Site C Clean Energy Project

Fisheries and Aquatic Habitat Monitoring and Follow-up Program

Peace River Fish Community Monitoring Program (Mon-2)

Task 2a – Peace River Large Fish Indexing Survey

Construction Year 1 (2015)

Dustin Ford, RPBio
Golder Associates Ltd.

David Roscoe, MSc
Golder Associates Ltd.

Gary Ash, PBiol
Golder Associates Ltd.

Bill Gazey
W.J. Gazey Research

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PEACE RIVER LARGE FISH INDEXING SURVEY

Peace River Large Fish Indexing Survey - 2015 Investigations

Submitted to:
Dave Hunter
BC Hydro
Four Bentall Centre
1100-1055 Dunsmuir Street
PO BOX 49260
Vancouver, BC V7X 1V5
Canada

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EXECUTIVE SUMMARY

Fish and fish habitat are valued components of the Peace River that are considered important by BC Hydro, Aboriginal groups, the public, the scientific community, and government agencies. The Site C Clean Energy Project (the Project), including Project construction, reservoir filling, and operation, could affect fish and fish habitat via three key pathways: changes to fish habitat (including nutrient concentrations and lower trophic biota), changes to fish health and fish survival, and changes to fish movement. These paths are examined in detail in Volume 2 of the Project's Environmental Impact Statement (EIS; BC Hydro 2013). The EIS makes both qualitative and quantitative predictions of fish production in the Peace River downstream of the Project. The objective of the Peace River Large Fish Indexing Survey (Indexing Survey) is to validate these predictions and address uncertainties identified in the EIS regarding the Project's effects on fish in the Peace River and to assess the effectiveness of fish and fish habitat mitigation measures.

The Indexing Survey represents one component of a suite of studies within BC Hydro's Fisheries and Aquatic Habitat Monitoring and Follow-up Program and is designed to provide supporting data to address conditions listed in the Project's Provincial Environmental Assessment Certificate (EAC)[1] and Federal Decision Statement[2]. Specifically, the Indexing Survey represents Task 2a of the Peace River Fish Community Monitoring Program (Mon-2) within the Fisheries and Aquatic Habitat Monitoring and Follow-up Program.

The Indexing Survey is a continuation and expansion of two previous programs conducted using similar methods. These included BC Hydro's Large River Fish Indexing Program (2001-2007; P&E 2002; P&E and Gazey 2003; Mainstream and Gazey 2004-2008) and the Peace River Fish Index (2008-2014; Mainstream and Gazey 2009-2014; Golder and Gazey 2015).

Sampling for the Indexing Survey was conducted in six different sections of the Peace River mainstem located between Peace Canyon Dam (PCD) and the Many Islands area in Alberta. All large-bodied fish were monitored; however, the Program focused on seven indicator species of most interest to regulatory agencies (BC Government 2011), these included Arctic Grayling (*Thymallus arcticus*), Bull Trout (*Salvelinus confluentus*), Burbot (*Lota lota*), Goldeye (*Hiodon alosoides*), Mountain Whitefish (*Prosopium williamsoni*), Rainbow Trout (*Oncorhynchus mykiss*), and Walleye (*Sander vitreus*). Fish were sampled by boat electroshocking within nearshore habitats (less than 2.0 m depth). Length, weight, and ageing structures were collected from all captured indicator species. Depending of fish size and sample session, captured indicator species were marked with passive integrated transponder (PIT) tags. For species with sufficient mark-recapture data, population abundance was estimated using a Bayes sequential model (conducted by W.J. Gazey Research). Other fish population metrics analyzed included survival, length-at-age, and body condition. These metrics were compared to results from 2002 to 2014 and to select environmental parameters such as discharge and water temperature.

[1] Site C Clean Energy Project EAC Condition #7.

[2] Site C Clean Energy Project Decision Statement, October 14, 2014, Section 8 Fish and Fish Habitat.

Key results from 2015 are summarized as follows:

- In 2015, water levels in the Peace River were below average during the summer growing season and during most of the study period. Low water levels may have implications for population abundance estimates because it is hypothesized that some side channel habitats in the study area become unavailable at low water levels, resulting in Mountain Whitefish and other fishes becoming more clustered in mainstem habitat areas, where they are more susceptible to capture.
- Catch rates for Arctic Grayling have been low since 2012, suggesting a recent decline in abundance in the study area.
- A greater than normal proportion of age-1 Arctic Grayling and Mountain Whitefish in 2015 may indicate good recruitment from the 2014 brood year.
- Population abundance estimates for Bull Trout were greatest in 2011 and 2012 but confidence intervals overlapped among most years and sections. Overall, neither population abundance estimates nor catch-per-unit effort suggested significant or sustained changes in the abundance of Bull Trout between 2002 and 2015.
- Mean length-at-age was greater in 2014 and 2015 than all previous years for most age-classes (age-1 to age-4) of Arctic Grayling, Bull Trout, and Mountain Whitefish, suggesting favourable growing conditions in the Peace River study area during the last two years.
- For Burbot, Goldeye, Rainbow Trout, and Walleye, limited mark-recapture data prevented the generation of population abundance estimates. In future study years, small sample sizes will likely limit the ability to detect changes in catch rates or life history metrics for these species.

Data collected from 2002 to 2015 represent the baseline, pre-Project state of the fish community. Management hypotheses cannot be statistically tested until after the commencement of Project construction activities.

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The following employees of **GOLDER ASSOCIATES LTD.** contributed to the collection of data and preparation of this report:

Dustin Ford, RPBio	Project Manager/Coauthor
David Roscoe	Biologist/Coauthor
Gary Ash	Senior Fisheries Biologist/Project Director/Senior Reviewer
Larry Hildebrand, RPBio	Senior Fisheries Biologist/Project Advisor
Dana Schmidt, RPBio	Senior Fisheries Biologist
Demitria Burgoon	Biologist
James Chircoski	Biologist
Mike Hildebrand	Biologist
Kent Nuspl	Biologist
Kevin Little	Biologist
Sima Usvyatsov	Biological Scientist
Eztiaan Groenewald	Biological Technician
Chris King	Biological Technician
Geoff Sawatzky	Biological Technician
Corby Shurgot	Biological Technician
Jack Yurko	Field Technician
James Goodier	GIS Technician
Carrie McAllister	Project Coordinator
Ron Giles	Warehouse Manager (Castlegar)
Devin Dickson	Warehouse Manager (Fort St. John)

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1.0 INTRODUCTION

Potential effects of the Site C Clean Energy Project (the Project) on fish[3] and fish habitat[4] are described in Volume 2 of the Project's Environmental Impact Statement as follows[5]:

> The Project has the potential to affect fish habitat in two ways. The Project may destroy fish habitat by placing a permanent physical structure on that habitat, or the Project may alter fish habitat by changing the physical or chemical characteristics of that habitat in such a way as to make it unusable by fish. Destruction or alteration of important habitats may be critical to the sustainability of a species population.
>
> The Project may affect fish health and survival. It may cause direct mortality of fish or indirect mortality of fish by changing system productivity, food resource type and abundance, and environmental conditions on which fish depend (e.g., water temperature).
>
> The Project may affect fish movement by physically blocking upstream and downstream migration of fish or by causing water velocities that exceed the swimming capabilities of fish, which results in hindered or blocked upstream migration of fish. Blocked or hindered fish movement has consequences to the species population. Fish may not be able to access important habitats in a timely manner or not at all (e.g., spawning habitats). Blocked fish movement may result in genetic fragmentation of the population.

Condition No. 7 of the Project's Provincial Environmental Assessment Certificate (EAC) states the following:

> The EAC Holder must develop a Fisheries and Aquatic Habitat Monitoring and Follow-up Program [FAHMFP] 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 [Qualified Environmental Professional] or FLNR [BC Ministry of Forests, Lands and Natural Resource Operations], to assess the need to adjust those measures to adequately mitigate the Project's effects.

Furthermore, the Project's Federal Decision Statement states that a plan should be developed that addresses the following:

> Condition No. 8.4.3: an approach to monitor changes to fish and fish habitat baseline conditions in the Local Assessment Area;
>
> Condition No. 8.4.4: 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;

The intent of the Peace River Large Fish Indexing Survey (herein refered to as Indexing Survey) as described in Appendix C (Peace River Fish Community Monitoring Program; Mon-2) of the Project's FAHMFP is to "monitor the response of large-bodied fish species in the Peace River to the Project". Large-bodied fish species include sportfish and sucker species (Mainstream 2012). The Indexing Survey is designed to provide supporting data to address the EAC and Federal Decision Statement conditions detailed above. Specifically, the Indexing Survey represents Task 2a of the Peace River Fish Community Monitoring Program (Mon-2) within the Site C Clean Energy Project's FAHMFP.

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[3] Fish includes fish abundance, biomass, composition, health, and survival.

[4] Fish habitat includes water quality, sediment quality, lower trophic levels (periphyton and benthic invertebrates), and physical habitat.

[5] EIS, Volume 2, Section 12.1.2.

The Indexing Survey will monitor the response of large-bodied fish species to the Project over the short term (10 years after Project operations begin) and long term (30 years after the Project operations begin). In 2015, the Program focused on collecting data that quantified the relative and absolute abundances and spatial distributions of seven indicator species. The seven indicator species included Arctic Grayling (*Thymallus arcticus*), Bull Trout (*Salvelinus confluentus*), Burbot (*Lota lota*), Goldeye (*Hiodon alosoides*), Mountain Whitefish (*Prosopium williamsoni*), Rainbow Trout (*Oncorhynchus mykiss*), and Walleye (*Sander vitreus*). These species were identified in local provincial management objectives (BC Ministry of Environment 2009; BC Government 2011), were identified as species of interest to anglers and harvested by Aboriginal groups, and were the focus of the Project's EIS effects assessment (BC Hydro 2013).

In 2008, BC Hydro implemented the Peace River Fish Index (GMSMON-2), an annual program designed to monitor Arctic Grayling, Bull Trout, and Mountain Whitefish populations in the Peace River downstream of Peace Canyon Dam (PCD) and their responses to in-stream physical works designed to improve fish habitat in select side channel areas (Mainstream and Gazey 2009-2014; Golder and Gazey 2015). Data collected under GMSMON-2 and its predecessor, the Peace River Fish Community Indexing Program (P&E 2002; P&E and Gazey 2003; Mainstream and Gazey 2004-2008), provide a continuous dataset for the fish community within the study area beginning in 2001 that can be compared to data collected during the current Program.

1.1 Key Management Question

The overarching management question for the Peace River Fish Community Monitoring Program is as follows:

1. How does the Project affect fish in the Peace River between the Project and the Many Islands area in Alberta during the short (10 years after Project operations begin) and longer (30 years after Project operations begin) term?

1.2 Management Hypotheses

The overarching management question will be addressed by testing a series of management hypotheses that are based on predictions made in the Project's EIS. Management hypotheses detailed within the Peace River Fish Community Monitoring Program that will be tested using data collected under the Indexing Survey are as follows:

H_1: Post-Project total fish biomass in the Peace River between the Project and the Many Islands area in Alberta will be less than pre-Project conditions (current = 37.42 t; at 10 years of operations = 30.78 t; >30 years of operations = 30.79 t).

H_2: Post-Project harvestable fish biomass in the Peace River between the Project and the Many Islands area in Alberta will be greater than pre-Project estimates of harvestable fish biomass (current = 13.93 t; at 10 years of operations = 18.77 t; >30 years of operations = 18.78 t).

H_3: Post-Project biomass of each fish species in the Peace River between the Project and the Many Islands area in Alberta will be consistent with biomass estimates in the EIS.

H4: Changes in post-Project fish community composition in the Peace River between the Project and the Many Islands area in Alberta will be consistent with EIS predictions.

H5: The fish community can support angling effort that is similar to baseline conditions.

H6: Indicator fish species will use the Site C offset habitat areas in the Peace River between the Project and the Many Islands area in Alberta for rearing, feeding, and/or spawning as shown in Table 1.

Table 1: Expected fish use of proposed offsetting locations in the Peace River between the Project and the Many Islands area in Alberta.

Location	Species				
	Arctic Grayling	Bull Trout	Mountain Whitefish	Rainbow Trout	Walleye
River Road Rock Spurs	R[a],F	F	R,F	R,F	
Upper Site 109L	R	F	R,F,S	R,F	F
Side Channel Site 108R	R,F		R,F	R,F	
Lower Site 109L	R	F	R,F,S	R,F	F

[a] R = rearing; F = feeding; and S = habitat suitable for spawning.

The Site C offset habitat areas identified in Table 1 are described in detail in BC Hydro (2015a, 2015b). These offset areas are scheduled for development starting in 2016; therefore, data collected during the current study year will serve as a baseline dataset to compare against future study years.

1.3 Study Objectives

The objective of the Indexing Survey is to validate predictions and address uncertainties identified in the EIS regarding the Project's effects on fish in the Peace River and to assess the effectiveness of fish and fish habitat mitigation measures. The purpose of the Indexing Survey is to monitor the response of large-bodied fish species in the Peace River to the Project. The Indexing Survey will build on data previously collected under BC Hydro's WLR Peace River Fish Index (GMSMON-2), and its predecessor the Peace River Fish Community Indexing Program. Objectives of GMSMON-2 (BC Hydro 2008), which also apply to the current Indexing Survey, are as follows:

1) Collect a time series of data on the abundance, spatial distribution, and biological characteristics of nearshore and shallow water fish populations in the Peace River that will build upon previously collected data.

2) Build upon earlier investigations for further refinement of the sampling strategy, sampling methodology, and analytical procedures required to establish a long-term monitoring program for fish populations.

3) Identify gaps in data and understanding of current knowledge about fish populations and procedures for sampling.

The spatial extent of the Program is consistent with the spatial boundaries for the effects assessment in the EIS, which was guided by physical modelling and fisheries studies.

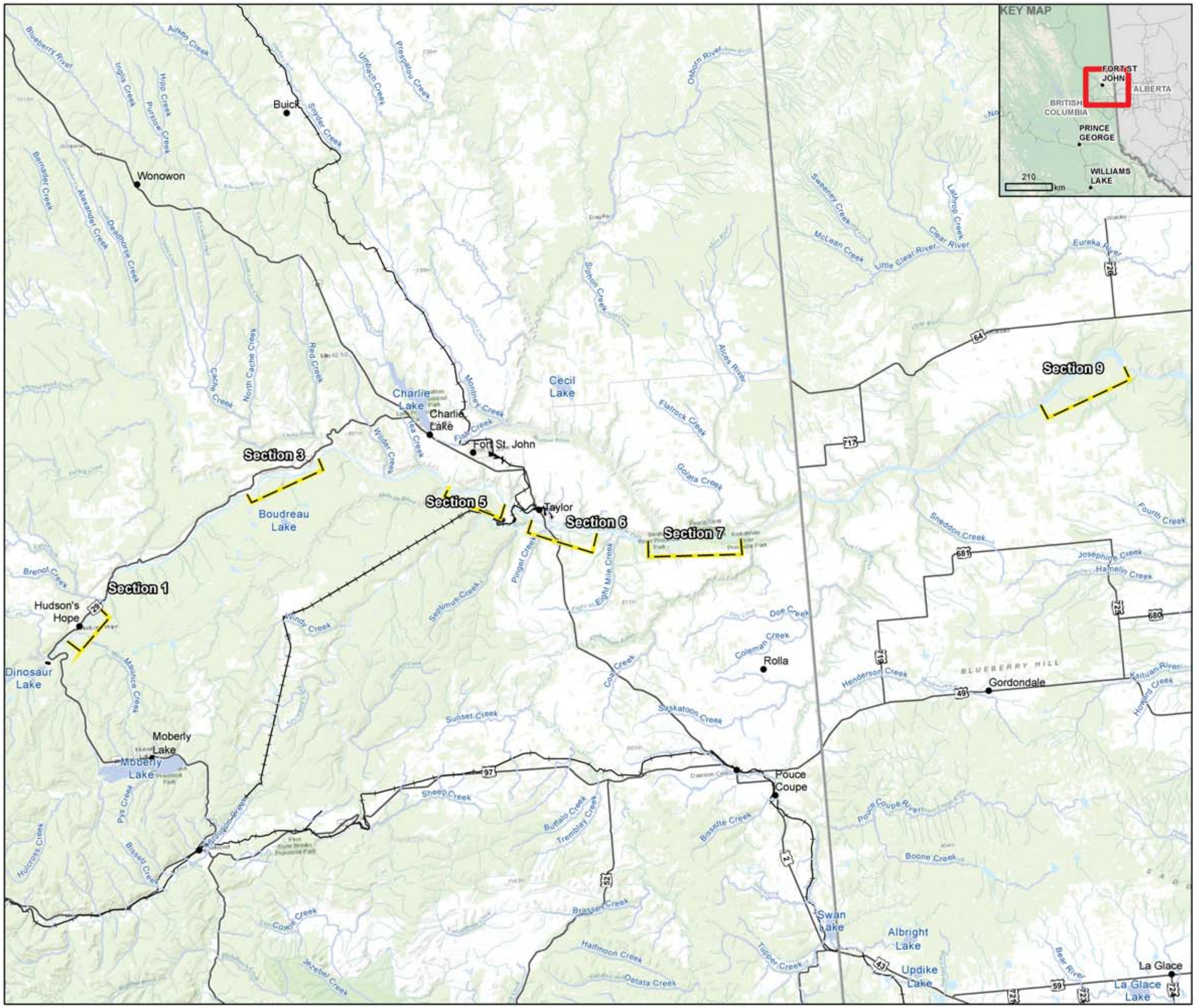
1.4 Study Area and Study Period

The study area for the Indexing Survey includes an approximately 205 km section of the Peace River from near the outlet of PCD (river kilometre [RKm] 25 as measured downstream from WAC Bennett Dam) downstream to the Many Islands area in Alberta (RKm 230; Figure 1).

The mainstem of the Peace River between PCD and the Many Islands area in Alberta was delineated into various sections using information provided by Mainstream (2012; Figure 1, Table 2). The upstream extent of Section 5 was moved approximately 6 km downstream relative to Mainstream's classification to more closely align with the location of the Site C dam site, as described below.

Table 2: Location and distance from WAC Bennett Dam of Peace River sample sections as delineated by Mainstream (2012).

Section Number	Location	River Kilometre[a]		Number of Sites Sampled in 2015
		Upstream	Downstream	
1a	Peace River Canyon area	20.4	25	0
1	Downstream end of the Peace River Canyon area downstream to the Lynx Creek confluence area	25	34	15
2	The Lynx Creek confluence area downstream to the Halfway River confluence area	34	65.8	0
3	The Halfway River confluence area downstream to the Cache Creek confluence area	65.8	82.1	15
4	The Cache Creek Confluence area downstream to the Moberly River confluence area	82.1	105	0
5	The Moberly River confluence area downstream to near the Canadian National Railway bridge	105	117.7	15
6	The Pine River confluence area downstream to the Six Mile Creek confluence area	121.5	134	18
7	The Beatton River confluence area downstream to the Kiskatinaw River confluence area	140	158	16
8	The Pouce Coupe River confluence area downstream to the Clear River confluence area	174	187.7	0
9	Dunvegan West Wildland Provincial Park boundary downstream to Many Islands Park	217.5	231	16



LEGEND

- PLACE NAME
- SECTION
- DAM SECTION
- PROVINCIAL BOUNDARY
- WATERCOURSE
- WATERBODY
- RAILWAY
- ROAD

0 10 20

1:625,000 METRES

REFERENCES
1. TRANSPORTATION, RAILWAY, HYDROLOGY AND TOPOGRPHY LAYERS CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. DAM SITE OBTAINED FROM FROM GEOBASE®.
3. SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, DELORME, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

CLIENT
BC HYDRO

PROJECT
PEACE RIVER FISH COMMUNITY MONITORING PROGRAM (MON-2)

TITLE
OVERVIEW OF THE PEACE RIVER LARGE FISH INDEXING SURVEY (TASK 2A) STUDY AREA

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-09-12
DESIGNED	DF
PREPARED	AD
REVIEWED	DF
APPROVED	GA

PROJECT NO.	CONTROL	REV.	FIGURE
1400753	2015 / 5001	0	1

In 2015, Sections 1, 3, 5, 6, 7, and 9 were sampled (Appendix A, Figures A1 to A6, Table A1). Sections 1 and 3 are situated upstream of the Site C dam site and are scheduled to be sampled under the current program until the reservoir filling stage of the Project's development in 2022 (Construction Year 8). These sections will be sampled to monitor potential effects of construction (i.e., creation of the head pond and river diversion) on the Peace River fish community. Sections 5, 6, 7, and 9 are scheduled to be sampled annually under the current program until 2053 (Operation Year 30). A summary of historical datasets by section and year are detailed in Appendix B, Table B1.

During most historical study years, the same sites were sampled within each section. In 2015, three sites that were historically located near the upstream end of Section 5 (Site 0501, 0503, and 0504; Golder and Gazey 2015) were not sampled because they were situated within the Project's dam site footprint area. These three sites will not be available for sampling after 2016. Fish habitats within these three sites were consistent with fish habitats present in adjacent downstream sites (i.e., Site 0502, 0505, 0506, 0507). Their removal from the Program is not expected to adversely affect study results or influence comparability between study years, as similar habitats are still being monitored in the immediate area.

In 2015, three new sites were sampled in Section 5 to ensure the Program could adequately address Hypothesis #6 regarding the use of Site C offset habitat areas by indicator fish species. Sites 0516 and 0517 were established in a side channel within the island complex immediately upstream of the community of Old Fort between RKm 110 and 111 (Appendix A, Figure A3). These two sites are situated within the Upper Site 109L and the Lower Site 109L offset habitat areas. The third site, Site 05SC060, was located in the south bank side channel downstream of the Site C dam site between RKm 109 and 110 and within the Side Channel Site 108R offset habitat area. Site 05SC060 was sampled in 2009, 2010, and 2011 during Site C baseline studies (Mainstream 2010, 2011, 2013a). Long-term data collected under the Indexing Survey will be used to determine the effectiveness of these habitat offsets.

Three provincial parks are situated within Section 7: Beatton River Provincial Park, Peace River Corridor Provincial Park, and Kiskatinaw River Provincial Park. Of the 19 different sites established during baseline studies (Mainstream 2010, 2011, 2013a), 11 were located within park boundaries. Under the *Park Act*, a Park Use permit is required from BC Parks for research activities that take place within parks and protected areas. A Park Use permit application was submitted for these areas; however, a permit was not received in time for the 2015 field program. In lieu of sampling within park boundaries, in 2015, 11 synoptic sites were defined outside park boundaries but within Section 7. The synoptic sites were sampled in conjunction with the original eight sites that were situated outside of provincial parks boundaries. Fish habitats within synoptic sites were similar to fish habitats within most index sites. Two exceptions were sites at the confluences of the Beatton and Kiskatinaw rivers, which are are known feeding areas for Walleye (Mainstream 2010, 2011, 2013a). These confluence areas are situated within provincial park boundaries and have not been sampled since 2011 (Mainstream 2013a). An inability to monitor these confluence areas during future study years may make it difficult to interpret changes to Walleye populations.

Overall, 95 sites were sampled within the six sections (Appendix A, Figures A1 to A6). The length of sites varied between 200 and 1900 m and consisted of the nearshore area along a bank of the Peace River. The two sites in the Pine River were 1000 and 1500 m in length. Site descriptions and UTM locations for all 95 sites are included in Appendix A, Table A1.

Field crews attempted to sample each site six times (i.e., six sessions) over the study period (Table 3). During Session 1, low water levels in the mainstem Peace River prevented the field crew from accessing the side channels in which Site 0516 and 07SC012 were located. These two sites were not sampled during Session 1. Low water levels also prevented the crew from sampling 07SC012 during Session 3. A sample is defined as a single pass through a site while boat electroshocking (see Section 2.1.4). During Session 1, Section 9 was sampled by Mainstream Aquatics Ltd. (Mainstream), as they were collecting comparable data at that time.

Table 3: Summary of boat electroshocking sample sessions conducted in Sections 1, 3, 5, 6, 7 and 9 of the Peace River, 2015.

Session	Start Date	End Date	Section					
			1	3	5	6	7	9
1	25 Aug	19 Sep	26, 27 Aug	28, 29, 30, 31 Aug	31 Aug, 1 Sep	25, 26, 27, 28, 29 Aug	29, 30 Aug, 1 Sep	19 Sep[a]
2	1 Sep	23 Sep	2, 3 Sep	4 Sep	10, 11 Sep	1, 2, 3 Sep	5, 7, 9 Sep	22, 23 Sep
3	8 Sep	27 Sep	10, 11 Sep	12, 13 Sep	15, 16 Sep	8, 9 Sep	13, 14 Sep	27 Sep
4	15 Sep	1 Oct	15, 16 Sep	17, 18, 19 Sep	20, 21 Sep	17, 18 Sep	19, 20 Sep	1 Oct
5	22 Sep	4 Oct	24 Sep	25, 26 Sep	25 Sep	22, 23 Sep	23, 24 Sep	4 Oct
6	26 Sep	7 Oct	28, 29 Sep	29, 30 Sep	30 Sep	26, 28 Sep	28, 29 Sep	7 Oct

[a] Data collected by Mainstream Aquatics Ltd.

Each session took between 9 and 16 days to complete. During most sessions, each sections was sampled over 1 to 4 days. During some sessions, two crews worked in single sections simultaneously, and at different sites within the section.

2.0 METHODS

2.1 Data Collection

2.1.1 Discharge

Hourly discharge data for the mainstem Peace River were obtained from BC Hydro (discharge through PCD). Unless indicated otherwise, discharges throughout this report are daily averages presented as cubic metres per second (m^3/s).

2.1.2 Water Temperature

Water temperatures (hourly intervals) for the Peace River were obtained from BC Hydro's Peace River Baseline TGP/Temperature program (GMSWORKS-2; DES 2015). These data were collected using Onset Tidbit™ temperature data loggers (Model #UTBI-001; accuracy ± 0.2°C). In this report, water temperature data from 2008 to 2015 from three different Peace River stations were used. These included the Peace River downstream of PCD, downstream of the Moberly River, and downstream of the Halfway River. Water temperature data were summarized to provide daily average temperatures. Spot measurements of water temperature were obtained at all sample sites at the time of sampling using a handheld Oakton ECTestr 11 meter (accuracy ± 0.5°C).

2.1.3 Habitat Conditions

Habitat variables recorded at each site (Table 4) included variables recorded during previous study years (Golder and Gazey 2015) and variables recorded as part of other, similar BC Hydro programs (i.e., CLBMON-16 [ONA et al. 2014] and CLBMON-45 [Golder and Poisson 2014]). These data were collected to provide a means of detecting changes in habitat availability or suitability in sample sites over time. Data collected were not intended to quantify habitat availability or imply habitat preferences.

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). Water clarity was visually estimated and categorized at each site as low (less than 1.0 m depth), medium (1.0 to 3.0 m depth), or high (greater than 3.0 m depth). Where water depths were sufficient, water clarity also was estimated using a "Secchi Bar" that was manufactured based on the description provided by Mainstream and Gazey (2014). Mean and maximum sample depths were estimated by the boat operator based on the boat's sonar depth display.

Table 4: Habitat variables recorded at each site during each session in 2015.

Variable	Description
Date	The date the site was sampled
Time	The time the site was sampled
Estimated Flow Category	A categorical ranking of PCD discharge (high; low; transitional) at the time of sampling
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)
Water Surface Visibility	A categorical ranking of water surface visibility (low = waves; medium = small ripples; high = flat surface)
Boat Model	The model of boat used during sampling

Variable	Description
Range	The range of voltage used during sampling (high or low)
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
Length Sampled	The length of shoreline sampled (to the nearest 1 m)
Time Sampled	The duration of electroshocker operation (to the nearest 1 second)
Netter Skill	A categorical ranking of each netters skill level (1 = few misses; 2 = misses common for difficult fish; 3 = misses are common for difficult and easy fish; 4 = most fish are missed)
Observer Skill	A categorical ranking of each observer's skill level (1 = few misses; 2 = misses common for difficult fish; 3 = misses are common for difficult and easy fish; 4 = most fish are missed)
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)
Effectiveness	A categorical ranking of sampling effectiveness (1 = good; 2 = moderately good; 3 = moderately poor; 4 = poor)
Water Clarity	A categorical ranking of water clarity (High = greater than 3.0 m visibility; Medium = 1.0 to 3.0 m visibility; Low = less than 1 m visibility)
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 instream cover
Recent Flow Variations	A general description of recent flow changes
Crew	The field crew that conducted the sample
Sample Comments	Any additional comments regarding the sample

2.1.4 Fish Capture

Boat electroshocking was conducted at all sites along the channel margin, typically within a range of 0.5 to 2.0 m water depth. Two different three-person crews were employed. Each crew used Smith-Root Inc. high-output Generator Powered Pulsator (GPP 5.0) electroshockers operated out of 140 HP outboard jet-drive riverboats. The electroshocking procedure consisted of manoeuvring the boat downstream along the shoreline of each sample site. Field crews sampled large eddies (i.e., eddies longer than approximately two boat lengths) while travelling with the direction of water flow. Two crew members, positioned on a netting platforms at the bows of the boats, netted stunned fish, while the third individual on each crew operated the boat and electroshocking unit. The two netters on each crew attempted to capture all fish that were stunned by the electrical field. Captured fish were immediately placed into 175 L onboard live-wells equipped with freshwater pumps. To prevent electroshocking-induced injuries, fish were netted one at a time (i.e., fish were not double-netted). Fish that were positively identified but avoided capture were enumerated and recorded as "observed". Netters attempted to collect a random sample of fish species and sizes; however, netters focussed their effort on rare fish species (e.g., Arctic Grayling) or life stages (e.g., adult Bull Trout) when they were observed.

