 - 180	66	144 ± 16	103 - 190	81	171 ± 13	145 - 195	24
3	192 ± 17	163 - 216	8	161 ± 26	118 - 194	8	192 ± 39	145 – 239	6	199 ± 16	181 – 215	6
4	212 ± 5	207 - 217	3	187 ± 14	177 - 197	2	-	-	-	-	-	-

Ten Bull Trout were captured in Colt Creek with fork lengths between 128 and 340 mm, and three Bull Trout were captured in Maurice Creek with fork lengths between 141 and 202 mm. All captured Bull Trout were implanted with PIT tags except for a single individual from Colt Creek that was not tagged because it was unhealthy, and a single individual from Maurice Creek that succumbed to sampling. Bull Trout were not captured in Farrell or Kobes creeks.

Six YOY Arctic Grayling were captured in Kobes Creek, providing evidence of a spawning population of Arctic Grayling within this system. Arctic Grayling were not captured in Kobes Creek prior to 2021 as part of this survey. Fork lengths of these individuals ranged between 62 and 66 mm and were too small to be implanted with PIT tags.

Block nets used at the downstream end of Kobes Creek sites KOC-EF-055.5 and KOC-EF-046.7 did not result in increased Rainbow Trout YOY catch (i.e., no YOY fish were observed in the netting at the end of sampling). The block net at KOC-EF-055.5 captured five Slimy Sculpin, and the block net at KOC-EF-046.7 captured one sculpin that was too small to identify to species.

In 2021, non-target fish species captured in Colt, Farrell, Kobes, and Maurice creeks, in declining order of abundance, included Longnose Dace (*n* = 260), Slimy Sculpin (*n* = 216), Redside Shiner (*n* = 161), Longnose Sucker (*Catostomus catostomus; n* = 72), Lake Chub (*Couesius plumbeus*; *n* = 65), Prickly Sculpin (*Cottus asper; n* = 43), Mountain Whitefish (*n* = 35), sucker spp. (*n* = 30), sculpin spp. (*n* = 28), Largescale Sucker (*Catostomus macrocheilus; n* = 27), Trout-perch (*Percopsis omiscomaycus; n* = 7), Northern Pikeminnow (*Ptychocheilus oregonensis; n* = 4), and White Sucker (*Catostomus commersonii; n* = 1).

Mountain Whitefish were the only non-target salmonid species encountered, and they were captured in Colt (*n* = 23), Kobes (*n* = 9), and Maurice (*n* = 3) creeks. Lengths of Mountain Whitefish ranged between 45 and 255 mm FL.

3.2.3 Interannual Comparison

In 2021, YOY Rainbow Trout were captured in Colt, Kobes, and Maurice creeks, with the highest CPUE for YOY Rainbow Trout recorded in Kobes Creek (5.76 fish/h). YOY were not captured in 2021 or 2020 in Farrell Creek; however, CPUE for immature Rainbow Trout in 2021 was high in Farrell Creek (25.0 fish/h), suggesting successful Rainbow Trout recruitment in Farrell Creek in 2020, despite the lack of YOY fish in the catch during the 2020 study year. CPUE for immature Rainbow Trout in 2021 was lower than in 2020 but remained within the range of CPUE values recorded during in previous study years.

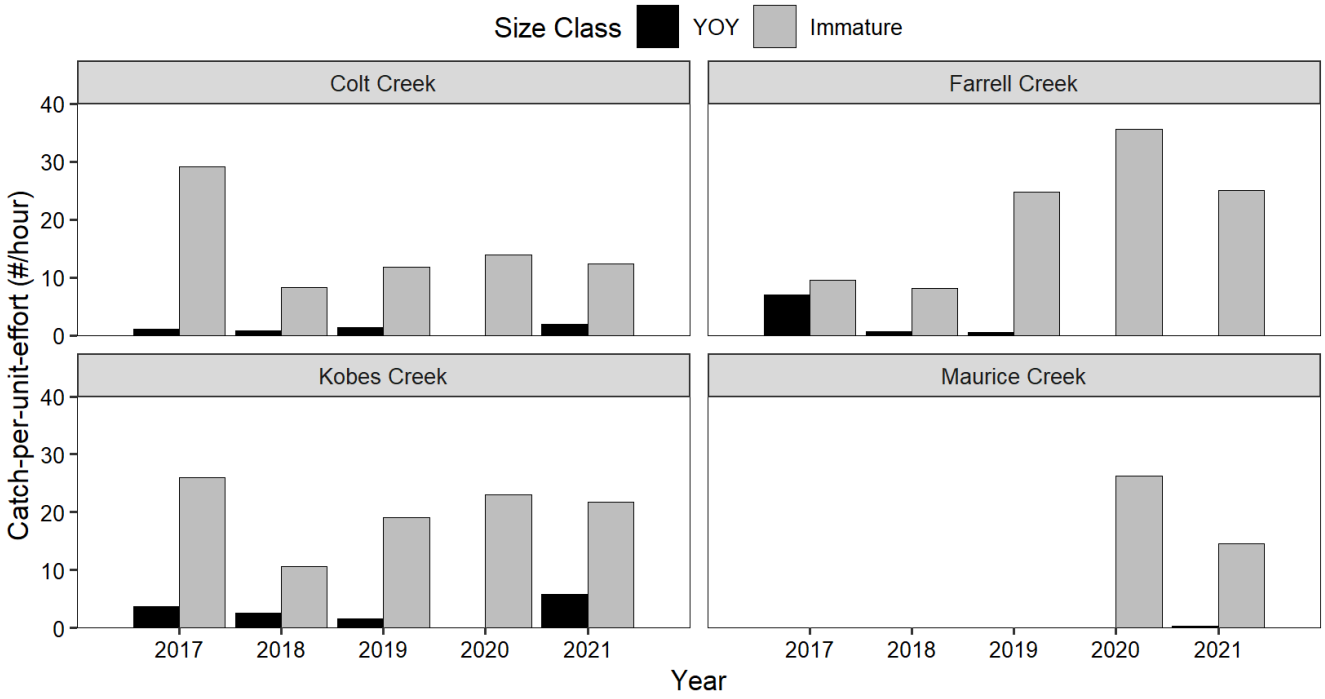

Figure 7: Interannual comparison of catch per unit effort (fish/h) for Rainbow Trout captured by backpack electrofishing in the Colt, Farrell, Kobes, and Maurice creeks during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2017–2021. Maurice Creek was not sampled prior to 2020.

3.3 Moberly River

3.3.1 Moberly River Discharge and Temperature

Moberly River discharge typically decreases from June to September (Water Survey of Canada Station 07FB008; Figure 8). In 2021, sampling in the Moberly River was conducted from 21 to 30 July (similar timing as the 2019 study, and approximately 1 week earlier than the 2020 study). During the 2021 study period, Moberly River discharge remained below the historical average, with a mean discharge of 7.0 m^3/s. Over the 10-day study period, discharge in the Moberly River decreased from 8.4 to 5.4 m^3/s (Figure 8). The discharge range was adequate for sampling; however, near the end of the study period, it became challenging to navigate the low water and the rafts had to be dragged over some shallow riffle areas. The low water levels experienced in 2021 also limited the amount of side channel habitat available for sampling.

During the 2021 study period, water temperatures in the Moberly River ranged between 9.0°C and 23.6°C (mean = 17.6°C) (Appendix C, Table C1). The coldest water temperatures (i.e., 9.0°C) were recorded near locations where groundwater upwelling was observed.

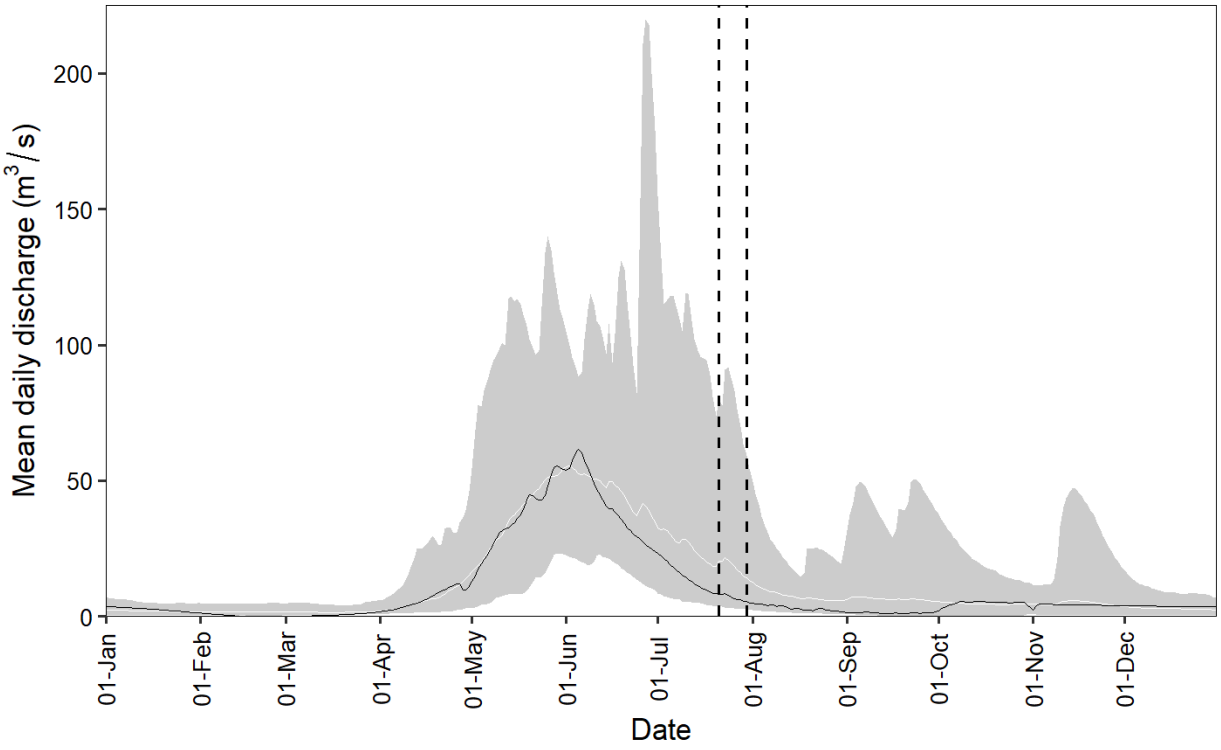

Figure 8: Mean daily discharge in the Moberly River near Fort St. John (station 07FB008) in 2021 (black line). The white line shows the mean daily discharge and grey ribbon shows the range from minimum to maximum from historical daily discharge data from 2001 to 2020. Vertical dashed lines show the 2021 study period.

3.3.2 Sample Effort

Sampling was conducted at 34 backpack electrofishing sites and 58 boat electrofishing sites over 11 sections of the Moberly River. In total, 27.5 angler-hours of angling effort was conducted at 72 angling sites (Table 11)[17]. Summaries of effort employed during the Moberly River survey by section and capture method are provided in Appendix B, Tables B1 to B3.

[17] To increase potential catch of target species, angling also occurred opportunistically while the boats were travelling between sites and any fish captured while in transit were processed at the location of capture. The level of effort employed during this opportunistic sampling is not included in the effort summaries presented in this report.

Table 11: Summary of sampling effort employed in the Moberly River by section during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Section	Backpack Electrofishing			Small Boat Electroshocking			Angling	
	Number of Sites	Effort (s)	Effort (m)	Number of Sites	Effort (s)	Effort (m)	Number of Sites	Effort (h)
MR-S1A	3	3,786	257	7	2,933	4,390	6	6.4
MR-S1	2	1,579	139	4	3,559	3,663	4	1.5
MR-S2	1	1,104	106	4	3,211	3,771	5	1.6
MR-S3	1	1,303	75	5	3,298	3,552	8	2.3
MR-S4	2	1,048	143	3	1,961	3,390	4	1.0
MR-S5	2	2,201	193	4	2,235	4,060	5	1.0
MR-S6	1	948	88	2	731	1,229	2	0.3
MR-S7	15	13,750	2,031	18	9,668	14,778	22	9.1
MR-S8	3	2,939	490	5	3,045	6,106	8	2.3
MR-S9	2	1,415	158	2	1,469	2,610	4	1.0
MR-S10	2	1,972	335	4	3,047	5,430	4	1.1
Total	**34**	**32,045**	**4,015**	**58**	**35,157**	**52,979**	**72**	**27.5**

3.3.3 Catch and Life History

In total, 42 Arctic Grayling were captured in the Moberly River in 2021. Life history and capture data are provided in Appendix B, Table B7. Sections MR-S7 and MR-S8 accounted for 71% and 14% of the total Arctic Grayling catch, respectively. No more than one Arctic Grayling was captured in each of the remaining sections of the Moberly River. During previous study years, angling was the most effective method for capturing Arctic Grayling (i.e., 2019 and 2020); however, in 2021, backpack electrofishing was the most successful method, accounting for 57% of the total Arctic Grayling catch.

Of the 42 Arctic Grayling captured in the Moberly River, 15 (38%) were implanted with PIT tags, and one was a recapture that was originally tagged in 2020 (Table 12). All remaining Arctic Grayling were not tagged because they were too small to receive a PIT Tag (i.e., less than 80 mm FL; n = 23), incidental mortalities (n = 2), or were unhealthy and unlikely to survive the tagging process (n = 1).

The Arctic Grayling that was originally captured in 2020, measured 155 mm FL upon original capture (age-1), and measured 218 mm FL in 2021 (age-2). In 2020, this individual was captured by angling at River Km 38.9, and in 2021, this individual was captured by small-fish boat electroshocking at River Km 38.2.

Table 12: Number of FAHMFP indicator species fish caught and tagged in the Moberly River during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Species	Life Stage[a]	Angling			Backpack Electrofishing			Small-Fish Boat Electroshocking			Total		
		# Caught	# Tagged	CPUE (#/h)	# Caught	# Tagged	CPUE (#/h)	# Caught	#Tagged	CPUE (#/h)	# Caught	# Tagged	CPUE (#/h)
Arctic Grayling	Adult	1	1	<0.1	-	-	-	2	2	0.2	3	3	<0.1
	Immature	6	6	0.2	1	1	0.1	8	6	0.8	15	13	0.3
	YOY	-	-	-	24	-	2.7	-	-	-	24	-	0.5
Burbot	Adult	-	-	-	1	1	0.1	1	1	0.1	2	2	<0.1
	Immature	-	-	-	20	18	2.2	15	13	1.5	35	31	0.8
	YOY	-	-	-	1	1	0.1	-	-	-	1	1	<0.1
Mountain Whitefish	Adult	-	-	-	-	-	-	129	-	13.2	129	-	2.8
	Immature	6	-	0.2	11	-	1.2	366	-	37.5	383	-	8.3
	YOY	-	-	-	135	-	15.2	76	-	7.8	211	-	4.6
Northern Pike	Adult	-	-	-	-	-	-	1	1	0.1	1	1	<0.1
	Immature	1	-	<0.1	21	14	2.4	4	4	0.4	26	20	0.5

[a] Life stage was assigned based on fork length. Fish were classified as adult when longer than 249 mm FL and immature when between approximately 60 and 250 mm FL. The maximum size of YOY fish varied by species and was selected based on modes observed in length-frequency histograms and corroborated with length-at-age data when possible.

While low numbers (*n* = 2 to 4 individuals/year) of Bull Trout were captured during some previous study years (2016, 2018, 2019, and 2020), Bull Trout were not captured in 2021.

Non-target species comprised the majority of the Moberly River catch (all methods combined). Captured species by section are presented in Appendix B, Table B6. A summary of catch by capture method for target species is provided in Table 12. All YOY Arctic Grayling were captured by backpack electrofishing (*n* = 24). Small-fish boat electrofishing and angling captured the greatest number of immature Arctic Grayling (*n* = 12). CPUE for YOY Arctic Grayling was 2.7 fish/hour for backpack electrofishing and CPUE for immature Arctic Grayling was less than 1 fish/hour for all three methods. Small-fish boat electroshocking caught more fish than all other methods for most species and life stages.

As in previous years, Arctic Grayling length-frequency data from 2021 indicate that a wide range of size classes use the Moberly River (Figure 9). Distinct modes were apparent in the length-frequency data, with age-0 Arctic Grayling occurring between 40 and 80 mm FL, age-1 individuals between 130 and 170 mm FL, age-2 individuals between 200 and 230 mm FL, and age-3 and older individuals being approximately 250 mm FL or larger.

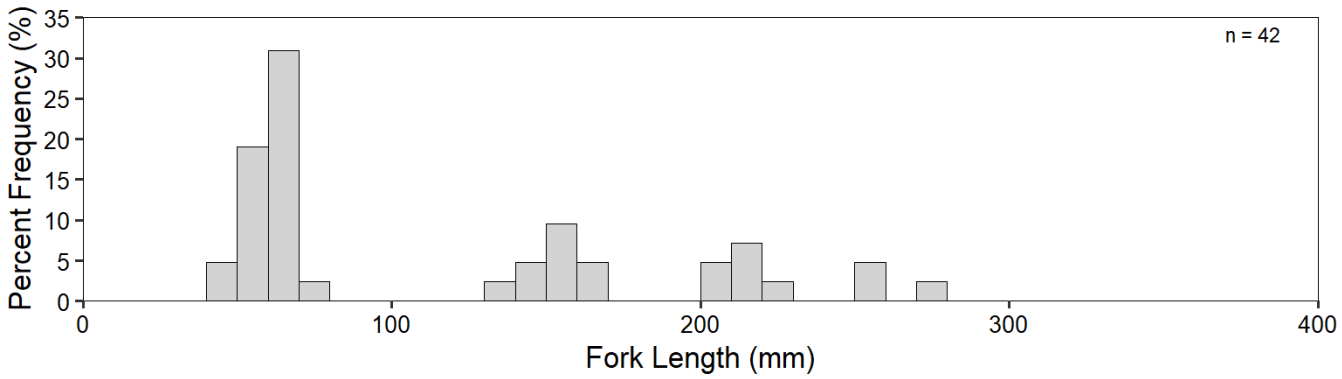

Figure 9: Length-frequency distribution for Arctic Grayling captured in the Moberly River (all capture methods combined) during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Ages were assigned to all 42 Arctic Grayling captured in 2021 and ranged between age-0 and age-4 (Figure 10 and Table 13). Age data supported the age assignments based on length-frequency modes detailed above and inter-year mark-recapture data. The majority (79%) of Arctic Grayling captured in 2021 were age-0 and age-1.

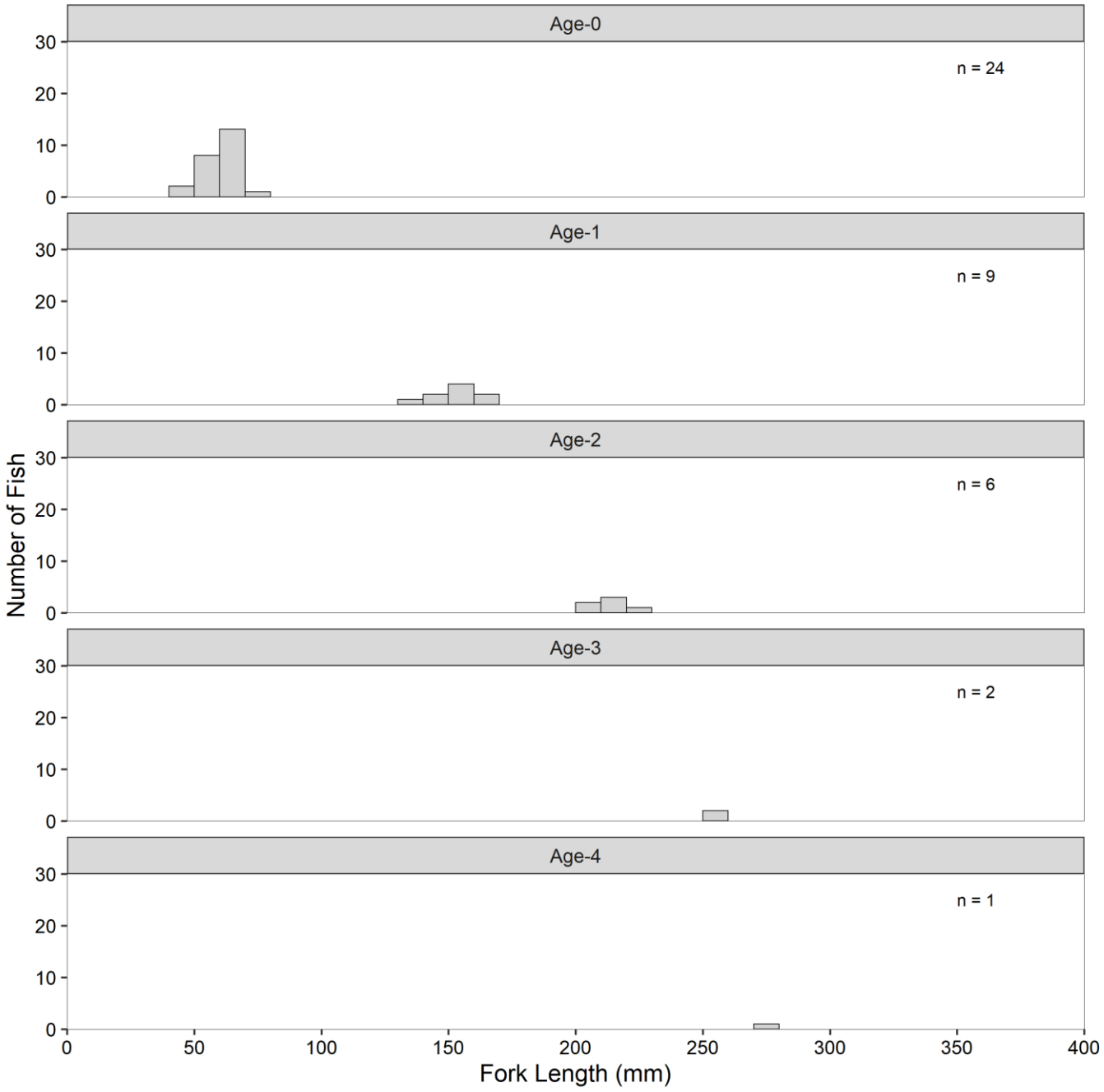

Figure 10: Length-frequency distribution by age class for Arctic Grayling captured in the Moberly River during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Table 13: Descriptive statistics of fork length and weight by age for Arctic Grayling captured in the Moberly River during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021. Ages were assigned based on scale samples.

Age	Fork Length			Weight		
	Average ± SD (mm)	Range (mm)	*n*	Average ± SD (g)	Range (g)	*n*
0	61 ± 6	48 – 72	24	3 ± 1	2 – 5	23
1	152 ± 10	133 – 166	9	43 ± 8	26 – 57	9
2	212 ± 8	201 – 223	6	104 ± 15	85 – 130	6
3	254 ± 3	252 – 256	2	190 ± 19	178 – 204	2
4	270	n/a	1	256	n/a	1

The length-frequency histogram for Burbot, a FAHMFP indicator species, suggests a mode representing age-1 individuals from approximately 90 to 160 mm TL and age-2 fish at approximately 160 to 260 mm TL (Figure 11). In previous years, age-0 Burbot have been captured in the Moberly River (Golder 2021a); however, this cohort was rarely recorded in the catch in 2021.

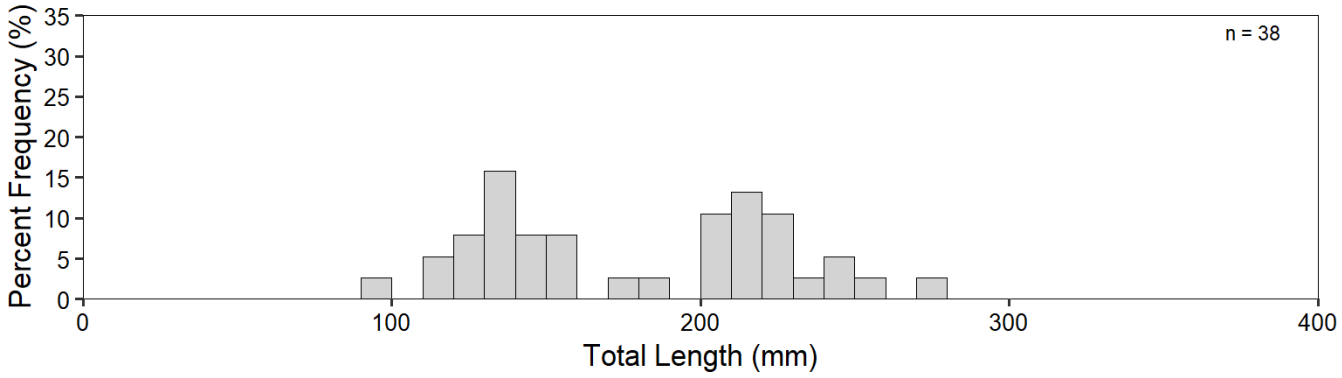

Figure 11: Length-frequency distribution for Burbot captured in the Moberly River (all capture methods combined) during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

The length-frequency histogram for Mountain Whitefish suggests a mode representing age-0 fish from 20 to 90 mm FL, age-1 fish from 110 to 160 mm FL, and age-2 and older fish starting at approximately 170 mm FL; however, the distribution of individual cohorts overlapped after age-0 (Figure 12). The modes apparent for Mountain Whitefish captured in the Moberly River in 2021 align closely with previous study years (Golder 2019, 2020a, 2021a), suggesting similar annual growth rates.