This approach was employed during previous study years (Mainstream and Gazey 2014; Golder and Gazey 2015) and may cause an overestimate of the catch of these species and life stages; however, by maintaining this approach the bias remains constant among study years.

Both the time sampled (seconds of electroshocker operation) and length of shoreline sampled (metres; Table 5) were recorded for each sample. The start and end location of each site was established prior to the start of the field program; however, if a complete site could not be sampled, the difference in distance between what was sampled and the established site length was estimated, recorded on the site form, and used as the sampled length in the subsequent analyses. In 2015, reasons for field crews not being able to sample an entire site's length included public on shore, beavers swimming in a site, and shallow water depths preventing boat access.

Table 5: Number and lengths of sites sampled by boat electroshocking in 2015.

Section	Number of Sites	Site Length (m)		
		Minimum	Average	Maximum
1	15	500	860	1200
3	15	950	1338	1900
5	15	530	873	1280
6	18	500	979	1500
7	16	220	961	1600
9	16	260	983	1200

Each boat electroshocking unit was operated at a frequency of 30 Hz with pulsed direct current. Amperage was adjusted as needed to achieve the desired effect on fishes, which was the minimum level of immobilization that allowed efficient capture, and did not cause undesired outcomes such as immediate tetany or visible hemorrhaging (Martinez and Kolz 2009). An amperage of 2.7 A typically produced the desired effect on fishes; however, amperage was set as high as 4.5 A at some sites based on local water conditions and the electroshocking unit employed.

The electroshocker settings used in 2014 (Golder and Gazey 2015) and 2015 were different when compared to the settings employed during previous study years (Mainstream and Gazey 2004-2014). Prior to 2014, higher frequencies and higher amperages were used. The settings used in 2014 and 2015 were proven to result in less electroshocking-induced injuries on large-bodied Rainbow Trout in the Columbia River (Golder 2004, 2005) and align with recommendations by Snyder (2003) for pulsed direct current and low frequencies for adult salmonids. Reducing the impacts of sampling will help ensure the long-term sustainability of the program.

Although electrical output varies with water conductivity, water depth, and water temperature, field crews attempted to maintain electrical output at similar levels for all sites over all sessions.

2.1.5 Ageing

Scale samples were collected from all captured Arctic Grayling, Bull Trout, Kokanee (*Oncorhynchus nerka*), Mountain Whitefish (with the exceptions detailed in Section 2.1.6), and Rainbow Trout. Fin ray samples were collected from all initially captured Bull Trout, Goldeye, Lake Trout (*Salvelinus namaycush*), Northern Pike (*Esox lucius*), and Walleye. Otoliths were collected opportunistically from Mountain Whitefish that succumbed to sampling. Ageing structures (i.e., scales, fin rays, and/or otoliths) were collected in accordance with the methods outlined in Mackay et al. (1990). All ageing structure samples were stored in appropriately labelled coin envelopes and archived for long-term storage for BC Hydro.

Scales were assigned an age by counting the number of growth annuli present on the scale following procedures outlined by Mackay et al. (1990). Scales were temporarily mounted between two slides and examined using a digital microscope. Where possible, several scales were examined and the highest quality scale was photographed using a 3.1-megapixel digital macro camera (Leica EC3) and saved as a JPEG-type picture file. All scale images were linked to the Peace River Fish Index Database and provided to BC Hydro (referred to as Attachment A). All scales were examined independently by two experienced individuals, and ages were assigned. If the assigned ages differed between the two examiners, the sample was re-examined by a third examiner. If there was agreement between two of three examiners, then the consensus age was assigned to the fish.

Fin rays were aged by counting the number of growth annuli present on the fin ray following procedures outlined in Mackay et al. (1990). Fin rays were coated in epoxy and allowed to dry. Once the epoxy dried, a jeweler's saw was used to create multiple cross-sections of each fin ray sample. The cross-sections were permanently mounted on a microscope slide using a clear coat nail polish and examined using a digital microscope. Where possible, several fin ray cross-sections were examined, and the cross-section with the most visible annuli was aged. All fin rays were examined independently by two experienced individuals. If the assigned ages differed between the two examiners, the sample was re-examined jointly by a third examiner. If there was agreement between two of three examiners, then the consensus age was assigned to the fish.

While assigning ages, examiners were aware of the species of each sample but did not have other information about the fish, such as body size or capture history. Some fish species had ages assigned using both scale and fin ray samples. Fin ray ages were used for Goldeye and Lake Trout because scale-based ages were typically younger than those from fin rays. For Northern Pike, there was no consistent difference between scale and fin ray ages, and the most plausible age based on body size was assigned to the fish. Only fin rays were used to age Bull Trout because previous analyses indicated that scale-based ages were between one and three years younger than fin ray-based ages for the same fish (Golder and Gazey 2015).

Ages were assigned to all Arctic Grayling, Bull Trout, Goldeye, Kokanee, Lake Trout, Northern Pike, Rainbow Trout and Walleye that were captured, except in cases where ageing structures were too poor quality to assign an age. In total, 1094 (10.9%) of captured Mountain Whitefish were assigned ages. The subsample was randomly selected from all Mountain Whitefish captured during Session 1 in Sections 1, 3, 5, 6, and 7. For Section 9, the subsample was randomly selected from Mountain Whitefish captured during Session 2 because Session 1 was conducted by Mainstream Aquatics Ltd. (Section 1.4).

2.1.6 Fish Processing

A site form was completed at the end of each sampled site. Site habitat conditions and the number of fish observed were recorded before the start of fish processing for life history data (Table 6). All captured fish were enumerated and identified to species, and their physical condition and general health were recorded (i.e., any abnormalities were noted). Data collected from each fish were consistent with previous study years (e.g., Golder and Gazey 2015).

Fish were measured for fork length (FL) or total length (TL) depending on the species to the nearest 1 mm and weighed to the nearest 1 g using an A&D Weighing™ digital scale (Model SK-5001WP; accuracy ±1 g). Data were entered directly into the Peace River Fish Index Database (provided to BC Hydro as Attachment A), using a laptop computer. All sampled fish were automatically assigned a unique identifying number by the database that provided a method of cataloguing associated ageing structures.

Table 6: Variables recorded for each fish encountered in 2015.

Variable	Description
Species	The species of fish
Size Class	A general size class for the fish (e.g., Bull Trout will be categorized as YOY for age-0 fish, Immature for fish <250 mm FL, and Adult for fish >250 mm FL)
Length	The fork length of the fish to the nearest 1 mm
Weight	The weight of the fish to the nearest 1 g
Sex and Maturity	The sex and maturity of the fish (determined where possible through external examination)
Ageing Method	The type of ageing structure collected if applicable (i.e., scale, fin ray, otolith)
Tag Colour/Type	The type (i.e., T-bar anchor or PIT tag) or colour (for T-bar anchor tags only) of tag applied or present at capture
Tag Number	The number of the applied tag or tag present at capture
Tag Scar	The presence of a scar from a previous tag application
Fin Clip	The presence of an adipose fin clip (only recorded if present without a tag)
Condition	The general condition of the fish (e.g., alive, dead, unhealthy, etc.)
Preserve	Details regarding sample collection (if applicable)
Comments	Any additional comments regarding the fish

All Arctic Grayling, Burbot, Bull Trout, Goldeye, Lake Trout, Largescale Sucker (*Catostomus macrocheilus*), Longnose Sucker (*Catostomus catostomus*), Mountain Whitefish, Northern Pike, Rainbow Trout, Walleye, and White Sucker (*Catostomus commersonii*) that were >200 mm in length and in good condition following processing were marked with a 12 mm food-safe polymer-shelled full duplex ISO-type 134.2 kHz passive integrated transponder (PIT) tag (SP128, Hallprint Pty Ltd., Australia). PIT tags were read using an AVID PowerTracker VIII.

PIT tags were inserted with a single shot 12 mm polymer PIT tag applicator gun (Hallprint Pty Ltd., Australia) into the dorsal musculature on the left side below the dorsal fin near the pterygiophores. All tags and tag applicators were immersed in an antiseptic (Super Germiphene™) and rinsed with distilled water prior to insertion.

Tags were checked to ensure they were inserted securely, and the tag number was recorded in the Peace River Fish Index Database (Attachment A).

A simplified fish processing procedure was used during Sessions 5 and 6 in which only certain species were tagged and measured, depending on the river section. As was done during previous study years, the simplified processing method was used for the more common species in each section. During the simplified fish processing, fish that that did not have a PIT tag at capture were assigned a categorical length (i.e., <250 mm FL or ≥250 mm FL) and were released without recording lengths or weights, collecting scale samples, or implanting PIT tags. The simplified fish processing procedure allowed field crews to conduct multiple sessions over a shorter time period by reducing fish handling and fish processing time. During Sessions 5 and 6, the simplified fish processing procedure was used for Mountain Whitefish in Sections 1 and 3, Mountain Whitefish and all sucker species (Largescale Sucker, Longnose Sucker, and White Sucker) in Section 5, and all sucker species in Sections 6 and 7. All other fish species were sampled using the full processing procedure. Due to the low total number of fish captured in Section 9, the full processing procedure was used for all species during all sessions.

To reduce the possibility of capturing the same fish at multiple sites in a single session, fish were released near the middle of the site where they were captured.

2.2 Data Analyses

2.2.1 Data Compilation and Validation

Data for the monitoring program are stored in the Peace River Fish Index Database, which contains historical data collected under the Large River Fish Indexing Program (P&E 2002; P&E and Gazey 2003; Mainstream and Gazey 2004-2008), and the Peace River Fish Index (Mainstream and Gazey 2009-2014; Golder and Gazey 2015). The database is designed to allow data to be entered directly by the crew while out in the field using Microsoft® Access 2010 software. It contains several integrated features to ensure that data are entered correctly, consistently, and completely.

Various input validation rules programmed into the database checked each entry to verify that the data met specific criteria for that particular field. For example, all species codes were automatically checked upon entry against a list of accepted species codes that were saved as a reference table in the database; this feature forced the user to enter the correct species code for each species (e.g., Rainbow Trout had to be entered as “RB”; the database would not accept “RT” or “rb”). Combo boxes were used to restrict data entry to a limited list of choices, which kept data consistent and decreased data entry time. For example, a combo box limited the choices for Cloud Cover to Clear, Partly Cloudy, Mostly Cloudy, or Overcast. The user had to select one of these choices, which decreased data entry time (e.g., by eliminating the need to type out “Partly Cloudy”) and ensured consistency in the data (e.g., by forcing the user to select “Partly Cloudy” instead of typing “Part Cloud” or “P.C.”). The database contained input masks that required the user to enter data in a pre-determined manner. For example, an input mask required the user to enter Sample Time in 24-hour short-time format (i.e., HH:mm:ss). Event procedures ensured data conformed to underlying data in the database. For example, after the user entered life history information for a particular fish, the database automatically calculated the body condition of that fish. If the body condition was outside a previously determined range for that species (based on the measurements of other fish in the database), a message box appeared on the screen informing the user of a possible data entry error. This allowed the user to double-check the species, length, and weight of the fish before it was released. The database also allowed a direct connection between the PIT tag reader (AVID PowerTracker VIII) and the data entry form, which eliminated transcription errors associated with manually recording the 15-digit PIT tag numbers.

The database also included tools that allowed field crews to quickly query historical encounters of marked fish while the fish was in-hand. This allowed the crew to determine if ageing structures, such as fin rays, had been previously collected from a fish or comment on the status of previously noted conditions (e.g., whether a damaged fin had properly healed). Quality Assurance/Quality Control (QA/QC) was conducted on the database before analyses. QA/QC included checks of capture codes and tag numbers for consistency and accuracy, checks of data ranges, visual inspection of plots, and removal of age-length, and length-weight outliers, where applicable.

Various metrics were used to provide background information and to help set initial parameter value estimates for some analyses. Although these summaries are important, not all of them are presented or specifically discussed in detail in this report. However, these metrics are provided in the appendices for reference purposes and are referred to when necessary to support or discount results of various analyses. Metrics presented in the appendices include the following:

- discharge and water temperature summaries (Appendix C, Figures C1 to C5)
- bank habitat classification types and site lengths (Appendix D, Tables D1 and D2)
- habitat variables recorded at each sample site (Appendix D, Table D3)
- percent composition of sportfish and non-sportfish by study year (Appendix E, Tables E1 and E2)
- catch rates for all sportfish (Appendix E, Table E3) and non-sportfish (Appendix E, Table E4), 2015
- summary of captured, marked, and recaptured fish by species and session, 2015 (Appendix E, Table E5)
- length-frequency histograms, age-frequency histograms, and length-weight regressions by year for Arctic Grayling, Bull Trout, Largescale Sucker, Longnose Sucker, Mountain Whitefish, Northern Pike, Rainbow Trout, Walleye, and White Sucker, 2002 to 2015 (Appendix F)
- catch curve estimates of mortality for Arctic Grayling, Bull Trout, and Mountain Whitefish by section and year, 2003 to 2015 (Appendix F)

For all figures in this report, sites are ordered by increasing distance from WAC Bennett Dam (RKm 0.0) based on the upstream boundary of each site.

As detailed in Section 1.4 and Appendix B, Table B1, not all sections were sampled during all study years. For figures and statistics related to fish life history (i.e., length, weight, and age), analyses were supplemented when feasible with data collected in Sections 6, 7, and 9 under the Peace River Fish Inventory in 2009, 2010, and 2011 (Mainstream 2010, 2011, 2013a) as the Peace River Fish Inventory employed similar capture techniques during similar times of the year. Because effort differed between the Peace River Fish Inventory and the current program, these data were not included in figures or statistics related to effort or fish counts.

2.2.2 Population Abundance Estimates

A mark-recapture program was conducted on Arctic Grayling, Bull Trout, Largescale Sucker, Longnose Sucker, Mountain Whitefish, Northern Pike, Rainbow Trout, Walleye, and White Sucker over the 44 day study period (Table 3). Although all species were marked with the intention of including them in the mark-recapture program, there were insufficient numbers captured to generate abundance estimates for Northern Pike, Rainbow Trout, and Walleye.

Two T-bar anchor tags, one initially applied in 2002 and one initially applied in 2004, were recovered in 2015. These two tags were not included in mark-recapture models. In 2015, PIT tags were applied to all Mountain Whitefish greater than or equal to 200 mm FL. Prior to 2015, only fish greater than or equal to 250 mm FL were marked with either T-bar anchor or PIT tags, depending on the study year. The inclusion of fish between 200 and 249 mm FL in 2015, and during future study years, increases the number of tags available for recapture, thereby increasing the precision of future growth, survival, and abundance estimates. Furthurmore, Mountain Whitefish in the 200 to 249 mm FL size range are large enough to fully recruit to the electroshocking gear while still being young enough to estimate ages based on fork lengths. The majority of these fish are age-2. Including age-2 fish in future mark-recapture studies could allow the generation of survival and abundance estimates for specific brood years, which could be used to test for the correlations with environmental conditions during early life history. To maintain consistency with analyses conducted during previous study years, Mountain Whitefish marked between 200 to 249 mm FL were excluded from the 2015 population abundance models; however, this size range should be included in future analyses to allow comparisons between study years (i.e., when more than one year of data are available).

In the text that follows, frequent reference is made to the terms “capture probability” and “catchability”. Capture probability is defined as the probability of detecting (i.e., encountering) an individual fish given that it is alive during a sampling event (Otis et al. 1978). For the current study, a sampling event is a sampling day or session within a section (one to three sampling days, see Table 3), dependent on the estimation model used. Catchability is defined as the fraction of the population that is captured by a defined unit of effort (Ricker 1975). Under these classical definitions, the two terms are not synonymous. For example, if the number of fish sampled was directly related to the level of effort employed, then sessions with different levels of effort on the same population may have exhibited similar catchabilities but different capture probabilities.

Overall, the program was successful in terms of the number of tags applied and recaptured for Mountain Whitefish, but was less successful for all other species including Arctic Grayling, Bull Trout, and Sucker species. Therefore, methodologies described (diagnostics, population estimation, catchability, and sampling power analyses) were comprehensively applied to Mountain Whitefish. Due to sparse data, only the closed population estimation methodologies without empirical diagnostics for model selection were applied for Arctic Grayling, Bull Trout, and Sucker species.

2.2.2.1 Factors that Impact Population Abundance Estimates

The field program had some characteristics that must be considered with reference to population estimation methodologies and limitations of the subsequent estimates:

- The capture probability was likely heterogeneous (i.e., some fish were more likely to be captured than others) because of their spatial distribution or their reaction to the boat electroshocker.
- For Mountain Whitefish, marks were applied only to fish greater than or equal to 200 mm FL but only fish greater than or equal to 250 mm FL were used in the population abundance estimates; therefore, estimates for this species are only applicable to that portion of the population.
- Fish grew over the study period such that new fish recruited into the study population (i.e., Mountain Whitefish greater than or equal to 250 mm FL) after the study commenced. However, given the short duration of the study period (44 days), growth would be small and only a small (negligible) proportion of the population would be recruited into the study population.
- The population was open and marked fish were free to move to sections where capture probabilities may have been different due to possible differences in sample size (sampling effort), catchability, number of marks available for recapture, or the size of the population.
- Capture probability within a section may have varied over time due to differences in catchability generated by physical-biological interactions. For instance, fish are typically collected throughout the day from depths between approximately 0.5 and 2 m; the distribution of fish within this area may vary throughout a typical day.

To investigate these characteristics, capture behaviours of marked Mountain Whitefish were examined. Length histograms of the fish marked and recaptured were examined to reveal selectivity patterns generated by the presence of a mark. These patterns were further evaluated by comparing cumulative length distributions at release and recapture. Growth over the study period was examined by regressing the time at large (days) of a recaptured fish on the increment in growth (i.e., difference in length measured at release and recapture).

The movements of fish between sections during the 2015 study period, as well as the movements of fish that were at-large for over a year (i.e., fish marked between 2002 and 2014 and recaptured in 2015), were assessed through weighting the number of recaptured fish by sampling intensity. The distance travelled upstream or downstream between a fish's initial release and recapture were determined using the upstream River Km value for each of the 95 sample sites.

2.2.2.2 Empirical Model Selection

Apparent survival of Mountain Whitefish over the study period, which represents fish that survive and have not left the study area, was estimated with the Cormack-Jolly-Seber (CJS) model using MARK software (White 2006). Unlike other open population models (e.g., Jolly-Seber), the CJS model allows for time-varying capture probability. Only marked fish were used because their encounter histories were known. The encounter history for an individual fish was assigned to the section of first encounter regardless of the location of subsequent encounters. The CJS analysis was applied to several aggregations of survival and capture probabilities over time and sections. The best fitting model for survival is reported here and applied to the population estimation models.

The large number of recaptured Mountain Whitefish also allowed an empirical evaluation of the change in catchability over the study period. Two models (constant versus time-varying catchability) were compared using the delta Akaike's information criteria (ΔAIC) adjusted to account for the number of parameters following Burnham and Anderson (2002). If the catchability is constant, then the probability that an encountered fish is marked at sequence t (p_t) depends only on the proportion of the population that is marked, as follows:

(1) $$p_t = \frac{M_t}{M_t + U_t} = \frac{M_t}{N},$$

where M_t is the cumulative marks applied that are available for recapture at time t, U_t is the number of unmarked fish in the population at time t, and N is the population size that is to be estimated. The number of cumulative marks available at time t was adjusted (estimated) for mortality following procedures detailed below (see equation 6). Note that if catchability varies over time but equally for marked and unmarked fish, then P_t does not change and still reflects the proportion of the population that is marked. This is the formulation that is used in the Bayes Sequential model presented below. If the catchability of marked and unmarked fish varies over the study period, then the probability that an encountered fish is marked can be characterized as follows:

(2) $$p_t = \frac{M_t}{N \exp(b_t)} \text{ with the constraint that } \sum_t b_t = 0,$$

where b_t is the logarithmic population deviation and will provide a better fit to the data. In the remainder of this document, all reference to "time-varying catchability" is as characterized by equation 2. Equation 2 is also consistent with a change in population size (population change and time-varying catchability are confounded). The negative log-likelihoods (L) were computed for these models with an assumed binomial sampling distribution as follows:

(3) $$L \propto \sum_t \left[R_t \log_e(p_t) + (C_t - R_t) \log_e(1 - p_t) \right],$$

where R_t is the number of recovered tags in the sample of C_t fish taken at time t. Parameter estimates, standard deviations, and AIC values were calculated through the minimization of equation 3 using AD Model Builder (Fournier et al. 2012) to implement the model. For these estimates, each sampling day after the first session was used as a sequence.

2.2.2.3 Bayes Sequential Model for a Closed Population

A Bayesian mark-recapture model for closed populations (Gazey and Staley 1986; Gazey 1994) was applied to the mark-recapture data. The Bayesian model was adapted to accommodate adjustments for apparent mortality, for movement between river sections, allow for stratified capture probabilities, and cope with sparse recaptures characteristic of Arctic Grayling and Bull trout. The major assumptions of the model were as follows:

1) The population size in the study area did not change and was not subject to apparent mortality over the study period. Any apparent mortality was assumed to be constant over the study area and the study period and was specified (instantaneous daily mortality). Fish could move within the study area (i.e., to different sections); however, the movement was fully determined by the history of recaptured fish.

2) All fish in a stratum (day and section), whether marked or unmarked, had the same probability of being captured.

3) Fish did not lose their marks over the study period.

4) All marks were reported when encountered.

The following data were used by the Bayes model to generate population abundance estimates:

- m_{ti} the number of marks applied in 2015, or marked during a previous study year and encountered in 2015 during day *t* in section *i*
- c_{ti} the number of fish examined for marks during day *t* in section *i*
- r_{ti} the number of recaptured fish in the sample c_{ti}
- d_{ti} the number of fish removed or killed at recapture r_{ti}

A fish had to be greater than or equal to 250 mm FL (or 200 mm FL for Arctic Grayling) to be a member of m_{ti}. A fish was counted as examined (a member of c_{ti}) only if the fish was examined for the presence of a mark and was greater than or equal to 250 mm FL (or 200 mm FL for Arctic grayling) in length. A fish was counted as a recapture (r_{ti}) only if it was a member of the sample (c_{ti}), was a member of marks applied (m_{ti}), and was recaptured in a session later than its release session. A fish was counted as removed (d_{ti}) if it was not returned to the river, its tag was removed, or if the fish was deemed to be unlikely to survive.

The number of marks available for recapture, adjusted for movement, was determined by first estimating the proportion of marks released in section *i* moving to section *j* (p_{ij}), defined as follows:

$$\sum_j p_{ij} = 1 .$$

The movements of marked fish were determined by their recapture histories corrected for sampling intensity as follows:

$$(4) \qquad \hat{p}_{ij} = \left. \frac{w_{ij}}{\sum_t c_{tj}} \middle/ \sum_j \frac{w_{ij}}{\sum_t c_{tj}} \right. ,$$

where w_{ij} is the total number of recaptures that were released in section i and recaptured in section j over the entire study period. The maximum number of releases available for recapture during day t in section j (m^*_{tj}) is then as follows:

(5) $$m_{tj}^{*} = \sum_{i} \hat{p}_{ij} m_{ti}$$.

The typical closed population model assumptions (e.g., Gazey and Staley 1986) can be adjusted for mortality, emigration of fish from the study area, and the non-detection of a mark when a fish is recaptured. Thus, the number of marks available for recapture at the start of day t in section i (M_{ti}) consists of released tags in each section adjusted for removals (mortality and emigration) summed over time:

(6) $$M_{ti} = \sum_{v=1}^{t-h} (m_{vi}^{*} - d_{vi}) \exp\{(v + h - t)Q_i\}$$,

where Q_i is the instantaneous daily rate of apparent mortality in the i-th region and h is the number of lags or mixing days (nominally set to three days). The number of fish examined during day t in the i-th region (C_{ti}) does not require correction:

(7) $$C_{ti} = c_{ti}$$.

Recaptured fish (R_{ti}) in the sample, C_{ti}, however, needed to be adjusted for the proportion of undetected marks (u) as follows:

(8) $$R_{ti} = (1 + u) r_{ti}$$.

The corrected number of marks available, sampled, and recaptured (Equations 6, 7, and 8) were used in the model (Gazey and Staley 1986) to form the population abundance estimates. If apparent mortality is assumed ($Q_i > 0$ in equation 6), then the population abundance estimates represent the mean population size weighted by the information (likelihood of recapture) contained in each sampling event during the study period.

Population size was estimated using a Microsoft Excel© spreadsheet model with macros coded in Visual Basic. The model has two phases. First, mark-recapture data were assembled by section under the selection criteria of minimum time-at-large (i.e., days) and minimum fork length (mm) specified by the user. Second, the user specified the sections to be included in the estimate, an annual instantaneous mortality rate, the proportion of undetected marked fish, and the confidence interval percentage desired for the output. The model then assembled the adjusted mark-recapture data (equations 6, 7, and 8) and followed Gazey and Staley (1986) using the replacement model to compute the population abundance estimates. Output included posterior distributions, the Bayesian mean, standard deviation, median, mode, symmetric confidence interval, and the highest probability density (HPD) interval.

Population abundance estimates were generated for the six sections using marks applied at a start-date of 26 August 2015, a minimum length of 250 mm FL (200 mm FL for Arctic Grayling), daily instantaneous removal rate (which represented natural mortality, unobserved removals, and emigration) estimated using the CJS model, and an undetected mark rate of 0%. The total population abundance estimate for the study area was obtained by summing the section estimates. Confidence intervals for the total study area estimates were calculated invoking a normal distribution under the central limit theorem with a variance equal to the sum of the variances for the sections where a population abundance estimate was feasible. For Arctic Grayling, all marked fish greater than 200 mm FL were used to increase the available data; however, population abundance estimates were not produced because of very sparse recoveries (two recaptured Arctic Grayling in Section 3, zero in all other sections). Minimal population abundance estimates (i.e., the probability of *x* that the population size is at least *y*) were computed for Arctic Grayling following Gazey and Staley (1986).

2.2.3 Catchability

If catchability is constant across years and river sections, then indices of abundance such as catch rate (number of fish sampled per unit effort, CPUE) would be comparable. Handling time to process a fish, gear saturation, size selectivity by the sampling gear, and other variations in physical conditions can cause systematic bias in the relationship between CPUE and abundance (Hilborn and Walters 1992). Catchability coefficients (parameters relating abundance indices to actual abundance, Ricker 1975) were calculated using closed population assumptions, possibly subject to apparent mortality. If an index of abundance is applicable, then the coefficients should remain constant over study years and river sections.

An estimate for the catchability coefficient for the *i*-th section was calculated following Ricker (1975) as follows:

(9) $$\hat{q}_i = \frac{\sum_t C_{ti}}{E_i \cdot N_i},$$

where C_{ti} is from equation (7), E_i is electroshocking effort (measured as hours of electroshocking or distance traveled), and N_i is the Bayes population abundance estimate for Section *i*, as described in Section 2.2.2.3 above. Given the number of fish sampled and effort data, the variance of catchability coefficient was defined as follows:

(10) $$Var(\hat{q}_i) = \left(\frac{\sum_t C_{ti}}{E_i} \right)^2 Var\left(\frac{1}{N_i} \right),$$

where the reciprocal of estimated abundance is distributed normally and can be estimated using the following expression (Ricker 1975, p 97):

(11) $$Var\left(\frac{1}{N_i} \right) = \frac{\sum_t R_{ti}}{\left(\sum_t M_{ti} C_{ti} \right)^2}.$$

2.2.4 Effort Required to Detect Change

To explore the precision that may be obtained under alternative sampling intensities, a simple power analysis was conducted on Mountain Whitefish sampled in Section 1. Section 1 was selected because a consistent sampling program has been conducted in this section since 2002, providing a large, comparable dataset. The analysis assumed that the Bayesian mean estimate ($\overline{N}$) was the actual population size and adjusted the data for an altered sampling factor for any sequence as follows:

(11) $$M_t' = \left[1 - \left(1 - \frac{M_t}{\overline{N}}\right)^f\right] \cdot \overline{N}$$

(12) $$C_t' = \left[1 - \left(1 - \frac{C_t}{\overline{N}}\right)^f\right] \cdot \overline{N}$$

(13) $$R_t' = R_t \cdot \frac{M_t'}{M_t} \cdot \frac{C_t'}{C_t},$$

where f was the sampling factor (e.g., f = 2 represents a doubling of the sampling effort), M_t was the number of marks applied at the start of the t-th sampling sequence, C_t was the total number of fish examined for marks, and R_t was the number of recaptured fish. The prime notation represents the data generated for a specified sampling factor. Since the number of fish sampled was small in relation to the population size, a sampling factor of two nearly doubles the number of marks applied and quadruples the number of recaptured fish.

For the purposes of this analysis, precision was defined as half of the 80% HPD expressed as a percentage of the mean (i.e., precision = 100 – x, where x is the percentage of the mean when at 80% HPD). If the posterior distribution was perfectly symmetrical, then our precision definition would equate to the plus/minus 80% confidence interval.

2.2.5 Catch and Life History Data

Catch rates for each site were expressed as the number of fish captured per kilometre of shoreline sampled per hour of electroshocker operation (CPUE = no. fish/km/h). The CPUE for each session was the sum of the number of fish captured per kilometre of shoreline sampled per hour of electroshocker operation for all sites within a section. The average CPUE was estimated for each section by averaging the CPUE from all sites for all sessions within the section. The standard error of the mean CPUE was calculated by using the square root of the variance of the CPUE from all sites for all sessions within the section divided by the number of sampling events.

Length-frequencies were calculated using the statistical environment R, v. 3.1.0 (R Core Team 2014). Frequency plots were constructed for fork lengths by year, for all years combined (but plotted separately for each section), and by section within 2015. For all species, fork lengths were plotted using 10 mm bins. Similar to length-frequency, age-frequency plots were constructed by year, for all years combined (but plotted separately by section), and by section within 2015.

Fulton's body condition index (*K*; Murphy and Willis 1996) was calculated as follows:

(15) $$K = (\frac{W_t}{L^3}) \times 100{,}000$$

Where W_t was a fish's weight (g) and *L* was a fish's fork length (mm). Body condition was plotted for all previous years by section. Mean condition values were estimated for each year and section combination, along with their respective 95% confidence intervals. These plots were constructed for most species.

Length-at-age data were used to construct three-parameter von Bertalanffy models (Quinn and Deriso 1999) for all species of interest:

(16) $$L(t) = L_\infty (1 - e^{-K(t - t0)}),$$

where L_∞ is the asymptotic length of each species, *K* is the curvature parameter (i.e., growth rate), and *t0* is the theoretical time when a fish has length zero. Non-linear modeling in R was used to evaluate all three parameters of interest.

For each study year *i*, the mean fork length of all study years excluding Year *i* was estimated, and the estimated mean was subtracted from the individual fork lengths sampled in Year *i*. The mean and 95% confidence intervals of the estimated differences in fork lengths were then calculated for each year.

Length-weight regressions (Murphy and Willis 1996) were calculated for all species of interest as follows:

(17) $$W = a \times L^b,$$

where *W* is weight (g) and *L* is fork length (mm).

Catch curves (Ricker 1975) were estimated for Arctic Grayling, Bull Trout, Mountain Whitefish, and Walleye using year-specific data (with Sections 1, 3, 5 combined into one curve, and Sections 6, 7, and 9 combined into another curve). In addition, 2015 data were used to construct section-specific catch curves; this was performed for Arctic Grayling, Bull Trout, Mountain Whitefish, and Walleye only, due to scarce ageing data for other species. Instantaneous total mortality (*Z*) was estimated using ordinary least squares regression of natural logarithm-transformed counts of fish at age, performed on the descending arm of the age distribution:

(18) $$\ln(N_t) = \ln(N_0) - Z \times t,$$

where N_0 is the number of fish at the first age-class included in the catch curve analysis, *Z* is instantaneous total mortality, and *t* is years. Survival was then estimated as $S = e^{-Z}$. Annual mortality (*A*) was calculated as 1-*S*. Confidence intervals (95%) around the annual mortality estimates were calculated using the confidence intervals estimated during regression around *Z*, converting it to confidence intervals around *A* as described above. The catch curves used counts of fish for age-3 and older age-classes. Abundances of age-0 to age-2 fish were not used in catch curves because they were under-represented in the study area, likely because many individuals rear in spawning tributaries, and the smaller age-classes were not fully recruited to the sampling gear.

3.0 RESULTS

3.1 Physical Parameters

3.1.1 Discharge

Overall, discharge for the Peace River (i.e., discharge through PCD) was low in 2015 when compared to average discharge values recorded over all other study years combined (i.e., 2002 to 2014; Figure 2). Mean daily discharge in the Peace River at PCD was greater than average from mid-April to late June and from late September until end of December but lower than average for the remainder of the year. For most of the year, discharges remained within the range of discharges recorded between 2002 and 2014 (Figure 2; Appendix C, Figure C1). During a typical year, discharge through PCD gradually decreases from January to early June, increases from early June to mid-July, remains near stable from mid-July to early October, and increases from early October to late December (associated with increased hydropower generation). In 2015, discharge decreased from January to early June with several substantial changes in discharge, remained low for most of the period from mid-June to early September, and increased between mid-September and late December. Over the 2015 sample period, discharge generally increased (Figure 2).

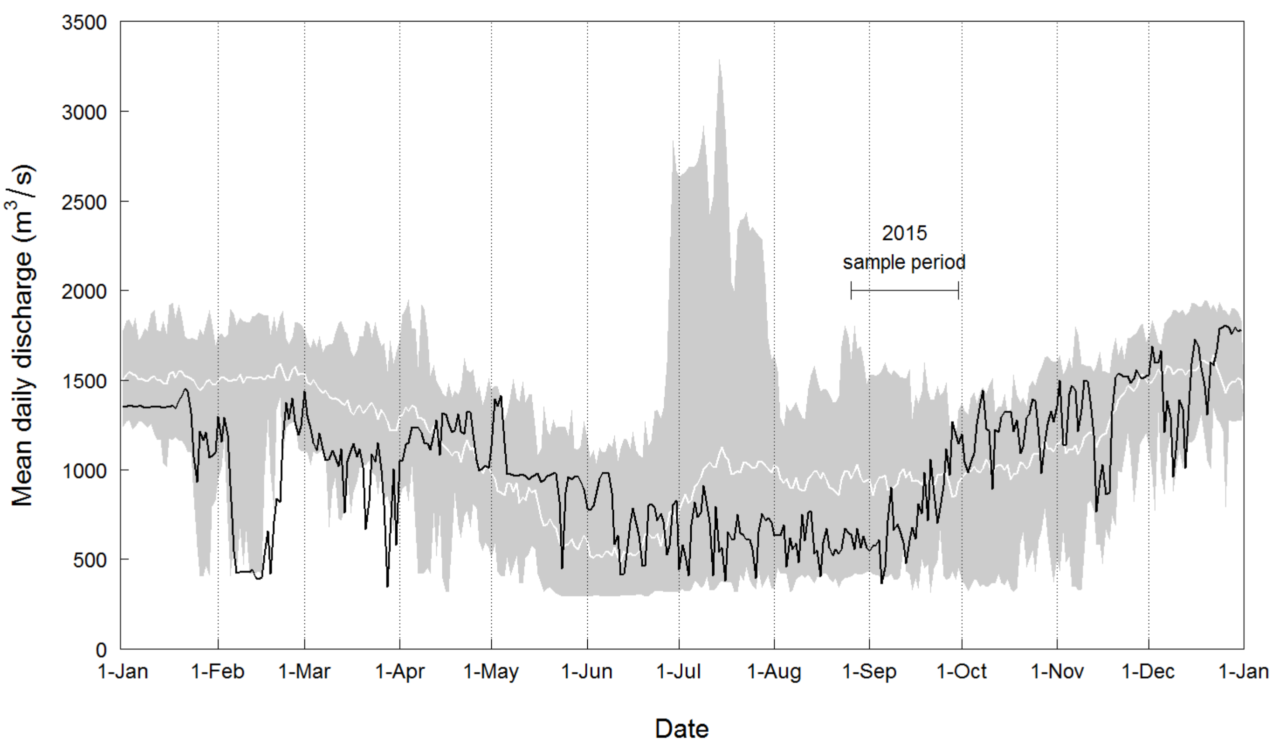


Figure 2: Mean daily discharge (m^3/s) for the Peace River at Peace Canyon Dam, 2015 (black line). The shaded area represents minimum and maximum mean daily discharge values recorded at the dam from 2002 to 2014. The white line represents average mean daily discharge values over the same time period.

3.1.2 Water Temperature

During a typical study year, water temperatures are generally lower in Section 1 during the spring and summer and higher in Section 1 during the fall and winter when compared to Sections 3 and 5 (Appendix C, Figure C2; DES 2015). During a typical year, Peace River water temperatures remain low (generally less than 2°C) from January to early April, gradually increase from early April to early September, and gradually decrease from early September to late December (Appendix C, Figures C3 to C5).

Mean daily water temperatures in the Peace River measured at the Halfway River were greater than average from June to August but less than average during the study period in late August and September (Figure 3). In 2015, mean water temperatures in the Peace River measured near PCD were close to average during most of the year, but below average during the study period (Figure 4). Water temperatures in the Peace River are compared among years (2008-2015) at stations located near PCD (Section 1), the Halfway River confluence (Section 3), and the Moberly River confluence (Section 5) in Appendix C, Figures C3 to C5, respectively. In 2015, water temperature data for the Peace River downstream of Section 5 were not available.

In Section 5, water temperatures were warmer than normal from March to mid-August and colder than normal from mid-August to late September (Appendix C, Figure C5). During the 2015 study period (i.e., 25 August to 07 October), water temperatures in Section 1 varied between a low of 9.1°C on 29 August and a high of 12.1°C on 05 September and 01 and 02 October (Appendix C, Figure C3). In Section 3, water temperatures varied between a low of 6.7°C on 05 and 06 October and a high of 14.7°C on 24 August (Appendix C, Figure C4). In Section 5, water temperatures varied between a low of 9.3°C on September 3 and a high of 12.4°C on 27 August (Appendix C, Figure C5). Spot temperature readings for the Peace River taken at the time of sampling ranged between 8.7°C and 12.5°C and were warmer in Section 1 when compared to Sections 3 and 5 (Attachment A).

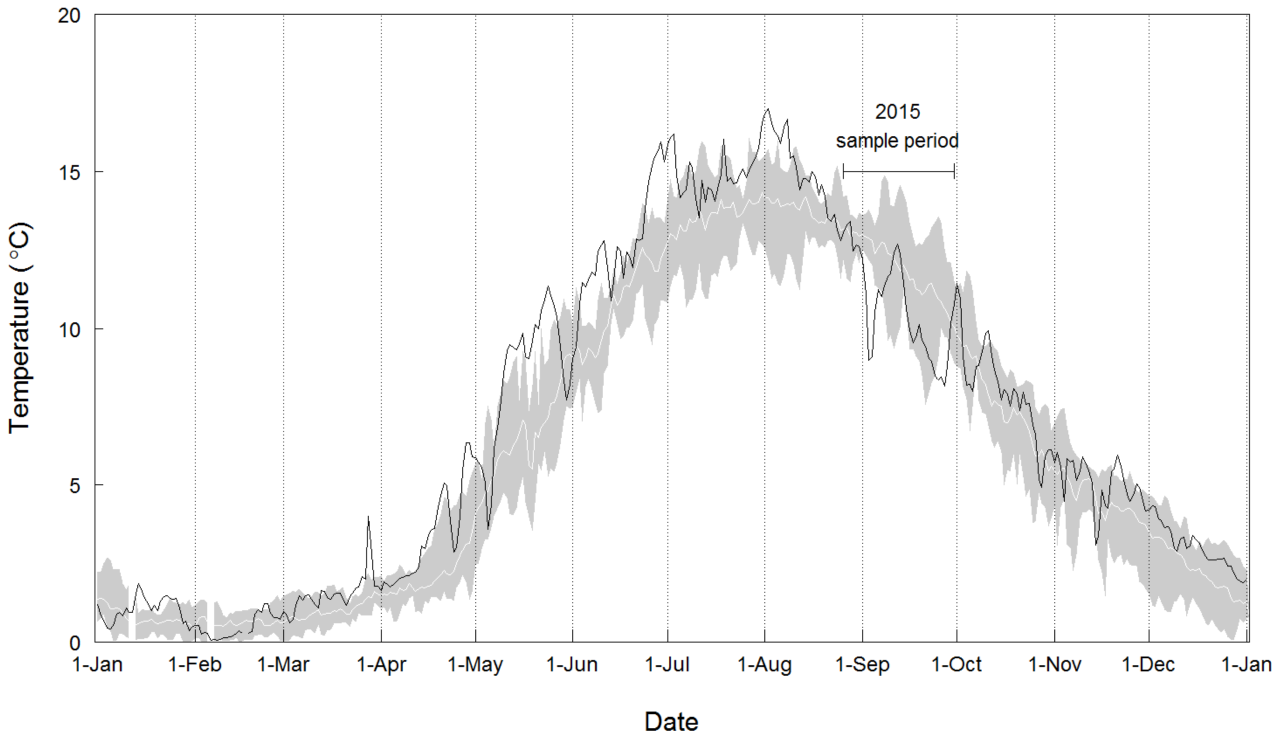


Figure 3: Mean daily water temperature (°C) for the Peace River recorded near the Halfway River confluence, 2015 (black line). The shaded area represents the minimum and maximum mean daily water temperature values recorded at that location between 2008 and 2013. The white line represents the average mean daily water temperature during the same time period. Data were collected under GMSWORKS-2 (DES 2015).

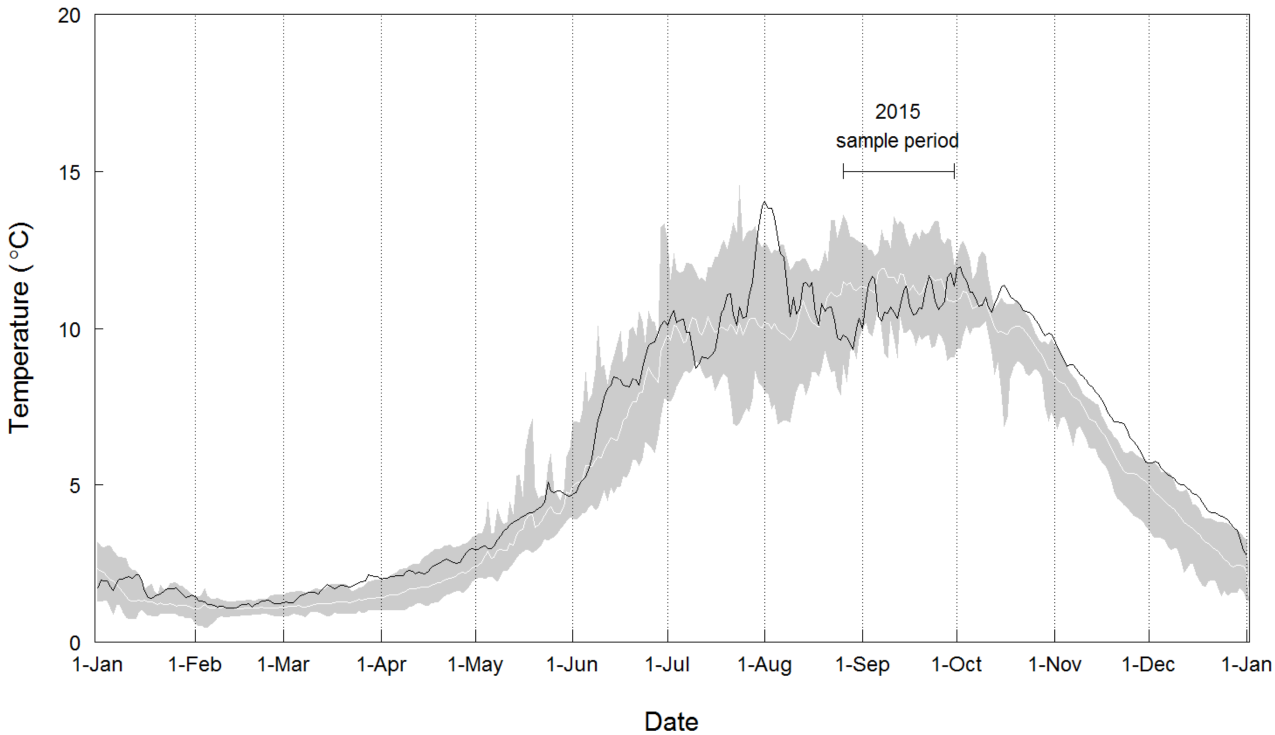


Figure 4: Mean daily water temperature (°C) for the Peace River recorded near the Peace Canyon Dam, 2015 (black line). The shaded area represents the minimum and maximum mean daily water temperature values recorded at that location between 2008 and 2014. The white line represents the average mean daily water temperature during the same time period. Data were collected under GMSWORKS-2 (DES 2015).

3.1.3 Habitat Variables

A description of fish habitat available in the study area is provided by Mainstream (2012). Habitat variables collected at each site during the present study are provided in Appendix D, Table D3 and are also included in the Peace River Fish Index Database (Attachment A). In Sections 1, 3, and 5, each site was categorized into various habitat types using their bank habitat type as assigned by R.L.&L. (2001) and the presence or absence of physical cover as assigned by P&E and Gazey (2003). The Bank Habitat Type Classification System is summarized in Appendix D, Table D2. Bank habitat types and the presence/absence of physical cover have not been classified and are not available for Sections 6, 7, and 9. Sampling locations and habitat classifications (when available) are illustrated in Appendix A, Figures A1 to A6. Site lengths were calculated using ArcView® GIS software and are shown in Appendix A, Table A1. Overall, habitat data recorded during the survey did not suggest any substantially changes to fish habitat in Sections 1, 3, and 5 between the 2014 and 2015 study periods.

3.2 General Characteristics of the Fish Community

In 2015, 16,811 fish from 26 different species were recorded in the Peace River (Table 7). This includes captured and observed fish that were identified to species. Of those 26 species, 12 were classified as sportfish and 14 were classified as non-sportfish. Catch was greatest in Section 6 (25% of the total catch) and lowest in Section 9 (6% of the total catch; Table 7).

Table 7: Number of fish caught and observed by boat electroshocking and their frequency of occurrence in sampled sections of the Peace River, 25 August to 07 October 2015.

Species	Section												All Sections		
	1		3		5		6		7		9				
	n[a]	%[b]	n[a]	%[b]	n[a]	%[b]	n[a]	%[b]	n[a]	%[b]	n[a]	%[b]	n[a]	%[b]	%[c]
Sportfish															
Arctic Grayling			42	1	18	1	7	<1	1	<1			68	1	<1
Bull Trout	73	4	108	4	46	3	62	2	28	3	27	5	344	3	2
Burbot							1	<1	2	<1	2	<1	5	<1	<1
Kokanee	26	1	6	<1	2	<1					1	<1	35	<1	<1
Northern Pike					2	<1	15	1	7	1	1	<1	25	<1	<1
Lake Trout	3	<1							1	<1			4	<1	<1
Goldeye					1	<1			1	<1	1	<1	3	<1	<1
Rainbow Trout	40	2	111	4	26	2	17	1	9	1	1	<1	204	2	1
Yellow Perch					14	1	5	<1					19	<1	<1
Lake Whitefish	2	<1	1	<1	5	<1							8	<1	<1
Walleye	1	<1	2	<1	10	1	65	2	39	4	28	5	145	1	1
Mountain Whitefish	1893	93	2618	91	1518	92	2528	94	1008	92	470	89	10,035	92	60
Sportfish subtotal	**2038**	**100**	**2888**	**100**	**1642**	**100**	**2700**	**100**	**1096**	**100**	**531**	**100**	**10,895**	**100**	**65**
Non-sportfish															
Finescale Dace									1	<1			1	<1	<1
Lake Chub			1	<1			7	<1	16	1	19	4	43	1	<1
Flathead Chub									2	<1	1	<1	3	<1	<1
Longnose Dace			1	<1	5	1	4	<1	5	<1	1	<1	16	<1	<1
Longnose Sucker	174	43	746	71	653	66	1201	77	871	63	363	71	4008	68	24
Prickly Sculpin	3	1											3	<1	<1
Largescale Sucker	102	25	156	15	115	12	154	10	219	16	37	7	783	13	5
Redside Shiner			1	<1	24	2	61	4	110	8	22	4	218	4	1
Northern Pikeminnow	9	2	48	5	62	6	74	5	95	7	17	3	305	5	2
Spottail Shiner					5	1	6	<1	1	<1	3	1	15	<1	<1
Trout-perch							1	<1	5	<1			6	<1	<1
Slimy Sculpin	7	2	10	1	24	2	2	<1	4	<1			47	1	<1
White Sucker	109	27	91	9	107	11	57	4	53	4	51	10	468	8	3
Non-sportfish subtotal	**404**	**100**	**1054**	**100**	**995**	**100**	**1567**	**100**	**1382**	**100**	**514**	**100**	**5916**	**100**	**35**
All species	**2442**	**15**	**3942**	**23**	**2637**	**16**	**4267**	**25**	**2478**	**15**	**1045**	**6**	**16,811**	**100**	**100**

[a] Includes fish observed and identified to species; does not include within-year recaptured fish.

[b] Percent composition of the sportfish or non-sportfish catch.

[c] Percent composition of the total catch.

Mountain Whitefish was the most common species encountered, representing 60% of the total catch and 92% of the sportfish catch, followed by Longnose Sucker (24% of the total catch), Largescale Sucker (5%), White Sucker (3%), Bull Trout (2%), Northern Pikeminnow (*Ptychocheilus oregonensis*; 2%), Redside Shiner

(*Richardsonius balteatus*; 1.3%), and Rainbow Trout (1%). The remaining species accounted for less than 1% of the total catch each and included the following species in declining order of abundance: Walleye, Arctic Grayling, Slimy Sculpin (*Cottus cognatus*), Lake Chub (*Couesius plumbeus*), Kokanee, Northern Pike, Yellow Perch (*Perca flavescens*), Longnose Dace (*Rhinichthys cataractae*), Spottail Shiner (*Notropis hudsonius*), Lake Whitefish (*Coregonus clupeaformis*), Trout-perch (Percopsis omiscomaycus), Burbot, Lake Trout, Goldeye (*Hiodon alosoides*), Flathead Chub (*Platygobio gracilis*), Prickly Sculpin (*Cottus asper*), and Finescale Dace (*Chrosomus neogaeus*).

In general, cold-water species (as defined by Mainstream 2012), such as Bull Trout, Mountain Whitefish, and Rainbow Trout, were found throughout all sections of the study area. Cool-water species (Mainstream 2012), such as Northern Pike and Walleye, were more common in the downstream portions of the study area (Table 7).

Arctic Grayling, Bull Trout, and Mountain Whitefish were consistently captured between 2002 and 2015; therefore, changes in catch-rates over time could be compared for these species Figure 5. Changes in catch-rates over time for other species were not compared. Arctic Grayling catch rates declined between 2011 and 2014 and remained low in 2015; however, confidence intervals overlapped for most estimates. Catch rates of Arctic Grayling were greatest in 2004 (18 fish/km) and also were high in 2007 (16 fish/km). Bull Trout catch rates in 2015 were similar to most other study years (Figure 5) but have declined since the peak catch rates observed in 2012. Mountain Whitefish catch rates were stable between 2002 and 2010, increased substantially in 2011, and decreased during each successive year between 2011 and 2014 (Figure 5). Catch rates for this species were lower in 2014 and 2015 than during all previous study years. Catch rates declined an average of approximately 20% each year between 2011 and 2014.

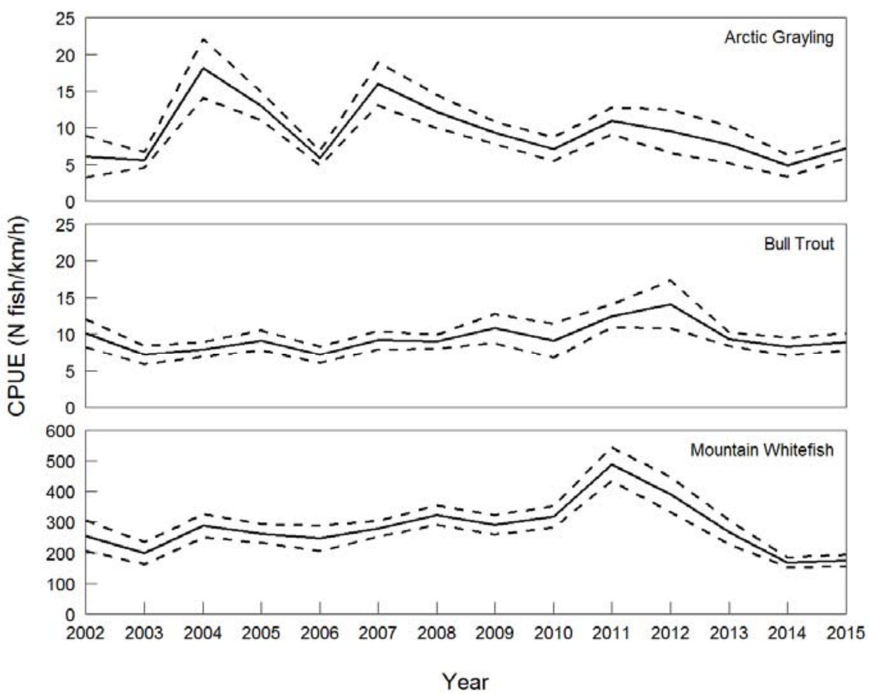


Figure 5: Mean annual catch rates for Arctic Grayling, Bull Trout, and Mountain Whitefish captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River combined, 2002 to 2015. The dashed lines denote 95% confidence intervals. Analysis included captured fish only and all size-cohorts combined. Sections 6, 7, and 9 were excluded as these sections were not consistently sampled prior to 2015.

3.3 Arctic Grayling

3.3.1 Biological Characteristics

During the 2015 survey, 55 Arctic Grayling were initially captured (i.e., excluding within-year recaptures); 31 were captured in Section 3, 17 were captured in Section 5, 6 were captured in Section 6, and one was captured in Section 7. Arctic Grayling were not recorded in Section 1 or 9 during the 2015 survey. Fork lengths ranged between 124 and 357 mm; weights ranged between 16 and 561 g (Table 8). Scale samples were analyzed from all captured Arctic Grayling and the ages ranged from age-0 to age-4.

The numbers of Arctic Grayling by age-class (Table 8) and length-frequencies (Figure 6) indicate that both juvenile (age-0 and age-1) and age-2 and older age-classes are present in the study area. Length-frequency data from previous study years also showed a variety of length groupings in most years (Appendix F, Figure F1).

Table 8: Average fork length, weight, and body condition by age for Arctic Grayling captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Age	Fork Length (mm)		Weight (g)		Body Condition (K)		n[a]
	Average ± SD	Range	Average ± SD	Range	Average ± SD	Range	
0	144 ± 26	124 - 186	33 ± 29	16 - 84	0.9 ± 0.2	0.8 - 1.3	5
1	214 ± 11	195 - 245	125 ± 22	83 - 179	1.3 ± 0.1	0.9 - 1.4	36
2	310 ± 14	288 - 328	406 ± 69	328 - 508	1.4 ± 0.1	1.1 - 1.7	10
3	n/a						0
4	357	357 - 357	561	561 - 561	1.2	1.2 - 1.2	1

[a] Number of individuals sampled.

The interpretation of age-frequency distributions of Arctic Grayling by river section was limited due to the low number of captured and aged individuals in most sections (Figure 7). Most of the Arctic Grayling were age-0, age-1, or age-2. Only one individual captured was older than age-3. Age-1 and age-2 Arctic Grayling were under-represented in the 2012 and 2013 study years, respectively (Appendix F, Figure F2), which suggests poor recruitment from the 2011 spawning season. The large percentage of age-1 Arctic Grayling in 2015 suggests strong recruitment in 2014 when compared to the immediately preceding study years (Appendix F, Figure F2).

Growth rates estimated using the von Bertalanffy growth curve suggested that Arctic Grayling were slightly larger (i.e., greater y-intercept) in 2015 when compared to previous study years; however, rates of growth were similar (Figure 8). This is supported by greater than average length-at-age of age-0 to age-2 Arctic Grayling in 2015 (Figure 9). The body condition (*K*) of Arctic Grayling captured in 2015 ranged between 0.8 and 1.4 (Table 8). Body condition was similar among river sections (Figure 10). Body condition was generally lower in 2011 but similar among other years with overlapping confidence intervals for most estimates (Figure 10). Regressions suggested a similar relationship between weight and length for Arctic Grayling among sections (Figure 11) and years (Appendix F, Figure F3), although sample sizes were small in some sections or years.