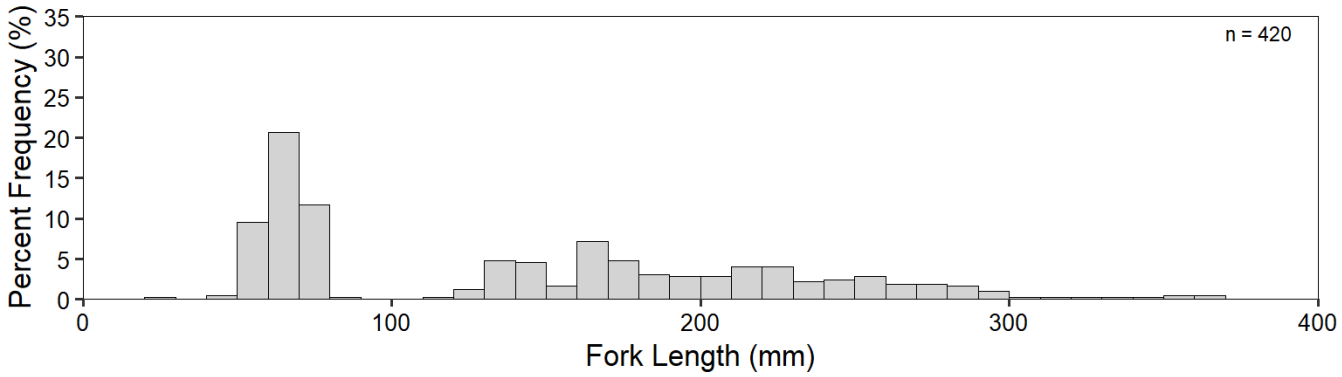

Figure 12: Length-frequency distribution for Mountain Whitefish captured in the Moberly River (all capture methods combined) during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

3.4 Genetic and Microchemistry Tissue Sample Collection

In 2021, small pieces of fin tissue for DNA analysis were collected from 41 Arctic Grayling, 547 Bull Trout, and 277 Rainbow Trout (Table 14). Fin tissue samples were also collected from Redside Shiner (*n* = 25), Longnose Dace (*n* = 23), and Slimy Sculpin (*n* = 10) in support of the Site C Small Fish Translocation Monitoring Program (Mon-15). All tissue samples were preserved in 95% non-denatured ethyl alcohol and provided to BC Hydro.

During the 2021 study period, fin rays (and otoliths if individuals succumbed to sampling) were collected from target species for potential microchemistry analysis. In 2021, fin rays and/or otoliths were collected from 5 Arctic Grayling, 163 Bull Trout, and 55 Rainbow Trout (Table 15). Fin rays and otoliths were provided to BC Hydro. The results of these analysis are not presented in this report.

Table 14: Summary of genetic samples collected as part of the Site C Reservoir Tributary Fish Population Indexing Survey, 2021.

Location	Arctic Grayling	Bull Trout	Rainbow Trout
Chowade River	-	214	7
Cypress Creek	-	201	6
Fiddes Creek	-	120	1
Colt Creek	-	10	46
Kobes Creek	3	-	93
Farrell Creek	-	-	76
Maurice Creek	-	2	48
Moberly River	38	-	-
Total	**41**	**547**	**277**

Table 15: Summary of microchemistry samples collected as part of the Site C Reservoir Tributary Fish Population Indexing Survey, 2021.

Location	Arctic Grayling	Bull Trout	Rainbow Trout
Chowade River	-	31	-
Cypress Creek	-	24	5
Fiddes Creek	-	95	1
Colt Creek	-	10	1
Kobes Creek	3	-	20
Farrell Creek	-	-	-
Maurice Creek	-	3	28
Moberly River	2	-	-
Total	**5**	**163**	**55**

4.0 DISCUSSION

The principal objective of the program is to collect data from Peace River fish populations that use tributaries situated within the future inundation zone of the Site C reservoir to fulfil portions of their life cycles. These data will be used to monitor population-level responses to the construction and operation of the Project. The 2021 study was the sixth year of a multi-year monitoring program and represents the first year of data collected after the river diversion phase of Project construction, which occurred on 3 October 2020. Since only a single year of data has been collected post-river diversion, analysis to answer the management questions of Task 2c was not conducted during the present study; however, the findings of the 2021 study year were compared to the baseline dataset (year 2016 to 2020). Like previous survey years, the secondary objective in 2021 was to deploy PIT tags into target species to allow their movements to be monitored by other components of the FAHMFP.

4.1 Tributaries Targeting Bull Trout

The 2021 study design was developed to capture and tag immature Bull Trout in identified Halfway River tributaries. The study design was unchanged from 2017 to 2021 and is based on results of the 2016 reconnaissance study design (Golder 2017) and input by the Site C Fisheries and Aquatic Habitat Mitigation and Monitoring Technical Committee (BC Hydro 2017). The study design is intended to produce high catch rates of immature Bull Trout that are large enough (i.e., greater than 80 mm FL) to receive PIT tags. The mark-recapture data from PIT tagged Bull Trout will be incorporated into the BTIPM to generate population abundance estimates to monitor changes in the Halfway River Bull Trout population.

Immature Bull Trout tagged as part of the current study that are subsequently encountered at the PIT detector arrays in the Chowade River and Cypress Creek, or encountered in the Peace River mainstem under other components of the FAHMFP, will be taken as evidence that the fish is the offspring of a migratory Bull Trout population. Combined, this information will further BC Hydro's understanding of resident and migrant Bull Trout populations in Halfway River tributaries. The PIT detector arrays will also monitor the upstream migrations of these same fish in subsequent years when they return to the Halfway River watershed as adults to spawn. As such, these data will be used by the BTIPM to estimate juvenile to adult survival of Halfway River Bull Trout.

In 2021, 840 Bull Trout were captured in the Chowade River and Cypress and Fiddes creeks, and 567 individuals were implanted with PIT tags. In 2021, fork lengths were used to assign ages to all YOY and immature Bull Trout captured, with age-1 Bull Trout represented the largest cohort (n = 462), which was consistent with previous study years (Golder 2017, 2018, 2019, 2020a, 2021a).

CPUE values among years were compared to provide a coarse assessment of Bull Trout abundance in the Chowade River and Cypress and Fiddes creeks. In both the Chowade River and Cypress Creek, CPUE for immature Bull Trout increased year-over-year between 2018 and 2021, providing evidence of a strong immature Bull Trout population within these systems. Similarly, CPUE for YOY Bull Trout also increased between 2019 and 2021, providing evidence of successful recruitment within these tributaries in recent years.

The Bull Trout assemblage in Fiddes Creek differs from that of the Chowade River and Cypress Creek. In Fiddes Creek, there is a greater abundance of age-2 and older fish (i.e., fish greater than approximately 100 mm FL), compared to the Chowade River and Cypress Creek, which may indicate there are some Bull Trout within this system that are resident or migration downstream may occur later in life compared to other systems. Although the CPUE for YOY Bull Trout in Fiddes Creek was generally low compared to the Chowade River and Cypress Creek, the CPUE for immature Bull Trout in Fiddes Creek was greater than in the Chowade River and Cypress Creek.

Furthermore, the CPUE for immature Bull Trout in Fiddes Creek increased year-over-year between 2019 and 2021, suggesting successful recruitment in recent years despite low YOY catch in 2019 (n = 0) and 2020 (n = 1).

YOY Bull Trout captured in 2021 are the offspring of the 2020 spawning population. If the spawning population was from the Peace River, these fish would have migrated from the Peace River into the spawning tributaries prior to the onset of river diversion.

4.2 Tributaries Targeting Rainbow Trout

Sampling in Farrell and Maurice creeks is intended to test the Mon-1b hypothesis regarding Peace River Rainbow Trout continuing to spawn and rear in tributaries of the Site C reservoir upstream of the inundation zone. Sampling in Farrell Creek has been conducted annually for the past five years (2017 to 2021) and sampling in Maurice Creek has been conducted for the past two years (2020 and 2021). YOY were captured in Farrell Creek between 2017 and 2019, but this age cohort was absent in the 2020 and 2021 catches. This finding suggests there have been two years of low recruitment in Farrell Creek; however, this result may be compounded by limitations of sampling methods. Capturing YOY Rainbow Trout using backpack electrofishing is challenging, as the effectiveness of backpack electrofishing is reduced due to the small size of YOY fish (e.g., larger bodied fish cross a greater potential gradient along the electrical current between the anode and the cathode and as a result, galvanotaxis is more effectively induced). YOY have consistently comprised a small proportion of the total Rainbow Trout catch for all creeks and years (range = 0 to 42%). In 2021, a single YOY in Maurice Creek was captured providing evidence that spawning occurred in the spring of 2021. Furthermore, the presence of age-1 fish captured in 2021 indicates that spawning also occurred in 2020.

Rainbow Trout encountered in Farrell and Maurice creeks may be individuals from a resident population within each tributary or the offspring of Peace River Rainbow Trout. Since 2017, a total of 449 immature Rainbow Trout have been tagged in Farrell and Maurice creeks; however, none of these Rainbow Trout have been captured in the Peace River under other components of the FAHMFP. Additionally, none of the adult Rainbow Trout that have received PIT tags under other components of the FAHMFP have been observed in Farrell or Maurice creeks. Radio telemetry data provides some insight into the use of Farrell and Maurice creeks by the Peace River Rainbow Trout population (Hatch et al. 2021, 2022; LGL 2020). To date, two radio tagged adult Rainbow Trout have been detected 1.0 to 1.7 km up Maurice Creek during the suspected spawning season and two have been detected 31.7 to 95.5 km up Farrell Creek during the suspected spawning season (4 March 2021) (Hatch et al. 2022).

Sampling in Colt and Kobes creeks is intended to collect additional baseline data for Rainbow Trout within the Halfway River watershed. Data collected as part of these surveys will not be used to specifically test any hypotheses under the FAHMFP but will contribute to the regional Rainbow Trout dataset and contribute to BC Hydro's understanding of potential changes to Rainbow Trout populations in Peace River tributaries and the Site C reservoir. In 2021, YOY Rainbow Trout were captured in Colt and Kobes creeks indicating successful spawning within these systems in the spring of 2021.

4.3 Moberly River

In 2021, 42 Arctic Grayling were captured in the Moberly River, with the YOY cohort representing the highest proportion of the catch (57%, *n* = 24). The presence of YOY fish in 2021 provides evidence of Arctic Grayling spawned in the Moberly River in the spring of 2021.

The present study year (2021) was the first year sampling for Arctic Grayling occurred in the Moberly River since the river diversion phase of the Project. As a result of river diversion, Arctic Grayling within the Peace River downstream of the Project would not have been able to migrate upstream into the Moberly River to spawn in the spring of 2021 without assisted transport from the operation of the TUF or the activities of Site C Contingent Boat Electroshocking (Golder 2022a). The timing for Arctic Grayling spawning in northern British Columbia occurs between early and late May (McPhail 2007). In 2021, fish transport activities commenced on 1 April and between 5 April and 31 May, 13 adult Arctic Grayling were transported from downstream of the Project to the Project forebay release location (immediately upstream of the Moberly River confluence) (BC Hydro 2021a; Golder 2022). During tracking of radio telemetry tagged adult Arctic Grayling in 2021, five individuals that were captured downstream of the Project and transported upstream of the Project, were subsequently detected in the Moberly River (Hatch et al. 2022).

When compared to baseline study years (2016 to 2020), the number of YOY Arctic Grayling captured in 2021 was lower than in 2020, but greater than in 2017, 2018, and 2019 combined (Golder 2018, 2019, 2020a, 2021a). The greater number of YOY Arctic Grayling in 2020 and 2021 compared to the previous three years may reflect an increase in Arctic Grayling abundance or may, in part, reflect variations in sampling efficiency. In 2020, the majority of Arctic Grayling were captured in Section 7. As a result, this section was an area where increased effort was employed in 2021. In 2021, Section 7 accounted for 71% of the total Arctic Grayling catch and 71% of the YOY captured. Within Section 7, 97% of Arctic Grayling were captured within a 3.4 km section of the river between River Km 36.0 and 39.4. As described in Golder 2021a, this section of the Moberly River is highly braided with multiple side channels, and evidence of groundwater upwelling within the side channels was observed. The findings of the 2021 study program provide further evidence that this area provides preferred rearing habitat for YOY Arctic Grayling in the Moberly River. Furthermore, the high density of YOY Arctic Grayling within this small area of the Moberly River indicates that Arctic Grayling spawning likely occurs at or near these locations.

Throughout the six years of the Mon-1b, Task 2c study on the Moberly River, the total Arctic Grayling catch each year has varied. When total catch is compared to sample timing, Moberly River discharge, and water temperature values, relationships are not apparent (Table 16), suggesting variable abundance and catch efficiency.

Table 16: Number of Arctic Grayling captured on the Moberly River (total and YOY) during each study year of the Site C Reservoir Tributary Fish Population Indexing Survey in relation to mean river discharge and mean and maximum water temperature values recorded at the time of sampling.

Phase of the Project Construction	Study Year	Sample Period	Mean Discharge (m^3/s)	Mean Water Temperature (ºC)	Maximum Water Temperature (ºC)	Total Arctic Grayling Catch (# of fish)	Total YOY Arctic Grayling Catch (# of fish)
Pre- River Diversion	2016	8 – 18 Sep	35.1	13.2	14.9	105	87
	2017	30 Aug – 8 Sep	1.1	15.8	18.8	2	0
	2018	13 – 31 Aug	10.9	17.9	20.4	8	4
	2019	22 Jul – 2 Aug	11.1	18.4	23.4	36	4
	2020	28 Jul – 8 Aug	11.6	18.5	23.1	134	42
Post – River Diversion	2021	21 – 30 Jul	7.0	17.6	23.6	42	24

5.0 CLOSURE

We trust the information contained in this report is sufficiently detailed for your review purposes. Please do not hesitate to contact us should you have any questions or require clarification.

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https://golderassociates.sharepoint.com/sites/124588/project files/6 deliverables/2021_trib_indexing_final/20136472-004-r-rev0-2021_trib_index 21oct_22.docx

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APPENDIX A

Maps and UTM Locations

Table A1 Locations of sites sampled during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

River	Upstream River Km[a]	Site Name	Sample Method	Upstream UTM[b]			Downstream UTM[b]		
				Zone	Easting	Northing	Zone	Easting	Northing
Chowade River	49.4	CHR-EF-049.4-2021-07-26	Backpack Electrofishing	10V	494224	6284175	10V	494325	6284167
	49.3	CHR-EF-049.3-2021-07-26	Backpack Electrofishing	10V	494392	6284208	10V	494648	6284124
	49.2	CHR-EF-049.2-2021-07-26	Backpack Electrofishing	10V	494377	6284128	10V	494493	6284058
	48.5	CHR-EF-048.5-2021-07-26	Backpack Electrofishing	10V	494859	6284064	10V	495064	6284015
	48.4	CHR-EF-048.4-2021-07-26	Backpack Electrofishing	10V	494991	6284110	10V	495188	6284062
	48.3	CHR-EF-048.3-2021-07-26	Backpack Electrofishing	10V	495095	6283986	10V	495197	6283944
	48.2	CHR-EF-048.2-2021-07-26	Backpack Electrofishing	10V	495188	6284062	10V	495331	6283910
	48.1	CHR-EF-048.1-2021-07-26	Backpack Electrofishing	10V	495251	6283831	10V	495373	6283834
	46.6	CHR-EF-046.6-2021-07-25	Backpack Electrofishing	10V	496450	6283598	10V	496724	6283557
	46.3	CHR-EF-046.3-2021-07-25	Backpack Electrofishing	10V	496708	6283457	10V	496817	6283423
	45.0	CHR-EF-045.0-2021-07-25	Backpack Electrofishing	10V	497913	6284008	10V	498162	6284063
	44.7	CHR-EF-044.7-2021-07-25	Backpack Electrofishing	10V	498203	6284055	10V	498427	6283880
	44.2	CHR-EF-044.2-2021-07-25	Backpack Electrofishing	10V	498499	6283929	10V	498717	6283768
	44.0	CHR-EF-044.0-2021-07-25	Backpack Electrofishing	10V	498769	6283718	10V	498830	6283567
	36.2	CHR-EF-036.2-2021-07-25	Backpack Electrofishing	10V	503715	6281957	10V	503701	6282058
	36.0	CHR-EF-036.0-2021-07-25	Backpack Electrofishing	10V	503734	6282178	10V	503925	6282286
	30.0	CHR-EF-030.0-2021-07-24	Backpack Electrofishing	10V	508292	6283308	10V	508480	6283211
	29.8	CHR-EF-029.8-2021-07-24	Backpack Electrofishing	10V	508461	6283228	10V	508564	6283069
	27.8	CHR-EF-027.8-2021-07-24	Backpack Electrofishing	10V	509918	6282768	10V	510009	6282958
	27.7	CHR-EF-027.7-2021-07-24	Backpack Electrofishing	10V	509980	6282990	10V	509872	6282857
	27.4	CHR-EF-027.4-2021-07-24	Backpack Electrofishing	10V	509910	6282967	10V	510181	6282999
	27.0	CHR-EF-027.0-2021-07-24	Backpack Electrofishing	10V	510199	6282964	10V	510291	6282993
	26.0	CHR-EF-026.0-2021-07-24	Backpack Electrofishing	10V	510781	6283137	10V	510921	6283317
	25.2	CHR-EF-025.2-2021-07-24	Backpack Electrofishing	10V	511176	6283497	10V	511374	6283596
Colt Creek	30.4	COC-EF-030.4-2021-07-22	Backpack Electrofishing	10V	521153	6258201	10V	521236	6258383
	30.2	COC-EF-030.2-2021-07-22	Backpack Electrofishing	10V	521240	6258378	10V	521401	6258481
	29.0	COC-EF-029.0-2021-07-22	Backpack Electrofishing	10V	522211	6258978	10V	522340	6259132
	28.8	COC-EF-028.8-2021-07-22	Backpack Electrofishing	10V	522336	6259092	10V	522480	6259170
	14.3	COC-EF-014.3-2021-07-22	Backpack Electrofishing	10V	531633	6260273	10V	531804	6260341
	14.1	COC-EF-014.1-2021-07-22	Backpack Electrofishing	10V	531806	6260337	10V	532005	6260315
	3.7	COC-EF-003.7-2021-07-21	Backpack Electrofishing	10V	538108	6258692	10V	538266	6258627
	3.5	COC-EF-003.5-2021-07-21	Backpack Electrofishing	10V	538344	6258447	10V	538274	6258623
Cypress Creek	38.8	CYC-EF-038.8-2021-07-29	Backpack Electrofishing	10V	497102	6303392	10V	497243	6303500
	38.7	CYC-EF-038.7-2021-07-29	Backpack Electrofishing	10V	497274	6303410	10V	497171	6303544
	35.0	CYC-EF-035.0-2021-07-29	Backpack Electrofishing	10V	499071	6304014	10V	499283	6303937
	34.8	CYC-EF-034.8-2021-07-29	Backpack Electrofishing	10V	499285	6303935	10V	499426	6303809
	34.6	CYC-EF-034.6-2021-07-27	Backpack Electrofishing	10V	499607	6304018	10V	499426	6303809
	34.5	CYC-EF-034.5-2021-07-27	Backpack Electrofishing	10V	499458	6303925	10V	499590	6304055
	33.1	CYC-EF-033.1-2021-07-30	Backpack Electrofishing	10V	500146	6304660	10V	500277	6304840
	32.3	CYC-EF-032.3-2021-07-30	Backpack Electrofishing	10V	500385	6304839	10V	500540	6304938
	29.0	CYC-EF-029.0-2021-07-30	Backpack Electrofishing	10V	502805	6305501	10V	503107	6305502
	28.8	CYC-EF-028.8-2021-07-30	Backpack Electrofishing	10V	503250	6305478	10V	503484	6305502
	28.3	CYC-EF-028.3-2021-07-27	Backpack Electrofishing	10V	503633	6305500	10V	503850	6305364
	28.2	CYC-EF-028.2-2021-07-27	Backpack Electrofishing	10V	503842	6305318	10V	503913	6305140

[a] Upstream River Km of each site as measured upstream from the stream's confluence.

[b] NAD83.

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Table A1 Continued.

River	Upstream River Km[a]	Site Name	Sample Method	Upstream UTM[b]			Downstream UTM[b]		
				Zone	Easting	Northing	Zone	Easting	Northing
Farrell Creek	102.1	FAC-EF-102.1-2021-07-23	Backpack Electrofishing	10V	560898	6238243	10V	560993	6238344
	101.9	FAC-EF-101.9-2021-07-23	Backpack Electrofishing	10V	561061	6238261	10V	561085	6238166
	65.7	FAC-EF-065.7-2021-07-18	Backpack Electrofishing	10V	573215	6338266	10V	573010	6238384
	65.5	FAC-EF-065.5-2021-07-18	Backpack Electrofishing	10V	573010	6239394	10V	572916	6238479
	63.3	FAC-EF-063.3-2021-07-17	Backpack Electrofishing	10V	572209	6239771	10V	572376	6239986
	63.0	FAC-EF-063.0-2021-07-17	Backpack Electrofishing	10V	572379	6239983	10V	572601	6240140
Fiddes Creek	7.9	FIC-EF-007.9-2021-07-31	Backpack Electrofishing	10V	479533	6310751	10V	479651	6310885
	7.7	FIC-EF-007.7-2021-07-31	Backpack Electrofishing	10V	479696	6310889	10V	479823	6310990
	5.7	FIC-EF-005.7-2021-07-31	Backpack Electrofishing	10V	480363	6312393	10V	480331	6312554
	5.5	FIC-EF-005.5-2021-07-31	Backpack Electrofishing	10V	480331	6312559	10V	480277	6312753
Kobes Creek	55.5	KOC-EF-055.5-2021-08-01	Backpack Electrofishing	10V	544266	6243071	10V	544214	6243320
	55.3	KOC-EF-055.3-2021-08-01	Backpack Electrofishing	10V	544213	6243313	10V	544080	6243446
	46.7	KOC-EF-046.7-2021-08-01	Backpack Electrofishing	10V	543337	6248298	10V	543199	6248222
	46.5	KOC-EF-046.5-2021-08-01	Backpack Electrofishing	10V	543346	6248300	10V	543366	6248585
	40.4	KOC-EF-040.4-2021-08-02	Backpack Electrofishing	10V	544003	6252165	10V	544123	6252327
	40.2	KOC-EF-040.2-2021-08-02	Backpack Electrofishing	10V	544117	6252335	10V	544006	6252535
	11.7	KOC-EF-011.7-2021-07-23	Backpack Electrofishing	10V	555132	6256395	10V	555224	6256194
	11.5	KOC-EF-011.5-2021-07-23	Backpack Electrofishing	10V	555235	6256189	10V	555424	6256146
Maurice Creek	2.0	MAC-EF-002.0-2021-08-03	Backpack Electrofishing	10V	569816	6208573	10V	569623	6208557
	1.8	MAC-EF-001.8-2021-08-03	Backpack Electrofishing	10V	569541	6208605	10V	569420	6208767
	1.5	MAC-EF-001.5-2021-07-28	Backpack Electrofishing	10V	569414	6208777	10V	569403	6208992
	1.3	MAC-EF-001.3-2021-07-28	Backpack Electrofishing	10V	569403	6208992	10V	569211	6208984
	1.2	MAC-EF-001.2-2021-07-28	Backpack Electrofishing	10V	568941	6208913	10V	568767	6209001
	1.0	MAC-EF-001.0-2021-07-28	Backpack Electrofishing	10V	568767	6209001	10V	568501	6209003
	0.8	MAC-EF-000.8-2021-07-28	Backpack Electrofishing	10V	568501	6209003	10V	568323	6209093
	0.6	MAC-EF-000.6-2021-07-28	Backpack Electrofishing	10V	499426	6303809	10V	568190	6209122
Moberly River	118.0	MOR-AN-118.0-2021-07-27	Angling	10U	587968	6189383	10U	588061	6189397
	118.0	MOR-AN-118.0-2021-07-26	Angling	10U	587968	6189383	10U	588062	6189397
	118.0	MOR-ES-118.0-2021-07-27	Small Fish Boat Electroshocker	10U	588000	6189387	10U	588587	6189587
	117.9	MOR-AN-117.9-2021-07-27	Angling	10U	588165	6189434	10U	588400	6189476
	117.0	MOR-ES-117.0-2021-07-27	Small Fish Boat Electroshocker	10U	588561	6189937	10U	588534	6190535
	116.5	MOR-EF-116.5-2021-07-27	Backpack Electrofishing	-	-	-	10U	588536	6190485
	116.5	MOR-ES-116.5-2021-07-27	Small Fish Boat Electroshocker	10U	588534	6190535	10U	588490	6191167
	116.0	MOR-AN-116.0-2021-07-27	Angling	10U	588329	6190861	10U	588329	6190861
	115.6	MOR-AN-115.6-2021-07-27	Angling	10U	588523	6191179	10U	588681	6191223
	115.6	MOR-EF-115.6-2021-07-27	Backpack Electrofishing	10U	588528	6191178	10U	588643	6191247
	115.5	MOR-ES-115.5-2021-07-27	Small Fish Boat Electroshocker	10U	588522	6191180	10U	588556	6191165
	115.3	MOR-ES-115.3-2021-07-27	Small Fish Boat Electroshocker	10U	588776	6191362	10U	589074	6191404
	115.0	MOR-ES-115.0-2021-07-27	Small Fish Boat Electroshocker	10U	589074	6191404	10U	589407	6191957
	114.1	MOR-ES-114.1-2021-07-27	Small Fish Boat Electroshocker	10U	589407	6191957	10U	589245	6192752
	113.0	MOR-AN-113.0-2021-07-27	Angling	10U	589311	6192661	10U	589226	6192834
	113.0	MOR-EF-113.0-2021-07-27	Backpack Electrofishing	10U	589238	6192810	10U	589220	6192934
	103.5	MOR-ES-103.5-2021-07-28	Small Fish Boat Electroshocker	10U	590200	6198433	10U	590631	6198733
	103.0	MOR-AN-103.0-2021-07-28	Angling	10U	590567	6198495	10U	590590	6198510
	102.7	MOR-AN-102.7-2021-07-28	Angling	10U	590528	6198748	10U	590600	6198754

[a] Upstream River Km of each site as measured upstream from the stream's confluence.