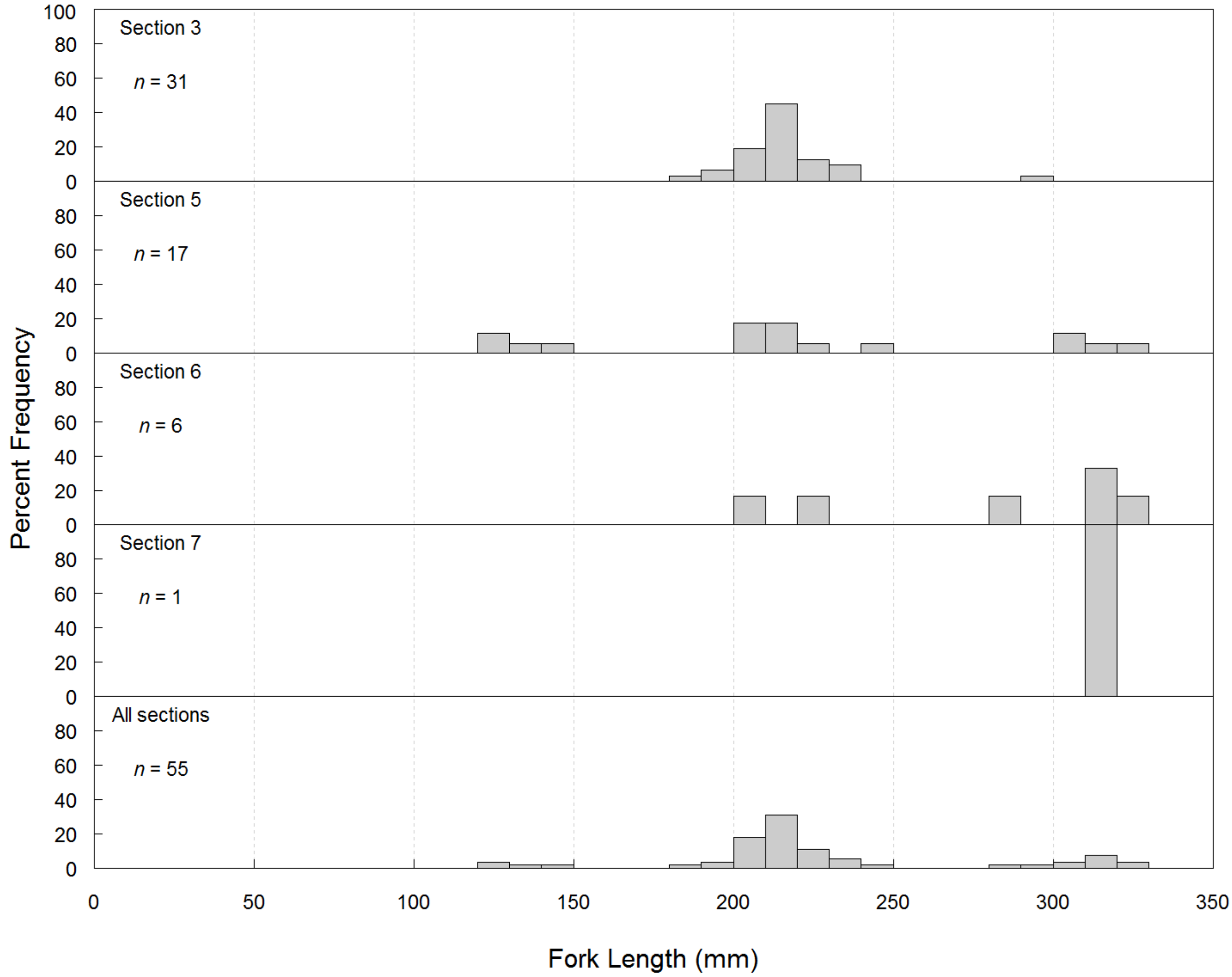


Figure 6: Length-frequency distribution for Arctic Grayling captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015. In 2015, Arctic Grayling were not recorded in Section 1 or Section 9.

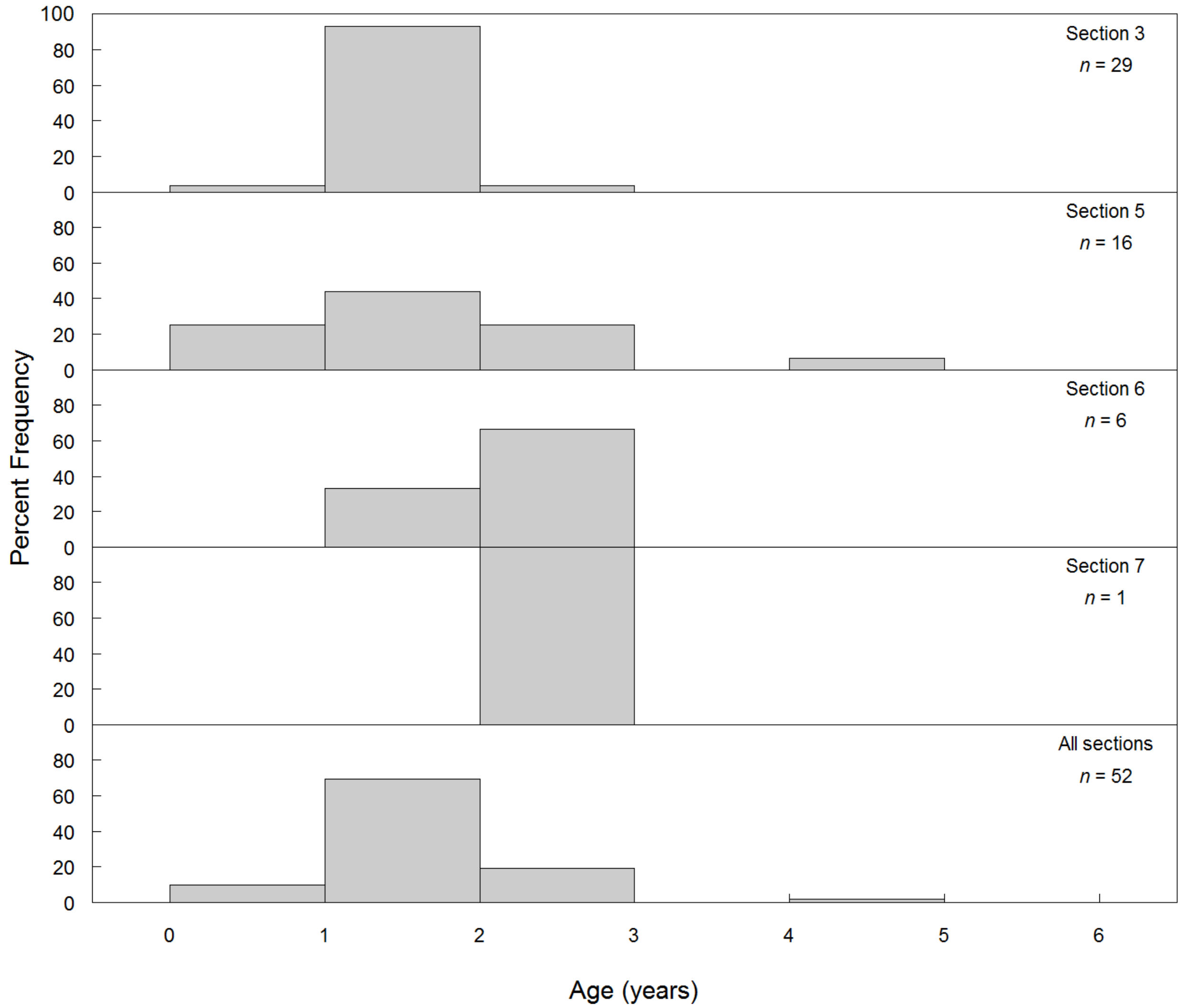


Figure 7: Age-frequency distributions for Arctic Grayling captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

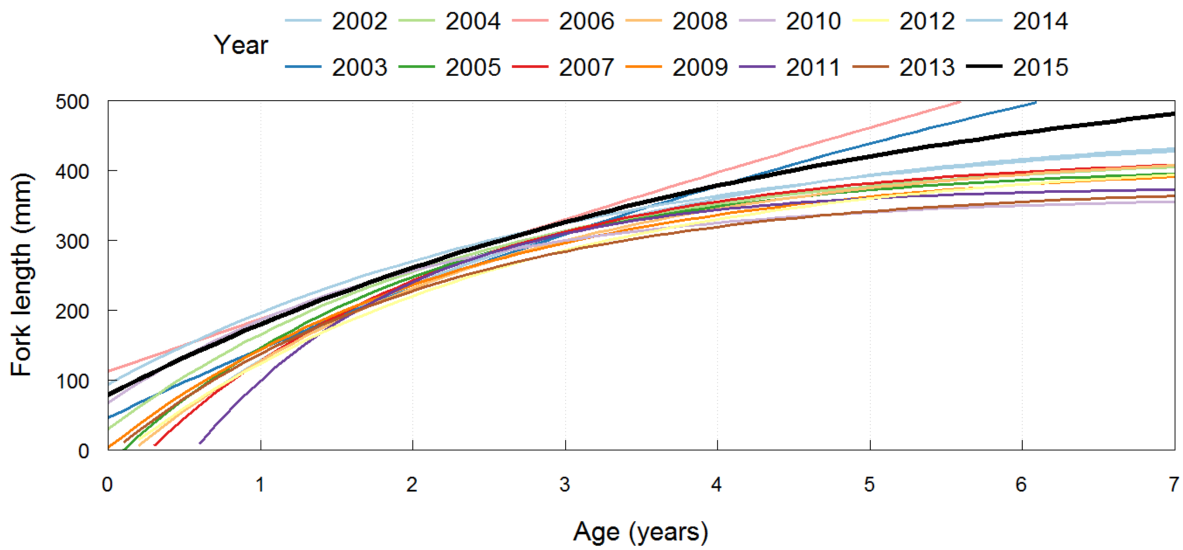


Figure 8: von Bertalanffy growth curves for Arctic Grayling captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015.

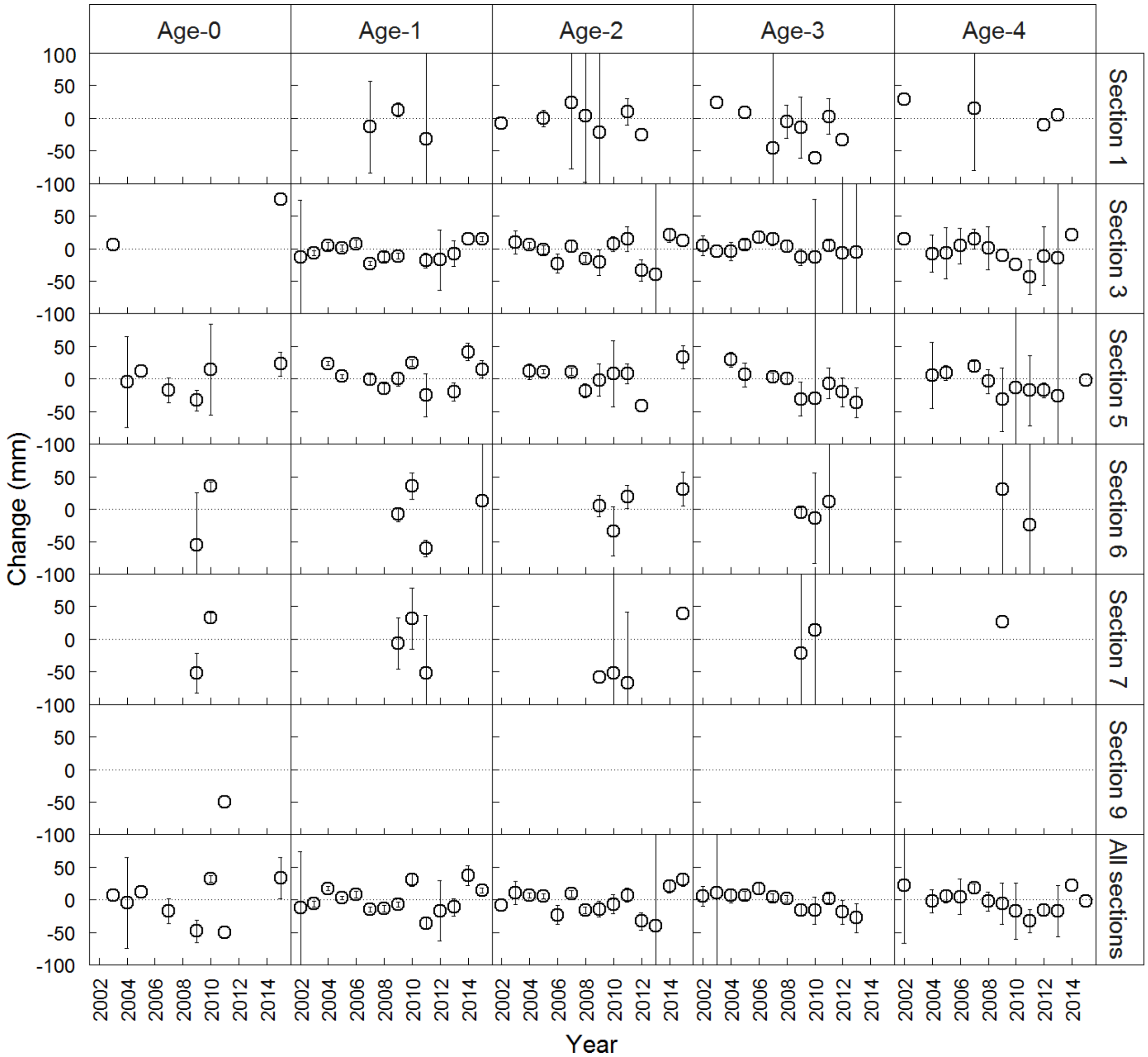


Figure 9: Change in mean length-at-age for Arctic Grayling captured by boat electroshocking in the Peace River, 2002 to 2015. Change is defined as the difference between the annual estimate and the estimate of all years combined. Error bars represent 95% confidence intervals. For Sections 6, 7, and 9, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

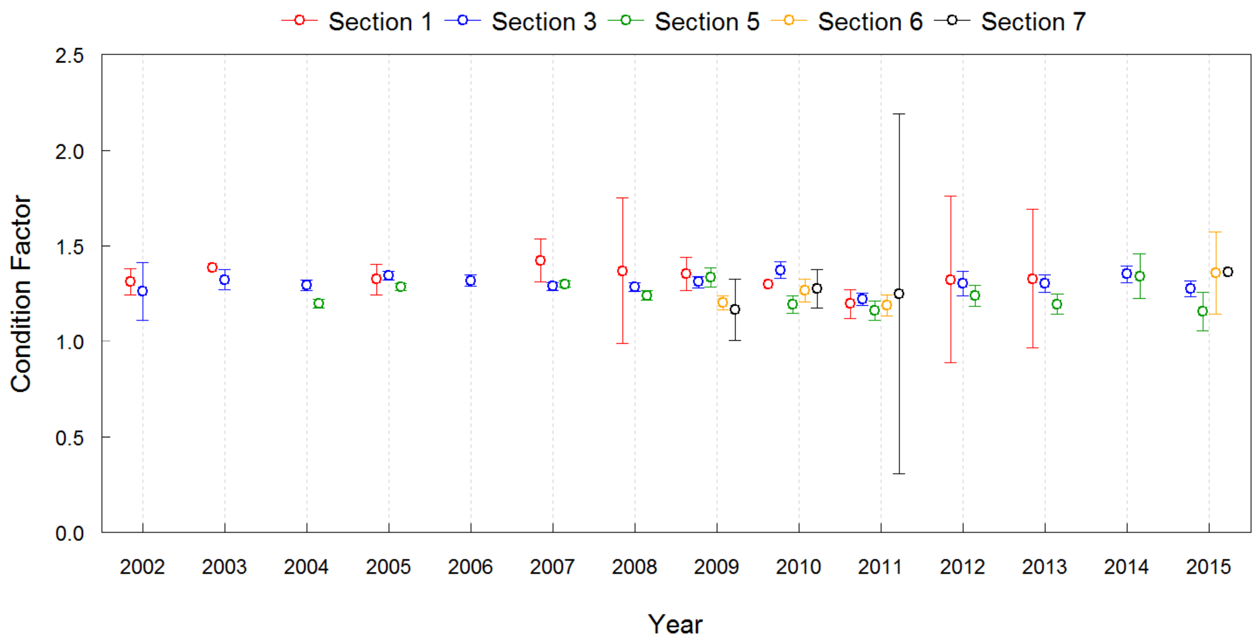


Figure 10: Mean body condition with 95% confidence intervals for Arctic Grayling captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. For Sections 6 and 7, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

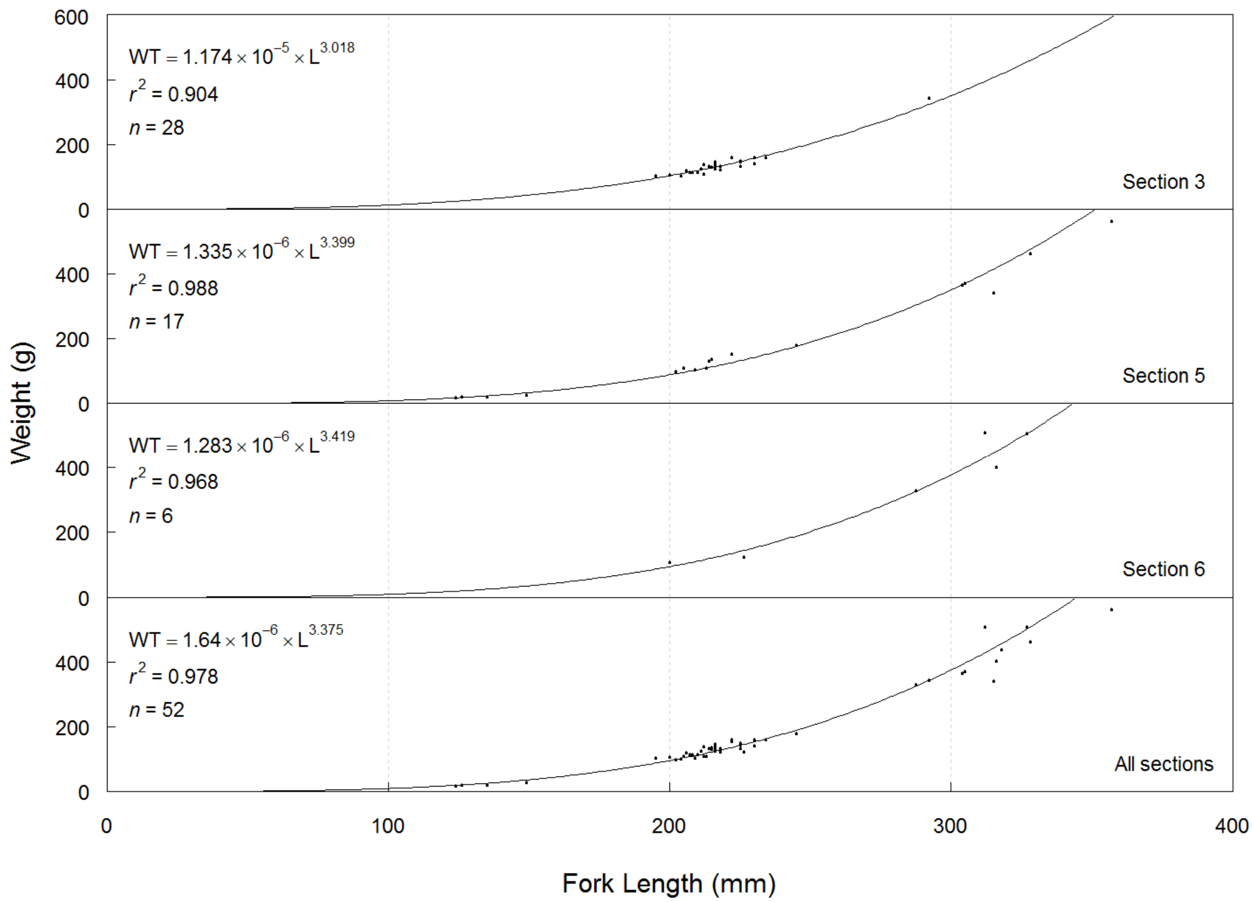


Figure 11: Length-weight regressions for Arctic Grayling captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015. Sections with only one captured fish were removed from the figure; however, these fish were included in the summary for all sections combined.

3.3.2 Abundance and Spatial Distribution

Of the 55 Arctic Grayling captured in 2015, 45% were captured at sites with physical cover, 42% were captured at sites without physical cover, and 13% were captured at sites where the presence of cover had not been assessed by P&E and Gazey (2003). These data suggest that Arctic Grayling in the study area use habitats with and without physical cover. Overall, capture data from 2015 and earlier study years indicate that Arctic Grayling are common in Sections 3 and 5 and present in small numbers in Sections 1, 6, 7. Arctic Grayling were not captured in Section 9 in 2015.

Small catches of Arctic Grayling prevented the generation of population abundance estimates for most river sections in 2015. Minimum population abundance estimates could only be calculated for Section 3. There was a 0.95 probability of at least 125 fish in Section 3 in 2015. The number of Arctic Grayling captured was greatest in 2007 for Sections 1, 3, and 5 combined (n = 364). However, less than 50 Arctic Grayling have been recorded in these sections during each study year since 2012, which suggests declining abundance in recent years.

3.4 Bull Trout

3.4.1 Biological Characteristics

During the 2015 survey, 216 Bull Trout were initially captured (i.e., excluding within-year recaptures) and measured for length and weight. Fork lengths ranged between 174 and 780 mm, and weights ranged between 48 and 4633 g (Table 9). Fin ray samples were analyzed from all individuals; however, ages could not be assigned to all samples. Assigned ages for Bull Trout ranged from age-0 to age-11.

Length-frequency histograms suggest similar size distributions among river sections in the study area (Figure 12). The majority of Bull Trout sampled (72%) were between 200 and 400 mm FL, which is consistent with historical results (Appendix F, Figure F4) and indicative of the use of the area primarily by subadults during the study period. Three Bull Trout were classified as age-0 based on fin rays; however, these ages are likely errors as the fork lengths of these individuals (206, 335, and 476 mm) suggest they were older than age-0. Only one Bull Trout less than 200 mm FL (174 mm FL) was captured in 2015. Smaller Bull Trout (i.e., less than approximately 200 mm FL) rear in select Peace River tributaries (Mainstream 2012) and are generally very rare in the mainstem. During the study period, there are typically few large, sexually mature Bull Trout present in the Peace River mainstream because they are spawning in select tributaries (mainly in the Halfway River watershed; DES and Mainstream 2011).

Table 9: Average fork length, weight, and body condition by age for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Age	Fork Length (mm)		Weight (g)		Body Condition (K)		*n*[a]
	Average ± SD	Range	Average ± SD	Range	Average ± SD	Range	
0	n/a[b]						3
1	252.6 ± 19.8	217 - 295	160.8 ± 39.7	101 - 254	1.0 ± 0.1	0.7 - 1.1	29
2	275.7 ± 41.9	212 - 440	226.2 ± 133.5	94 - 904	1.0 ± 0.1	0.8 - 1.2	76
3	344.7 ± 75.3	239 - 526	476.8 ± 350.2	140 - 1581	1.0 ± 0.1	0.9 - 1.4	47
4	417.9 ± 92.7	270 - 760	897.2 ± 723.8	199 - 4314	1.1 ± 0.2	0.8 - 1.7	36
5	458 ± 72.1	280 - 550	1043.7 ± 415	204 - 1776	1.0 ± 0.1	0.9 - 1.3	13
6	541.4 ± 121	392 - 708	2066.6 ± 1566.1	529 - 4337	1.1 ± 0.2	0.9 - 1.3	5
7	529.7 ± 146.2	367 - 650	1783.7 ± 1164.5	464 - 2667	1.0 ± 0.1	0.9 - 1.2	3
8	671	671	2968	2968	1	1	1
9	710.5 ± 68.6	662 - 759	3747 ± 736.8	3226 - 4268	1.0 ± 0.1	1 - 1.1	2
10	n/a						0
11	780	780	4458	4458	0.9	0.9	1

[a] Number of individuals sampled.

[b] Length, weight, and condition data are not reported because these three Bull Trout were likely incorrectly classified as age-0.

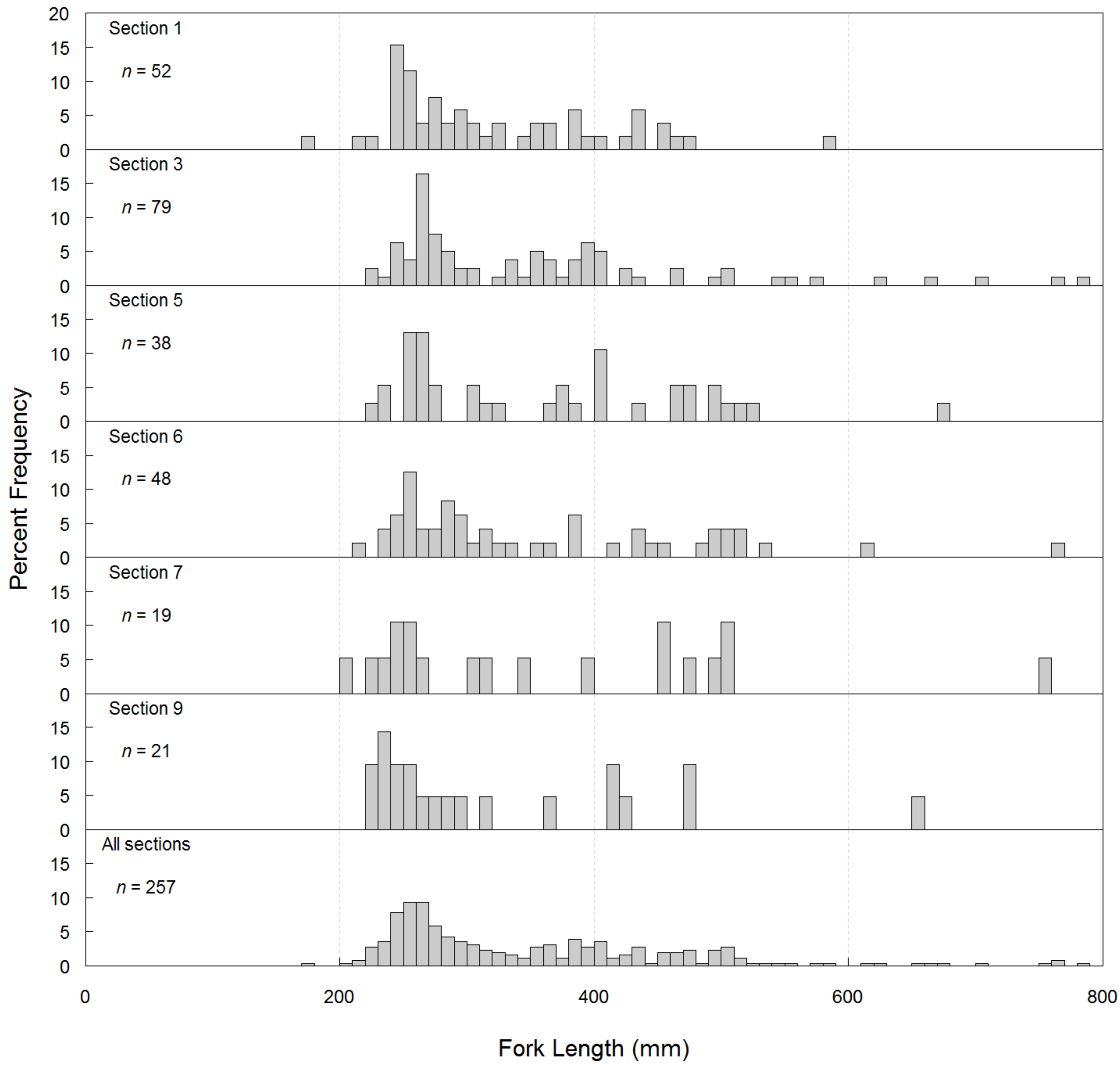


Figure 12: Length-frequency distributions for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Age-frequency histograms indicated that age-2 and age-3 were the more common age-classes of Bull Trout captured (Figure 13), which may be because most juvenile Bull Trout do not enter the Peace River mainstem until age-2 to age-3 (Appendix F, Figure F5). The age-1 fish captured during the 2015 survey were large enough (217-295 mm) to be effectively sampled by boat electroshocking, indicating that this age-class is not being missed by the sampling gear but is present in low numbers. Age distributions did not differ by river sections, with most age-classes being present in most sections and habitats during the 2015 survey.