[b] NAD83.

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Table A1 Continued.

River	Upstream River Km[a]	Site Name	Sample Method	Upstream UTM[b]			Downstream UTM[b]		
				Zone	Easting	Northing	Zone	Easting	Northing
Moberly River	102.7	MOR-ES-102.7-2021-07-28	Small Fish Boat Electroshocker	10U	590631	6198733	10U	590638	6199055
	102.0	MOR-EF-102.0-2021-07-28	Backpack Electrofishing	10V	590772	6198775	10V	590711	6198793
	101.6	MOR-ES-101.6-2021-07-28	Small Fish Boat Electroshocker	10U	590638	6199055	10U	591087	6199691
	101.5	MOR-AN-101.5-2021-07-28	Angling	10U	590705	6199160	10U	590792	6199193
	100.6	MOR-ES-100.6-2021-07-28	Small Fish Boat Electroshocker	10U	591087	6199691	10U	591429	6200032
	100.5	MOR-EF-100.5-2021-07-28	Backpack Electrofishing	10U	591221	6199730	10U	591293	6199727
	100.2	MOR-AN-100.2-2021-07-28	Angling	10U	591234	6199739	10U	591339	6199751
	98.7	MOR-AN-098.7-2021-07-28	Angling	10U	591216	6200795	10U	591216	6200795
	94.8	MOR-AN-094.8-2021-07-28	Angling	10U	589661	6200607	10U	589219	6200587
	94.5	MOR-ES-094.5-2021-07-28	Small Fish Boat Electroshocker	10U	589475	6200632	10U	589080	6200730
	91.0	MOR-AN-091.0-2021-07-28	Angling	10U	588602	6202010	10U	588617	6201975
	90.4	MOR-ES-090.4-2021-07-28	Small Fish Boat Electroshocker	10U	588506	6202763	10U	587260	6202645
	90.0	MOR-AN-090.0-2021-07-28	Angling	10U	588232	6202653	10U	588139	6202640
	87.0	MOR-ES-087.0-2021-07-28	Small Fish Boat Electroshocker	10U	586670	6204059	10U	587413	6204231
	86.3	MOR-EF-086.3-2021-07-28	Backpack Electrofishing	10U	587196	6204031	10U	587194	6203916
	86.1	MOR-AN-086.1-2021-07-28	Angling	10U	587100	6204103	10U	587196	6204028
	84.4	MOR-ES-084.4-2021-07-28	Small Fish Boat Electroshocker	10U	588515	6204457	10U	589050	6205005
	81	MOR-ES-081.0-2021-07-29	Small Fish Boat Electroshocker	10U	589466	6206498	10U	589617	6206691
	80.8	MOR-AN-080.8-2021-07-29	Angling	10U	589677	6206430	10U	589710	6206426
	79.8	MOR-EF-079.8-2021-07-29	Backpack Electrofishing	10V	589693	6206907	10V	589763	6206885
	79.5	MOR-AN-079.5-2021-07-29	Angling	10V	589992	6206833	10V	589997	6206761
	78.9	MOR-ES-078.9-2021-07-29	Small Fish Boat Electroshocker	10U	590184	6207139	10V	590433	6207590
	77.9	MOR-ES-077.9-2021-07-29	Small Fish Boat Electroshocker	10V	590612	6207866	10V	590839	6207808
	77.8	MOR-AN-077.8-2021-07-29	Angling	10V	590625	6207798	10V	590640	6207705
	77.1	MOR-AN-077.1-2021-07-29	Angling	10V	590707	6207874	10V	590660	6207913
	75.3	MOR-ES-075.3-2021-07-29	Small Fish Boat Electroshocker	10V	590769	6208927	10V	591009	6209260
	73.9	MOR-AN-073.9-2021-07-29	Angling	10V	590824	6209829	10V	590338	6210542
	73.1	MOR-ES-073.1-2021-07-29	Small Fish Boat Electroshocker	10V	590506	6210423	10V	590527	6211109
	73	MOR-AN-073.0-2021-07-29	Angling	10V	590417	6210476	10V	590366	6210526
	72	MOR-AN-072.0-2021-07-29	Angling	10V	590682	6211077	10V	590745	6211046
	71.6	MOR-AN-071.6-2021-07-29	Angling	10V	590921	6210765	10V	590956	6210762
	70.9	MOR-ES-070.9-2021-07-29	Small Fish Boat Electroshocker	10V	591079	6211398	10V	592191	6211167
	69.5	MOR-EF-069.5-2021-07-29	Backpack Electrofishing	10V	592183	6211214	10V	592183	6211195
	69.5	MOR-ES-069.5-2021-07-29	Small Fish Boat Electroshocker	10V	592191	6211167	10V	593050	6211596
	69.4	MOR-AN-069.4-2021-07-29	Angling	10V	592258	6211195	10V	592232	6211191
	68.2	MOR-EF-068.2-2021-07-29	Backpack Electrofishing	10V	593218	6211578	10V	593307	6211557
	68.0	MOR-AN-068.0-2021-07-29	Angling	10V	593524	6211553	10V	593524	6211553
	64.8	MOR-AN-064.8-2021-07-29	Angling	10V	594417	6212049	10V	594299	6211860
	64.8	MOR-ES-064.8-2021-07-29	Small Fish Boat Electroshocker	10V	594439	6212046	10V	594647	6211823
	61.5	MOR-AN-061.5-2021-07-30	Angling	10V	595039	6212588	10V	594960	6212608
	58.9	MOR-AN-058.9-2021-07-30	Angling	10V	595635	6214239	10V	595659	6214282
	58.8	MOR-ES-058.8-2021-07-30	Small Fish Boat Electroshocker	10V	595686	6214342	10V	596422	6215044
	57.9	MOR-EF-057.9-2021-07-30	Backpack Electrofishing	10V	596335	6214820	10V	596381	6214882
	57.8	MOR-ES-057.8-2021-07-30	Small Fish Boat Electroshocker	10V	596422	6215044	10V	596414	6215608

[a] Upstream River Km of each site as measured upstream from the stream's confluence.

[b] NAD83.

continued…

Table A1 Continued.

River	Upstream River Km[a]	Site Name	Sample Method	Upstream UTM[b]			Downstream UTM[b]		
				Zone	Easting	Northing	Zone	Easting	Northing
Moberly River	57.2	MOR-AN-057.2-2021-07-30	Angling	10V	596379	6215328	10V	596320	6215434
	56.8	MOR-AN-056.8-2021-07-30	Angling	10V	597267	6215227	10V	597284	6215206
	56.4	MOR-ES-056.4-2021-07-30	Small Fish Boat Electroshocker	10V	596922	6215495	10V	597684	6215159
	55.4	MOR-AN-055.4-2021-07-30	Angling	10V	597571	6215119	10V	597651	6215135
	53.4	MOR-ES-053.4-2021-07-30	Small Fish Boat Electroshocker	10V	598443	6214908	10V	598772	6214126
	52.9	MOR-EF-052.9-2021-07-30	Backpack Electrofishing	10V	598486	6214298	10V	598457	6214172
	51.1	MOR-AN-051.1-2021-07-30	Angling	10V	599195	6214829	10V	599194	6214837
	50.9	MOR-AN-050.9-2021-07-30	Angling	10V	599418	6215051	10V	599471	6215070
	50.5	MOR-ES-050.5-2021-07-30	Small Fish Boat Electroshocker	10V	599522	6215288	10V	599207	6215749
	48.8	MOR-ES-048.8-2021-07-30	Small Fish Boat Electroshocker	10V	599451	6216573	10V	599948	6216443
	47.0	MOR-AN-047.0-2021-07-30	Angling	10V	600591	6217146	10V	600630	6217218
	47.0	MOR-EF-047.0-2021-07-30	Backpack Electrofishing	10V	600615	6217136	10V	600635	6217224
	46.2	MOR-AN-046.2-2021-07-29	Angling	10V	601202	6217296	10V	601247	6217247
	46.1	MOR-ES-046.1-2021-07-30	Small Fish Boat Electroshocker	10V	601361	6217330	10V	601252	6217747
	45.0	MOR-AN-045.0-2021-07-30	Angling	10V	601668	6217570	10V	601870	6217723
	44.6	MOR-ES-044.6-2021-07-30	Small Fish Boat Electroshocker	10V	602128	6217842	10V	602756	6217801
	44.0	MOR-EF-044.0-2021-07-30	Backpack Electrofishing	10V	602549	6217729	10V	602610	6217788
	43.1	MOR-AN-043.1-2021-07-30	Angling	10V	602922	6218045	10V	602974	6218062
	42.7	MOR-EF-042.7-2021-07-21	Backpack Electrofishing	10V	603515	6217963	10V	603626	6218012
	42.5	MOR-AN-042.5-2021-07-21	Angling	10V	603724	6217991	10V	603791	6217977
	42.5	MOR-ES-042.5-2021-07-21	Small Fish Boat Electroshocker	10V	603585	6217969	10V	604225	6218173
	42.4	MOR-AN-042.4-2021-07-21	Angling	10V	603889	6217958	10V	604015	6218093
	42.0	MOR-ES-042.0-2021-07-21	Small Fish Boat Electroshocker	10V	604225	6218173	10V	604344	6218599
	41.8	MOR-AN-041.8-2021-07-21	Angling	10V	604382	6218188	10V	604460	6218298
	41.2	MOR-ES-041.2-2021-07-21	Small Fish Boat Electroshocker	10V	604344	6218599	10V	605257	6219099
	41.0	MOR-EF-041.0-2021-07-21	Backpack Electrofishing	10V	604462	6218669	10V	604548	6218739
	40.8	MOR-AN-040.8-2021-07-21	Angling	10V	604666	6218913	10V	604833	6218940
	39.8	MOR-AN-039.8-2021-07-21	Angling	10V	605468	6219147	10V	605578	6219149
	39.8	MOR-ES-039.8-2021-07-22	Small Fish Boat Electroshocker	10V	605518	6219108	10V	605684	6219273
	39.6	MOR-EF-039.6-2021-07-22	Backpack Electrofishing	10V	605712	6219307	10V	605818	6219322
	39.5	MOR-ES-039.5-2021-07-22	Small Fish Boat Electroshocker	10V	605684	6219273	10V	605764	6219521
	39.4	MOR-AN-039.4-2021-07-22	Angling	10V	605704	6219296	10V	605794	6219337
	39.2	MOR-ES-039.2-2021-07-22	Small Fish Boat Electroshocker	10V	605787	6219513	10V	606018	6219802
	39.1	MOR-AN-039.1-2021-07-22	Angling	10V	605871	6219520	10V	605909	6219478
	38.9	MOR-AN-038.9-2021-07-22	Angling	10V	606050	3219524	10V	606113	6219781
	38.7	MOR-EF-038.7-2021-07-22	Backpack Electrofishing	10V	606120	6219755	10V	606213	6219719
	38.7	MOR-ES-038.7-2021-07-22	Small Fish Boat Electroshocker	10V	606050	6219789	10V	606192	6219999
	38.2	MOR-ES-038.2-2021-07-22	Small Fish Boat Electroshocker	10V	606206	6220172	10V	606396	6220345
	38.0	MOR-AN-038.0-2021-07-22	Angling	10V	606192	6219998	10V	606183	6220151
	38.0	MOR-EF-038.0-2021-07-22	Backpack Electrofishing	10V	606283	6220187	10V	606428	6220322
	38.0	MOR-EF-038.0-2021-07-22_1	Backpack Electrofishing	10V	606299	6220361	-	-	-
	38.0	MOR-ES-038.0-2021-07-22	Small Fish Boat Electroshocker	10V	606400	6220337	10V	606581	6220974
	37.9	MOR-AN-037.9-2021-07-22	Angling	10V	606529	6220374	10V	606586	6220989
	37.9	MOR-EF-037.9-2021-07-22	Backpack Electrofishing	10V	606470	6220211	10V	606521	6220364

[a] Upstream River Km of each site as measured upstream from the stream's confluence.

continued…

[b] NAD83.

Table A1 Continued.

River	Upstream River Km[a]	Site Name	Sample Method	Upstream UTM[b]			Downstream UTM[b]		
				Zone	Easting	Northing	Zone	Easting	Northing
Moberly River	37.3	MOR-EF-037.3-2021-07-22	Backpack Electrofishing	10V	606690	6220922	10V	606621	6221125
	37.0	MOR-EF-037.0-2021-07-22	Backpack Electrofishing	10V	606378	6220922	10V	606515	6221177
	37.0	MOR-EF-037.0-2021-07-23	Backpack Electrofishing	10V	606708	6221309	10V	606787	6221381
	37.0	MOR-ES-037.0-2021-07-22	Small Fish Boat Electroshocker	10V	606581	6220974	10V	606588	6221329
	36.9	MOR-AN-036.9-2021-07-23	Angling	10V	606507	6221183	10V	606583	6221322
	36.9	MOR-AN-036.9-2021-07-22	Angling	10V	606555	6220975	10V	606507	6221183
	36.9	MOR-EF-036.9-2021-07-23	Backpack Electrofishing	10V	606519	6221177	10V	606537	6221278
	36.9	MOR-ES-036.9-2021-07-23	Small Fish Boat Electroshocker	10V	606557	6221277	10V	606900	6221916
	36.2	MOR-AN-036.2-2021-07-23	Angling	10V	606614	6221664	10V	606679	6221861
	36.2	MOR-EF-036.2-2021-07-23	Backpack Electrofishing	10V	606971	6221626	10V	606986	6221941
	36.0	MOR-AN-036.0-2021-07-23	Angling	10V	606923	6221916	10V	606981	6221945
	35.9	MOR-ES-035.9-2021-07-23	Small Fish Boat Electroshocker	10V	606900	6221916	10V	607106	6222343
	35.0	MOR-AN-035.0-2021-07-23	Angling	10V	607015	6222318	10V	607089	6222305
	34.9	MOR-ES-034.9-2021-07-23	Small Fish Boat Electroshocker	10V	607106	6222343	10V	607937	6222702
	34.1	MOR-AN-034.1-2021-07-23	Angling	10V	607387	6222716	10V	607453	6222811
	33.6	MOR-ES-033.6-2021-07-23	Small Fish Boat Electroshocker	10V	607937	6222702	10V	607584	6223562
	32.5	MOR-AN-032.5-2021-07-23	Angling	10V	607430	6223347	10V	607352	6223353
	32.0	MOR-AN-032.0-2021-07-23	Angling	10V	607576	6223554	10V	607576	6223554
	32.0	MOR-EF-032.0-2021-07-23	Backpack Electrofishing	10V	607598	6223559	10V	607666	6223542
	31.9	MOR-ES-031.9-2021-07-23	Small Fish Boat Electroshocker	10V	607811	6223503	10V	608838	6223931
	31.5	MOR-AN-031.5-2021-07-23	Angling	10V	608002	6223500	10V	608148	6223497
	30.2	MOR-ES-030.2-2021-07-23	Small Fish Boat Electroshocker	10V	609028	6224038	10V	609796	6224144
	29.8	MOR-EF-029.8-2021-07-23	Backpack Electrofishing	10V	609172	6224340	10V	609210	6224314
	25.4	MOR-ES-025.4-2021-07-24	Small Fish Boat Electroshocker	10V	610461	6225782	10V	611612	6226546
	25.3	MOR-AN-025.3-2021-07-24	Angling	10V	610429	6225729	10V	610482	6225770
	24.8	MOR-AN-024.8-2021-07-24	Angling	10V	611032	6226184	10V	611076	6226182
	24.3	MOR-EF-024.3-2021-07-24	Backpack Electrofishing	10V	611097	6226193	10V	611380	6226257
	23.9	MOR-ES-023.9-2021-07-24	Small Fish Boat Electroshocker	10V	611612	6226546	10V	612060	6227284
	23.8	MOR-AN-023.8-2021-07-24	Angling	10V	611544	6226652	10V	611436	6226799
	23.5	MOR-AN-023.5-2021-07-24	Angling	10V	611475	6226334	10V	611494	6226399
	22.9	MOR-ES-022.9-2021-07-24	Small Fish Boat Electroshocker	10V	612060	6227284	10V	612764	6227283
	22.5	MOR-AN-022.5-2021-07-24	Angling	10V	612218	6227077	10V	612304	6227027
	22.4	MOR-AN-022.4-2021-07-24	Angling	10V	614303	6227860	10V	614191	6227896
	22.1	MOR-AN-022.1-2021-07-24	Angling	10V	612420	6227081	10V	612530	6227124
	22.0	MOR-ES-022.0-2021-07-24	Small Fish Boat Electroshocker	10V	613403	6227674	10V	614196	6227901
	20.7	MOR-EF-020.7-2021-07-24	Backpack Electrofishing	10V	613703	6227794	10V	613784	6227783
	19.7	MOR-ES-019.7-2021-07-24	Small Fish Boat Electroshocker	10V	614547	6227934	10V	615242	6228279
	19.6	MOR-EF-019.6-2021-07-24	Backpack Electrofishing	10V	614426	6227928	10V	614626	6227996
	17.9	MOR-AN-017.9-2021-07-24	Angling	10V	615623	6228815	10V	615664	6228579
	14.9	MOR-AN-014.9-2021-07-25	Angling	10V	617522	6228666	10V	617524	6228666
	14.9	MOR-ES-014.9-2021-07-25	Small Fish Boat Electroshocker	10V	617539	6228667	10V	618551	6228843
	13.4	MOR-AN-013.4-2021-07-25	Angling	10V	618631	6228851	10V	618728	6228792
	13.4	MOR-EF-013.4-2021-07-25	Backpack Electrofishing	10V	618675	6228778	10V	618744	6228777
	13.4	MOR-ES-013.4-2021-07-25	Small Fish Boat Electroshocker	10V	618725	6228795	10V	619667	6228371

[a] Upstream River Km of each site as measured upstream from the stream's confluence.

[b] NAD83.

continued…

Table A1 Concluded.

River	Upstream River Km[a]	Site Name	Sample Method	Upstream UTM[b]			Downstream UTM[b]		
				Zone	Easting	Northing	Zone	Easting	Northing
Moberly River	12.1	MOR-AN-012.1-2021-07-25	Angling	10V	619670	6228377	10V	619701	6228382
	12.0	MOR-EF-012.0-2021-07-25	Backpack Electrofishing	10V	619740	6228374	10V	619864	6228398
	11.5	MOR-AN-011.5-2021-07-25	Angling	10V	620181	6228050	10V	620260	6228039
	11.1	MOR-ES-011.1-2021-07-25	Small Fish Boat Electroshocker	10V	620457	6228034	10V	621238	6228068
	9.0	MOR-ES-009.0-2021-07-25	Small Fish Boat Electroshocker	10V	622367	6228157	10V	623169	6227429
	7.6	MOR-EF-007.6-2021-07-25	Backpack Electrofishing	10V	623115	6227666	10V	623169	6227431
	7.5	Moberly River	Angling	10V	623174	6227437	10V	623205	6227363
	6.0	MOR-AN-006.0-2021-07-25	Angling	10V	624505	6227456	10V	624505	6227456
	6.0	MOR-ES-006.0-2021-07-25	Small Fish Boat Electroshocker	10V	624505	6227456	10V	625520	6227841
	4.6	MOR-AN-004.6-2021-07-25	Angling	10V	625506	6227840	10V	625586	6227833
	4.0	MOR-AN-004.0-2021-07-25	Angling	10V	626687	6228763	10V	626642	6228622
	2.9	MOR-EF-002.9-2021-07-25	Backpack Electrofishing	10V	626690	6228761	10V	626689	6228676
	2.9	MOR-ES-002.9-2021-07-25	Small Fish Boat Electroshocker	10V	626686	6228749	10V	627759	6229656

[a] Upstream River Km of each site as measured upstream from the stream's confluence. concluded.

[b] NAD83.

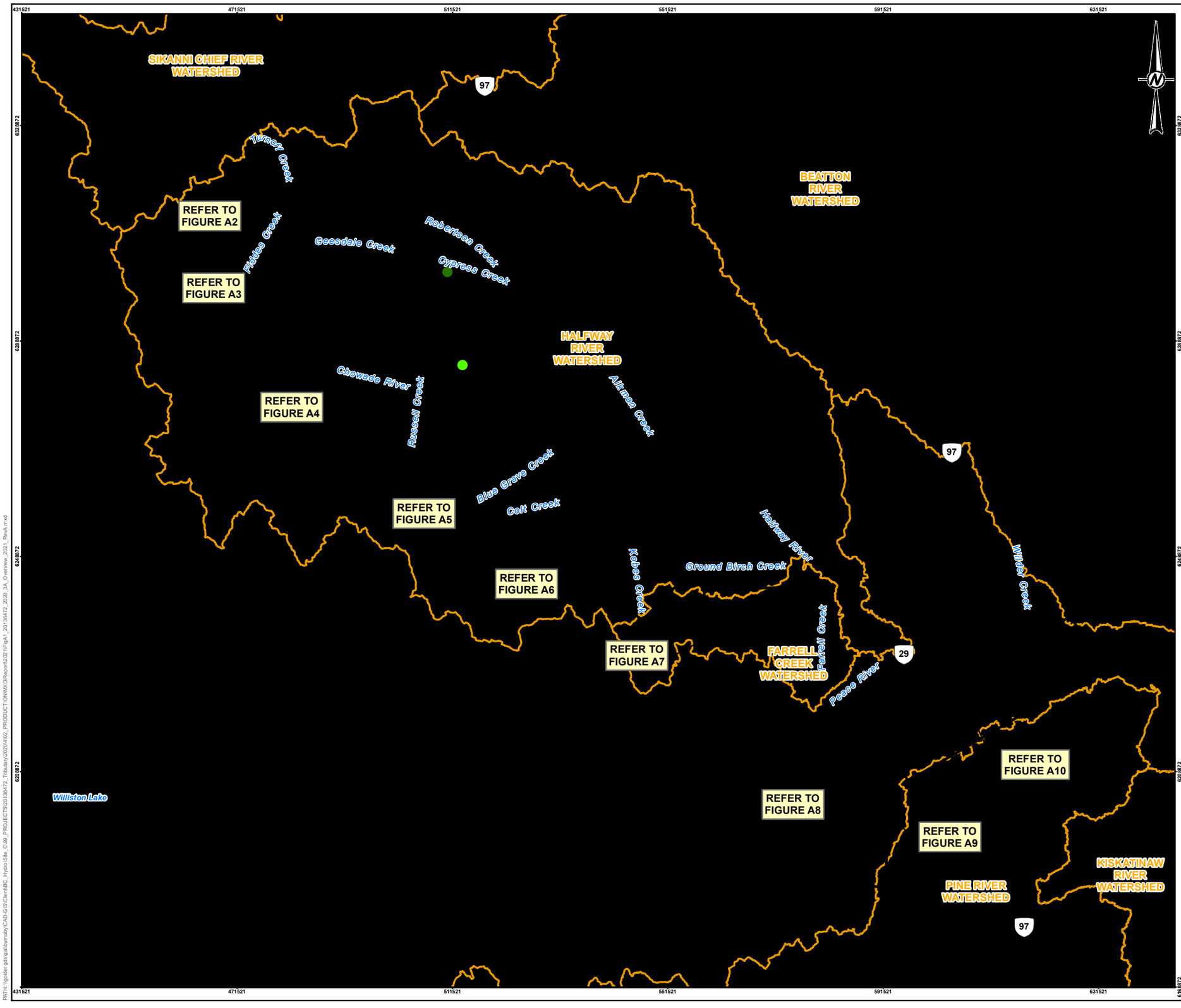
Table A2 Location information for Moberly River sections sampled during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

River	Section	Habitat Type[a]	Length (km)	River Km[b]	Upstream UTM[c]			River Km[b]	Downstream UTM[c]		
					Zone	Easting	Northing		Zone	Easting	Northing
Moberly River	MR-S1A	Irregular Meanders	5.8	118.2	10U	587890	6189345	112.4	10U	589439	6193416
	MR-S1	Tortuous Meanders	4.3	103.9	10U	590194	6198180	99.6	10U	591248	6200259
	MR-S2	Tortuous Meanders	15.8	99.6	10U	591248	6200259	83.8	10U	589031	6204822
	MR-S3	Tortuous Meanders	11.6	83.1	10U	589407	6205349	71.4	10V	591076	6210858
	MR-S4	Tortuous Meanders	11.5	71.4	10V	591076	6210858	60.0	10V	595402	6213268
	MR-S5	Tortuous Meanders	9.0	60.0	10V	595402	6213268	51.0	10V	599325	6214944
	MR-S6	Tortuous Meanders	4.3	51.0	10V	599325	6214944	46.7	10V	600924	6217136
	MR-S7	Irregular meandering; Braided; Frequently Confined	18.4	46.7	10V	600924	6217136	28.2	10V	609657	6224625
	MR-S8	Irregular meandering; Braided; Frequently Confined	11.0	28.2	10V	609657	6224625	17.2	10V	616182	6228657
	MR-S9	Irregular meandering; Braided; Frequently Confined	5.5	17.2	10V	616182	6228657	11.7	10V	619999	6228240
	MR-S10	Irregular meandering; Braided; Frequently Confined	11.7	11.7	10V	619999	6228240	0.0	10V	628556	6230023

[a] Habitat types and section breaks for the Moberly River were established by Mainstream (2011b).