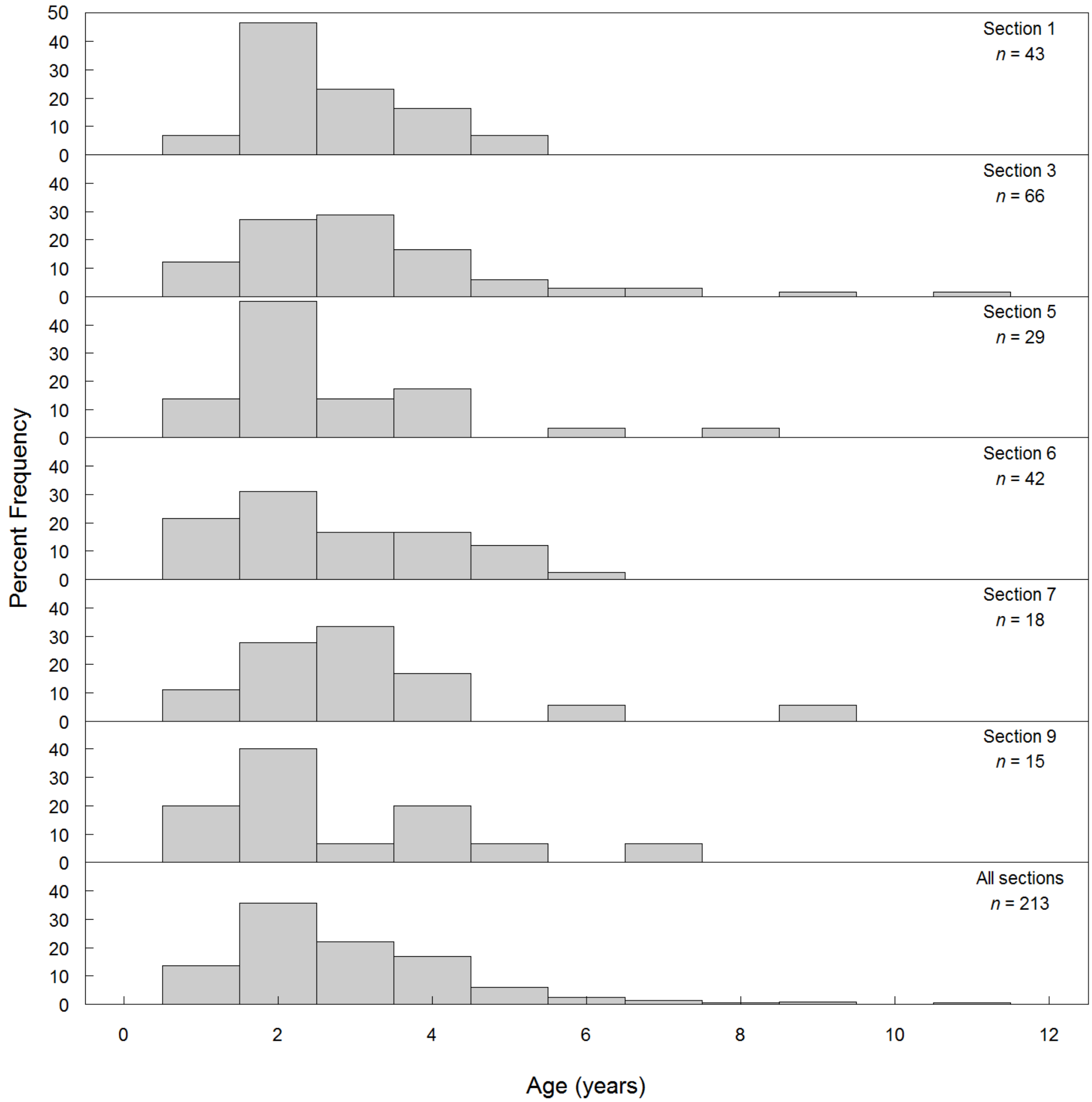


Figure 13: Age-frequency distributions for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

The absence of distinct modes in length-frequency histograms (Figure 12; Appendix F, Figure F4) suggests that Bull Trout grow slowly after migrating into the Peace River from their natal streams. Slow growth of Bull Trout in the study area is supported by average length-at-age data (Table 9) and von Bertalanffy growth analyses (Figure 14 and Figure 15). In 2015, there was little difference in growth among river sections for Bull Trout (Figure 14), which could be due to the migratory nature of the Bull Trout population. It is possible that Peace River Bull Trout are not present in any single section of the study area long enough for the habitat quality of that section to influence their growth rate. The von Bertalanffy growth analysis indicates slightly larger initial sizes but slower growth rates of Bull Trout in 2015 when compared to most previous study years (Figure 15).

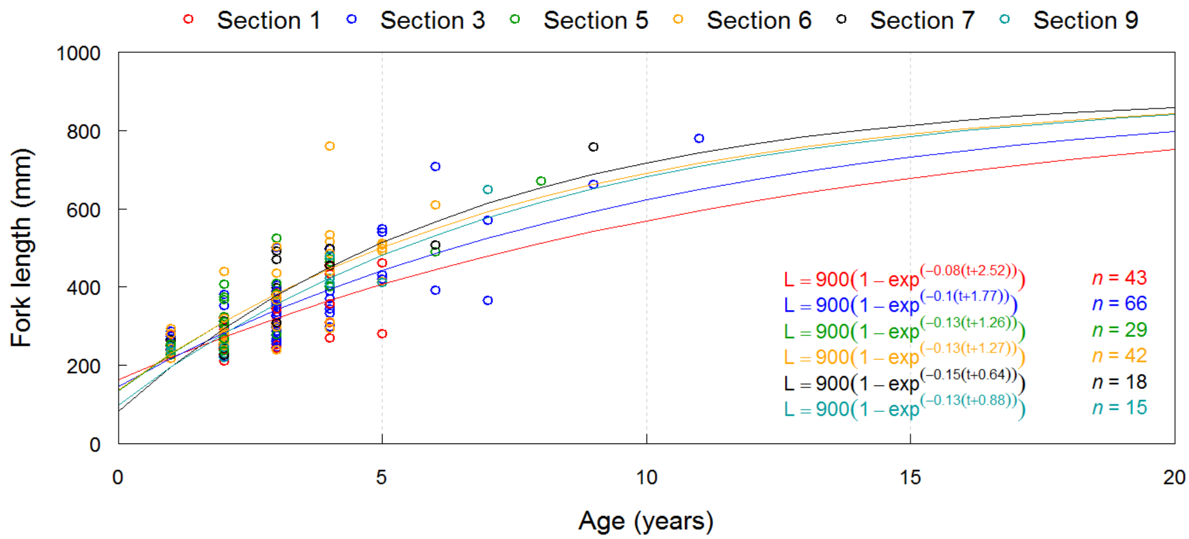


Figure 14: von Bertalanffy growth curve for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

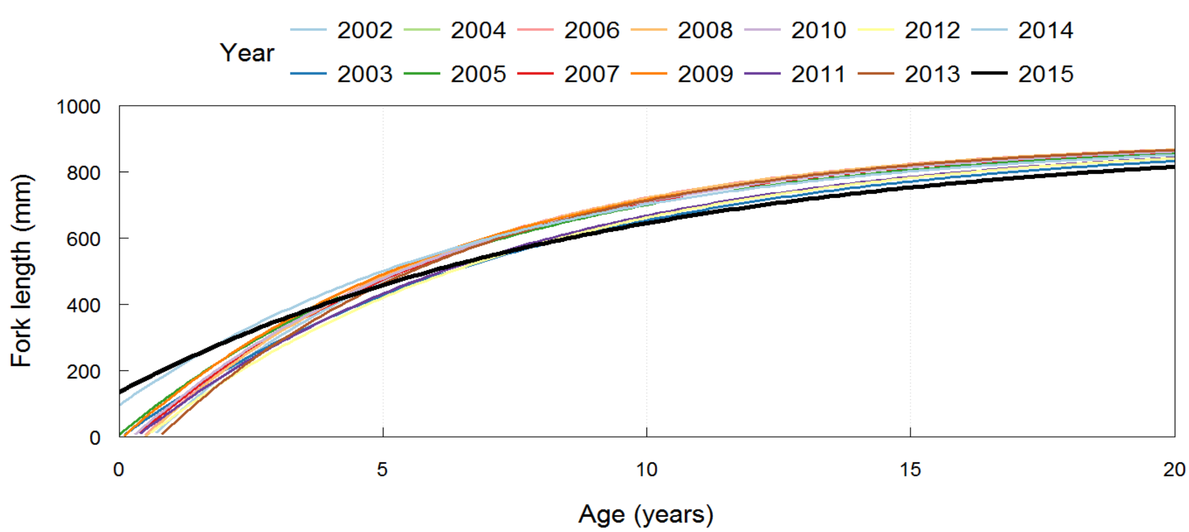


Figure 15: von Bertalanffy growth curve for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015.

The average change in length-at-age analysis for Bull Trout (Figure 16) was limited to individuals less than age-5 due to the slow growth, wide range of lengths recorded, and unknown precision of ages assigned to older individuals. The results of this analysis should be treated as suspect as there was little correlation in growth between years for individual cohorts. For example, the average length of age-3 Bull Trout in 2013 was 30 mm less than the average over the entire 14-year study period. However, in 2014, this same cohort (i.e., age-4) was almost 50 mm larger than the average length of age-4 Bull Trout as measured between 2002 and 2013. The feasibility of an age-3 Bull Trout growing approximately 80 mm more than the 110 mm average annual growth for this cohort in a single year (or approximately 172%; Table 9) seems unlikely. Average length-at-age was greater in 2014 and 2015 for all age-classes between age-1 and age-4, suggesting an increase in size-at-age in recent years.

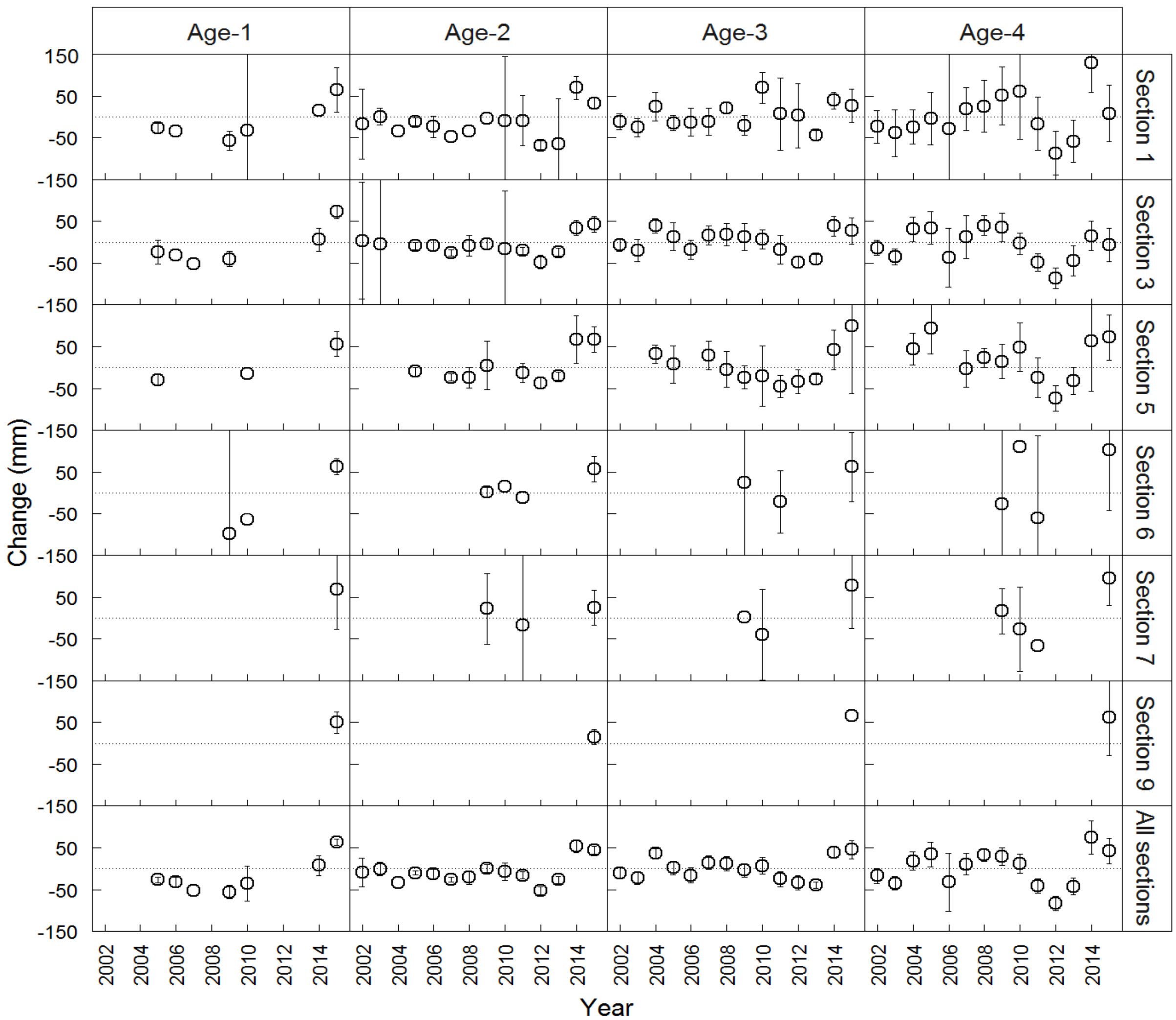


Figure 16: Change in mean length-at-age for Bull Trout captured by boat electroshocking during the Peace River Fish Index, 2002 to 2015. Change is defined as the difference between the annual estimate and the estimate of all years combined. Error bars represent 95% confidence intervals. For Sections 6, 7, and 9, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

Estimates of mean body condition (*K*) generally increased from 2002 to 2010 and decreased from 2010 to 2015, although overlapping confidence intervals for many of the annual estimates suggested that differences were not statistically different (Figure 17). Body condition estimates were greater in Section 1 than other river sections in most years. Greater body condition in Section 1 when compared to other river sections could be due to Bull Trout feeding on dead and injured fish entrained through PCD.

In 2015, length-weight regression analyses for Bull Trout (Figure 18) were similar to historical study years (Appendix F, Figure F6) and showed low variability over the 14-year study period.

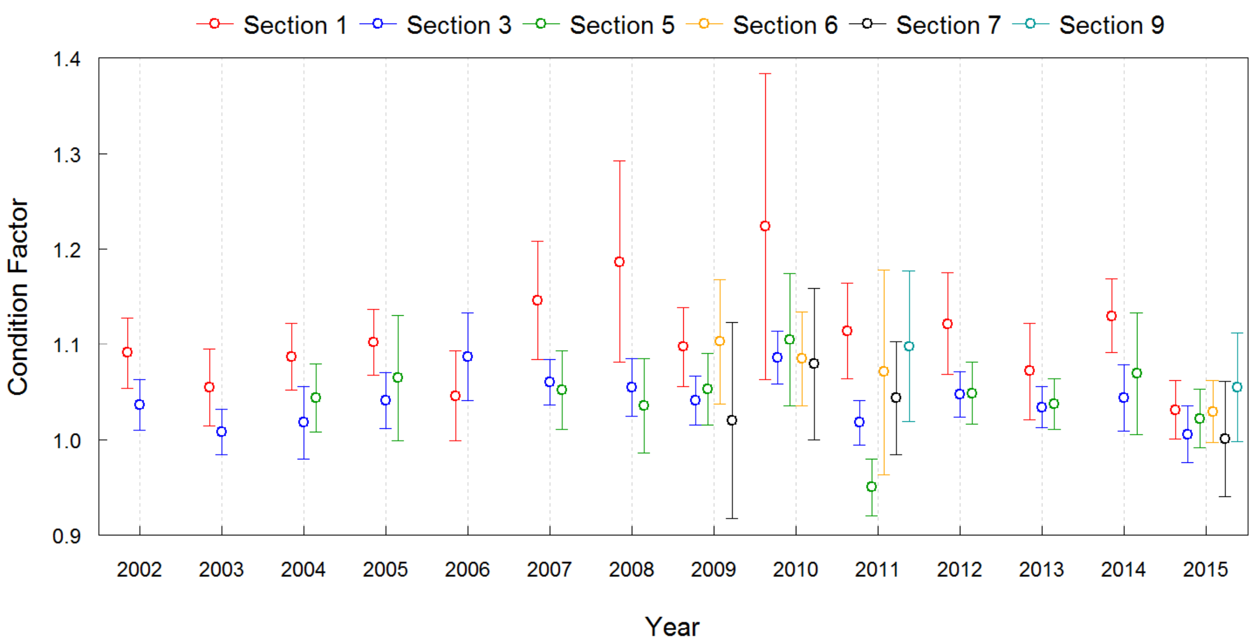


Figure 17: Mean body condition with 95% confidence intervals for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. For Sections 6, 7, and 9, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

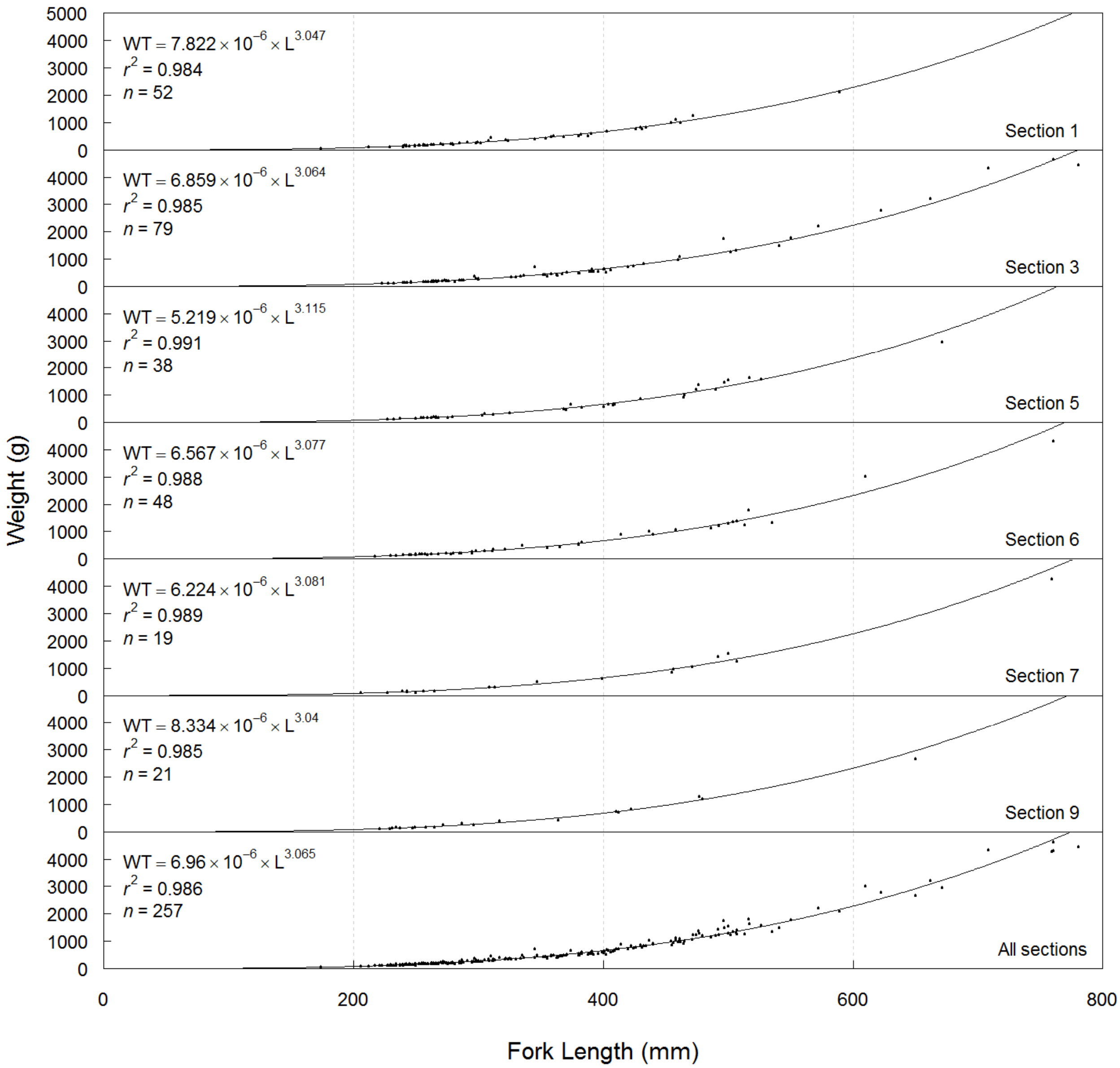


Figure 18: Length-weight regressions for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

3.4.2 Abundance and Spatial Distribution

A thorough description of the population abundance analysis conducted by W.J. Gazey Research is provided in Appendix G. The text below represents a summary of key findings and conclusions drawn from results provided in Appendix G.

Bull Trout population abundance estimates were generated for Sections 3 and 5 in 2015. Population abundance estimates for Bull Trout were not possible for some sections in some years due to small numbers of captured and recaptured fish. Population abundance estimates were lower in 2013 and 2014 when compared to previous study years but increased in 2015 (Figure 19). Of all study years, population abundance estimates were greatest in 2011 and 2012, although confidence intervals surrounding those estimates also were greater than other study years. During most study years, population abundance estimates were typically greater in Sections 1 and 3 when compared to Section 5. A summary of 2015 population abundance estimates generated using the Bayes sequential model (Appendix G) are provided in Table 10.

Table 10: Population abundance estimates generated using the Bayes sequential model for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 2015.

Section	Bayes Mean	Maximum Likelihood	95% Highest Probability Density		Standard Deviation	Coefficient of Variation (%)
			Low	High		
3	506	370	188	964	230	45.4
5	206	130	59	443	120	58.3
6	1243	360	100	3710	1073	86.3
7	229	92	36	658	228	99.4
9	238	109	43	631	177	74.3
Total	**2422**	**1061**	**186**	**4658**	**1141**	**47.1**

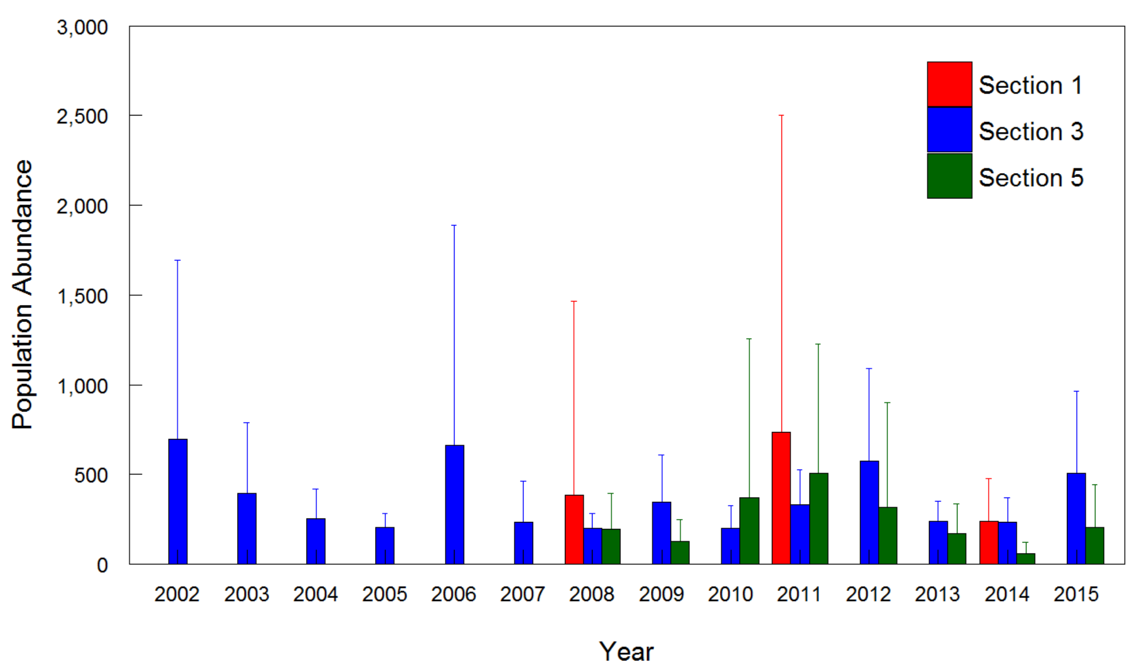


Figure 19: Population abundance estimates (with 95% confidence intervals) generated using the Bayes sequential model for Bull Trout captured by boat electroshocking in sample sections of the Peace River, 2002-2015.

The annual mortality rate for Bull Trout as calculated by catch-curve analysis using data from all study years combined was 41-42%, depending on the river section (Appendix F, Figure F11). Individual annual estimates of mortality for Bull Trout (all sections combined) varied between a low of 26% in 2004 and a high of 52% in 2007 (Appendix F, Figure F12).

3.5 Burbot

In 2015, two Burbot were captured and an additional three Burbot were observed but not captured. All five Burbot were recorded in Sections 6, 7, or 9. The two captured Burbot had total lengths of 424 mm and 552 mm. A sixth Burbot was found dead in the mouth of a Bull Trout captured in Section 9. The limited data available suggest that Burbot are present in small numbers in the downstream portion of the study area.

Table 11: Fork length, weight, and body condition by age for Burbot captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Section	Age	Fork Length (mm)	Weight (g)	Body Condition (K)	n[a]
7	n/a	552	928	0.5	1
9	n/a	424	362	0.5	1

[a] Number of individuals sampled.

3.6 Goldeye

A single Goldeye was captured during the 2015 survey. It was 383 mm FL and was age-18 based on a fin ray sample. This fish was captured at Site 0905 in Section 9. Goldeye were not captured during any previous study year when only Sections 1, 3, and 5 were sampled. Data from Goldeye captured during 2009-2011 in Sections 6, 7, and 9 were available (Mainstream 2010, 2011, 2013a) and were used for the analysis of length-at-age (Figure 20) and body condition (Figure 21). The limited data available suggest that Goldeye are present in small numbers in the downstream portion of the study area during the study period.

Table 12: Fork length, weight, body condition, and age for the single Goldeye captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Section	Age	Fork Length (mm)	Weight (g)	Body Condition (K)	n[a]
9	18	383	675	1.2	1

[a] Number of individuals sampled.

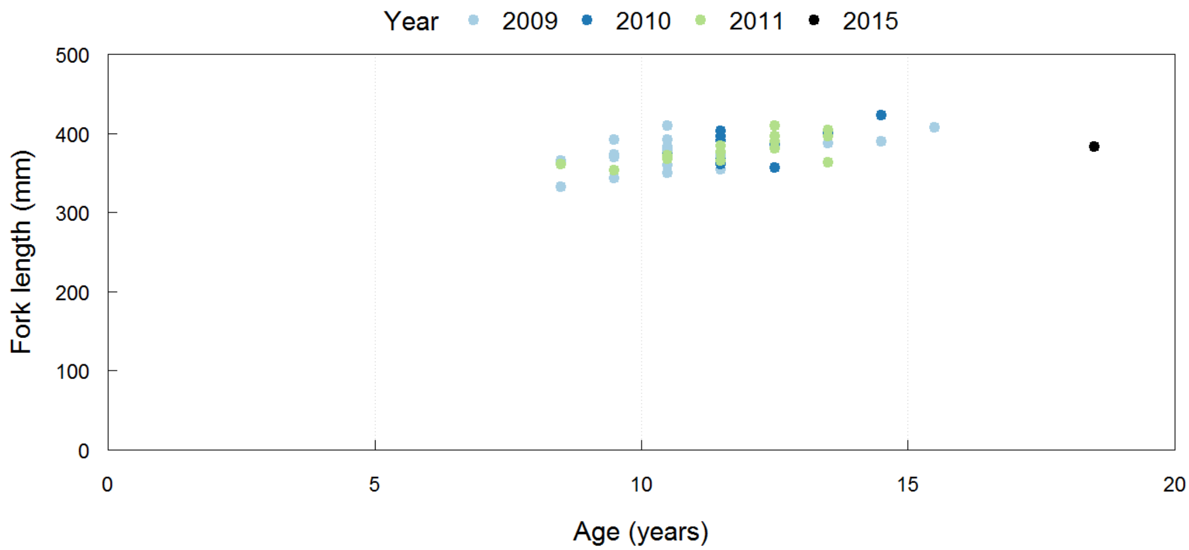


Figure 20: Length at age data for Goldeye captured by boat electroshocking in sampled sections of the Peace River, 2009 to 2015. Data from 2009, 2010, and 2011 were collected during boat electroshocking surveys conducted during the late summer to fall period by Mainstream (2010, 2011, 2013a).