[b] River Km as measured upstream from the Moberly River confluence with the Peace River.

[c] NAD83.



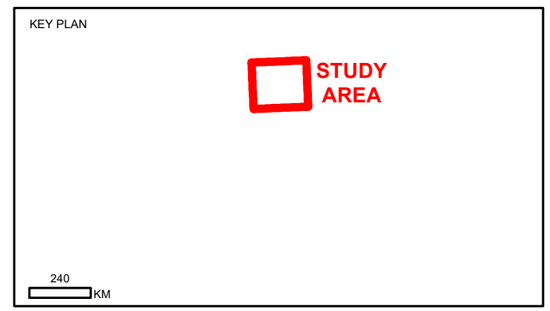
LEGEND

- CHOWADE RIVER PIT DETECTOR ARRAY
- CYPRESS CREEK PIT DETECTOR ARRAY
- MAJOR WATERSHED

BASEMAP FEATURE

- HIGHWAY
- MAJOR ROAD
- RAILWAY
- WATERBODY
- RESIDENTIAL AREA
- WOODED AREA

KEY PLAN



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REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c) STUDY AREA, 2021

CONSULTANT
[redacted]

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A1**

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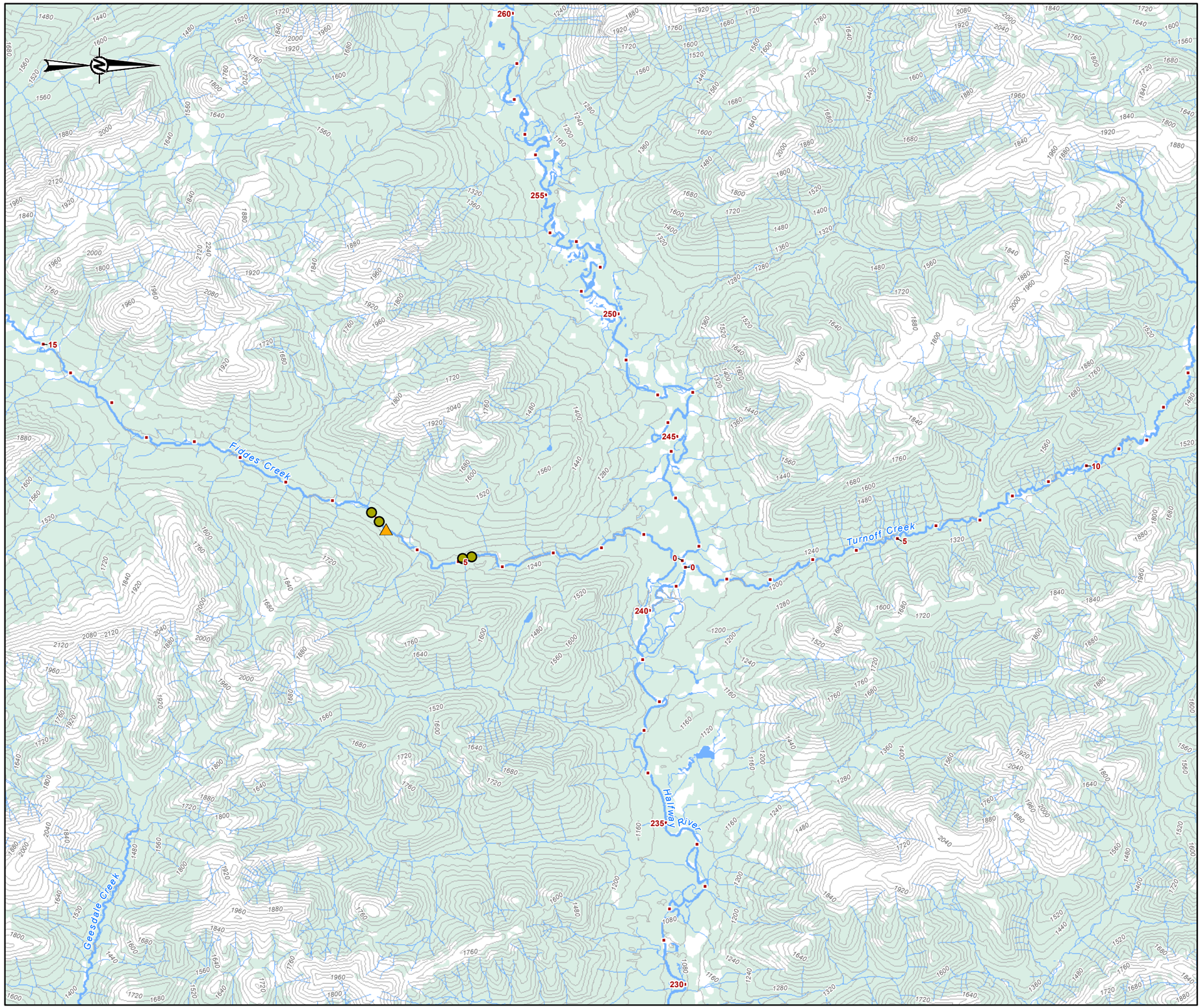


LEGEND

- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

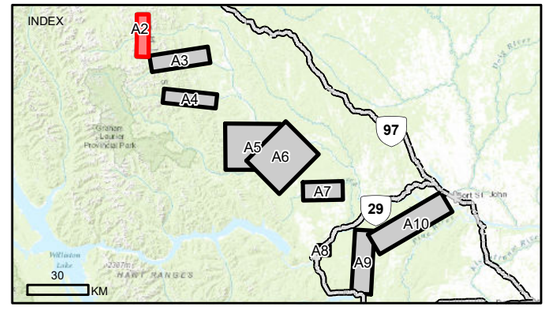
- BACKPACK ELECTROFISHING

UPSTREAM EXTENT OF EACH SAMPLE SITE

- TEMPERATURE LOGGER

BASEMAP FEATURE

- CONTOUR (100m)
- LOCAL ROAD
- WATERCOURSE
- WATERBODY
- WOODED AREA
- RESIDENTIAL AREA



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REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.

COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY
(Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c), FIDDES CREEK STUDY AREA, 2021

CONSULTANT

GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
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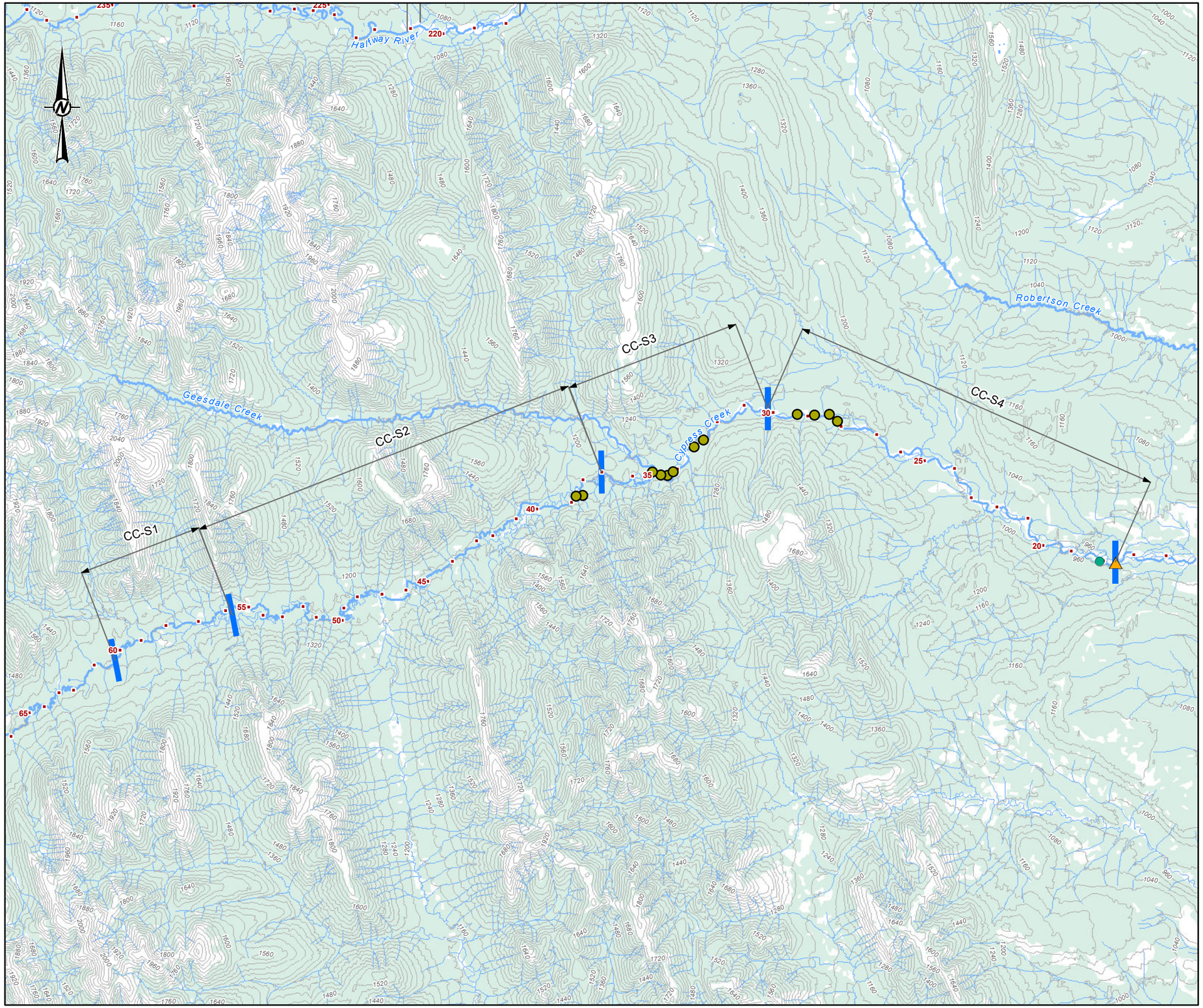


LEGEND

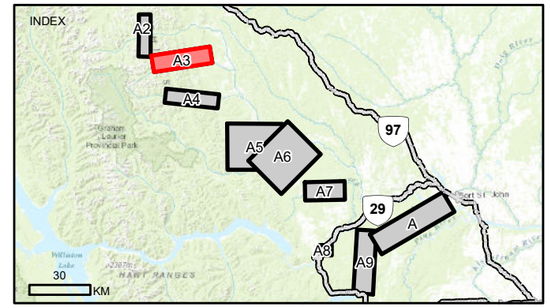
- CHOWADE RIVER PIT DETECTOR ARRAY
- CYPRESS CREEK PIT DETECTOR ARRAY
- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

- ANGLING
- BACKPACK ELECTROFISHING
- SMALL FISH BOAT ELECTROFISHING
- TEMPERATURE LOGGER
- SECTION BREAK

BASEMAP FEATURE

- CONTOUR (20 m)
- WATERCOURSE
- WATERBODY
- WOODED AREA



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REFERENCES

1. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. WATERSHED DATA OBTAINED FROM THE GOVERNMENT OF BRITISH COLUMBIA
3. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) CYPRESS CREEK STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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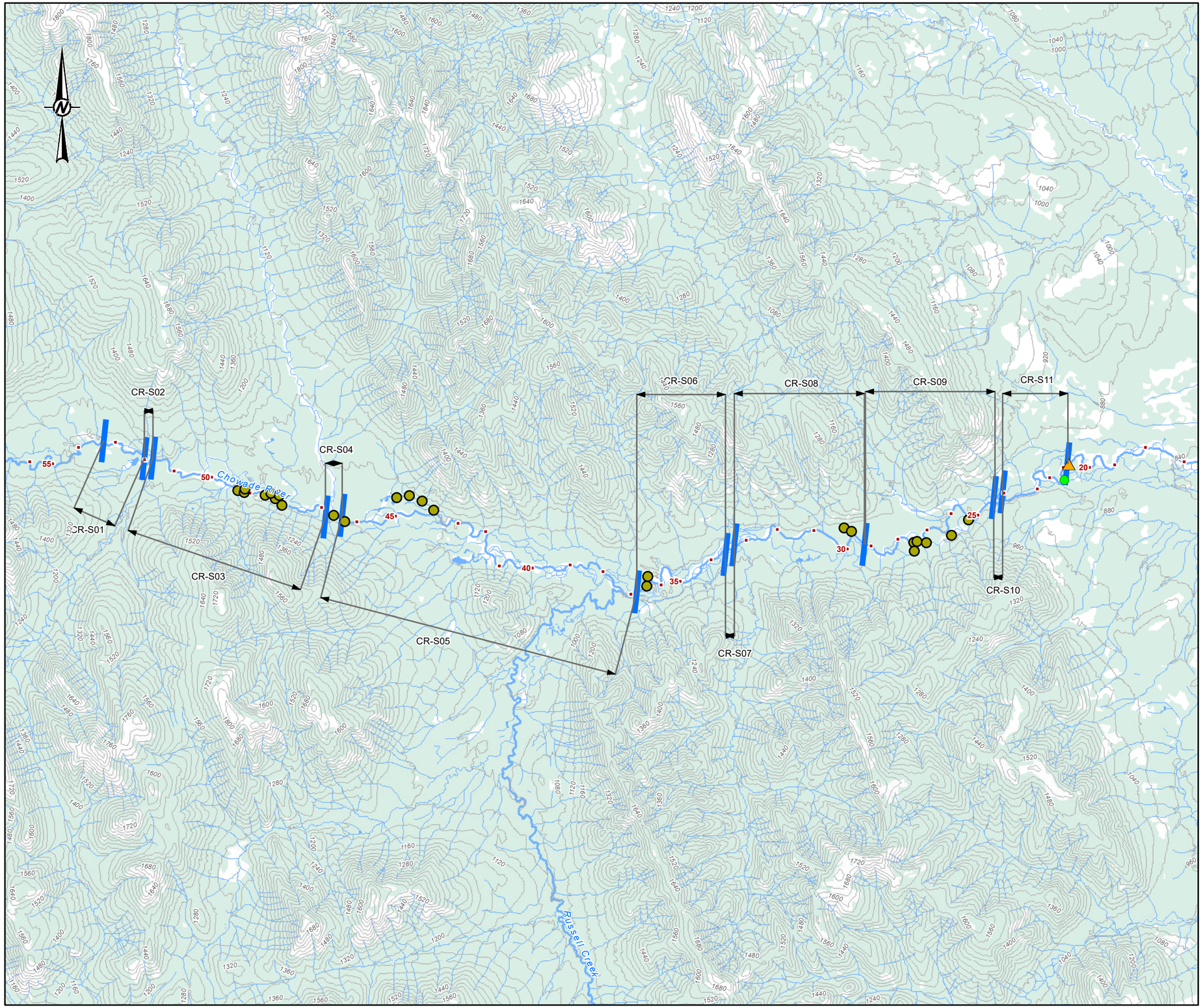


LEGEND

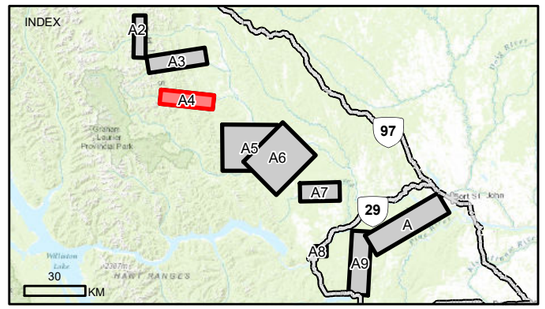
- CHOWADE RIVER PIT DETECTOR ARRAY
- CYPRESS CREEK PIT DETECTOR ARRAY
- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

- ANGLING
- BACKPACK ELECTROFISHING
- SMALL FISH BOAT ELECTROFISHING
- TEMPERATURE LOGGER
- SECTION BREAK

BASEMAP FEATURE

- CONTOUR (20 m)
- WATERCOURSE
- WATERBODY
- WOODED AREA



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REFERENCES

1. ROAD, WATERCOURSE AND WATERBODY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. WATERSHED DATA OBTAINED FROM THE GOVERNMENT OF BRITISH COLUMBIA
3. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) CHOWADE RIVER STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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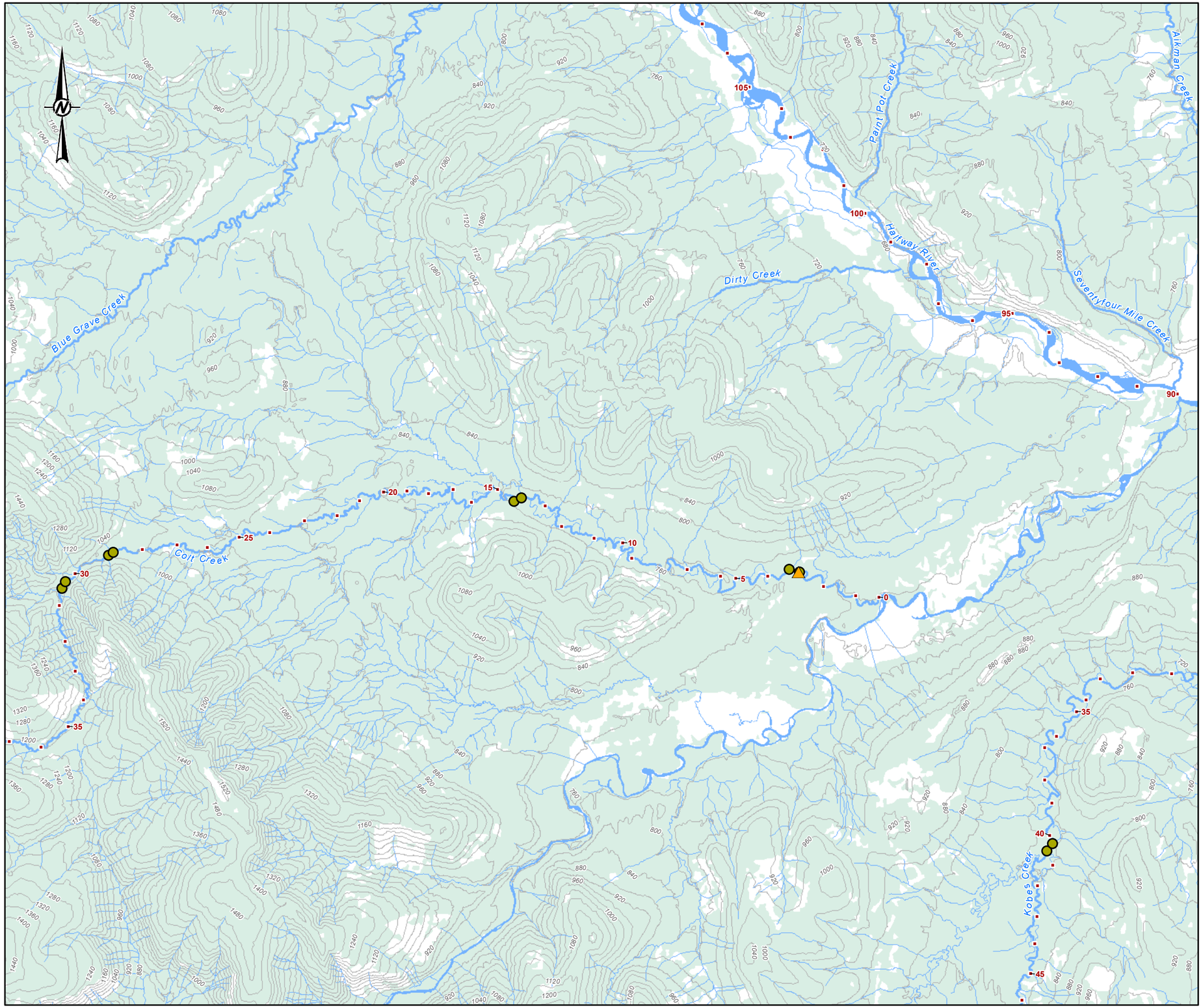

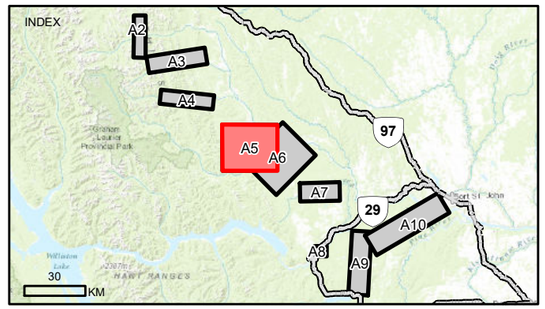

0 1,750 3,500

1:90,000 METRES

LEGEND

- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

- BACKPACK ELECTROFISHING
- TEMPERATURE LOGGER

BASEMAP FEATURE

- CONTOUR (100m)
- LOCAL ROAD
- WATERCOURSE
- WATERBODY
- WOODED AREA
- RESIDENTIAL AREA

REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) COLT CREEK STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A5**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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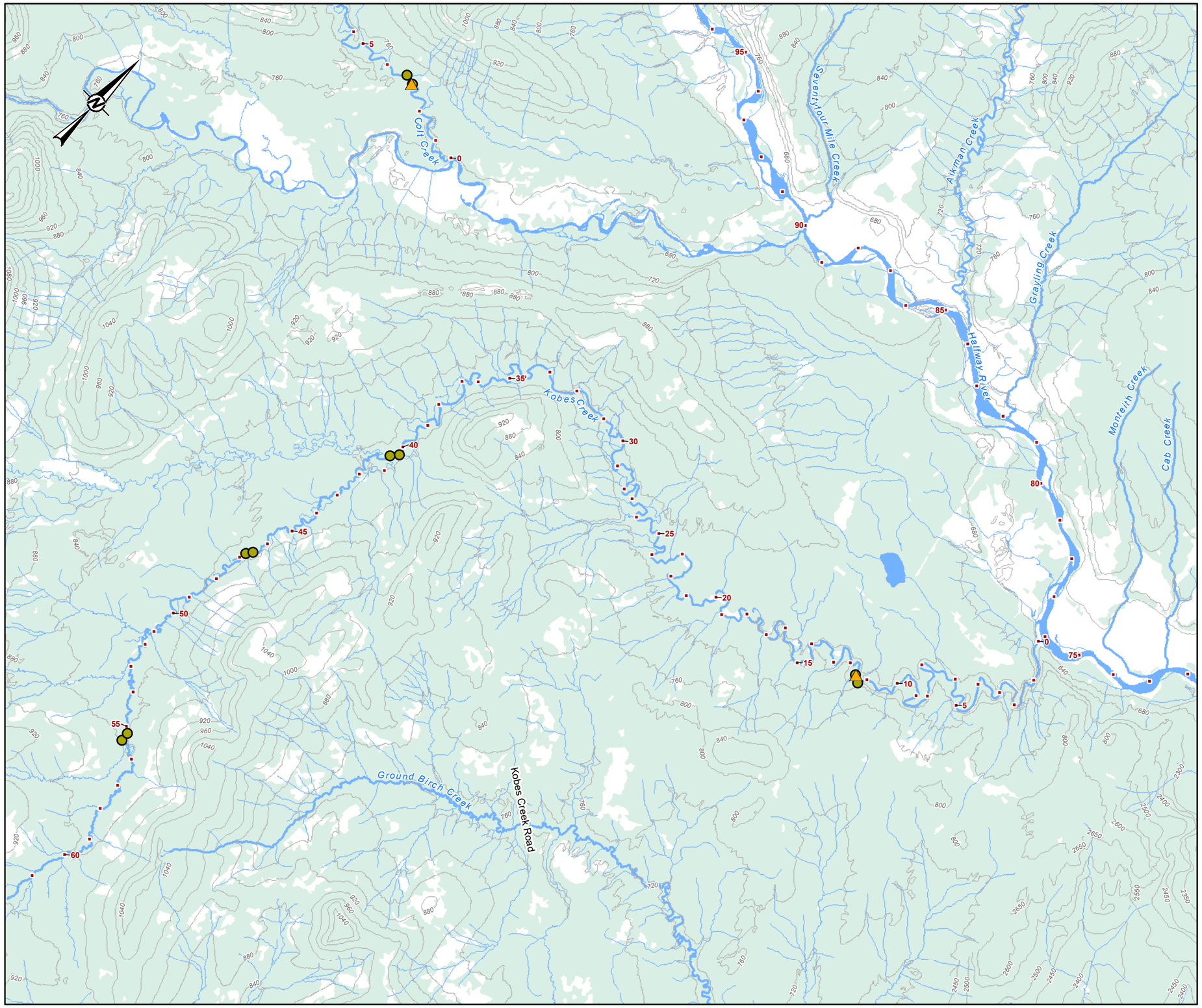


LEGEND

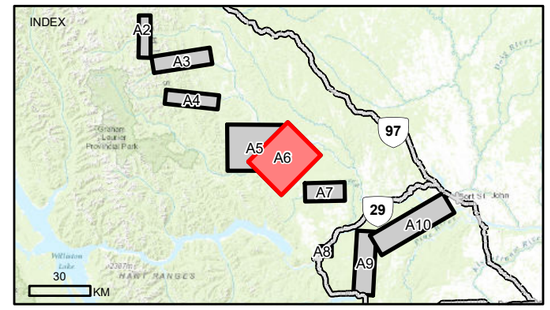
- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