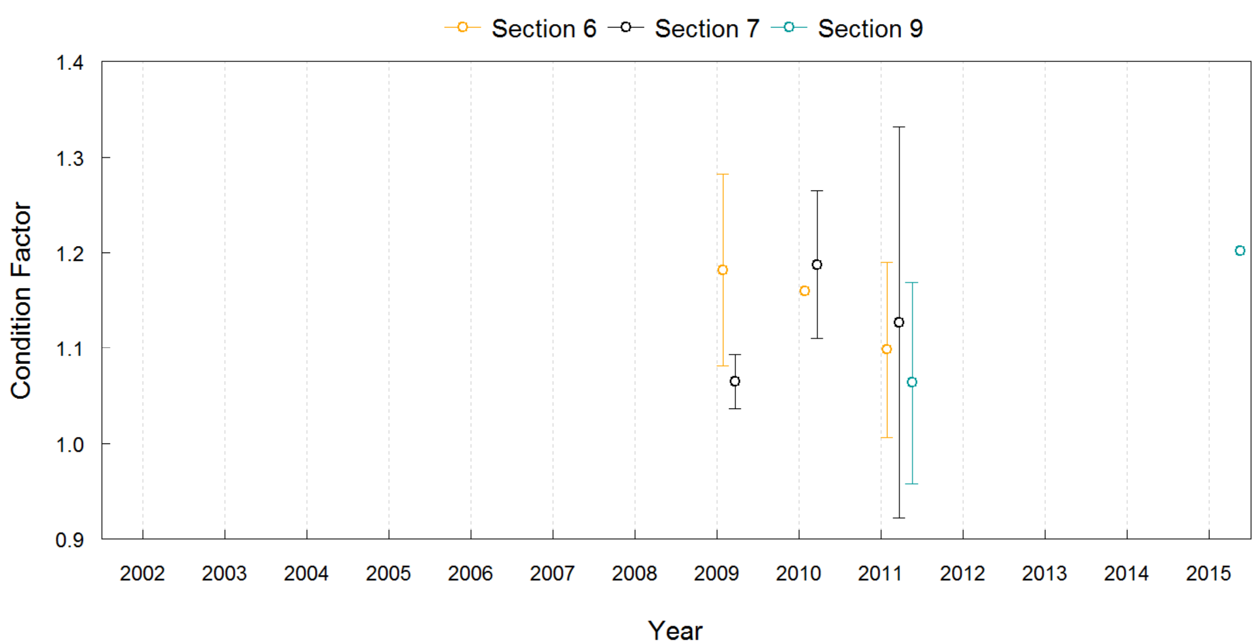


Figure 21: Mean body condition with 95% confidence intervals for Goldeye captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from 2009, 2010, and 2011 were collected during boat electroshocking surveys conducted during the late summer to fall period by Mainstream (2010, 2011, 2013a).

3.7 Largescale Sucker

3.7.1 Biological Characteristics

Length-frequency histograms for Largescale Sucker suggest some differences in length distribution among sections (Figure 22). Small fish (i.e., 100-300 mm FL) were most commonly recorded in Section 9, whereas large fish (i.e., 400 to 600 mm FL) were most commonly recorded in Section 1. Most size classes between 100 and 600 mm were recorded in most river sections.

The mean body condition of Largescale Sucker varied little between river sections or among years (Figure 23). In 2015, the length-weight relationship for Largescale Sucker (Figure 24) was similar to historical study years (Appendix F, Figures F25).

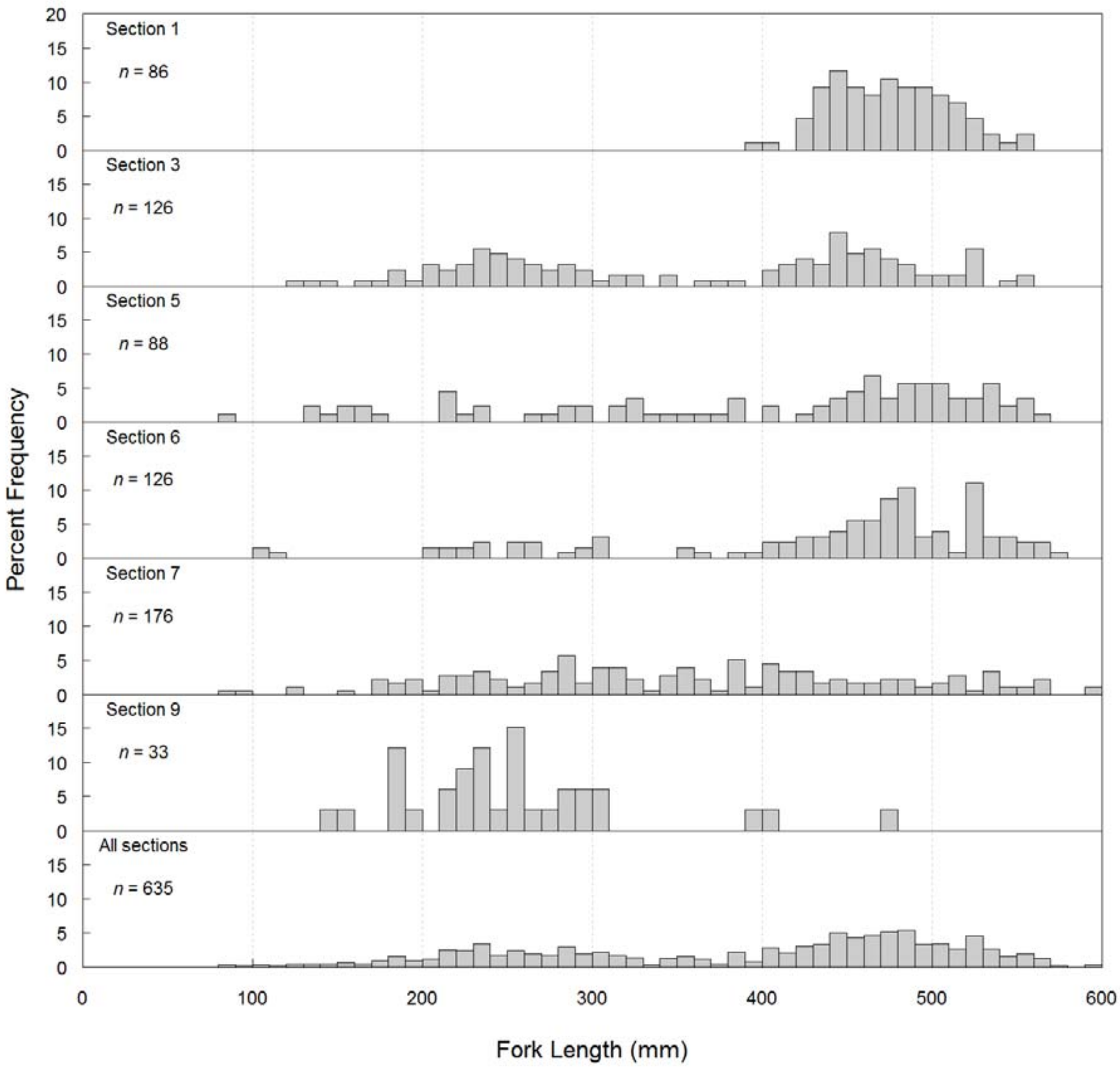


Figure 22: Length-frequency distributions for Largescale Sucker captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

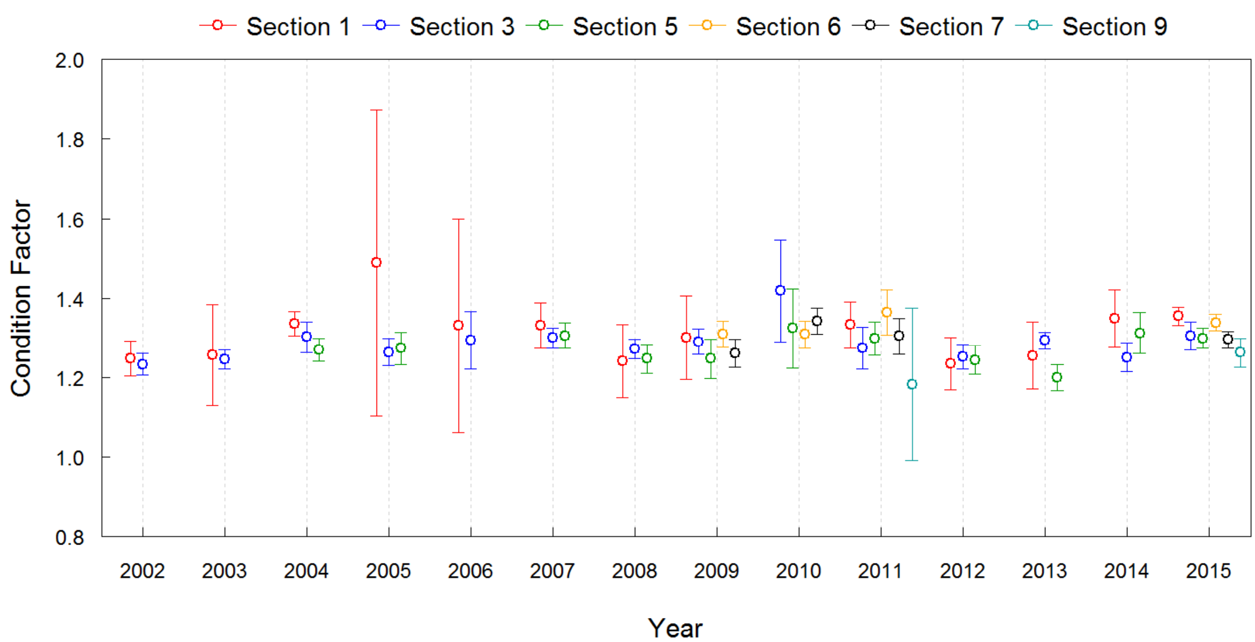


Figure 23: Mean body condition with 95% confidence intervals for Largescale Sucker captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. For Sections 6, 7, and 9, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

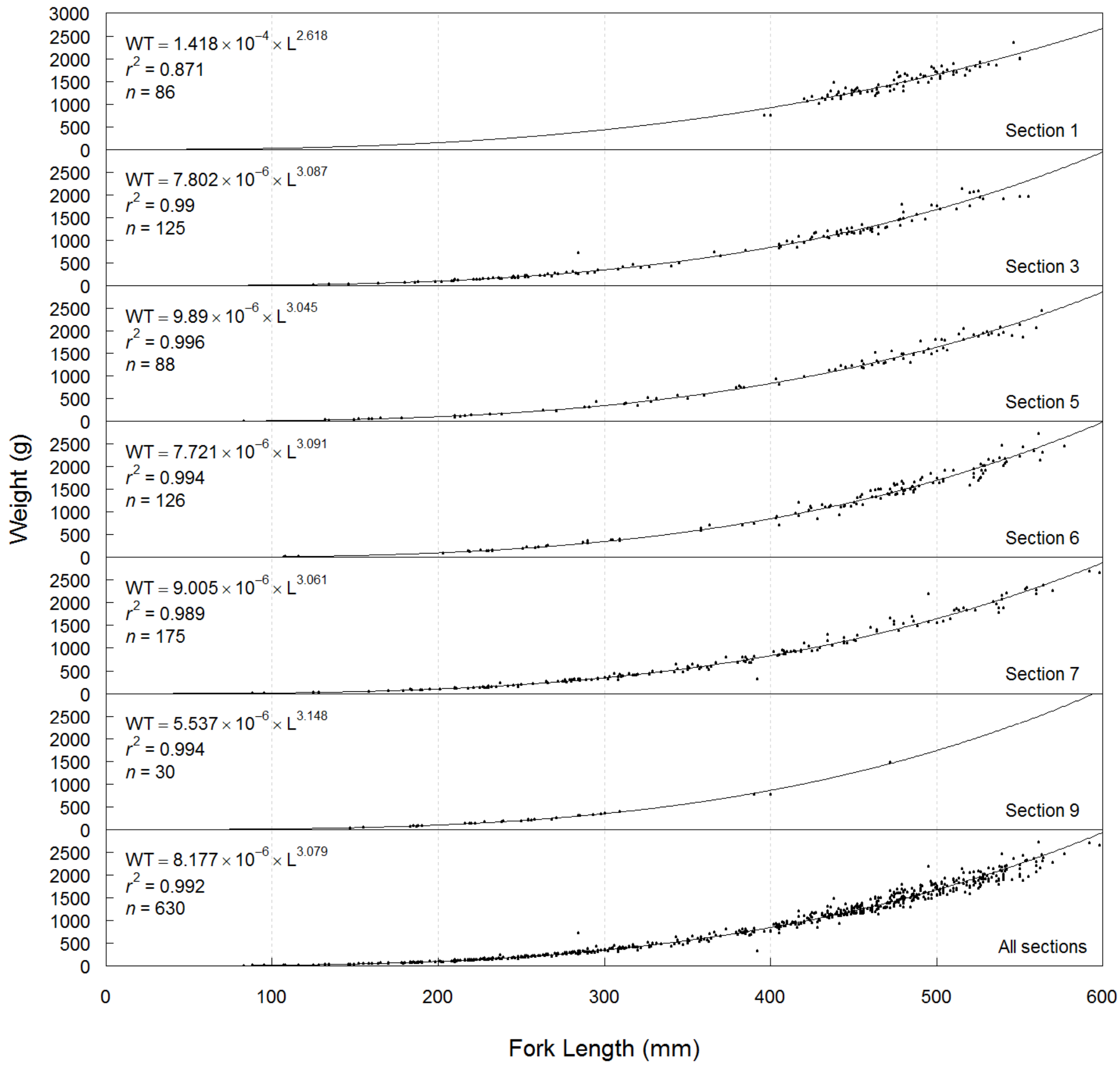


Figure 24: Length-weight regressions for Largescale Sucker captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

3.7.2 Abundance and Spatial Distribution

In 2015, Largescale Sucker were more abundant in Section 1 than other sections based on the Bayes sequential model (Table 13). Population abundance estimates were not available for other years because Largescale Sucker were not marked prior to 2015.

Table 13: Population abundance estimates generated using the Bayes sequential model for Largescale Sucker captured by boat electroshocking in sampled sections of the Peace River, 2015.

Section	Bayes Mean	Maximum Likelihood	95% Highest Probability Density		Standard Deviation	Coefficient of Variation (%)
			Low	High		
1	11,858	3940	1140	31,980	9028	76.1
3	2155	1516	716	4260	989	45.9
5	1949	1352	632	3912	931	47.8
6	2615	1770	800	5350	1416	54.2
7	3085	2090	940	6320	1642	53.2
Total	**21,662**	**10,668**	**3270**	**40,054**	**9384**	**43.3**

3.8 Longnose Sucker

3.8.1 Biological Characteristics

For Longnose Sucker, a lack of distinct modes in length-frequency histograms suggest that most individuals captured were adults, and the samples represented multiple age-classes with overlapping length distributions. Most captured Longnose Sucker were between 350 and 450 mm FL in all river sections in 2015 (Figure 25) and previous study years (Appendix F, Figure F20). Section 9 had more small (i.e., less than 200 mm FL) Longnose Sucker, whereas Section 1 had fewer small Longnose Sucker when compared to other sections (Figure 25). There was no consistent trend over time in the body condition of Longnose Sucker (Figure 26). In 2015, mean body condition of Longnose Sucker was greater in Section 1 when compared to other Sections; however, this difference was not consistent with all study years (Figure 26). Length-weight relationships were similar among river sections (Figure 27).

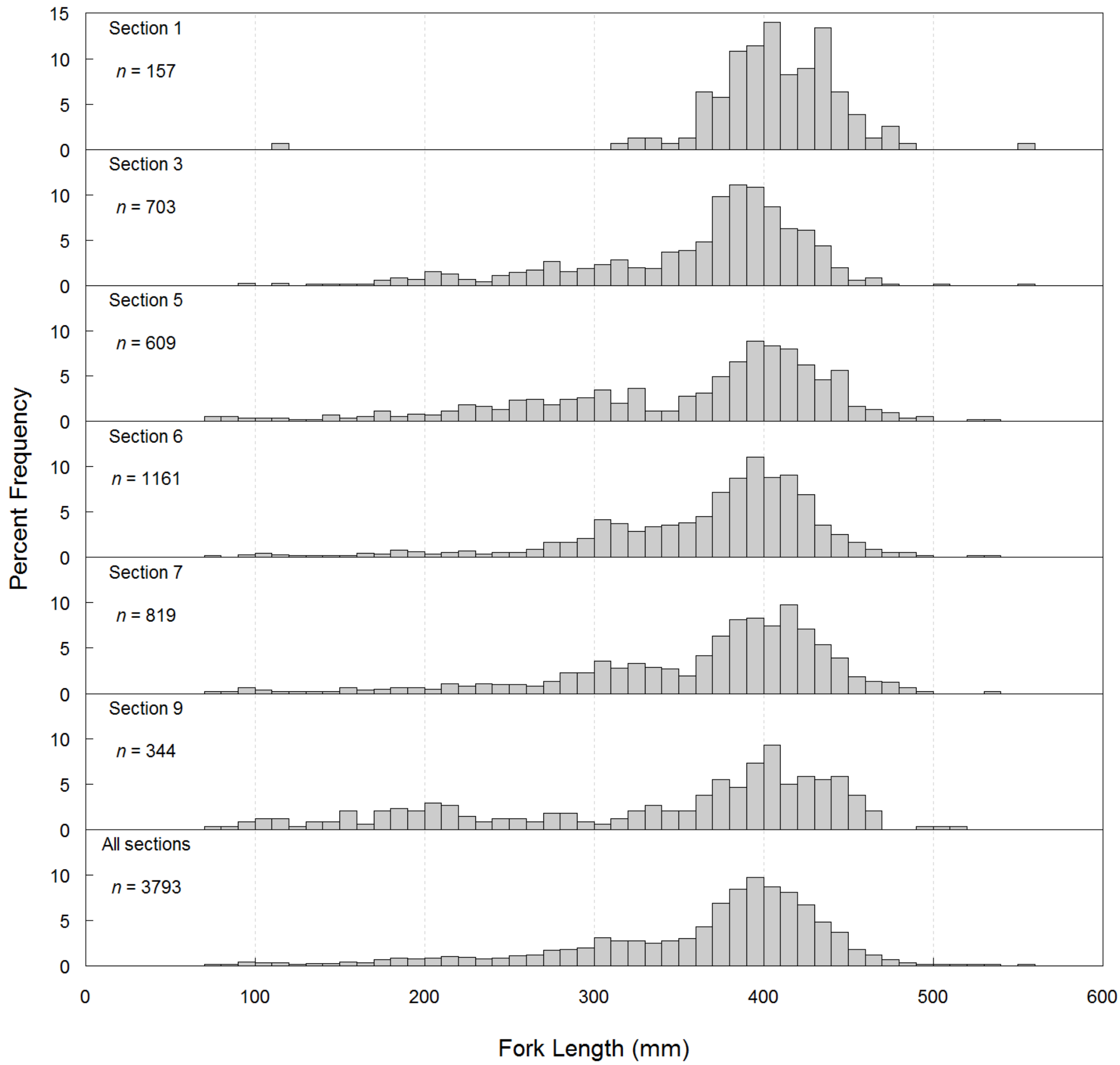


Figure 25: Length-frequency distributions for Longnose Sucker captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

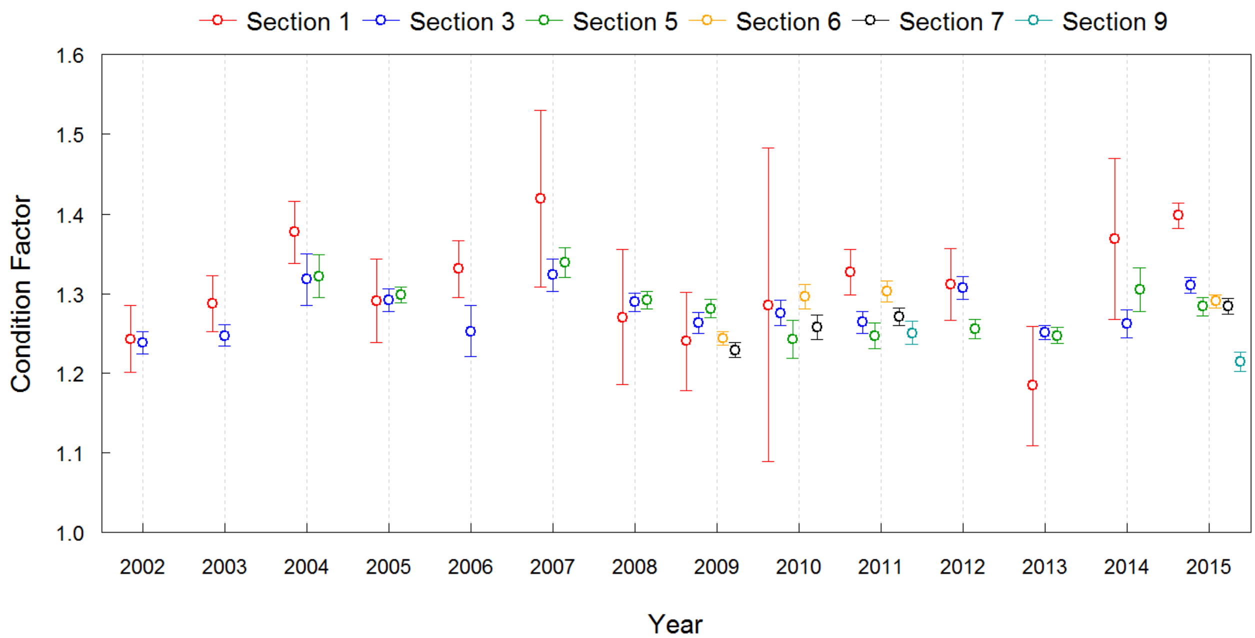


Figure 26: Mean body condition with 95% confidence intervals for Longnose Sucker captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. For Sections 6, 7, and 9, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

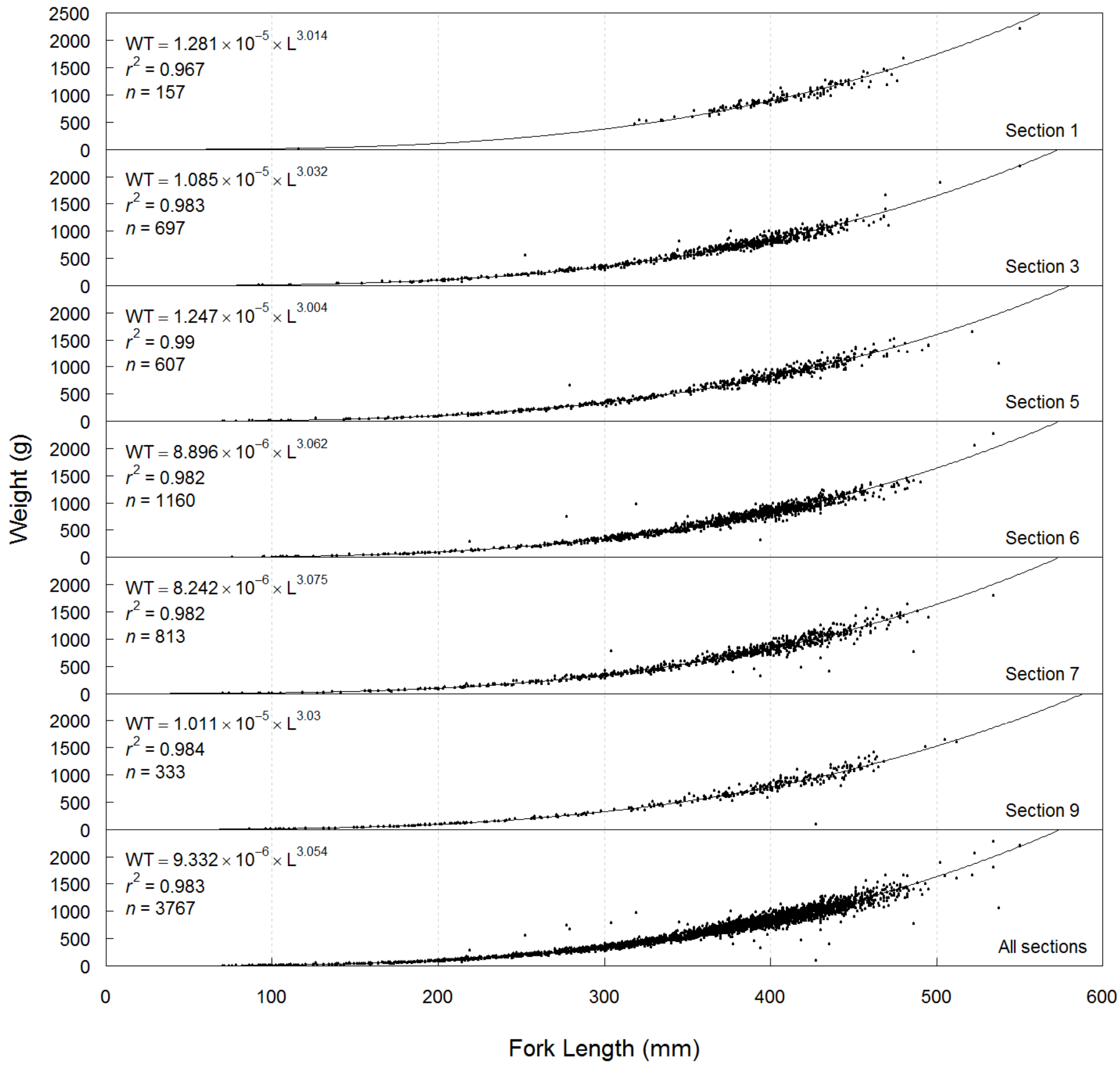


Figure 27: Length-weight regressions for Longnose Sucker captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

3.8.2 Abundance and Spatial Distribution

In 2015, Longnose Sucker were more abundant in Sections 5, 6, and 7 and comparatively less abundant in Sections 1, 3, and 9 (Table 14). Population abundance estimates were not available for other study years because Longnose Sucker were not marked prior to 2015.

Table 14: Population abundance estimates generated using the Bayes sequential model for Longnose Sucker captured by boat electroshocking in sampled sections of the Peace River, 2015.

Section	Bayes Mean	Maximum Likelihood	95% Highest Probability Density		Standard Deviation	Coefficient of Variation (%)
			Low	High		
1	8,560	4600	1680	20,840	5890	68.8
3	9766	9140	6500	13,480	1834	18.8
5	14,137	12,980	8820	20,340	2991	21.2
6	15,165	14,540	11,040	19,720	2239	14.8
7	16,401	15,920	12,660	20,460	2000	12.2
9	9656	7400	3800	17,625	3810	39.5
Total	**73,685**	**64,580**	**57,225**	**90,145**	**8398**	**11.4**

3.9 Mountain Whitefish

3.9.1 Biological Characteristics

During the 2015 survey, 8058 Mountain Whitefish were initially captured (i.e., excluding within-year recaptures) and measured for length and weight. Fork lengths ranged between 60 and 501 mm FL, and weights ranged between 2 and 1609 g. Randomly selected scale and otolith samples were analyzed from 1092 individuals; ages ranged between age-0 and age-11 (Table 15).

Table 15: Average fork length, weight, and body condition by age for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Age	Fork Length (mm)		Weight (g)		Body Condition (K)		n[a]
	Average ± SD	Range	Average ± SD	Range	Average ± SD	Range	
0	89 ± 13	60 – 110	6 ± 3	3 - 8	0.8 ± 0.2	0.5 - 1.4	23
1	170 ± 10	148 – 233	55 ± 15	21 - 130	1.1 ± 0.2	0.6 - 1.7	208
2	228 ± 20	168 – 414	135 ± 30	48 - 330	1.1 ± 0.1	0.2 - 1.5	167
3	272 ± 22	218 – 322	247 ± 69	94 - 464	1.2 ± 0.1	0.8 - 1.5	138
4	306 ± 19	262 – 372	351 ± 65	169 - 581	1.2 ± 0.1	0.9 - 1.7	179
5	325 ± 25	277 – 399	421 ± 88	269 - 707	1.2 ± 0.1	0.9 - 1.7	213
6	351 ± 31	290 – 433	517 ± 132	316 - 916	1.2 ± 0.1	0.8 - 1.5	105
7	376 ± 29	325 – 432	630 ± 144	402 - 976	1.2 ± 0.1	1.0 - 1.3	42
8	402 ± 26	339 – 432	785 ± 147	453 - 1031	1.2 ± 0.1	1.1 - 1.5	12
9	411 ± 31	386 – 446	811 ± 175	634 - 984	1.2 ± 0.1	1.1 - 1.2	3
10	438	438	914	914	1.1	1.1	1
11	394	394	627	627	1	1	1

[a] n = number of individuals sampled.

For Mountain Whitefish, four modes were evident in the 2015 length-frequency histograms (Figure 28), corresponding to the age-0, age-1, age-2, and age-3 and older cohorts. Based on these data, growth slows considerably after approximately age-3 for this species, most likely due to fish reaching sexual maturity. The slower growth rate of older individuals prevented the identification of distinct age-classes in the length-frequency histograms for fish larger than approximately 250 mm FL (Figure 29). Section 9 had the greatest percentage of age-0 Mountain Whitefish, based on the length-frequency in 2015, whereas Section 1 had the lowest percentage (Figure 28). There was a greater percentage of age-0 and age-1 fish captured in 2014 and 2015 than in previous study years, based on length-frequency histograms (Appendix F, Figure F13). A greater proportion of small Mountain Whitefish (i.e., fish less than 150 mm FL) also was observed in 2009 and 2010 when compared to other study years (Appendix F, Figure F13).

There was a small percentage of age-0 Mountain Whitefish in the catch in 2015 (Figure 30), which was consistent with previous study years (Appendix F, Figure F10) and likely due to age-0 Mountain Whitefish being too small to fully recruit to the boat electroshocker (Mainstream and Gazey 2014; Golder and Poisson 2014; ONA et al. 2014). Larger catches of age-1 Mountain Whitefish in 2014 and 2015 relative to other years suggests strong recruitment in 2013 and 2014 compared to most previous years. Alternatively, greater catch of age-0 and age-1 Mountain Whitefish in 2014 and 2015 may be at least partially explained by the different electroshocker settings that were used in those years (see Section 2.1.4). Potential biological and methodological biases are discussed in Section 4.0.

The annual growth of Mountain Whitefish in the study area, as assessed using the von Bertalanffy growth curve, was similar among all river sections (Figure 31). The growth curve in 2015 suggests faster growth of juvenile Mountain Whitefish when compared to other study years; however, annual differences in growth rate and asymptotic size were small and did not indicate substantial differences in growth among years (Figure 32). Mountain Whitefish in the study area exhibit rapid growth until approximately age-3; thereafter, growth slows considerably (Figures 31 and 32).

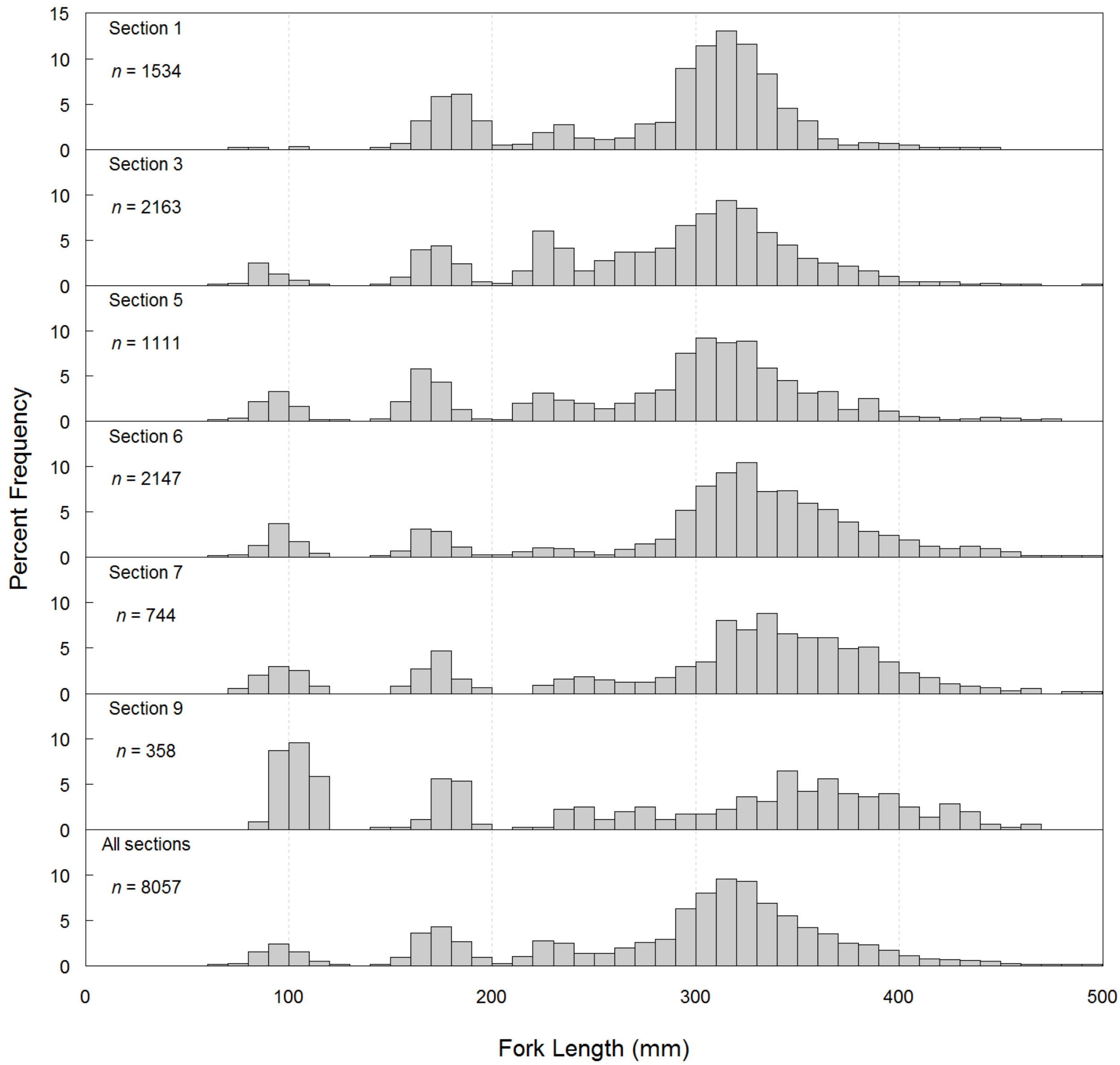


Figure 28: Length-frequency distributions for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

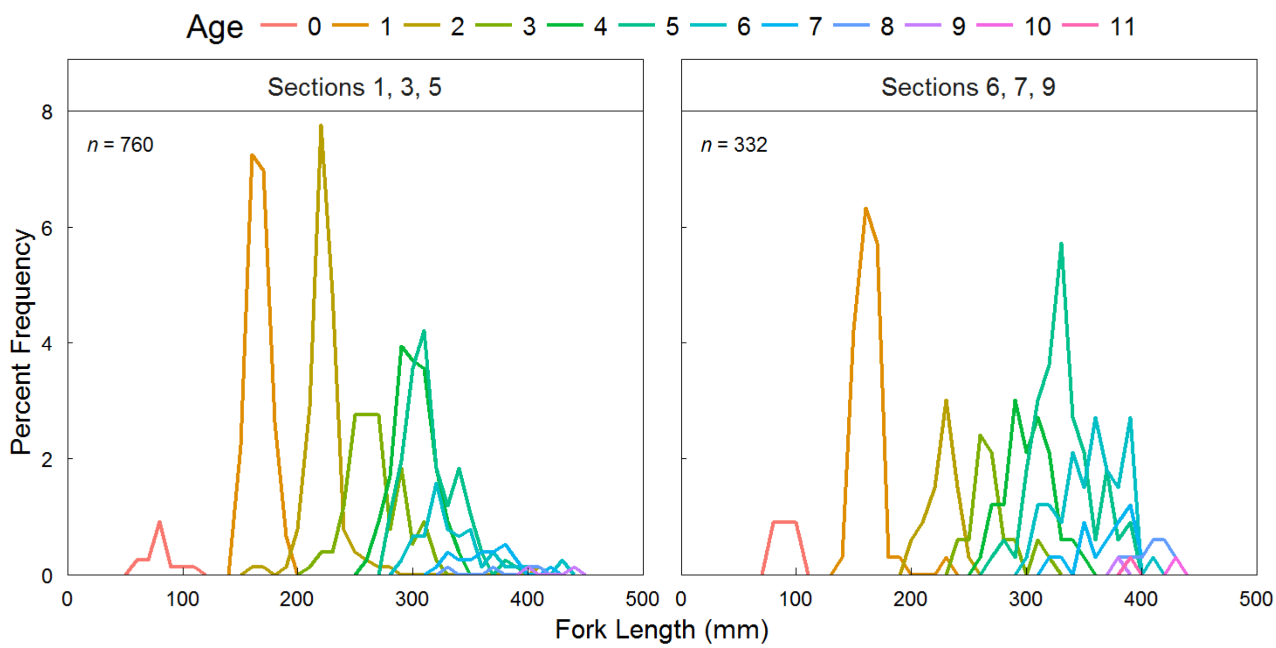


Figure 29: Length-at-age frequency distributions for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

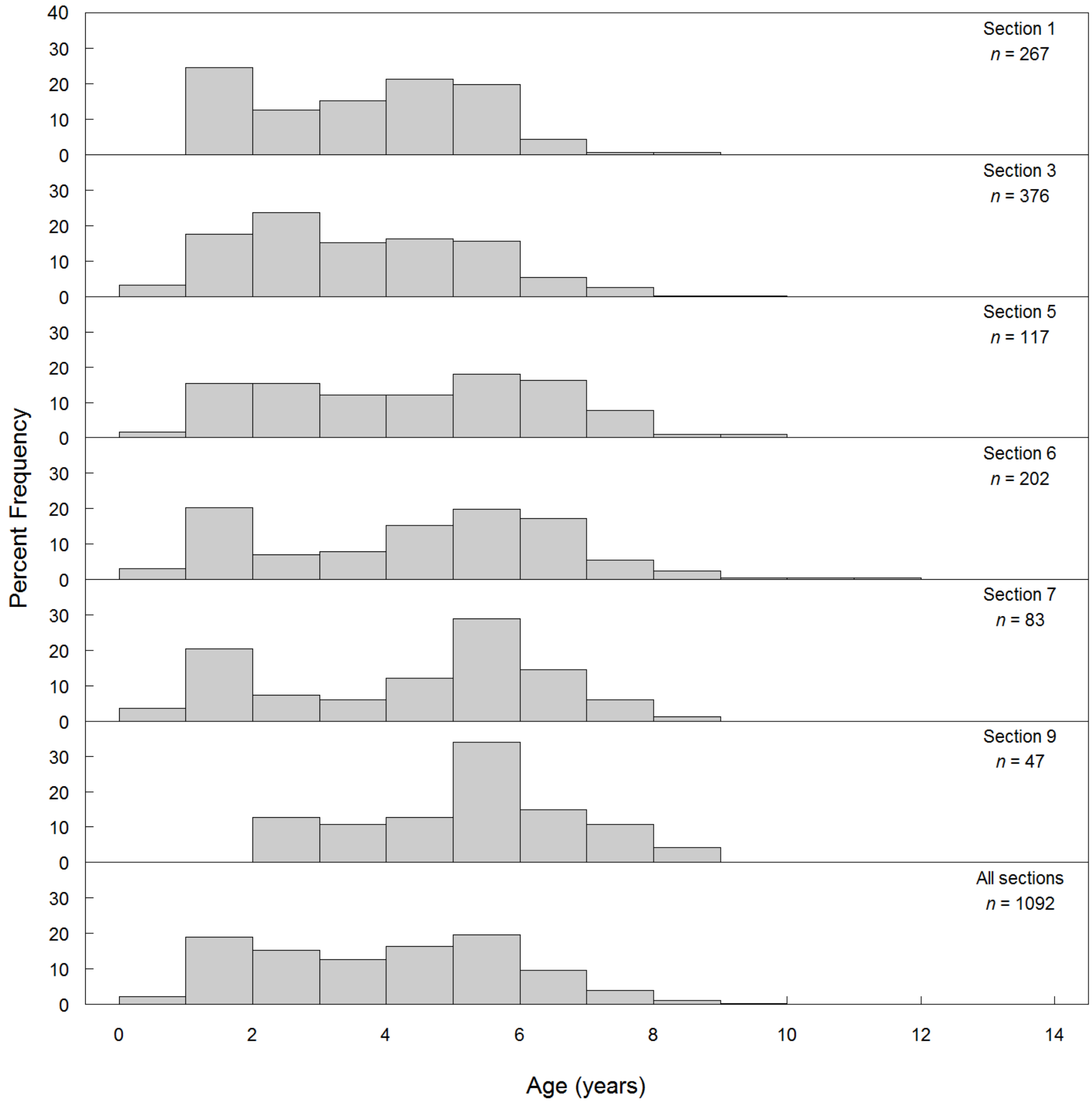


Figure 30: Age-frequency distributions for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

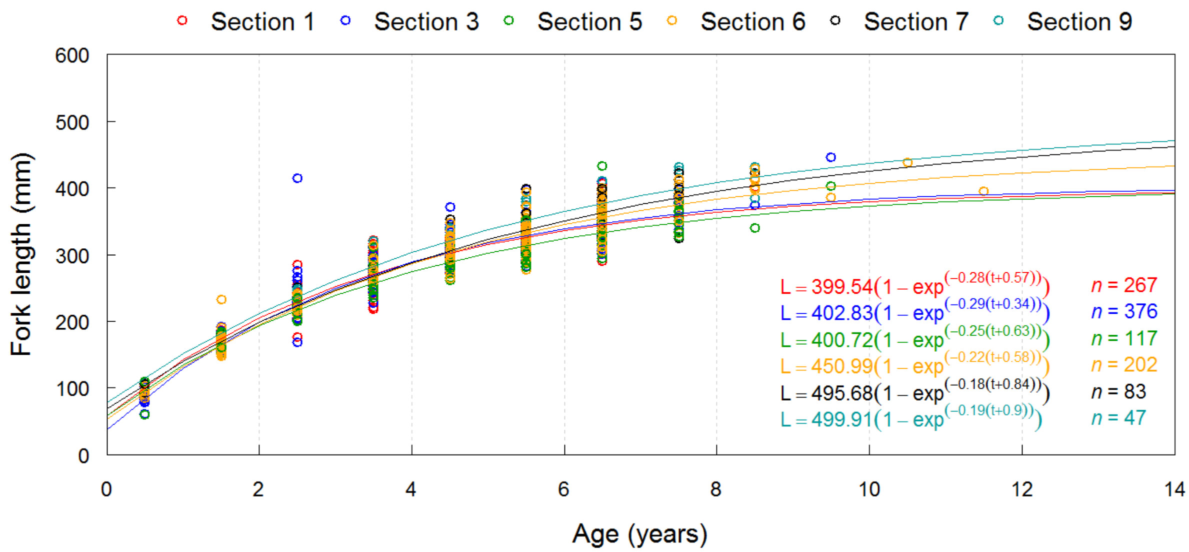


Figure 31: von Bertalanffy growth curve for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

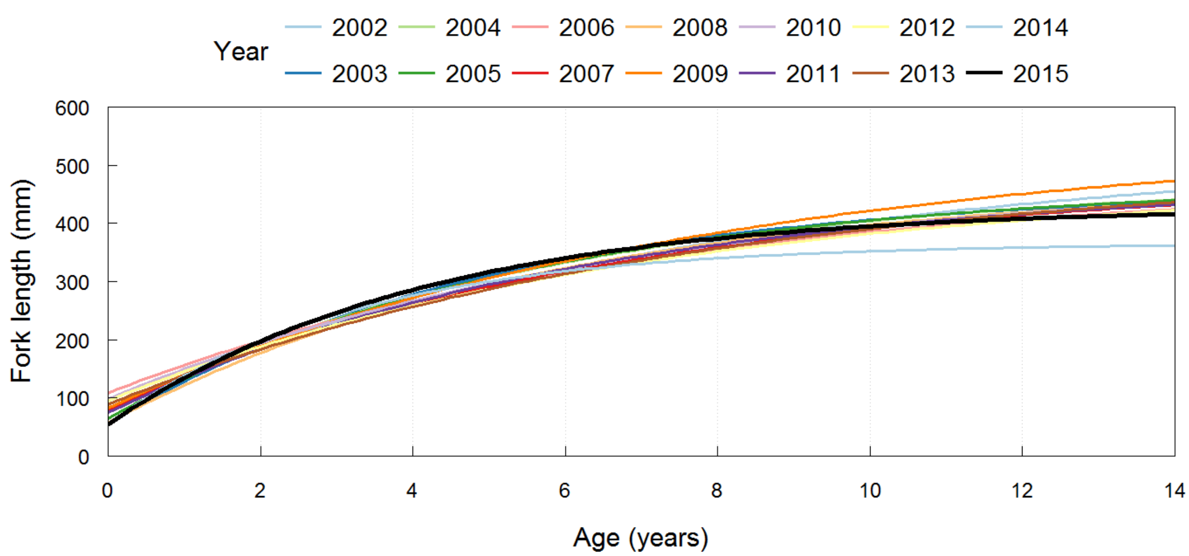


Figure 32: von Bertalanffy growth curve for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015.

The average change in length-at-age analysis for Mountain Whitefish (Figure 33) was limited to individuals younger than age-5 due to the slow growth, wide range of lengths recorded, and unknown precision of ages assigned to older individuals. Overall (all sections combined), the age-1 through age-4 age-classes were larger in 2014 and 2015 than previous years. Confidence intervals did not overlap between the 2014-2015 and the 2013 estimates, suggesting a statistically significant difference, with a difference of approximately 10-20 mm in length-at-age, depending on age group, relative to the 14-year average. A similar increase in length-at-age also was noted for Arctic Grayling for several age-classes (Figure 9). Both Mountain Whitefish and Arctic Grayling are insectivores that feed on drifting prey and on invertebrates on the stream bottom; therefore, the increase in length-at-age identified for both species could be related to increased food availability in 2014 and 2015.

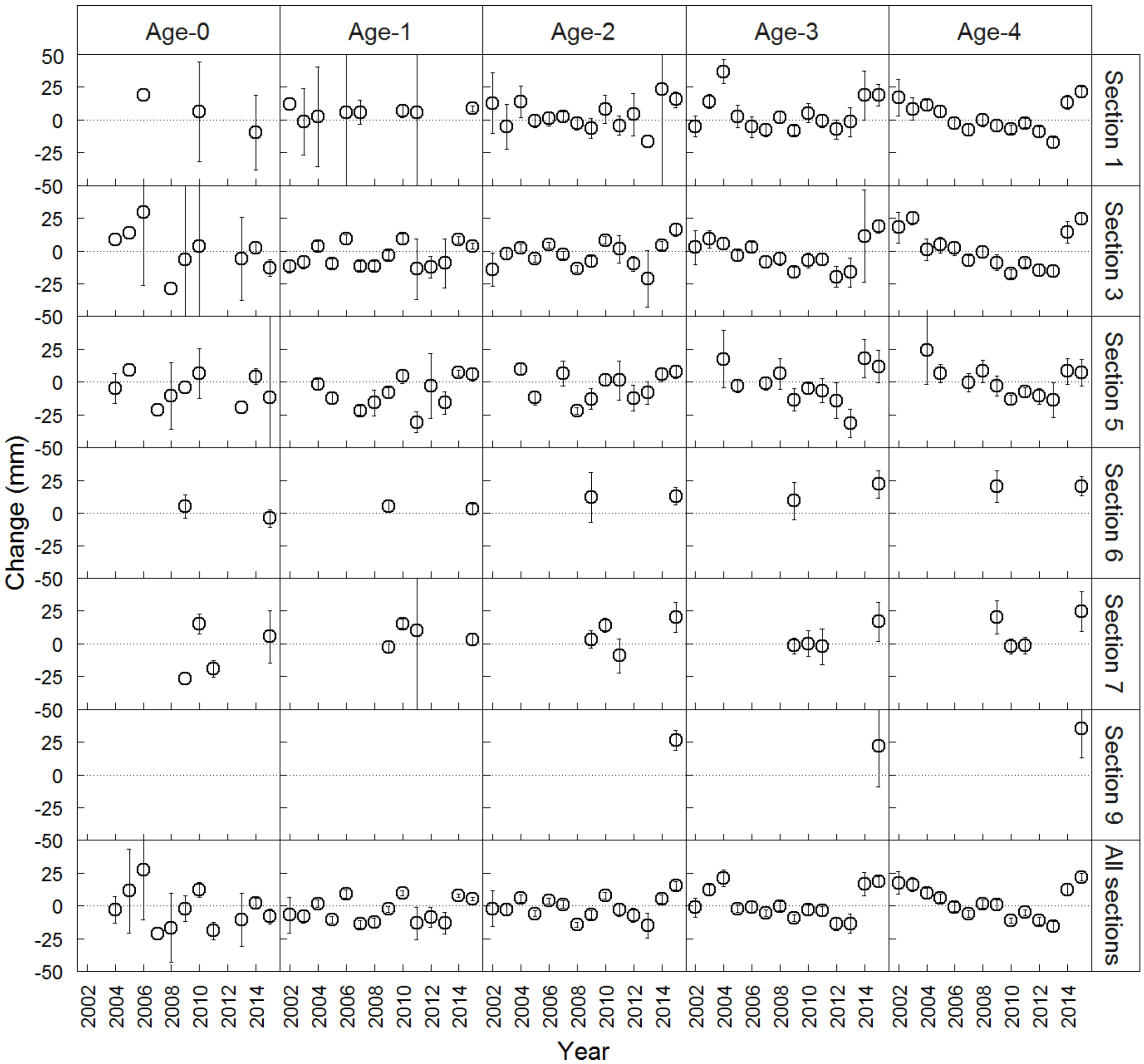


Figure 33: Change in mean length-at-age for Mountain Whitefish captured by boat electroshocking during the Peace River Fish Index, 2002 to 2015. Change is defined as the difference between the annual estimate and the estimate of all years and sections combined. Error bars represent 95% confidence intervals. For Sections 6 and 7, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

Mean body condition (*K*) of Mountain Whitefish was greater in Section 1 than other river sections in most study years (Figure 34). Mean body condition was greater in 2014 and 2015 and lower in 2011 to 2013 when compared to study years from 2002 to 2010 (Figure 34). Reasons for the greater body condition in 2014 and 2015, especially in Section 1, are not known. Mountain Whitefish body condition was more variable among years than the body condition of Arctic Grayling (Figure 10) or Bull Trout (Figure 17). Length-weight regression equations for Mountain Whitefish were similar among all sections (Figure 35) in 2015 and among all study years for the sections combined (Appendix F, Figure F11).

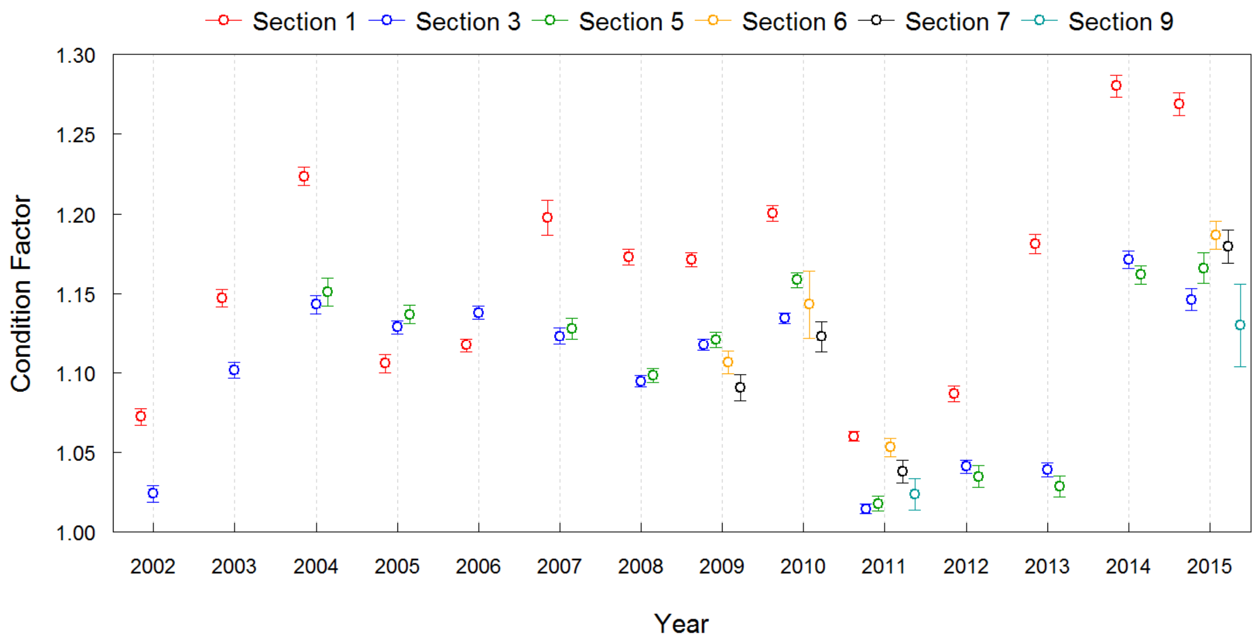


Figure 34: Mean body condition with 95% confidence intervals for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. For Sections 6, 7, and 9, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a).

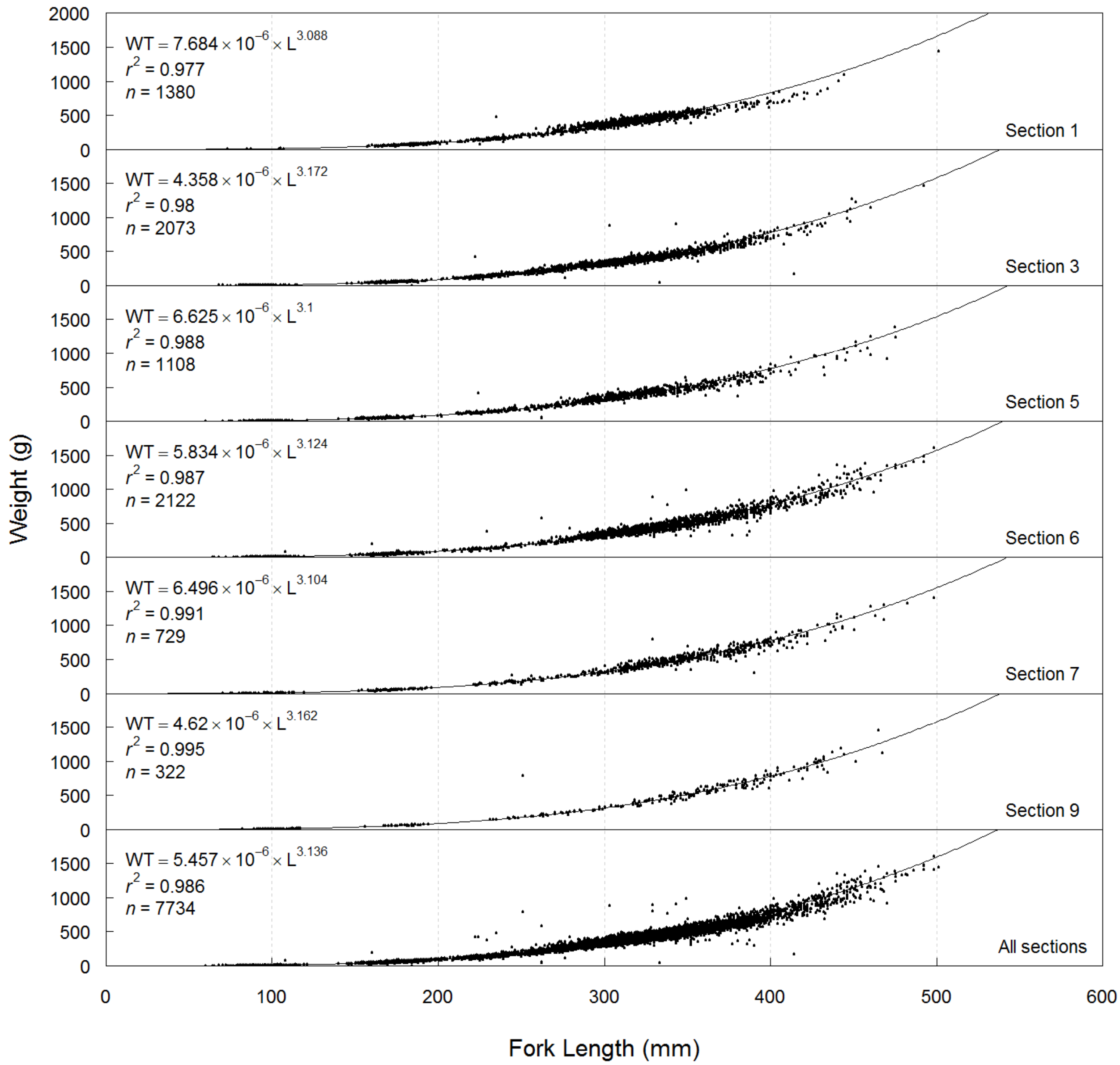


Figure 35: Length-weight regressions for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

3.9.2 Abundance and Spatial Distribution

A thorough description of the Mountain Whitefish population abundance analysis conducted by W.J. Gazey Research is provided in Appendix G. The text below represents a summary of key findings and conclusions drawn from results provided in Appendix G.

Comparison of length distributions between initially captured and recaptured Mountain Whitefish indicated that smaller fish (i.e., 200 to 290 mm FL) were under-represented in the recaptures (Appendix G, Figure G3), although the difference was not statistically significant (P>0.05). To maintain consistency with the analysis in previous study years, only Mountain Whitefish larger than 250 mm FL were included in population abundance estimates. As reported in previous study years (e.g., Golder and Gazey 2015), Mountain Whitefish had high site fidelity, with most (greater than 80%) individuals in all sections being recaptured at the same site as released (Appendix G, Figure G5).