- BACKPACK ELECTROFISHING
- TEMPERATURE LOGGER

BASEMAP FEATURE

- CONTOUR (100m)
- LOCAL ROAD
- WATERCOURSE
- WATERBODY
- WOODED AREA
- RESIDENTIAL AREA



0 1,750 3,500

1:90,000 METRES

REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) KOBES CREEK STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A6**

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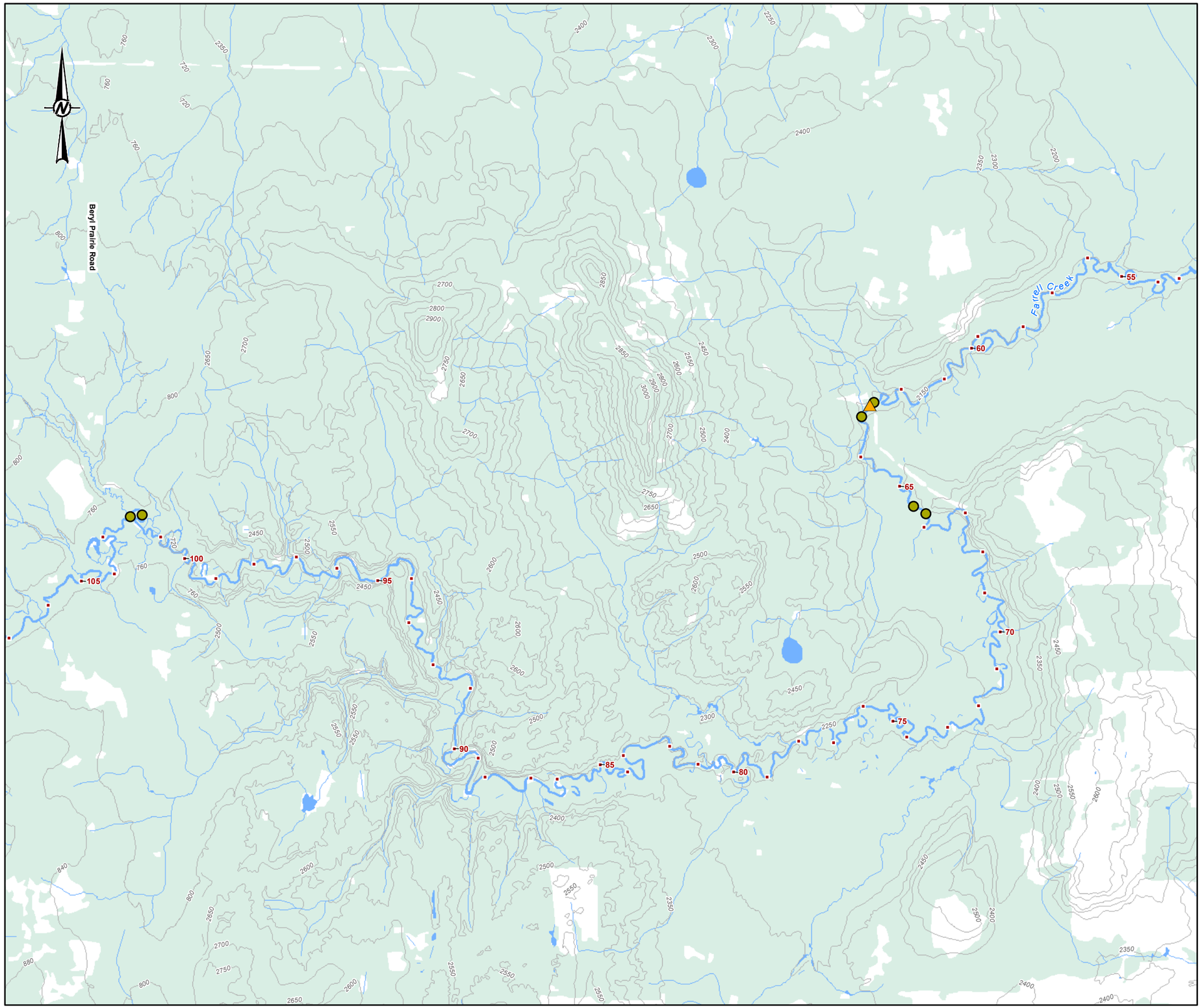


LEGEND

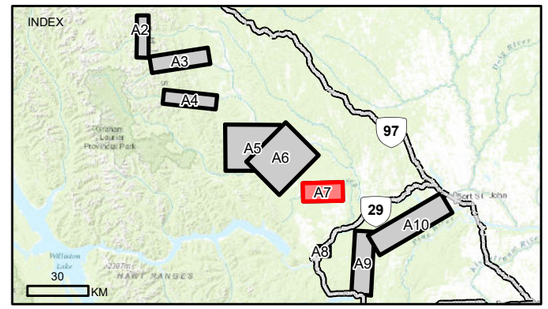
- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

- BACKPACK ELECTROFISHING
- TEMPERATURE LOGGER

BASEMAP FEATURE

- CONTOUR (100m)
- LOCAL ROAD
- WATERCOURSE
- WATERBODY
- WOODED AREA
- RESIDENTIAL AREA



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REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY
(Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) FARRELL CREEK STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A7**

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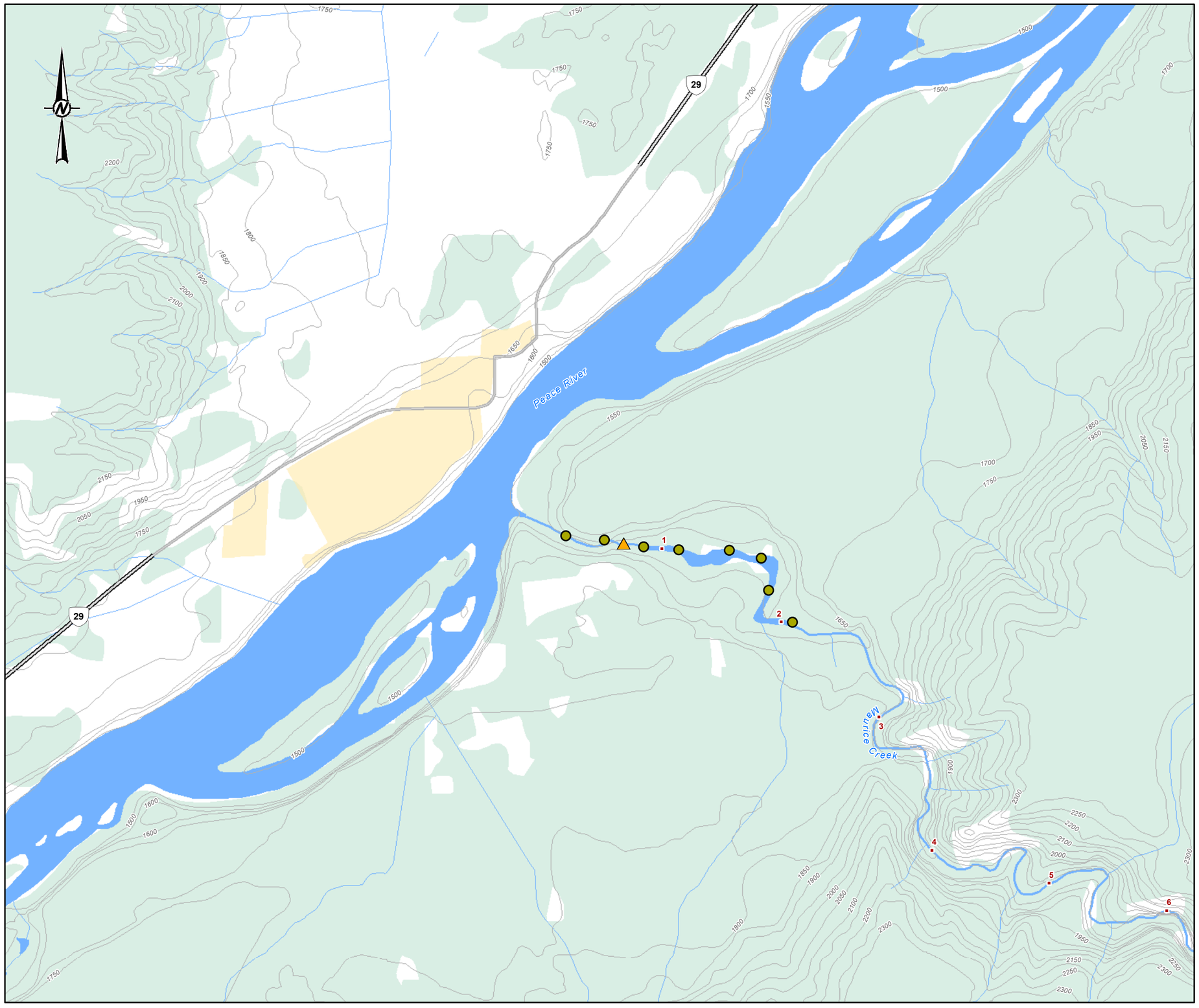


LEGEND

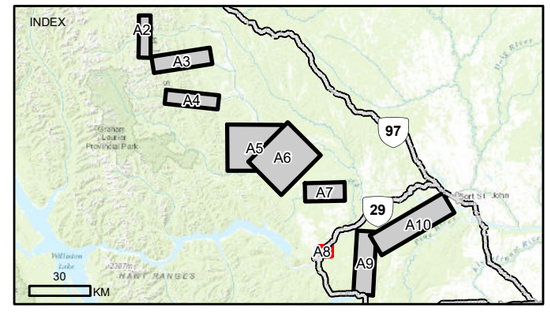
- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

- BACKPACK ELECTROFISHING
- TEMPERATURE LOGGER

BASEMAP FEATURE

- CONTOUR (100m)
- HIGHWAY
- MAJOR ROAD
- LOCAL ROAD
- WATERCOURSE
- WATERBODY
- WOODED AREA
- RESIDENTIAL AREA



0 400 800

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REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY
(Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) MAURICE CREEK STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A8**

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0 25mm

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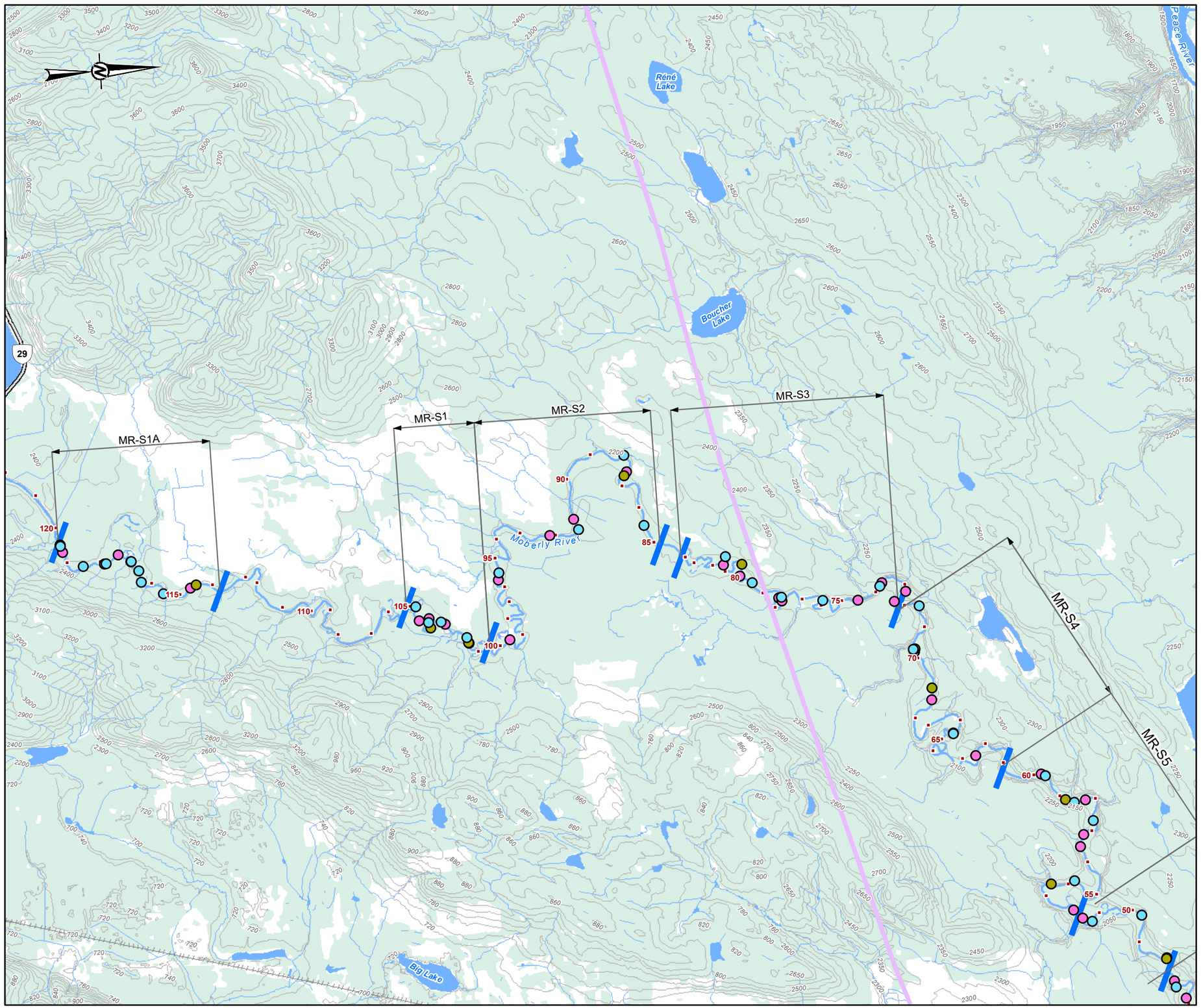

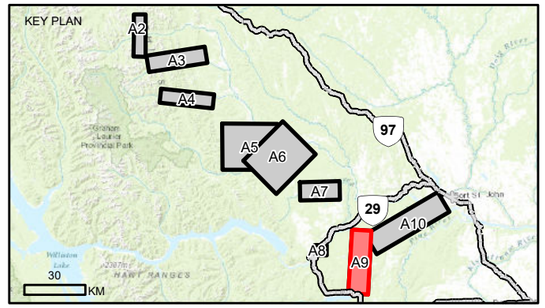

LEGEND

- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

- ANGLING
- BACKPACK ELECTROFISHING
- SMALL FISH BOAT ELECTROFISHING
- SECTION BREAK

BASEMAP FEATURE

- CONTOUR (20 m)
- HIGHWAY
- WATERBODY
- WOODED AREA

TRANSMISSION LINE RIGHT OF WAY (ROW)

- BC HYDRO EXISTING ROW

0 2,000 4,000

1:100,000 METRES

REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
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COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) MOBERLY RIVER STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-20
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A9**

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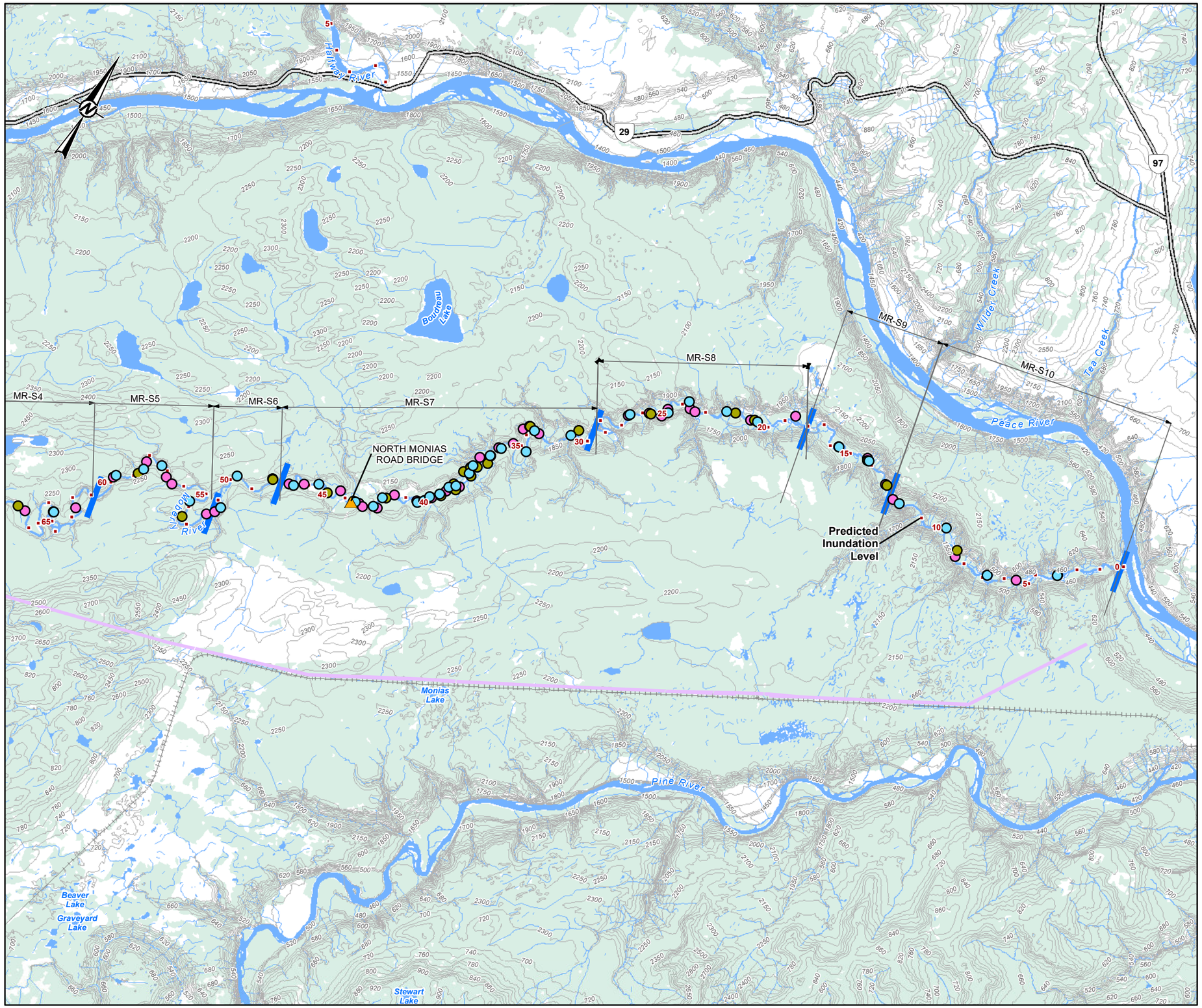


LEGEND

- RIVER KILOMETRE POSTS

UPSTREAM EXTENT OF EACH SAMPLE SITE

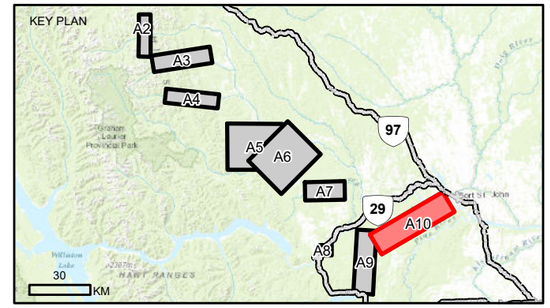
- ANGLING
- BACKPACK ELECTROFISHING
- SMALL FISH BOAT ELECTROFISHING
- TEMPERATURE LOGGER
- SECTION BREAK

BASEMAP FEATURE

- CONTOUR (20 m)
- HIGHWAY
- MAJOR ROAD
- WATERBODY
- WOODED AREA

TRANSMISSION LINE RIGHT OF WAY (ROW)

- BC HYDRO EXISTING ROW



0 2,750 5,500

1:140,000 METRES

REFERENCES

1. CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
2. BASEDATA SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESR I JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.
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COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N

CLIENT
BC HYDRO

PROJECT
SITE C RESERVOIR TRIBUTARIES FISH POPULATION INDEXING SURVEY (Mon-1b, Task 2c)

TITLE
OVERVIEW OF THE SITE C RESERVOIR TRIBUTARIES FISH POPULATI0N INDEXING SURVEY (Mon-1b, Task 2c) MOBERLY RIVER STUDY AREA, 2021

CONSULTANT
GOLDER

YYYY-MM-DD	2022-01-24
DESIGNED	KL
PREPARED	JG
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
20136472	2021/4	A	**A10**

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APPENDIX B

Catch and Effort Data

Table B1 **Summary of backpack electrofishing sites sampled during the Site C Reservoir Tributary Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.**

River	Section[a]	River Km[b]	Site Name	Sample Date	Sample Length (m)	Sample Time (s)
Chowade River		49.4	CHR-EF-049.4-2021-07-26	26-Jul-2021	200	1446
		49.3	CHR-EF-049.3-2021-07-26	26-Jul-2021	200	1023
		49.2	CHR-EF-049.2-2021-07-26	26-Jul-2021	200	1080
		48.5	CHR-EF-048.5-2021-07-26	26-Jul-2021	200	1965
		48.4	CHR-EF-048.4-2021-07-26	26-Jul-2021	201	2107
		48.3	CHR-EF-048.3-2021-07-26	26-Jul-2021	100	972
		48.2	CHR-EF-048.2-2021-07-26	26-Jul-2021	209	2835
		48.1	CHR-EF-048.1-2021-07-26	26-Jul-2021	100	848
		46.6	CHR-EF-046.6-2021-07-25	25-Jul-2021	200	1046
		46.3	CHR-EF-046.3-2021-07-25	25-Jul-2021	300	1312
		45.0	CHR-EF-045.0-2021-07-25	25-Jul-2021	200	1501
		44.7	CHR-EF-044.7-2021-07-25	25-Jul-2021	200	1802
		44.2	CHR-EF-044.2-2021-07-25	25-Jul-2021	200	1327
		44.0	CHR-EF-044.0-2021-07-25	25-Jul-2021	200	903
		36.2	CHR-EF-036.2-2021-07-25	25-Jul-2021	100	739
		36.0	CHR-EF-036.0-2021-07-25	25-Jul-2021	200	988
		30.0	CHR-EF-030.0-2021-07-24	24-Jul-2021	200	937
		29.8	CHR-EF-029.8-2021-07-24	24-Jul-2021	200	1094
		27.8	CHR-EF-027.8-2021-07-24	24-Jul-2021	200	679
		27.7	CHR-EF-027.7-2021-07-24	24-Jul-2021	150	1099
		27.4	CHR-EF-027.4-2021-07-24	24-Jul-2021	200	739
		27.0	CHR-EF-027.0-2021-07-24	24-Jul-2021	120	896
		26.0	CHR-EF-026.0-2021-07-24	24-Jul-2021	125	1231
		25.2	CHR-EF-025.2-2021-07-24	24-Jul-2021	200	661
Chowade River Total					**4,405**	**29,230**
Colt Creek		30.4	COC-EF-030.4-2021-07-22	22-Jul-2021	200	1130
		30.2	COC-EF-030.2-2021-07-22	22-Jul-2021	200	2301
		29.0	COC-EF-029.0-2021-07-22	22-Jul-2021	200	1359
		28.8	COC-EF-028.8-2021-07-22	22-Jul-2021	200	1,001
		14.1	COC-EF-014.1-2021-07-22	22-Jul-2021	200	1594
		14.3	COC-EF-014.3-2021-07-22	22-Jul-2021	200	1663
		3.7	COC-EF-003.7-2021-07-21	21-Jul-2021	200	2085
		3.5	COC-EF-003.5-2021-07-21	21-Jul-2021	200	2175
Colt Creek Total					**1,600**	**13,308**
Cypress Creek		38.8	CYC-EF-038.8-2021-07-29	29-Jul-2021	200	1938
		38.7	CYC-EF-038.7-2021-07-29	29-Jul-2021	200	1413
		35.0	CYC-EF-035.0-2021-07-29	29-Jul-2021	224	1729

[a] only applicable to Moberly River sites.

…continued.

[b] As measured upstream from the Moberly River's confluence with the Peace River.

Table B1 Continued.

River	Section[a]	River Km[b]	Site Name	Sample Date	Sample Length (m)	Sample Time (s)
Cypress Creek		34.8	CYC-EF-034.8-2021-07-29	29-Jul-2021	200	1101
		34.6	CYC-EF-034.6-2021-07-27	27-Jul-2021	230	2981
		34.5	CYC-EF-034.5-2021-07-27	27-Jul-2021	200	2326
		33.1	CYC-EF-033.1-2021-07-30	30-Jul-2021	222	1626
		32.3	CYC-EF-032.3-2021-07-30	30-Jul-2021	200	1623
		29.0	CYC-EF-029.0-2021-07-30	30-Jul-2021	200	2865
		28.8	CYC-EF-028.8-2021-07-30	30-Jul-2021	235	2104
		28.3	CYC-EF-028.3-2021-07-27	27-Jul-2021	200	1939
		28.2	CYC-EF-028.2-2021-07-27	27-Jul-2021	200	2530
Cypress Creek Total					**2,511**	**24,175**
Farrell Creek		102.1	FAC-EF-102.1-2021-07-23	23-Jul-2021	150	1909
		101.9	FAC-EF-101.9-2021-07-23	23-Jul-2021	100	798
		65.7	FAC-EF-065.7-2021-07-18	18-Jul-2021	233	1317
		65.5	FAC-EF-065.5-2021-07-18	18-Jul-2021	200	1694
		63.3	FAC-EF-063.3-2021-07-17	17-Jul-2021	200	3215
		63.0	FAC-EF-063.0-2021-07-17	17-Jul-2021	298	2286
Farrell Creek Total					**1,181**	**11,219**
Fiddes Creek		7.9	FIC-EF-007.9-2021-07-31	31-Jul-2021	200	2449
		7.7	FIC-EF-007.7-2021-07-31	31-Jul-2021	165	1247
		5.7	FIC-EF-005.7-2021-07-31	31-Jul-2021	200	2415
		5.5	FIC-EF-005.5-2021-07-31	31-Jul-2021	200	1543
Fiddes Creek Total					**765**	**7,654**
Kobes Creek		55.5	KOC-EF-055.5-2021-08-01	1-Aug-2021	200	1900
		55.3	KOC-EF-055.3-2021-08-01	1-Aug-2021	200	2728
		46.7	KOC-EF-046.7-2021-08-01	1-Aug-2021	200	1428
		46.5	KOC-EF-046.5-2021-08-01	1-Aug-2021	200	1998
		40.4	KOC-EF-040.4-2021-08-02	2-Aug-2021	200	1895
		40.2	KOC-EF-040.2-2021-08-02	2-Aug-2021	200	2439
		11.7	KOC-EF-011.7-2021-07-23	23-Jul-2021	200	1587
		11.5	KOC-EF-011.5-2021-07-23	23-Jul-2021	200	2267
Kobes Creek Total					**1,600**	**16,242**
Maurice Creek		2.0	MAC-EF-002.0-2021-08-03	3-Aug-2021	200	1700
		1.8	MAC-EF-001.8-2021-08-03	3-Aug-2021	200	1913
		1.5	MAC-EF-001.5-2021-07-28	28-Jul-2021	200	1592
		1.3	MAC-EF-001.3-2021-07-28	28-Jul-2021	200	1320
		1.2	MAC-EF-001.2-2021-07-28	28-Jul-2021	200	1446
		1.0	MAC-EF-001.0-2021-07-28	28-Jul-2021	200	1740

[a] only applicable to Moberly River sites.

[b] As measured upstream from the Moberly River's confluence with the Peace River.

…continued.

Table B1 Concluded.

River	Section[a]	River Km[b]	Site Name	Sample Date	Sample Length (m)	Sample Time (s)
Maurice Creek		0.8	MAC-EF-000.8-2021-07-28	28-Jul-2021	200	1491
		0.6	MAC-EF-000.6-2021-07-28	28-Jul-2021	200	1675
Maurice Creek Total					**1,600**	**12,877**
Moberly River	MR-S1A	116.5	MOR-EF-116.5-2021-07-27	27-Jul-2021	n/a	1040
	MR-S1A	115.6	MOR-EF-115.6-2021-07-27	27-Jul-2021	134	895
	MR-S1A	113.0	MOR-EF-113.0-2021-07-27	27-Jul-2021	123	1851
	MR-S1	102.0	MOR-EF-102.0-2021-07-28	28-Jul-2021	66	563
	MR-S1	100.5	MOR-EF-100.5-2021-07-28	28-Jul-2021	73	1016
	MR-S2	86.3	MOR-EF-086.3-2021-07-28	28-Jul-2021	106	1104
	MR-S3	79.8	MOR-EF-079.8-2021-07-29	29-Jul-2021	75	1303
	MR-S4	69.5	MOR-EF-069.5-2021-07-29	29-Jul-2021	42	448
	MR-S4	68.2	MOR-EF-068.2-2021-07-29	29-Jul-2021	101	600
	MR-S5	57.9	MOR-EF-057.9-2021-07-30	30-Jul-2021	87	733
	MR-S5	52.9	MOR-EF-052.9-2021-07-30	30-Jul-2021	106	1468
	MR-S6	47.0	MOR-EF-047.0-2021-07-30	30-Jul-2021	88	948
	MR-S7	44.0	MOR-EF-044.0-2021-07-30	30-Jul-2021	83	883
	MR-S7	42.7	MOR-EF-042.7-2021-07-21	21-Jul-2021	123	750
	MR-S7	41.0	MOR-EF-041.0-2021-07-21	21-Jul-2021	120	658
	MR-S7	39.6	MOR-EF-039.6-2021-07-22	22-Jul-2021	92	1638
	MR-S7	38.7	MOR-EF-038.7-2021-07-22	22-Jul-2021	87	760
	MR-S7	38.0	MOR-EF-038.0-2021-07-22	22-Jul-2021	134	602
	MR-S7	38.0	MOR-EF-038.0-2021-07-22_1	22-Jul-2021	20	309
	MR-S7	37.9	MOR-EF-037.9-2021-07-22	22-Jul-2021	161	782
	MR-S7	37.3	MOR-EF-037.3-2021-07-22	22-Jul-2021	266	1437
	MR-S7	37.0	MOR-EF-037.0-2021-07-22	22-Jul-2021	290	1755
	MR-S7	37.0	MOR-EF-037.0-2021-07-23	23-Jul-2021	109	475
	MR-S7	36.9	MOR-EF-036.9-2021-07-23	23-Jul-2021	104	1044
	MR-S7	36.2	MOR-EF-036.2-2021-07-23	23-Jul-2021	320	1450
	MR-S7	32.0	MOR-EF-032.0-2021-07-23	23-Jul-2021	72	595
	MR-S7	29.8	MOR-EF-029.8-2021-07-23	23-Jul-2021	50	612
	MR-S8	24.3	MOR-EF-024.3-2021-07-24	24-Jul-2021	203	1692
	MR-S8	20.7	MOR-EF-020.7-2021-07-24	24-Jul-2021	82	608
	MR-S8	19.6	MOR-EF-019.6-2021-07-24	24-Jul-2021	205	639
	MR-S9	13.4	MOR-EF-013.4-2021-07-25	25-Jul-2021	65	472
	MR-S9	12.0	MOR-EF-012.0-2021-07-25	25-Jul-2021	93	943
	MR-S10	7.6	MOR-EF-007.6-2021-07-25	25-Jul-2021	241	925
	MR-S10	2.9	MOR-EF-002.9-2021-07-25	25-Jul-2021	94	1047
Moberly River Total					**4,015**	**32,045**

[a] only applicable to Moberly River sites.

[b] As measured upstream from the Moberly River's confluence with the Peace River.

…concluded.

Table B2 Summary of angling sites sampled in the Moberly River during the Site C Reservoir Tributary Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

River	Section	River Km[a]	Site Name	Sample Date	Number of Rods	Angler-Minutes
Moberly River	MR-S1A	118.0	MOR-AN-118.0-2021-07-26	26-Jul-2021	1	120
	MR-S1A	118.0	MOR-AN-118.0-2021-07-27	27-Jul-2021	1	23
	MR-S1A	117.9	MOR-AN-117.9-2021-07-27	27-Jul-2021	2	39
	MR-S1A	116.0	MOR-AN-116.0-2021-07-27	27-Jul-2021	2	12
	MR-S1A	115.6	MOR-AN-115.6-2021-07-27	27-Jul-2021	2	103
	MR-S1A	113.0	MOR-AN-113.0-2021-07-27	27-Jul-2021	2	85
	MR-S1	103.0	MOR-AN-103.0-2021-07-28	28-Jul-2021	2	10
	MR-S1	102.7	MOR-AN-102.7-2021-07-28	28-Jul-2021	2	21
	MR-S1	101.5	MOR-AN-101.5-2021-07-28	28-Jul-2021	2	34
	MR-S1	100.2	MOR-AN-100.2-2021-07-28	28-Jul-2021	2	26
	MR-S2	98.7	MOR-AN-098.7-2021-07-28	28-Jul-2021	1	4
	MR-S2	94.8	MOR-AN-094.8-2021-07-28	28-Jul-2021	1	17
	MR-S2	91.0	MOR-AN-091.0-2021-07-28	28-Jul-2021	1	7
	MR-S2	90.0	MOR-AN-090.0-2021-07-28	28-Jul-2021	1	17
	MR-S2	86.1	MOR-AN-086.1-2021-07-28	28-Jul-2021	2	49
	MR-S3	80.8	MOR-AN-080.8-2021-07-29	29-Jul-2021	1	4
	MR-S3	79.5	MOR-AN-079.5-2021-07-29	29-Jul-2021	2	12
	MR-S3	77.8	MOR-AN-077.8-2021-07-29	29-Jul-2021	2	29
	MR-S3	77.1	MOR-AN-077.1-2021-07-29	29-Jul-2021	1	15
	MR-S3	73.9	MOR-AN-073.9-2021-07-29	29-Jul-2021	1	17
	MR-S3	73.0	MOR-AN-073.0-2021-07-29	29-Jul-2021	2	39
	MR-S3	72.0	MOR-AN-072.0-2021-07-29	29-Jul-2021	1	7
	MR-S3	71.6	MOR-AN-071.6-2021-07-29	29-Jul-2021	1	14
	MR-S4	69.4	MOR-AN-069.4-2021-07-29	29-Jul-2021	2	16
	MR-S4	68.0	MOR-AN-068.0-2021-07-29	29-Jul-2021	1	18
	MR-S4	64.8	MOR-AN-064.8-2021-07-29	29-Jul-2021	2	16
	MR-S4	61.5	MOR-AN-061.5-2021-07-30	30-Jul-2021	2	12
	MR-S5	58.9	MOR-AN-058.9-2021-07-30	30-Jul-2021	2	12
	MR-S5	57.2	MOR-AN-057.2-2021-07-30	30-Jul-2021	1	10
	MR-S5	56.8	MOR-AN-056.8-2021-07-30	30-Jul-2021	2	18
	MR-S5	55.4	MOR-AN-055.4-2021-07-30	30-Jul-2021	1	9
	MR-S5	51.1	MOR-AN-051.1-2021-07-30	30-Jul-2021	2	10
	MR-S6	50.9	MOR-AN-050.9-2021-07-30	30-Jul-2021	1	8
	MR-S6	47.0	MOR-AN-047.0-2021-07-30	30-Jul-2021	1	11
	MR-S7	46.2	MOR-AN-046.2-2021-07-29	29-Jul-2021	2	10
	MR-S7	45.0	MOR-AN-045.0-2021-07-30	30-Jul-2021	2	24
	MR-S7	43.1	MOR-AN-043.1-2021-07-30	30-Jul-2021	2	20
	MR-S7	42.5	MOR-AN-042.5-2021-07-21	21-Jul-2021	1	11

…continued.

[a] As measured upstream from the Moberly River's confluence with the Peace River.

Table B2 Concluded.

River	Section	River Km[a]	Site Name	Sample Date	Number of Rods	Angler-Minutes
Moberly River	MR-S7	42.4	MOR-AN-042.4-2021-07-21	21-Jul-2021	1	11
	MR-S7	41.8	MOR-AN-041.8-2021-07-21	21-Jul-2021	1	15
	MR-S7	40.8	MOR-AN-040.8-2021-07-21	21-Jul-2021	1	13
	MR-S7	39.8	MOR-AN-039.8-2021-07-21	21-Jul-2021	1	10
	MR-S7	39.4	MOR-AN-039.4-2021-07-22	22-Jul-2021	2	26
	MR-S7	39.1	MOR-AN-039.1-2021-07-22	22-Jul-2021	2	21
	MR-S7	38.9	MOR-AN-038.9-2021-07-22	22-Jul-2021	1	23
	MR-S7	38.0	MOR-AN-038.0-2021-07-22	22-Jul-2021	2	127
	MR-S7	37.9	MOR-AN-037.9-2021-07-22	22-Jul-2021	1	13
	MR-S7	36.9	MOR-AN-036.9-2021-07-22	22-Jul-2021	2	30
	MR-S7	36.9	MOR-AN-036.9-2021-07-23	23-Jul-2021	1	33
	MR-S7	36.2	MOR-AN-036.2-2021-07-23	23-Jul-2021	2	28
	MR-S7	36.0	MOR-AN-036.0-2021-07-23	23-Jul-2021	2	50
	MR-S7	35.0	MOR-AN-035.0-2021-07-23	23-Jul-2021	2	18
	MR-S7	34.1	MOR-AN-034.1-2021-07-23	23-Jul-2021	1	7
	MR-S7	32.5	MOR-AN-032.5-2021-07-23	23-Jul-2021	2	20
	MR-S7	32.0	MOR-AN-032.0-2021-07-23	23-Jul-2021	2	18
	MR-S7	31.5	MOR-AN-031.5-2021-07-23	23-Jul-2021	1	19
	MR-S8	25.3	MOR-AN-025.3-2021-07-24	24-Jul-2021	1	9
	MR-S8	24.8	MOR-AN-024.8-2021-07-24	24-Jul-2021	2	20
	MR-S8	23.8	MOR-AN-023.8-2021-07-24	24-Jul-2021	2	21
	MR-S8	23.5	MOR-AN-023.5-2021-07-24	24-Jul-2021	2	16
	MR-S8	22.5	MOR-AN-022.5-2021-07-24	24-Jul-2021	2	29
	MR-S8	22.4	MOR-AN-022.4-2021-07-24	24-Jul-2021	2	17
	MR-S8	22.1	MOR-AN-022.1-2021-07-24	24-Jul-2021	1	15
	MR-S8	17.9	MOR-AN-017.9-2021-07-24	24-Jul-2021	1	10
	MR-S9	14.9	MOR-AN-014.9-2021-07-25	25-Jul-2021	1	10
	MR-S9	13.4	MOR-AN-013.4-2021-07-25	25-Jul-2021	1	10
	MR-S9	12.1	MOR-AN-012.1-2021-07-25	25-Jul-2021	1	8
	MR-S9	11.5	MOR-AN-011.5-2021-07-25	25-Jul-2021	2	30
	MR-S10	7.5	MOR-AN-007.5-2021-07-25	25-Jul-2021	2	28
	MR-S10	6.0	MOR-AN-006.0-2021-07-25	25-Jul-2021	1	13
	MR-S10	4.6	MOR-AN-004.6-2021-07-25	25-Jul-2021	1	18
	MR-S10	4.0	MOR-AN-004.0-2021-07-25	25-Jul-2021	1	6
Total						**1,651**

…concluded.

[a] As measured upstream from the Moberly River's confluence with the Peace River.

Table B3 **Summary of small fish boat electroshocking sites sampled during the Site C Reservoir Tributary Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.**

River	Section	River Km[a]	Site Name	Sample Date	Sample Length (m)	Sample Time (s)
Moberly River	MR-S1A	118.0	MOR-ES-118.0-2021-07-27	27-Jul-2021	682	312
	MR-S1A	117.0	MOR-ES-117.0-2021-07-27	27-Jul-2021	660	400
	MR-S1A	116.5	MOR-ES-116.5-2021-07-27	27-Jul-2021	846	500
	MR-S1A	115.5	MOR-ES-115.5-2021-07-27	27-Jul-2021	40	64
	MR-S1A	115.3	MOR-ES-115.3-2021-07-27	27-Jul-2021	330	228
	MR-S1A	115.0	MOR-ES-115.0-2021-07-27	27-Jul-2021	861	664
	MR-S1A	114.1	MOR-ES-114.1-2021-07-27	27-Jul-2021	971	765
	MR-S1	103.5	MOR-ES-103.5-2021-07-28	28-Jul-2021	1120	1187
	MR-S1	102.7	MOR-ES-102.7-2021-07-28	28-Jul-2021	935	862
	MR-S1	101.6	MOR-ES-101.6-2021-07-28	28-Jul-2021	1020	987
	MR-S1	100.6	MOR-ES-100.6-2021-07-28	28-Jul-2021	588	523
	MR-S2	94.5	MOR-ES-094.5-2021-07-28	28-Jul-2021	594	582
	MR-S2	90.4	MOR-ES-090.4-2021-07-28	28-Jul-2021	1300	1025
	MR-S2	87.0	MOR-ES-087.0-2021-07-28	28-Jul-2021	1030	983
	MR-S2	84.4	MOR-ES-084.4-2021-07-28	28-Jul-2021	847	621
	MR-S3	81.0	MOR-ES-081.0-2021-07-29	29-Jul-2021	908	819
	MR-S3	78.9	MOR-ES-078.9-2021-07-29	29-Jul-2021	589	520
	MR-S3	77.9	MOR-ES-077.9-2021-07-29	29-Jul-2021	543	528
	MR-S3	75.3	MOR-ES-075.3-2021-07-29	29-Jul-2021	617	584
	MR-S3	73.1	MOR-ES-073.1-2021-07-29	29-Jul-2021	895	847
	MR-S4	70.9	MOR-ES-070.9-2021-07-29	29-Jul-2021	1330	804
	MR-S4	69.5	MOR-ES-069.5-2021-07-29	29-Jul-2021	1040	551
	MR-S4	64.8	MOR-ES-064.8-2021-07-29	29-Jul-2021	1020	606
	MR-S5	58.8	MOR-ES-058.8-2021-07-30	30-Jul-2021	1080	578
	MR-S5	57.8	MOR-ES-057.8-2021-07-30	30-Jul-2021	670	358
	MR-S5	56.4	MOR-ES-056.4-2021-07-30	30-Jul-2021	1120	620
	MR-S5	53.4	MOR-ES-053.4-2021-07-30	30-Jul-2021	1190	679
	MR-S6	50.5	MOR-ES-050.5-2021-07-30	30-Jul-2021	681	406
	MR-S6	48.8	MOR-ES-048.8-2021-07-30	30-Jul-2021	548	325
	MR-S7	46.1	MOR-ES-046.1-2021-07-30	30-Jul-2021	458	295
	MR-S7	44.6	MOR-ES-044.6-2021-07-30	30-Jul-2021	901	458
	MR-S7	42.5	MOR-ES-042.5-2021-07-21	21-Jul-2021	801	685
	MR-S7	42.0	MOR-ES-042.0-2021-07-21	21-Jul-2021	982	793
	MR-S7	41.2	MOR-ES-041.2-2021-07-21	21-Jul-2021	1460	954
	MR-S7	39.8	MOR-ES-039.8-2021-07-22	22-Jul-2021	270	171
	MR-S7	39.5	MOR-ES-039.5-2021-07-22	22-Jul-2021	416	340
	MR-S7	39.2	MOR-ES-039.2-2021-07-22	22-Jul-2021	414	346

…continued.

[a] As measured upstream from the Moberly River's confluence with the Peace River.

Table B3 Concluded.

River	Section	River Km[a]	Site Name	Sample Date	Sample Length (m)	Sample Time (s)
Moberly River	MR-S7	38.7	MOR-ES-038.7-2021-07-22	22-Jul-2021	286	243
	MR-S7	38.2	MOR-ES-038.2-2021-07-22	22-Jul-2021	278	191
	MR-S7	38.0	MOR-ES-038.0-2021-07-22	22-Jul-2021	733	455
	MR-S7	37.0	MOR-ES-037.0-2021-07-22	22-Jul-2021	355	230
	MR-S7	36.9	MOR-ES-036.9-2021-07-23	23-Jul-2021	993	745
	MR-S7	35.9	MOR-ES-035.9-2021-07-23	23-Jul-2021	871	674
	MR-S7	34.9	MOR-ES-034.9-2021-07-23	23-Jul-2021	1320	841
	MR-S7	33.6	MOR-ES-033.6-2021-07-23	23-Jul-2021	1330	707
	MR-S7	31.9	MOR-ES-031.9-2021-07-23	23-Jul-2021	1600	825
	MR-S7	30.2	MOR-ES-030.2-2021-07-23	23-Jul-2021	1310	715
	MR-S8	25.4	MOR-ES-025.4-2021-07-24	24-Jul-2021	1550	717
	MR-S8	23.9	MOR-ES-023.9-2021-07-24	24-Jul-2021	1380	777
	MR-S8	22.9	MOR-ES-022.9-2021-07-24	24-Jul-2021	1140	670
	MR-S8	22.0	MOR-ES-022.0-2021-07-24	24-Jul-2021	876	508
	MR-S8	19.7	MOR-ES-019.7-2021-07-24	24-Jul-2021	1160	373
	MR-S9	14.9	MOR-ES-014.9-2021-07-25	25-Jul-2021	1260	687
	MR-S9	13.4	MOR-ES-013.4-2021-07-25	25-Jul-2021	1350	782
	MR-S10	11.1	MOR-ES-011.1-2021-07-25	25-Jul-2021	1060	684
	MR-S10	9.0	MOR-ES-009.0-2021-07-25	25-Jul-2021	1310	828
	MR-S10	6.0	MOR-ES-006.0-2021-07-25	25-Jul-2021	1430	711
	MR-S10	2.9	MOR-ES-002.9-2021-07-25	25-Jul-2021	1630	824
Moberly River Total					**52,979**	**35,157**

…concluded.

[a] As measured upstream from the Moberly River's confluence with the Peace River.

Table B4 Number of fish captured by backpack electrofishing and their frequency of occurrence in the Chowade River and Cypress and Fiddes creeks during the Site C Reservoir Tributary Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Species	Life Stage	River						All Rivers	
		Chowade River		Cypress Creek		Fiddes Creek			
		n	%[a]	n	%[a]	n	%[a]	n	%[a]
Target Species									
Arctic Grayling	Adult								
	Immature								
	YOY								
All Arctic Grayling		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Bull Trout	Adult			1	<1			1	<1
	Immature	247	40.6	241	56.6	139	96.5	627	53.2
	YOY	144	23.7	64	15.0	4	2.8	212	18.0
All Bull Trout		**391**	**64.3**	**306**	**71.8**	**143**	**99.3**	**840**	**71.3**
Rainbow Trout	Adult	1	<1	1	<1	1	0.7	3	<1
	Immature	6	1.0	5	1.2			11	0.9
	YOY								
All Rainbow Trout		**7**	**1.2**	**6**	**1.4**	**1**	**0.0**	**14**	**1.2**
Target Species Subtotal		**398**	**65.5**	**312**	**73.2**	**144**	**100.0**	**854**	**72.5**
Non-Target Species									
Mountain Whitefish	All	10	1.6	5	1.2			15	1.3
Slimy Sculpin	All	194	31.9	108	25.4			302	25.6
Sculpin Unidentified	All	6	1.0	1	<1			7	0.6
Non-Target Species Subtotal		**210**	**34.5**	**114**	**26.8**	**0**	**0.0**	**324**	**27.5**
All species		**608**	**100.0**	**426**	**100.0**	**144**	**100.0**	**1,178**	**100.0**

[a] Percent composition of the total catch.

Table B5 Number of fish caught by backpack electrofishing and their frequency of occurrence in Colt, Farrell, Kobes, and Maurice creeks during the Site C Reservoir Tributary Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

Species	Life Stage	River								All Rivers	
		Colt Creek		Farrell Creek		Kobes Creek		Maurice Creek			
		n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]
Target Species											
Arctic Grayling	Adult										
	Immature										
	YOY					6	1.7			6	<1
All Arctic Grayling		**0**	**0.0**	**0**	**0.0**	**6**	**0.0**	**0**	**0.0**	**6**	**<1**
Bull Trout	Adult	1	<1							1	<1
	Immature	9	4.5					3	0.9	12	0.9
	YOY										
All Bull Trout		**10**	**5.0**	**0**	**0.0**	**0**	**0.0**	**3**	**2.8**	**13**	**1.0**
Rainbow Trout	Adult										
	Immature	46	22.9	78	19.5	98	27.8	52	16.2	274	21.5
	YOY	7	3.5			26	7.4	1	<1	34	2.7
All Rainbow Trout		**53**	**26.4**	**78**	**19.5**	**124**	**35.1**	**53**	**16.5**	**308**	**24.1**
Target Species Subtotal		**63**	**31.3**	**78**	**19.5**	**130**	**36.8**	**56**	**17.4**	**327**	**25.6**
Non-Target Species											
Lake Chub	All			27	6.7	38	10.8			65	5.1
Largescale Sucker	All			17	4.2	10	2.8			27	2.1
Longnose Dace	All	8	4.0	68	17.0	31	8.8	153	47.7	260	20.4
Longnose Sucker	All	17	8.5	21	5.2	9	2.5	25	7.8	72	5.6
Mountain Whitefish	All	23	11.4			9	2.5	3	0.9	35	2.7
Northern Pikeminnow	All			4	1.0					4	<1
Prickly Sculpin	All							43	13.4	43	3.4
Redside Shiner	All			117	29.2	40	11.3	4	1.2	161	12.6
Slimy Sculpin	All	72	35.8	30	7.5	83	23.5	31	9.7	216	16.9
Sculpin Unidentified	All	18	9.0	7	1.7			3	0.9	28	2.2
Sucker Unidentified	All			25	6.2	3	0.8	2	0.6	30	2.4
Trout-perch	All			7	1.7					7	0.5
White Sucker	All							1	<1	1	<1
Non-Target Species Subtotal		**138**	**68.7**	**323**	**80.5**	**223**	**63.2**	**265**	**82.6**	**949**	**74.4**
All species		**201**	**100.0**	**401**	**100.0**	**353**	**100.0**	**321**	**100.0**	**1,276**	**100.0**

[a] Percent composition of the total catch.

Table B6 **Number of fish captured and their frequency of occurrence for all sample methods combined in sampled sections of the Moberly River during the Site C Reservoir Tributary Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.**

Species	Section																				All Sections	
	1A		1		2		3		4		5		6		7		8		9		10			
	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]	n	%[a]
Arctic Grayling	1	<1	1	1.2			1	0.8	1	1.4	1	1.1			30	3.8	6	2.7	1	0.6			42	2.0
Burbot			2	2.4	1	1.1	4	3.1	3	4.3	2	2.2	3	6.4	21	2.7					2	1.0	38	1.8
Lake Chub															7	0.9	15	6.6	24	15.2	15	7.8	61	2.9
Largescale Sucker							1	0.8							8	1.0	4	1.8	9	5.7	25	13.0	47	2.2
Longnose Dace	18	7.0	2	2.4	15	16.1	20	15.6	15	21.7	15	16.3	15	31.9	124	15.8	37	16.4	49	31.0	55	28.6	365	17.2
Longnose Sucker	30	11.7	17	20.7	20	21.5	16	12.5	11	15.9	11	12.0	6	12.8	221	28.2	97	42.9	54	34.2	47	24.5	530	24.9
Mountain Whitefish	159	62.1	53	64.6	47	50.5	58	45.3	33	47.8	47	51.1	12	25.5	245	31.2	39	17.3	17	10.8	13	6.8	723	34.0
Northern Pike			1	1.2					1	1.4	3	3.3	1	2.1	17	2.2	4	1.8					27	1.3
Northern Pikeminnow	5	2.0													10	1.3	7	3.1	1	0.6	17	8.9	40	1.9
Peamouth Chub											1	1.1											1	<1
Redside Shiner	10	3.9			3	3.2	5	3.9	1	1.4	3	3.3	1	2.1	32	4.1	14	6.2	3	1.9	18	9.4	90	4.2
Sculpin Unidentified															2	<1							2	<1
Slimy Sculpin	30	11.7	3	3.7	6	6.5	21	16.4	4	5.8	7	7.6	9	19.1	66	8.4	3	1.3					149	7.0
Sucker Unidentified															2	<1							2	<1
Trout-perch			2	2.4			1	0.8															3	<1
White Sucker	3	1.2	1	1.2	1	1.1	1	0.8			2	2.2											8	<1
All species	**256**	**12.0**	**82**	**3.9**	**93**	**4.4**	**128**	**6.0**	**69**	**3.2**	**92**	**4.3**	**47**	**2.2**	**785**	**36.9**	**226**	**10.6**	**158**	**7.4**	**192**	**9.0**	**2128**	**100.0**

[a] Percent composition of the total catch.

Table B7 **Capture and life history information for Arctic Grayling caught in the Moberly River during Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.**

Capture Date	Method	Section	River km[a]	Fork Length (mm)	Weight (g)	Age	Tagged
27-Jul-2021	Small Fish Boat Electroshocker	1A	115.3	208	94	2	No
28-Jul-2021	Small Fish Boat Electroshocker	1	103.5	201	85	2	Yes
29-Jul-2021	Angling	3	73.0	157	46	1	Yes
29-Jul-2021	Small Fish Boat Electroshocker	4	70.9	256	204	3	Yes
30-Jul-2021	Small Fish Boat Electroshocker	5	57.8	166	57	1	Yes
22-Jul-2021	Angling	7	39.4	161	44	1	Yes
22-Jul-2021	Small Fish Boat Electroshocker	7	39.2	132	26	1	No
22-Jul-2021	Small Fish Boat Electroshocker	7	39.2	152	38	1	Yes
22-Jul-2021	Angling	7	38.9	252	178	3	Yes
22-Jul-2021	Small Fish Boat Electroshocker	7	38.2	218	108	2	Yes
22-Jul-2021	Small Fish Boat Electroshocker	7	38.2	270	256	4	Yes
22-Jul-2021	Backpack Electrofishing	7	38.0	59	5	0	No
22-Jul-2021	Small Fish Boat Electroshocker	7	38.0	211	102	2	Yes
22-Jul-2021	Angling	7	38.0	223	130	2	Yes
22-Jul-2021	Angling	7	37.9	214	103	2	Yes
22-Jul-2021	Backpack Electrofishing	7	37.3	56	2	0	No
22-Jul-2021	Backpack Electrofishing	7	37.3	57	2	0	No
22-Jul-2021	Backpack Electrofishing	7	37.3	66	3	0	No
22-Jul-2021	Backpack Electrofishing	7	37.0	48	2	0	No
22-Jul-2021	Backpack Electrofishing	7	37.0	49	3	0	No
22-Jul-2021	Backpack Electrofishing	7	37.0	55	2	0	No
23-Jul-2021	Backpack Electrofishing	7	37.0	64	3	0	No
23-Jul-2021	Backpack Electrofishing	7	37.0	64	3	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	59	3	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	59	2	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	61	3	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	62	2	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	68	4	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	69	3	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	72	5	0	No
23-Jul-2021	Backpack Electrofishing	7	36.9	153	46	1	Yes
23-Jul-2021	Small Fish Boat Electroshocker	7	36.9	149	45	1	Yes
23-Jul-2021	Backpack Electrofishing	7	36.2	66	2	0	No
23-Jul-2021	Angling	7	36.0	149	44	1	Yes
23-Jul-2021	Angling	7	31.5	157	42	1	Yes
24-Jul-2021	Backpack Electrofishing	8	24.3	61	2	0	No
24-Jul-2021	Backpack Electrofishing	8	24.3	68	2	0	No
24-Jul-2021	Backpack Electrofishing	8	24.3	69	3	0	No
24-Jul-2021	Backpack Electrofishing	8	20.7	60	3	0	No
24-Jul-2021	Backpack Electrofishing	8	20.7	60	2	0	No
24-Jul-2021	Backpack Electrofishing	8	19.6	59	-	0	No
25-Jul-2021	Backpack Electrofishing	9	13.4	58	2	0	No

[a]River Km values for the Moberly River are measured upstream from the Moberly River's confluence with the Peace River.

concluded.

APPENDIX C

Habitat Data

Table C1 Habitat variables measured during the Site C Reservoir Tributaries Fish Population Indexing Survey (Mon-1b, Task 2c), 2021.

River	River Km	Site Name	Sample Date	Water Temp. (°C)	Water Cond. (µS/cm)	Secchi Depth (m)	Instream Velocity[a]	Mean Water Depth (m)	Maximum Water Depth (m)	Substrate		Cover Type - Percent of Available Cover (%)									
										Dominant	Sub-dominant	Interstices	Large Woody Debris	Small Woody Debris	Cutbank	Turbulence	Terrestrial Vegetation	Aquatic Vegetation	Shallow Water	Deep Water	Turbid Water
Chowade River	49.4	CHR-EF-049.4-2021-07-26	26-Jul-2021	8.2	-	to bottom	Low	0.30	0.70	Silt	Gravel	51	20	10	5		2	2	5	5	
	49.3	CHR-EF-049.3-2021-07-26	26-Jul-2021	7.3	360	to bottom	Low	0.20	0.50	Cobble	Gravel	60	5	2	3				30		
	49.2	CHR-EF-049.2-2021-07-26	26-Jul-2021	8.2	350	to bottom	High	0.20	0.40	Boulder	Cobble	60	10	5	5	10			10		
	48.5	CHR-EF-048.5-2021-07-26	26-Jul-2021	7.5	360	to bottom	Medium	0.30	0.60	Cobble	Gravel	50	3	2	5	5			30	5	
	48.4	CHR-EF-048.4-2021-07-26	26-Jul-2021	7.5	360	to bottom	Low	0.20	1.10	Gravel	Silt	49	25	10	5		5		1	5	
	48.3	CHR-EF-048.3-2021-07-26	26-Jul-2021	7.3	360	to bottom	High	0.60	1.00	Cobble	Gravel	60	5	5	5	5			10	10	
	48.2	CHR-EF-048.2-2021-07-26	26-Jul-2021	7.6	360	to bottom	Low	0.30	1.00	Gravel	Silt	43	10	15	20		5		5	2	
	48.1	CHR-EF-048.1-2021-07-26	26-Jul-2021	7.3	360	to bottom	Low	0.20	0.40	Sand	Gravel	50	5	5					40		
	46.6	CHR-EF-046.6-2021-07-25	25-Jul-2021	9.6	340	>2	Medium	0.30	1.00	Gravel	Cobble	44	20	10	5	2	2	2	10	5	
	46.3	CHR-EF-046.3-2021-07-25	25-Jul-2021	9.6	330	to bottom	High	0.30	1.20	Cobble	Gravel	60	1	1	1	1		1	20	15	
	45.0	CHR-EF-045.0-2021-07-25	25-Jul-2021	6.5	360	>1	Low	0.20	1.00	Cobble	Silt	30	1	2	2		15	46	2	2	
	44.7	CHR-EF-044.7-2021-07-25	25-Jul-2021	6.5	370	to bottom	Medium	0.30	1.20	Cobble	Gravel	45	2	3	5			30	10	5	
	44.2	CHR-EF-044.2-2021-07-25	25-Jul-2021	9.7	360	>1.5	Medium	0.30	1.10	Gravel	Cobble	50	1	10	10		2	20	2	5	
	44.0	CHR-EF-044.0-2021-07-25	25-Jul-2021	9.7	360	to bottom	Low	0.30	0.40	Sand	Gravel	4	30	35	1				30		
	36.2	CHR-EF-036.2-2021-07-25	25-Jul-2021	6.8	360	to bottom	High	-	-	Gravel	Silt	47	25	3	2	3		5	5	10	
	36.0	CHR-EF-036.0-2021-07-25	25-Jul-2021	6.5	360	to bottom	Medium	0.60	1.00	Cobble	Gravel	20	4	1				5		70	
	30.0	CHR-EF-030.0-2021-07-24	24-Jul-2021	9.6	360	to bottom	Medium	0.30	1.10	Silt	Gravel	15	53	5					2	25	
	29.8	CHR-EF-029.8-2021-07-24	24-Jul-2021	10.1	360	to bottom	Medium	0.70	1.10	Silt	Gravel		5	5	5		5		20	60	
	27.8	CHR-EF-027.8-2021-07-24	24-Jul-2021	11.4	370	-	Medium	0.30	1.00	Gravel	Silt	40			5		5	10	20	20	
	27.7	CHR-EF-027.7-2021-07-24	24-Jul-2021	11.4	350	to bottom	Medium	0.40	1.00	Gravel	Sand	5	5	5	5				30	50	
	27.4	CHR-EF-027.4-2021-07-24	24-Jul-2021	11.6	360	-	Medium	-	-	Gravel	Cobble	69	10	2	2	2			5	10	
	27.0	CHR-EF-027.0-2021-07-24	24-Jul-2021	11.4	350	to bottom	Low	0.20	0.40	Cobble	Boulder	55			5	5	5		30		
	26.0	CHR-EF-026.0-2021-07-24	24-Jul-2021	8.3	360	to bottom	Medium	0.40	1.00	Cobble	-	25	3	2		5		10	50	5	
	25.2	CHR-EF-025.2-2021-07-24	24-Jul-2021	7.4	360	to bottom	High	0.50	1.20	Gravel	Cobble	20	2	1		3			1	73	
Colt Creek	30.4	COC-EF-030.4-2021-07-22	22-Jul-2021	6.2	290	to bottom	High	0.25	0.80	Cobble	Boulder	50	1	1	22	15			10	1	
	30.2	COC-EF-030.2-2021-07-22	22-Jul-2021	6.8	280	-	High	0.20	1.00	Cobble	Gravel	55	10	10	1	5	10		4	5	
	29.0	COC-EF-029.0-2021-07-22	22-Jul-2021	6.9	290	to bottom	High	0.30	0.90	Cobble	Boulder	55	1	1	10	5			23	5	
	28.8	COC-EF-028.8-2021-07-22	22-Jul-2021	6.9	290	>1.0	High	0.20	0.90	Cobble	Boulder	81	1	5	2	2	2		2	5	
	14.3	COC-EF-014.3-2021-07-22	22-Jul-2021	10.8	230	0.5	Medium	0.40	1.20	Cobble	Gravel	40	2	2	2	1			23	30	
	14.1	COC-EF-014.1-2021-07-22	22-Jul-2021	10.8	230	0.5	Medium	0.50	1.20	Cobble	Silt	66	5	5	2	1	5		1	15	
	3.7	COC-EF-003.7-2021-07-21	21-Jul-2021	10.8	250	0.1	Medium	0.30	1.00	Gravel	Cobble	40	5	10	2		1		20	10	12
	3.5	COC-EF-003.5-2021-07-21	21-Jul-2021	10.8	250	0.1	Medium	0.30	1.20	Gravel	Cobble	40	5		4		5	1	40	5	

…continued.

[a] A categorical ranking of water velocity (high = greater than 1.0 m/s; medium = 0.5 to 1.0 m/s; low = less than 0.5 m/s

Table C1 Continued.

River	River Km	Site Name	Sample Date	Water Temp. (°C)	Water Cond. (µS/cm)	Secchi Depth (m)	Instream Velocity[a]	Mean Water Depth (m)	Maximum Water Depth (m)	Substrate		Cover Type - Percent of Available Cover (%)								
										Dominant	Sub-dominant	Interstices	Large Woody Debris	Small Woody Debris	Cutbank	Turbulence	Terrestrial Vegetation	Aquatic Vegetation	Shallow Water	Deep Water	Turbid Water
Cypress Creek	38.8	CYC-EF-038.8-2021-07-29	29-Jul-2021	12.8	390	to bottom	Medium	0.50	1.20	Cobble	Gravel	45	5	5	5					40	
	38.7	CYC-EF-038.7-2021-07-29	29-Jul-2021	12.8	390	to bottom	Low	0.30	1.20	Gravel	Silt	93	1	1	1		3			1	
	35.0	CYC-EF-035.0-2021-07-29	29-Jul-2021	9.6	400	to bottom	Medium	0.20	1.20	Cobble	Gravel	94	2	1	1				1	1	
	34.8	CYC-EF-034.8-2021-07-29	29-Jul-2021	9.6	400	to bottom	Medium	0.40	1.00	Cobble	-	75	5	2	10	5				3	
	34.6	CYC-EF-034.6-2021-07-27	27-Jul-2021	10.0	400	to bottom	Medium	0.30	1.00	Cobble	Sand	40	3	2		20			30	5	
	34.5	CYC-EF-034.5-2021-07-27	27-Jul-2021	9.9	280	to bottom	Low	0.30	1.20	Gravel	Silt	50	20	10	10		2		5	3	
	33.1	CYC-EF-033.1-2021-07-30	30-Jul-2021	13.5	380	to bottom	Medium	0.00	0.00	Cobble	Boulder	86	2	2	1		1	8			
	32.3	CYC-EF-032.3-2021-07-30	30-Jul-2021	13.5	380	to bottom	Low	0.30	0.60	Cobble	Gravel	Not recorded									
	29.0	CYC-EF-029.0-2021-07-30	30-Jul-2021	9.7	380	to bottom	Medium	0.00	0.00	Cobble	Gravel	50	1	1		3			45		
	28.8	CYC-EF-028.8-2021-07-30	30-Jul-2021	9.7	380	to bottom	Medium	0.30	0.80	Cobble	Boulder	94	3	1	1		1				
	28.3	CYC-EF-028.3-2021-07-27	27-Jul-2021	8.7	370	to bottom	Medium	0.20	0.80	Cobble	Boulder	90	2	2			1	1	2	2	
	28.2	CYC-EF-028.2-2021-07-27	27-Jul-2021	8.7	370	to bottom	High	0.40	0.70	Cobble	Gravel	50	1	1	1	16			30	1	
Farrell Ceek	102.1	FAC-EF-102.1-2021-07-23	23-Jul-2021	15.3	300	1	Low	0.80	1.20	Silt	Gravel	5	3	2	5				5	60	20
	101.9	FAC-EF-101.9-2021-07-23	23-Jul-2021	15.3	300	1	Low	-	-	Silt	Sand	5	20	10	5	1			5	20	34
	65.7	FAC-EF-065.7-2021-07-18	18-Jul-2021	13.9	530	1.15	Low	0.60	1.50	Sand	Gravel		55	25						20	
	65.5	FAC-EF-065.5-2021-07-18	18-Jul-2021	13.9	530	1.15	Low	0.60	1.70	Sand	Gravel		55	30	5					10	
Farrell Creek	63.3	FAC-EF-063.3-2021-07-17	17-Jul-2021	14.3	510	1	Low	0.40	0.80	Cobble	Boulder	75	3	2	5	5		5		5	
	63.0	FAC-EF-063.0-2021-07-17	17-Jul-2021	14.7	510	1	Low	0.50	1.40	Cobble	Gravel	50	10	10		10				10	10
Fiddes Creek	7.9	FIC-EF-007.9-2021-07-31	31-Jul-2021	10.4	390	to bottom	High	0.20	0.60	Cobble	Boulder	76		2	2	10			10		
	7.7	FIC-EF-007.7-2021-07-31	31-Jul-2021	10.3	390	to bottom	Medium	-	-	Boulder	Cobble	89	1	1	1	2	1	3	1	1	
	5.7	FIC-EF-005.7-2021-07-31	31-Jul-2021	7.1	400	to bottom	High	0.30	0.50	Boulder	Cobble	30			5	30			30	5	
	5.5	FIC-EF-005.5-2021-07-31	31-Jul-2021	7.1	400	to bottom	Medium	0.25	1.00	Cobble	Boulder	92	1	1	1	2	1		1	1	
Kobes Creek	55.5	KOC-EF-055.5-2021-08-01	1-Aug-2021	16.7	90	to bottom	Low	0.30	0.70	Cobble	Gravel	Not recorded									
	55.3	KOC-EF-055.3-2021-08-01	1-Aug-2021	16.7	90	to bottom	-	0.20	0.50	Silt	Sand	17	20	14	4				40	5	
	46.7	KOC-EF-046.7-2021-08-01	1-Aug-2021	20.3	130	to bottom	Low	0.10	1.00	Silt	Sand	1	5	20	5	1		20	46	2	
	46.5	KOC-EF-046.5-2021-08-01	1-Aug-2021	20.3	150	to bottom	Low	0.20	1.00	Cobble	Gravel	60	2	3				10	25		
	40.4	KOC-EF-040.4-2021-08-02	2-Aug-2021	17.7	180	to bottom	-	0.30	1.00	Silt	Cobble	5	5	5	1	1	1		42	40	
	40.2	KOC-EF-040.2-2021-08-02	2-Aug-2021	17.7	180	to bottom	Low	0.80	1.50	Cobble	Sand	5	5	5					5	80	
	11.7	KOC-EF-011.7-2021-07-23	23-Jul-2021	13.9	220	0.25	Low	0.60	1.50	Silt	Boulder	2	1	2	1	2			5	15	72
	11.5	KOC-EF-011.5-2021-07-23	23-Jul-2021	13.9	220	0.3	Low	0.80	1.40	Silt	Sand	5	1	1				1	3	50	39
Maurice Creek	2.0	MAC-EF-002.0-2021-08-03	3-Aug-2021	17.3	490	to bottom	Low	-	-	Cobble	Bedrock	70	1	1					25	3	
	1.8	MAC-EF-001.8-2021-08-03	3-Aug-2021	17.3	490	to bottom	Low	0.20	1.20	Silt	Sand	30	10	5	10	10		2	23	10	
	1.5	MAC-EF-001.5-2021-07-28	28-Jul-2021	21.3	430	to bottom	Low	0.20	0.40	Cobble	Gravel	40	1	1				20	38		
	1.3	MAC-EF-001.3-2021-07-28	28-Jul-2021	23.1	430	to bottom	Low	0.20	1.00	Cobble	Gravel	97	2	1							
	1.2	MAC-EF-001.2-2021-07-28	28-Jul-2021	20.0	430	to bottom	-	0.20	0.40	Bedrock	Cobble	10							90		
	1.0	MAC-EF-001.0-2021-07-28	28-Jul-2021	20.0	430	to bottom	Low	0.10	0.30	Bedrock	Boulder	90			2				8		
	0.8	MAC-EF-000.8-2021-07-28	28-Jul-2021	16.4	430	to bottom	Low	0.15	0.30	Bedrock	Boulder	5			2	1			92		
	0.6	MAC-EF-000.6-2021-07-28	28-Jul-2021	16.4	430	to bottom	-	0.20	0.50	Cobble	Bedrock	60							35	5	

…continued.

[a] A categorical ranking of water velocity (high = greater than 1.0 m/s; medium = 0.5 to 1.0 m/s; low = less than 0.5 m/s

Table C1 Continued.

River	River Km	Site Name	Sample Date	Water Temp. (°C)	Water Cond. (µS/cm)	Secchi Depth (m)	Instream Velocity[a]	Mean Water Depth (m)	Maximum Water Depth (m)	Substrate		Cover Type - Percent of Available Cover (%)								
										Dominant	Sub-dominant	Interstices	Large Woody Debris	Small Woody Debris	Cutbank	Turbulence	Terrestrial Vegetation	Aquatic Vegetation	Shallow Water	Deep Water	Turbid Water
Moberly River	118.0	MOR-AN-118.0-2021-07-27	27-Jul-2021	17.0	190	1.2	Low	0.30	0.95	Gravel	Cobble	85		5						10	
	118.0	MOR-AN-118.0-2021-07-26	26-Jul-2021	17.0	190	1.2	Low	0.30	0.95	Gravel	Cobble	85	5							10	
	118.0	MOR-ES-118.0-2021-07-27	27-Jul-2021	17.0	190	1.2	Medium	0.70	1.40	Cobble	Boulder	40	10			40				10	
	117.9	MOR-AN-117.9-2021-07-27	27-Jul-2021	17.0	190	1.2	Low	0.50	1.40	Cobble	Gravel	75		5						20	
	117.0	MOR-ES-117.0-2021-07-27	27-Jul-2021	17.0	230	to bottom	Medium	0.80	1.30	Cobble	Boulder	50	20							30	
	116.5	MOR-EF-116.5-2021-07-27	27-Jul-2021	16.9	190	1.2	Low	0.40	0.70	Cobble	Gravel	70	5	5		15	5				
	116.5	MOR-ES-116.5-2021-07-27	27-Jul-2021	16.5	200	to bottom	Medium	1.00	1.40	Cobble	Gravel	30	10			30				30	
	116.0	MOR-AN-116.0-2021-07-27	27-Jul-2021	-	-	-	Low	0.25	0.40	Cobble	Gravel	Not recorded									
	115.6	MOR-AN-115.6-2021-07-27	27-Jul-2021	17.0	190	1.2	Low	0.60	1.7	Gravel	Sand	Not recorded									
	115.6	MOR-EF-115.6-2021-07-27	27-Jul-2021	18.0	190	1.2	Low	0.70	1.50	Gravel	Cobble	40	20	10		10				20	
	115.5	MOR-ES-115.5-2021-07-27	27-Jul-2021	18.0	190	to bottom	Low	1.20	1.60	Gravel	Cobble		60							40	
	115.3	MOR-ES-115.3-2021-07-27	27-Jul-2021	17.5	190	0.6	Low	0.80	1.40	Gravel	Boulder		10			10				70	10
	115.0	MOR-ES-115.0-2021-07-27	27-Jul-2021	17.5	190	to bottom	Low	0.90	1.40	Gravel	Boulder		30			10				60	
	114.1	MOR-ES-114.1-2021-07-27	27-Jul-2021	17.5	190	to bottom	Low	0.80	1.60	Gravel	Cobble		10						20	70	
	113.0	MOR-AN-113.0-2021-07-27	27-Jul-2021	17.5	-	1.0	Low	0.40	1.20	Gravel	Sand	70	10	10						10	
	113.0	MOR-EF-113.0-2021-07-27	27-Jul-2021	20.2	200	0.8	Low	0.30	0.80	Gravel	Sand	50	10	10		20	10				
	103.5	MOR-ES-103.5-2021-07-28	28-Jul-2021	17.0	210	1.4	Low	1.10	2.30	Gravel	Sand		20	20		10				50	
	103.0	MOR-AN-103.0-2021-07-28	28-Jul-2021	17.0	-	1.1	Low	0.90	1.00	Gravel	Sand	60	5	5					20	10	
	102.7	MOR-AN-102.7-2021-07-28	28-Jul-2021	17.0	-	1.1	Low	0.40	0.70	Gravel	Sand	90		5					5		
	102.7	MOR-ES-102.7-2021-07-28	28-Jul-2021	17.0	210	to bottom	Low	1.30	2.00	Gravel	Sand		20	20					10	50	
	102.0	MOR-EF-102.0-2021-07-28	28-Jul-2021	17.2	200	0.8	Low	0.3	0.7	Gravel	Silt	60	10	10		10	10				
	101.6	MOR-ES-101.6-2021-07-28	28-Jul-2021	17.0	210	1.7	Medium	0.9	2.7	Gravel	Sand		15	15		30				40	
	101.5	MOR-AN-101.5-2021-07-28	28-Jul-2021	17.0	-	1.1	Low	0.4	0.9	Gravel	Sand	90	5						2	3	
	100.6	MOR-ES-100.6-2021-07-28	28-Jul-2021	16.5	200	2.5	Medium	0.9	2	Gravel	Sand		10	10		30				50	
	100.5	MOR-EF-100.5-2021-07-28	28-Jul-2021	17.4	200	0.8	Low	0.4	0.9	Gravel	Cobble	50	5	10		20	10			5	
	100.2	MOR-AN-100.2-2021-07-28	28-Jul-2021	17.0	-	1.3	Low	0.3	0.9	Gravel	Sand	80	10	5					5		
	98.7	MOR-AN-098.7-2021-07-28	28-Jul-2021	17.5	-	1.2	Low	0.6	1.4	Sand	Silt			5						95	
	94.8	MOR-AN-094.8-2021-07-28	28-Jul-2021	17.5	-	1.3	Low	0.6	1.8	Sand	Gravel		10	10						80	
	94.5	MOR-ES-094.5-2021-07-28	28-Jul-2021	17.0	200	1.5	Low	0.9	3.4	Sand	Cobble		20	20						60	
	91.0	MOR-AN-091.0-2021-07-28	28-Jul-2021	17.5	-	1.3	Low	0.30	0.40	Cobble	Boulder	70	20	10							
	90.4	MOR-ES-090.4-2021-07-28	28-Jul-2021	17.0	200	to bottom	Medium	0.45	1.00	Boulder	Cobble	60	20	20							
	90.0	MOR-AN-090.0-2021-07-28	28-Jul-2021	17.5	-	1.3	Low	-	-	Gravel	Cobble	90	10								
	87.0	MOR-ES-087.0-2021-07-28	28-Jul-2021	19.0	200	to bottom	Medium	0.60	1.00	Boulder	Cobble	30	20	20		30					
	86.3	MOR-EF-086.3-2021-07-28	28-Jul-2021	18.6	200	0.8	-	0.50	0.70	Cobble	Gravel	Not recorded									
	86.1	MOR-AN-086.1-2021-07-28	28-Jul-2021	17.0	-	1.2	Low	0.30	0.50	Gravel	Sand	100									
	84.4	MOR-ES-084.4-2021-07-28	28-Jul-2021	19.0	200	to bottom	Low	0.60	0.90	Cobble	Boulder	70				30					
	81.0	MOR-ES-081.0-2021-07-29	29-Jul-2021	16.5	210	to bottom	Low	0.90	1.90	Cobble	Boulder	20				20				60	
	80.8	MOR-AN-080.8-2021-07-29	29-Jul-2021	18.0	-	1.2	Low	0.35	0.60	Gravel	Sand	60	15	15					5	5	
	79.8	MOR-EF-079.8-2021-07-29	29-Jul-2021	17.7	210	0.9	Low	0.40	0.70	Cobble	Gravel		10	10		75	2			3	

…continued.

[a] A categorical ranking of water velocity (high = greater than 1.0 m/s; medium = 0.5 to 1.0 m/s; low = less than 0.5 m/s

Table C1 Continued.

River	River Km	Site Name	Sample Date	Water Temp. (°C)	Water Cond. (µS/cm)	Secchi Depth (m)	Instream Velocity[a]	Mean Water Depth (m)	Maximum Water Depth (m)	Substrate		Cover Type - Percent of Available Cover (%)								
										Dominant	Sub-dominant	Interstices	Large Woody Debris	Small Woody Debris	Cutbank	Turbulence	Terrestrial Vegetation	Aquatic Vegetation	Shallow Water	Deep Water	Turbid Water
Moberly River	79.5	MOR-AN-079.5-2021-07-29	29-Jul-2021	18.0	-	1.2	Low	0.20	0.80	Gravel	Cobble	75	10	5					5	5	
	78.9	MOR-ES-078.9-2021-07-29	29-Jul-2021	16.5	210	to bottom	Medium	0.70	1.40	Cobble	Boulder	60				20				20	
	77.9	MOR-ES-077.9-2021-07-29	29-Jul-2021	17.0	210	1.5	Medium	1.50	3.20	Cobble	Gravel	20				20				60	
	77.8	MOR-AN-077.8-2021-07-29	29-Jul-2021	18.0	-	1.2	Low	0.30	0.80	Cobble	Gravel	75	10	10					5		
	77.1	MOR-AN-077.1-2021-07-29	29-Jul-2021	18.0	-	-	Low	0.30	0.40	Cobble	Gravel	80	5	5					10		
	75.3	MOR-ES-075.3-2021-07-29	29-Jul-2021	17.5	210	1.7	Low	0.80	1.50	Gravel	Cobble	60	10			10				20	
	73.9	MOR-AN-073.9-2021-07-29	29-Jul-2021	18.0	-	1.2	Low	0.80	1.50	Sand	Gravel	75	5							20	
	73.1	MOR-ES-073.1-2021-07-29	29-Jul-2021	18.0	210	to bottom	-	0.70	0.00	Gravel	Cobble	60	20			20					
	73.0	MOR-AN-073.0-2021-07-29	29-Jul-2021	18.0	-	1.2	Low	0.80	1.40	Boulder	Cobble	85		5					10		
	72.0	MOR-AN-072.0-2021-07-29	29-Jul-2021	18.0	-	1.2	Medium	0.20	0.40	Cobble	Gravel	100									
	71.6	MOR-AN-071.6-2021-07-29	29-Jul-2021	-	-	1.2	Low	0.70	1.20	Cobble	Gravel	45	10			40				5	
	70.9	MOR-ES-070.9-2021-07-29	29-Jul-2021	18.5	210	1.7	Low	1.00	1.50	Cobble	Gravel	80				20					
	69.5	MOR-EF-069.5-2021-07-29	29-Jul-2021	21.6	210	1.2	Low	0.30	0.50	Gravel	Sand	65	5	10			20				
	69.5	MOR-ES-069.5-2021-07-29	29-Jul-2021	18.0	210	1.7	Low	0.70	1.20	Cobble	Boulder	80				20					
	69.4	MOR-AN-069.4-2021-07-29	29-Jul-2021	18.0	-	-	Low	-	-	Cobble	Sand	80	10							10	
	68.2	MOR-EF-068.2-2021-07-29	29-Jul-2021	21.2	210	1.2	Low	0.40	0.90	Gravel	Cobble	50	10	10		20	10				
	68.0	MOR-AN-068.0-2021-07-29	29-Jul-2021	18.0	-	1.2	Low	0.30	0.35	Cobble	Boulder	100									
	64.8	MOR-AN-064.8-2021-07-29	29-Jul-2021	18.0	-	1.0	Medium	0.30	0.60	Gravel	Cobble	50				20			30		
	64.8	MOR-ES-064.8-2021-07-29	29-Jul-2021	21.0	200	1.6	Low	0.80	2.20	Cobble	Boulder	50				30				20	
	61.5	MOR-AN-061.5-2021-07-30	30-Jul-2021	17.0	-	1.2		0.30	0.50	Cobble	Gravel	80	5	5					10		
	58.9	MOR-AN-058.9-2021-07-30	30-Jul-2021	18.0	-	-	Low	0.40	0.90	Boulder	Cobble	80	5						10	5	
	58.8	MOR-ES-058.8-2021-07-30	30-Jul-2021	18.0	210	to bottom	Low	0.60	1.00	Cobble	Boulder	70				30					
	57.9	MOR-EF-057.9-2021-07-30	30-Jul-2021	19.3	210	0.8	Low	0.40	0.70	Cobble	Boulder	90				5	5				
	57.8	MOR-ES-057.8-2021-07-30	30-Jul-2021	18.0	210	to bottom		0.50	1.20	Cobble	Boulder	70				30					
	57.2	MOR-AN-057.2-2021-07-30	30-Jul-2021	18.0	-	1.2	Low	0.40	0.80	Cobble	Gravel	80		5					15		
	56.8	MOR-AN-056.8-2021-07-30	30-Jul-2021	18.0	-	1.2	Medium	0.40	0.90	Cobble	Gravel	70				30					
	56.4	MOR-ES-056.4-2021-07-30	30-Jul-2021	18.0	210	1.5	Low	0.60	3.00	Cobble	Boulder	60				20				20	
	55.4	MOR-AN-055.4-2021-07-30	30-Jul-2021	19.0	-	1.2	Low	0.25	0.40	Cobble	Gravel	80				20					
	53.4	MOR-ES-053.4-2021-07-30	30-Jul-2021	18.0	210	1.7	Medium	0.60	2.80	Cobble	Gravel	50				20				30	
	52.9	MOR-EF-052.9-2021-07-30	30-Jul-2021	21.6	210	0.7	Low	0.40	0.80	Silt	Gravel	60	20	5		10	5				
	51.1	MOR-AN-051.1-2021-07-30	30-Jul-2021	19.0	-	1.0	Medium	0.60	0.80	Gravel	Cobble	50				10				40	
	50.9	MOR-AN-050.9-2021-07-30	30-Jul-2021	19.0	-	1.1	Low	0.25	0.30	-	-	70				30					
	50.5	MOR-ES-050.5-2021-07-30	30-Jul-2021	22.0	200	1.2	Low	0.80	2.50	Cobble	Gravel	40				20				40	
	48.8	MOR-ES-048.8-2021-07-30	30-Jul-2021	22.0	200	1.1	Low	0.50	0.90	Cobble	Boulder	100									
	47.0	MOR-AN-047.0-2021-07-30	30-Jul-2021	22.7	-	1.2	Low	-	-	Cobble	Gravel	80	5	5					10		
	47.0	MOR-EF-047.0-2021-07-30	30-Jul-2021	22.7	210	-	Low	0.50	0.90	Gravel	Cobble	40	5	5		40	10				
	46.2	MOR-AN-046.2-2021-07-29	29-Jul-2021	21.7	-	-	Low	-	-	Cobble	Gravel	100									
	46.1	MOR-ES-046.1-2021-07-30	30-Jul-2021	22.0	200	1.2	Medium	0.80	1.20	Cobble	Boulder	70				30					
	45.0	MOR-AN-045.0-2021-07-30	30-Jul-2021	21.7	-	1.0	Low	0.30	0.50	Cobble	Gravel	100									
	44.6	MOR-ES-044.6-2021-07-30	30-Jul-2021	22.0	210	1.0	Low	0.60	1.60	Cobble	Boulder	40				20				40	
	44.0	MOR-EF-044.0-2021-07-30	30-Jul-2021	23.6	210	0.7	Low	0.40	1.50	Cobble	Gravel	55	5	5		20	5			10	

…continued.

[a] A categorical ranking of water velocity (high = greater than 1.0 m/s; medium = 0.5 to 1.0 m/s; low = less than 0.5 m/s

Table C1 Continued.

River	River Km	Site Name	Sample Date	Water Temp. (°C)	Water Cond. (µS/cm)	Secchi Depth (m)	Instream Velocity[a]	Mean Water Depth (m)	Maximum Water Depth (m)	Substrate		Cover Type - Percent of Available Cover (%)								
										Dominant	Sub-dominant	Interstices	Large Woody Debris	Small Woody Debris	Cutbank	Turbulence	Terrestrial Vegetation	Aquatic Vegetation	Shallow Water	Deep Water	Turbid Water
Moberly River	43.1	MOR-AN-043.1-2021-07-30	30-Jul-2021	22.0	-	0.7	Low	0.50	1.00	Cobble	Gravel	60	10	10	10				10		
	42.7	MOR-EF-042.7-2021-07-21	21-Jul-2021	20.7	440	0.6	Low	0.40	0.80	Gravel	Cobble	85		5	5		5				
	42.5	MOR-AN-042.5-2021-07-21	21-Jul-2021	18.5	200	0.6	Low	0.10	1.00	Cobble	Gravel	95		5							
	42.5	MOR-ES-042.5-2021-07-21	21-Jul-2021	17.5	210	0.4	Low	0.50	1.40	Gravel	Cobble	20	10		10	20				30	10
	42.4	MOR-AN-042.4-2021-07-21	21-Jul-2021	18.5	200	0.6	Low	0.10	0.40	Cobble	Gravel	97	3								
	42.0	MOR-ES-042.0-2021-07-21	21-Jul-2021	17.5	210	0.4	Low	0.50	1.20	Gravel	Cobble	40	10	10	5	15				10	10
	41.8	MOR-AN-041.8-2021-07-21	21-Jul-2021	18.5	200	0.6	Low	0.30	0.90	Gravel	Sand	98	2								
	41.2	MOR-ES-041.2-2021-07-21	21-Jul-2021	18.0	210	0.8	Medium	0.50	1.20	Cobble	Gravel	40	10		10	20			5	5	10
	41.0	MOR-EF-041.0-2021-07-21	21-Jul-2021	19.1	200	0.5	Low	0.40	0.90	Silt	Gravel	45	20	20	5		10				
	40.8	MOR-AN-040.8-2021-07-21	21-Jul-2021	18.5	200	0.6	Low	0.40	1.00	Cobble	Gravel	75	5						20		
	39.8	MOR-AN-039.8-2021-07-21	21-Jul-2021	18.5	200	0.7	Low	0.50	1.50	Cobble	Gravel	100									
	39.8	MOR-ES-039.8-2021-07-22	22-Jul-2021	15.0	210	0.8	Medium	0.40	1.00	Cobble	Gravel	80	10			10					
	39.6	MOR-EF-039.6-2021-07-22	22-Jul-2021	16.4	200	0.6	Low	0.50	1.20	Cobble	Gravel	60	5	5		20				10	
	39.5	MOR-ES-039.5-2021-07-22	22-Jul-2021	15.0	210	0.8	Medium	0.40	1.10	Gravel	Cobble	20	20	20		40					
	39.4	MOR-AN-039.4-2021-07-22	22-Jul-2021	16.0	210	0.8	Low	0.30	1.60	Cobble	Gravel	15	70							15	
	39.2	MOR-ES-039.2-2021-07-22	22-Jul-2021	15.0	210	0.8	Medium	0.40	1.00	Gravel	Cobble	20	20	20		20			10	10	
	39.1	MOR-AN-039.1-2021-07-22	22-Jul-2021	16.0	-	0.6	Low	0.40	0.90	Cobble	Gravel	15	70						5	10	
	38.9	MOR-AN-038.9-2021-07-22	22-Jul-2021	16.5	200	0.7	Low	-	-	Gravel	Sand	40	20	10						20	10
	38.7	MOR-EF-038.7-2021-07-22	22-Jul-2021	17.4	200	0.6	Low	0.50	0.80	Gravel	Sand	70	5	10		10	5				
	38.7	MOR-ES-038.7-2021-07-22	22-Jul-2021	15.0	210	0.8	Medium	0.40	0.90	Cobble	Boulder	30	20	10		20			20		
	38.2	MOR-ES-038.2-2021-07-22	22-Jul-2021	17.0	210	0.7	Medium	0.50	1.30	Cobble	Gravel	25	15	5		10			20	25	
	38.0	MOR-AN-038.0-2021-07-22	22-Jul-2021	10.1	350	1.0	-	-	-	Cobble	Gravel	60	10	10					10	10	
	38.0	MOR-EF-038.0-2021-07-22	22-Jul-2021	10.1	350	1.0	Low	0.30	0.50	Sand	Gravel	73	2	5			10	10			
	38.0	MOR-EF-038.0-2021-07-22_1	22-Jul-2021	17.0	420	0.4	Low	0.50	1.00	Silt	Organics							80			20
	38.0	MOR-ES-038.0-2021-07-22	22-Jul-2021	17.0	230	0.7	Medium	0.45	1.20	Cobble	Gravel	25	10	10	10	15			10	10	10
	37.9	MOR-AN-037.9-2021-07-22	22-Jul-2021	9.0	-	0.70	Low	0.30	0.50	Cobble	Gravel	100									
	37.9	MOR-EF-037.9-2021-07-22	22-Jul-2021	9.1	380	1.00	Low	0.40	0.60	Sand	Gravel	75		10			5	10			
	37.3	MOR-EF-037.3-2021-07-22	22-Jul-2021	13.0	350	to bottom	Low	0.30	0.70	Gravel	Sand	20				80					
	37.0	MOR-EF-037.0-2021-07-22	22-Jul-2021	11.2	360	-	Low	0.20	1.00	Silt	Gravel	50	5	10			5	10	15	5	
	37.0	MOR-EF-037.0-2021-07-23	23-Jul-2021	12.0	340	>1.0	Low	0.20	0.60	Cobble	Gravel	80	10	10							
	37.0	MOR-ES-037.0-2021-07-22	22-Jul-2021	17.0	230	0.7	Medium	0.40	1.00	Cobble	Gravel	80				20					
	36.9	MOR-AN-036.9-2021-07-23	23-Jul-2021	16.0	-	0.7	Medium	-	-	Cobble	Sand	30				30				30	10
	36.9	MOR-AN-036.9-2021-07-22	22-Jul-2021	14.0	-	0.7	Medium	0.40	1.20	Cobble	Sand	10				40				30	20
	36.9	MOR-EF-036.9-2021-07-23	23-Jul-2021	15.6	210	0.5	Low	0.50	1.20	Gravel	Cobble	35	20	10		5				10	20
	36.9	MOR-ES-036.9-2021-07-23	23-Jul-2021	16.0	210	0.5	Medium	0.50	1.00	Cobble	Gravel	30	20	20		30					
	36.2	MOR-AN-036.2-2021-07-23	23-Jul-2021	-	-	-	Low	0.40	1.00	-	-	70								30	
	36.2	MOR-EF-036.2-2021-07-23	23-Jul-2021	15.6	400	1	Low	0.40	0.80	Gravel	Cobble	55	10	10		5	10	5		5	
	36.0	MOR-AN-036.0-2021-07-23	23-Jul-2021	15.9	420	0.7	Low	0.60	1.90	Gravel	Sand	97		1					2		
	35.9	MOR-ES-035.9-2021-07-23	23-Jul-2021	16.0	210	0.5	Medium	0.70	1.50	Cobble	Gravel	30	30			30				10	
	35.0	MOR-AN-035.0-2021-07-23	23-Jul-2021	17.0	-	0.6	Low	0.30	1.30	Gravel	Sand	50									50
	34.9	MOR-ES-034.9-2021-07-23	23-Jul-2021	17.0	210	0.5	Medium	0.50	1.10	Cobble	Gravel	70				30					

…continued.

[a] A categorical ranking of water velocity (high = greater than 1.0 m/s; medium = 0.5 to 1.0 m/s; low = less than 0.5 m/s

Table C1 Concluded.

River	River Km	Site Name	Sample Date	Water Temp. (°C)	Water Cond. (µS/cm)	Secchi Depth (m)	Instream Velocity[a]	Mean Water Depth (m)	Maximum Water Depth (m)	Substrate		Cover Type - Percent of Available Cover (%)								
										Dominant	Sub-dominant	Interstices	Large Woody Debris	Small Woody Debris	Cutbank	Turbulence	Terrestrial Vegetation	Aquatic Vegetation	Shallow Water	Deep Water	Turbid Water
Moberly River	34.1	MOR-AN-034.1-2021-07-23	23-Jul-2021	17.0	-	0.6	Low	0.20	0.90	Cobble	Gravel	100								
	33.6	MOR-ES-033.6-2021-07-23	23-Jul-2021	17.0	210	0.4	Medium	0.50	1.10	Cobble	Gravel	60	10			30				
	32.5	MOR-AN-032.5-2021-07-23	23-Jul-2021	17.0	-	0.7	Low	0.30	0.90	Gravel	Cobble	100								
	32.0	MOR-AN-032.0-2021-07-23	23-Jul-2021	-	-	-	Low	-	-	Cobble	Gravel	95	1	4						
	32.0	MOR-EF-032.0-2021-07-23	23-Jul-2021	18.4	200	0.4	Low	0.40	1.20	Cobble	Gravel	25	5	10		30				10	20
	31.9	MOR-ES-031.9-2021-07-23	23-Jul-2021	17.0	220	0.5	Medium	0.60	1.40	Cobble	Gravel	60	10			30				
	31.5	MOR-AN-031.5-2021-07-23	23-Jul-2021	17.0	-	-	Low	0.25	0.30	Cobble	Gravel	100								
	30.2	MOR-ES-030.2-2021-07-23	23-Jul-2021	17.0	210	0.5	Medium	0.50	1.10	Cobble	Gravel	30	20			20			10	10	10
	29.8	MOR-EF-029.8-2021-07-23	23-Jul-2021	18.3	220	0.4	Low	0.30	0.80	Gravel	Cobble	60				30	10			
	25.4	MOR-ES-025.4-2021-07-24	24-Jul-2021	14.5	210	0.5	Medium	0.60	1.00	Cobble	Boulder	40	20			40				
	25.3	MOR-AN-025.3-2021-07-24	24-Jul-2021	16.0	-	0.7	Low	0.25	0.40	Gravel	Cobble	70							30		
	24.8	MOR-AN-024.8-2021-07-24	24-Jul-2021	-	-	-	Low	-	-	Gravel	Cobble	70	20						5	5	
	24.3	MOR-EF-024.3-2021-07-24	24-Jul-2021	16.4	260	0.5	Low	0.40	0.90	Gravel	Cobble	65	5	10		5	15				
	23.9	MOR-ES-023.9-2021-07-24	24-Jul-2021	14.5	210	0.5	Medium	0.40	0.70	Cobble	Gravel	60	20			20					
	23.8	MOR-AN-023.8-2021-07-24	24-Jul-2021	17.0	-	0.7	Low	0.30	0.60	Gravel	Cobble	60	20	20							
	23.5	MOR-AN-023.5-2021-07-24	24-Jul-2021	16.5	-	0.7	Low	0.40	0.60	Gravel	Cobble	80							20		
	22.9	MOR-ES-022.9-2021-07-24	24-Jul-2021	16.0	210	0.5	Medium	0.50	1.80	Cobble	Gravel	50	20			30					
	22.5	MOR-AN-022.5-2021-07-24	24-Jul-2021	17.0	-	0.7	Low	0.60	1.50	Cobble	Gravel	60	20	10					5	5	
	22.4	MOR-AN-022.4-2021-07-24	24-Jul-2021	17.0	-	0.7	Low	0.40	-	Gravel	Cobble	50	20	10						20	
	22.1	MOR-AN-022.1-2021-07-24	24-Jul-2021	17.0	-	0.7	Low	0.30	0.60	Gravel	Cobble	80							20		
	22.0	MOR-ES-022.0-2021-07-24	24-Jul-2021	17.0	210	0.5	Medium	0.40	0.90	Cobble	Gravel	40	40	10		10					
	20.7	MOR-EF-020.7-2021-07-24	24-Jul-2021	19.5	230	0.5	Low	0.40	1.20	Gravel	Sand	50	15	15		10				10	
	19.7	MOR-ES-019.7-2021-07-24	24-Jul-2021	17.0	210	0.5	Medium	0.45	1.10	Cobble	Gravel	40	20	10		30					
	19.6	MOR-EF-019.6-2021-07-24	24-Jul-2021	19.9	230	0.5	Low	0.40	0.90	Gravel	Cobble	65	5	5		20				5	
	17.9	MOR-AN-017.9-2021-07-24	24-Jul-2021	18.0	-	0.7	Low	0.40	0.70	Gravel	Cobble	80	5	5		10					
	14.9	MOR-AN-014.9-2021-07-25	25-Jul-2021	16.2	230	0.7	-	0.30	0.50	Gravel	Cobble	80							20		
	14.9	MOR-ES-014.9-2021-07-25	25-Jul-2021	15.5	230	0.3	Medium	0.60	1.20	Cobble	Gravel	30	30			30				10	
	13.4	MOR-AN-013.4-2021-07-25	25-Jul-2021	16.2	230	0.6	Low	0.40	0.80	Gravel	Sand	40							20	20	20
	13.4	MOR-EF-013.4-2021-07-25	25-Jul-2021	17.2	240	0.4	Low	0.50	0.80	Gravel	-	45	5	10		20	10			10	
	13.4	MOR-ES-013.4-2021-07-25	25-Jul-2021	16.0	230	0.3	Medium	0.60	1.10	Cobble	Gravel	10	40			30					20
	12.1	MOR-AN-012.1-2021-07-25	25-Jul-2021	17.0	220	0.7	Low	0.25	0.40	Gravel	-	70							30		
	12.0	MOR-EF-012.0-2021-07-25	25-Jul-2021	18.4	240	0.4	Low	0.40	1.30	Gravel	Cobble	60	10	10		10				5	5
	11.5	MOR-AN-011.5-2021-07-25	25-Jul-2021	17.0	-	-	Low	-	-	Gravel	Sand	70	15	10					5		
	11.1	MOR-ES-011.1-2021-07-25	25-Jul-2021	17.5	230	0.3	Medium	0.70	1.60	Cobble	Gravel	30	20			30					20
	9.0	MOR-ES-009.0-2021-07-25	25-Jul-2021	17.5	230	0.3	Low	0.80	1.70	Cobble	Boulder	20				20				30	30
	7.6	MOR-EF-007.6-2021-07-25	25-Jul-2021	21.1	260	0.3	Low	0.50	1.20	Sand	Gravel						12	12		25	50
	7.5	MOR-AN-007.5-2021-07-25	25-Jul-2021	20.0	-	0.6	Low	0.30	0.70	Cobble	Gravel	60	20	4					8	8	
	6.0	MOR-AN-006.0-2021-07-25	25-Jul-2021	20.0	-	0.7	Medium	0.30	0.50	Cobble	Gravel	70				30					
	6.0	MOR-ES-006.0-2021-07-25	25-Jul-2021	20.0	240	0.3	Low	0.60	1.40	Cobble	Gravel	40	10							10	40
	4.6	MOR-AN-004.6-2021-07-25	25-Jul-2021	20.0	-	0.7	Medium	0.40	0.60	Gravel	Cobble	80								20	
	4.0	MOR-AN-004.0-2021-07-25	25-Jul-2021	20.0	-	0.7	Medium	0.25	0.50	Gravel	Cobble	70				20			10		
	2.9	MOR-EF-002.9-2021-07-25	25-Jul-2021	21.3	230	0.5	Low	0.40	0.80	Gravel	Cobble	55	10	5		15				10	5
	2.9	MOR-ES-002.9-2021-07-25	25-Jul-2021	20.0	250	0.25	Medium	0.50	1.50	Cobble	Gravel	20				20				10	50

…concluded.

[a] A categorical ranking of water velocity (high = greater than 1.0 m/s; medium = 0.5 to 1.0 m/s; low = less than 0.5 m/s

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