CJS models that pooled capture probabilities over Sessions 1 to 4 and 5 to 6 had better fit than models with capture probability that varied by session (Appendix G, Table G3). Models with constant survival over time had better fit than those with survival that varied by session, except for in Section 3, where time-varying and constant survival had similar fit. These CJS models had survival estimates that were not significantly different than 1.0. Based on these results, population abundance analyses used pooled captured probabilities and assumed no apparent mortality within the study period. The direct test of catchability based on population abundance estimates calculated using AD model builder found that a model with time-varying catchability fit better for Section 3, whereas constant catchability had the most support for Sections 1, 5, and 6.

The recapture rate for Mountain Whitefish initially marked in 2015 was 5.5% (all sections combined) but varied between 3.4 and 6.1% among sections (Appendix G, Table G1). This value is similar to the estimated recapture rate in 2014 (5.8%) but lower than the average value recorded during all previous study years (12.0%; range from 6.8 to 18.8%; Attachment A). Reasons for the lower recapture rate in 2014 and 2015 are not known but could be related to a change in electroshocker settings used during those years, which is discussed further in Section 4.1. Recapture rates recorded for Mountain Whitefish in 2014 and 2015 in the Peace River were higher than the recapture rates recorded in the Columbia River downstream of Hugh L. Keenleyside Dam (0.8%; Golder and Poisson 2014) and downstream of Revelstoke Dam (0.4%; ONA et al. 2014).

Population abundance estimates for Mountain Whitefish in 2015 were similar among Sections 1, 3, 5, and 6, ranging from 11,291 to 14,231, but were lower in Sections 7 and 9 (Table 16). In nearly all years between 2002 and 2013, population abundance estimates were greater in Section 1 than other sections but this was not the case in 2014 and 2015 (Figure 36). Population abundance estimates were greatest in 2010 and 2011, with similar values that had overlapping confidence intervals for all other years (Figure 36). The results do not suggest any sustained changes in the abundance of Mountain Whitefish during the monitoring period.

Table 16: Population abundance estimates generated using the Bayes sequential model for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 2015.

Section	Bayes Mean	Maximum Likelihood	95% Highest Probability Density		Standard Deviation	Coefficient of Variation (%)
			Low	High		
1	13,664	13,310	10,760	16,770	1551	11.4
3	14,231	14,030	11,990	16,590	1179	8.3
5	11,291	10,890	8490	14,340	1517	13.4
6	13,335	13,110	11,020	15,790	1224	9.2
7	5273	4960	3610	7150	928	17.6
9	3137	2290	1120	6020	1402	44.7
Total	**60,931**	**58,590**	**54,603**	**67,259**	**3229**	**5.3**

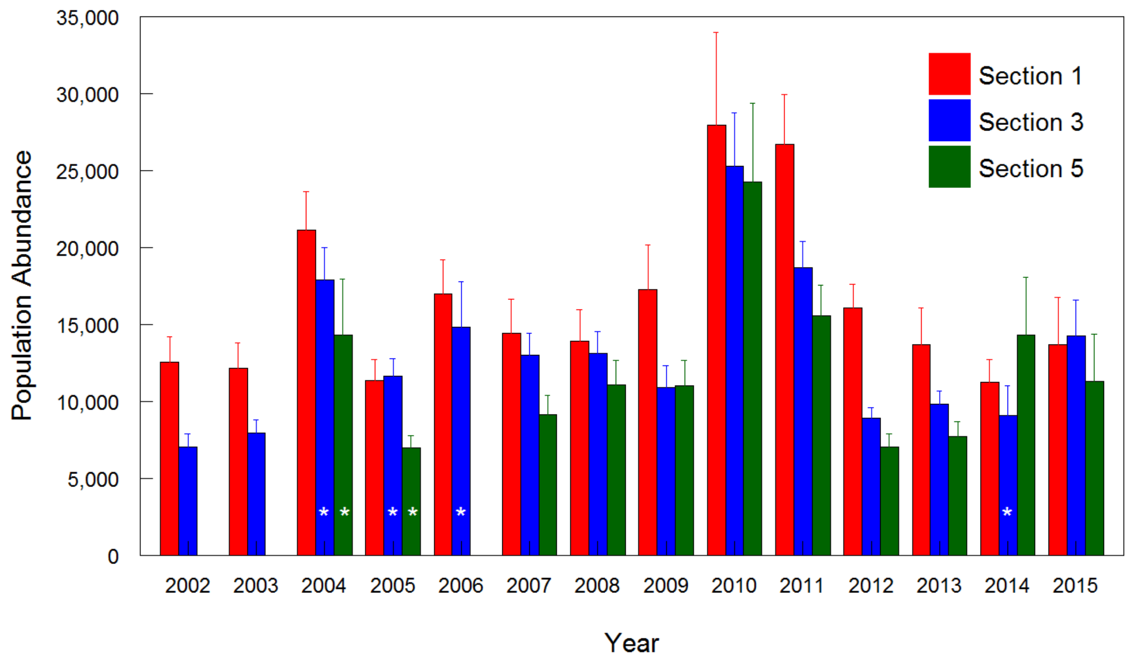


Figure 36: Population abundance estimates with 95% confidence intervals using a Bayes sequence model for Mountain Whitefish in sample sections of the Peace River, 2002-2015. Stars denote suspect estimates due to assumption violations.

3.10 Northern Pike

3.10.1 Biological Characteristics

During the 2015 survey, 13 Northern Pike were initially captured (i.e., excluding within-year recaptures) and measured for length and weight. Fork lengths ranged between 195 and 706 mm FL and weights ranged between 50 and 2857 g (Table 17). Ages were assigned to eight Northern Pike based on analysis of samples of either fin rays, scales, or both. The other six Northern Pike had ageing structures collected; however, assigned ages varied widely among analysts or the assigned ages were considered unreliable and were not used. Ages of Northern Pike ranged from age-1 to age-7.

There were too few Northern Pike to assess year-class strength based on length-frequency (Figure 37) or age-frequency histograms (Figure 38). The limited age and length data indicated that both juvenile and adult Northern Pike were present in Sections 6, 7, and 9. Northern Pike were not captured in Sections 1, 3, or 5 in 2015. However, Northern Pike were recorded in Sections 1, 3, and 5 during previous study years, with the number of captures ranging from 1 to 11 individuals per year between 2002 and 2014 (Appendix F, Figure F26).

The von Bertalanffy growth curve was based on eight Northern Pike captured in 2015 and one captured in 2007 (Figure 39). Growth estimates will improve as additional size-at-age data are collected during future study years. Although based on a small sample size, the mean body condition of Northern Pike in 2015 was approximately 0.8 for all age-classes (Table 17) and river sections (Figure 40). Length-weight relationships for Northern Pike in 2015 are shown in Figure 41.

Table 17: Average fork length, weight, and body condition by age for Northern Pike captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Age	Fork Length (mm)		Weight (g)		Body Condition (K)		n[a]
	Average ± SD	Range	Average ± SD	Range	Average ± SD	Range	
0	n/a						0
1	195	195	50	50	0.7	0.7	1
2	295 ± 85	235 - 355	220 ± 192	84 - 355	0.7 ± 0.1	0.6 - 0.8	2
3	623 ± 35	600 - 646	1820 ± 356	1568 - 2071	0.7 ± 0	0.7 - 0.8	2
4	623	623	1997	1997	0.8	0.8	1
5	706	706	2857	2857	0.8	0.8	1
6	n/a						0
7	635	635	2115	2115	0.8	0.8	1

[a] Number of individuals sampled.

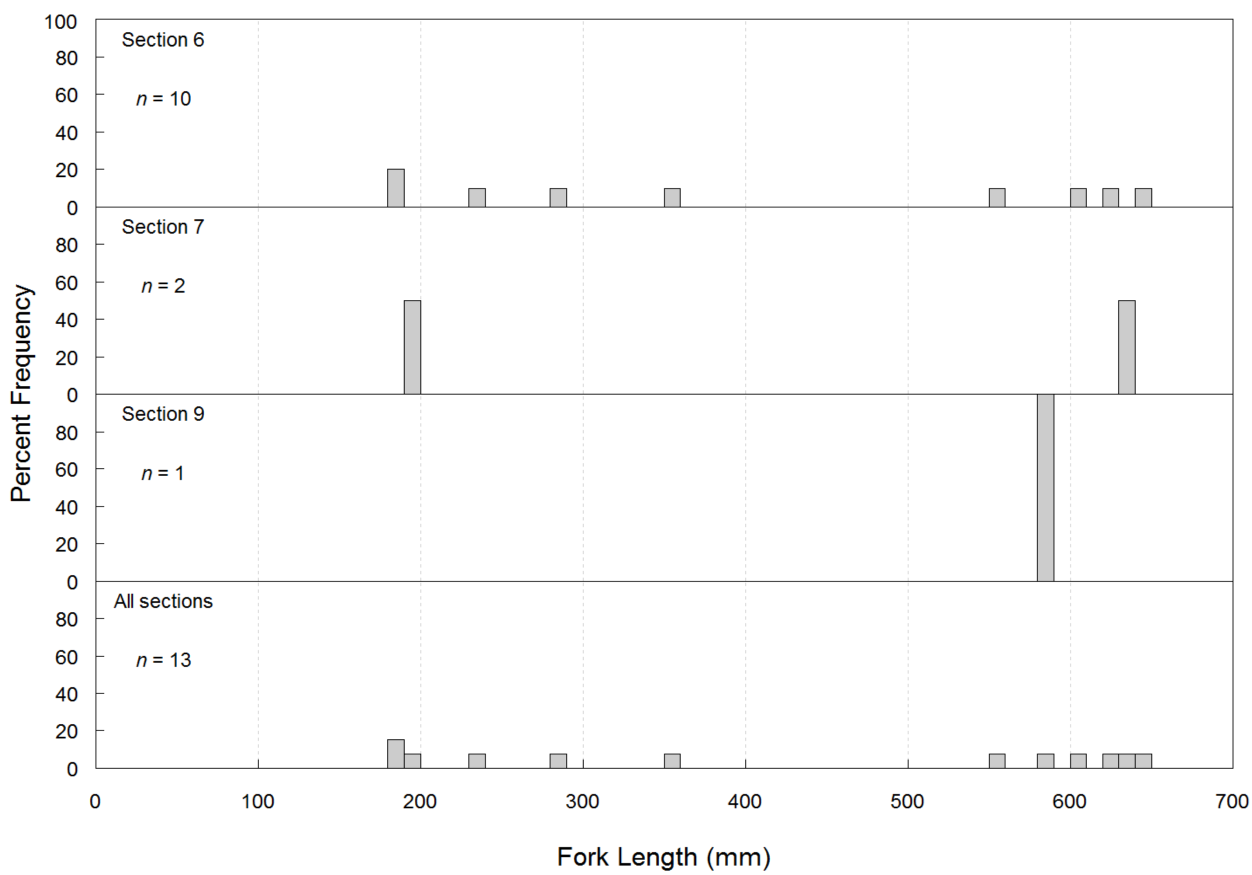


Figure 37: Length-frequency distributions for Northern Pike captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

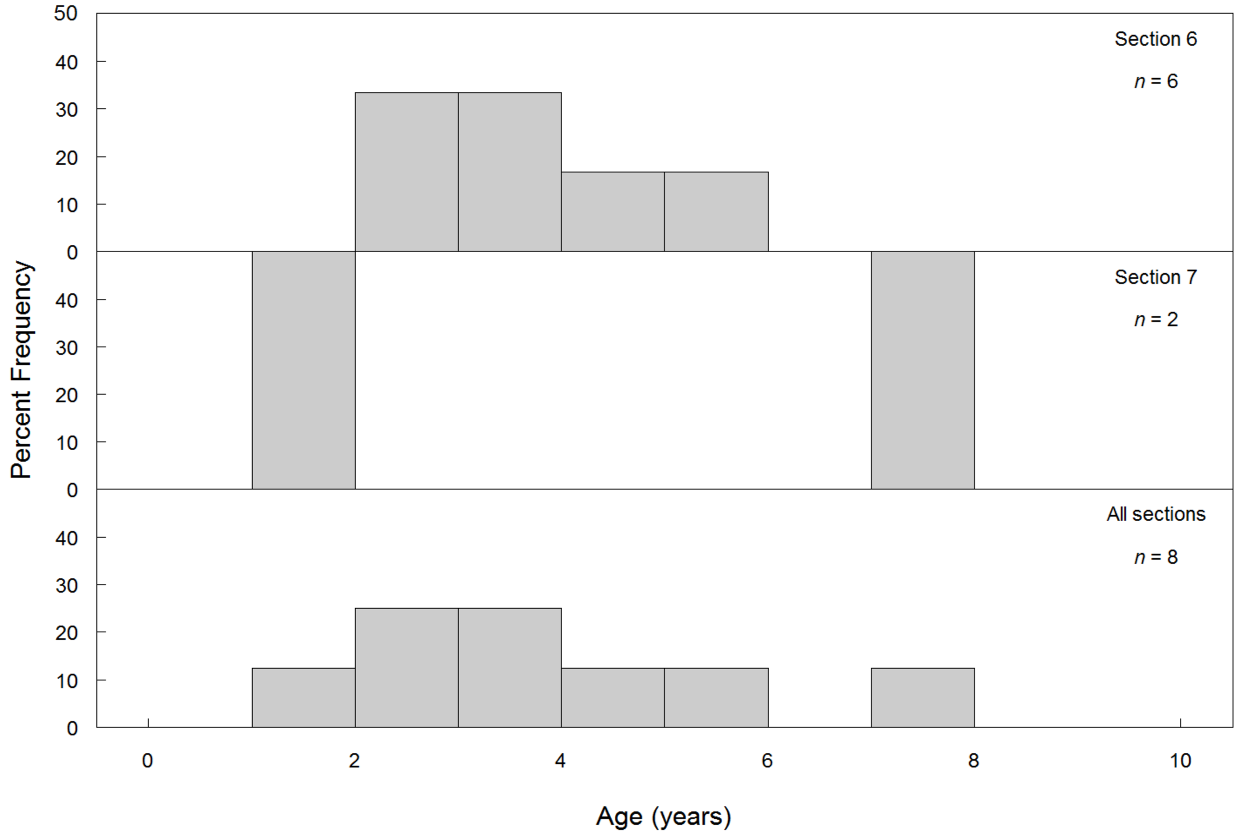


Figure 38: Age-frequency distributions for Northern Pike captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

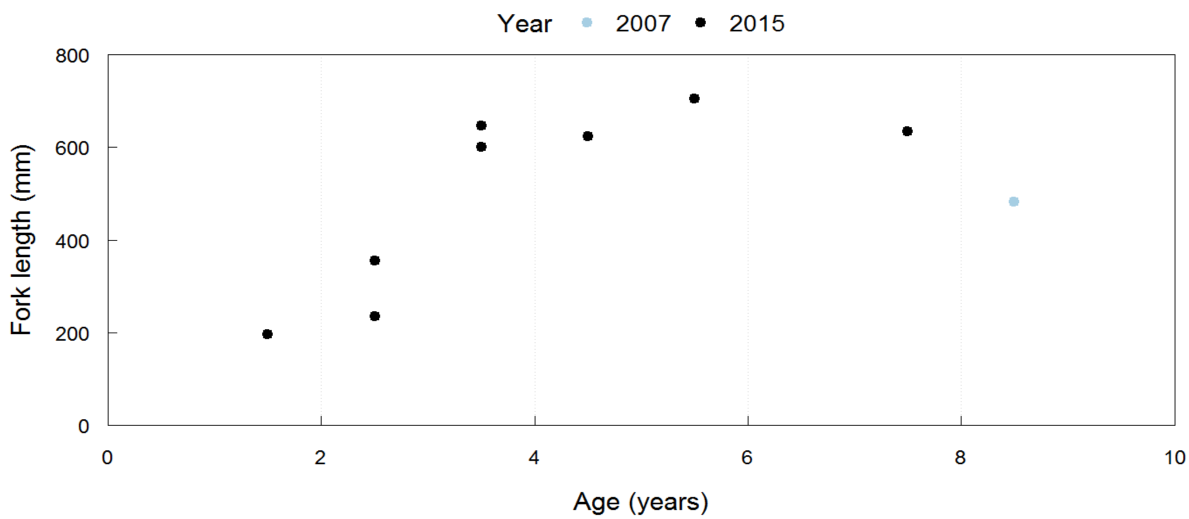


Figure 39: von Bertalanffy growth curve for Northern Pike captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015.

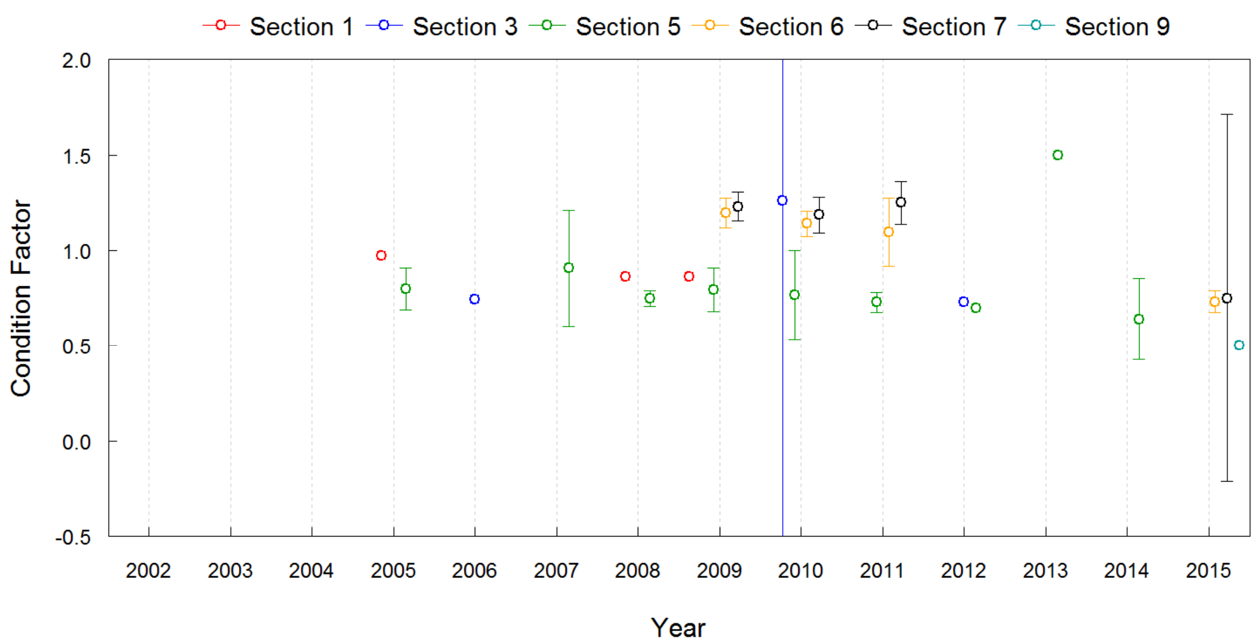


Figure 40: Mean body condition with 95% confidence intervals (CIs) for Northern Pike captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. For Sections 6, 7, and 9, analysis was supplemented with data collected during boat electroshocking surveys conducted during the late summer to fall period of 2009, 2010, and 2011 by Mainstream (2010, 2011, 2013a). The 95% CI of Section 3 values in 2010 extends from -1.14 to 3.66.

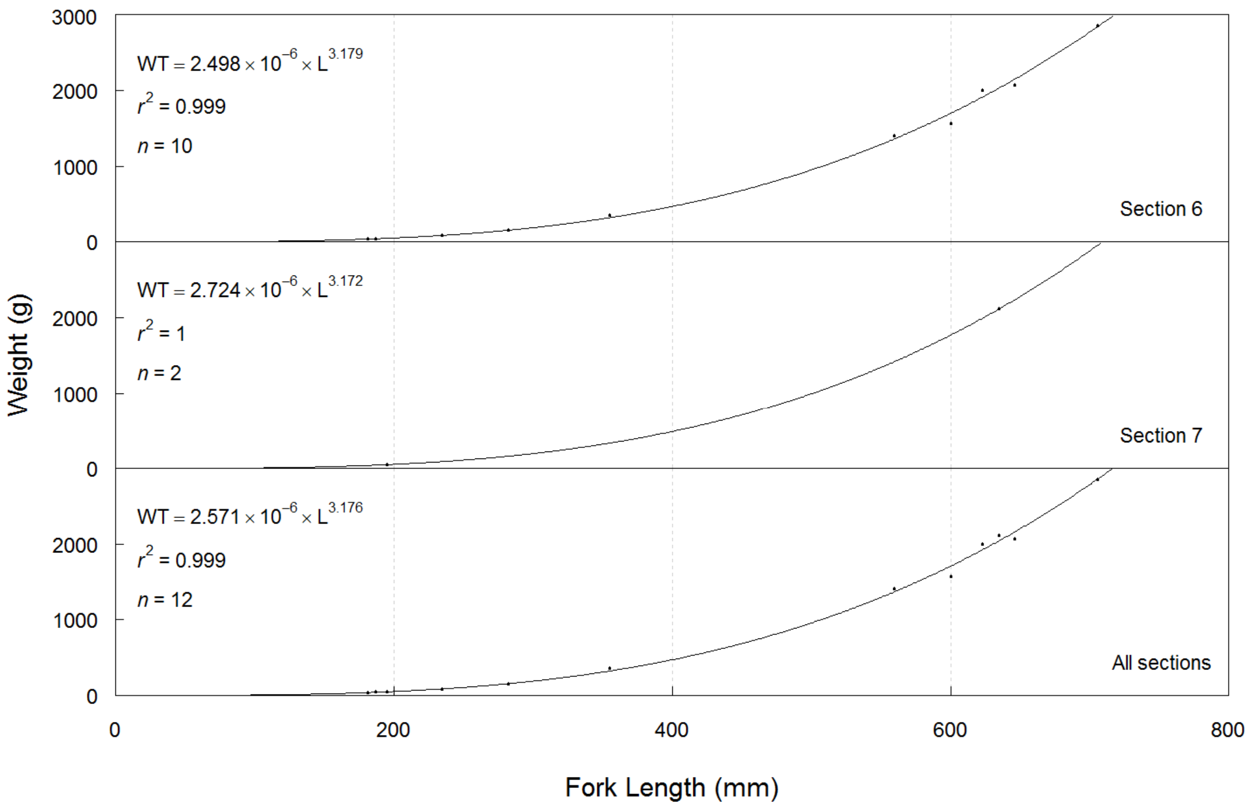


Figure 41: Length-weight regressions for Northern Pike captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

3.10.2 Abundance and Spatial Distribution

In Sections 1, 3, and 5, which are the sections where sampling was conducted during historical years of the survey (2002-2014), the number of Northern Pike captured each year ranged from 0 to 11, with the greatest number recorded in 2011 (n = 11). Northern Pike were not recorded in these sections in 2015 (Appendix E, Table E1). In Sections 6, 7, and 9, which were only sampled as part of this sampling program in 2015, 13 Northern Pike were captured (Appendix E, Table E2), which suggests a preference for the downstream portions of the study area for this species. The sparse catch data for Northern Pike between 2002 and 2015 do not suggest any substantial changes or trends over time.

3.11 Rainbow Trout

3.11.1 Biological Characteristics

During the 2015 survey, 129 Rainbow Trout were initially captured (i.e., excluding within-year recaptures) and measured for length and weight. Fork lengths ranged between 134 and 524 mm and weights ranged between 25 and 1906 g for fish that had ages assigned (Table 18). Ages were assigned to 118 Rainbow Trout based on scale analyses. Ages ranged from age-1 to age-5.

Most of the Rainbow Trout captured were between 150 and 400 mm in fork length (Figure 42). The length-frequency histograms did not suggest any difference in length distributions among river section although sample sizes within in each section were small (Figure 42). Age-2 Rainbow Trout were the most common in all river sections combined (Figure 43). Age-0 Rainbow Trout were not captured in 2015, which may be because this age-class remained in spawning tributaries and had not yet migrated into the Peace River mainstem. Alternatively, if they were present, they were not effectively sampled by the boat electroshocker due to their small size.

Growth curves estimated using the von Bertalanffy method suggested that the oldest age-classes captured had not yet reached their asymptotic length (Figure 44). Growth curves did not suggest any large differences in growth rates or body size among sections (Figures 46 and 47). Mean body condition was similar among all years and river sections, with overlapping confidence intervals for most estimates (Figure 46). Length-weight regressions are provided in Figure 47.

Table 18: Average fork length, weight, and body condition by age for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Age	Fork Length (mm)		Weight (g)		Body Condition (K)		*n*[a]
	Average ± SD	Range	Average ± SD	Range	Average ± SD	Range	
1	207 ± 36	134 - 279	115 ± 59	25 - 240	1.2 ± 0.1	0.8 - 1.4	25
2	240 ± 44	152 - 363	182 ± 107	42 - 574	1.2 ± 0.1	1.1 - 1.5	46
3	344 ± 60	217 - 441	515 ± 244	144 - 961	1.2 ± 0.1	1 - 1.4	31
4	361 ± 69	252 - 524	628 ± 454	186 - 1906	1.2 ± 0.1	1.1 - 1.3	11
5	391 ± 41	340 - 445	708 ± 281	392 - 1145	1.1 ± 0.1	1 - 1.3	5

[a] Number of individuals sampled.

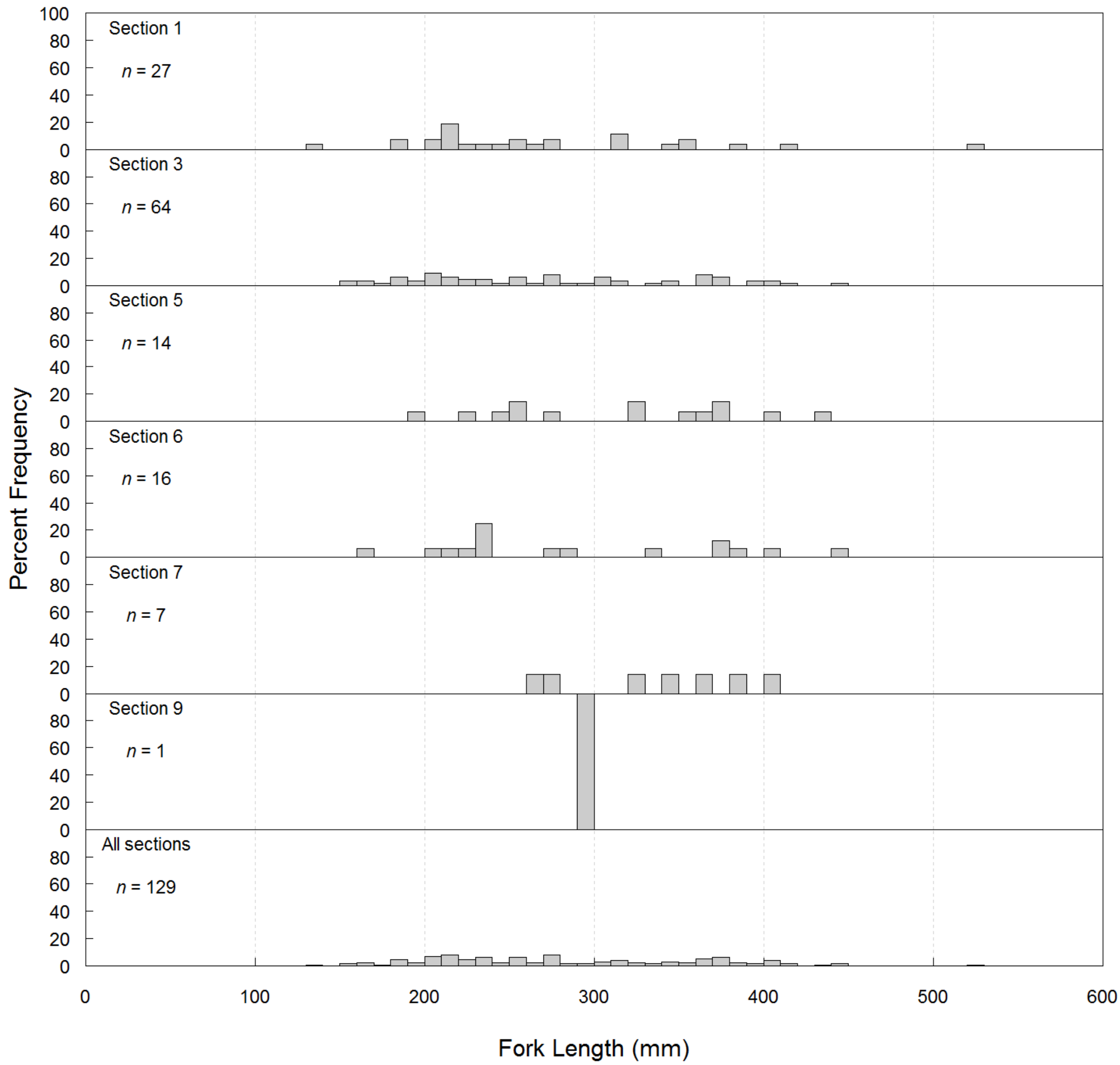


Figure 42: Length-frequency distributions for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

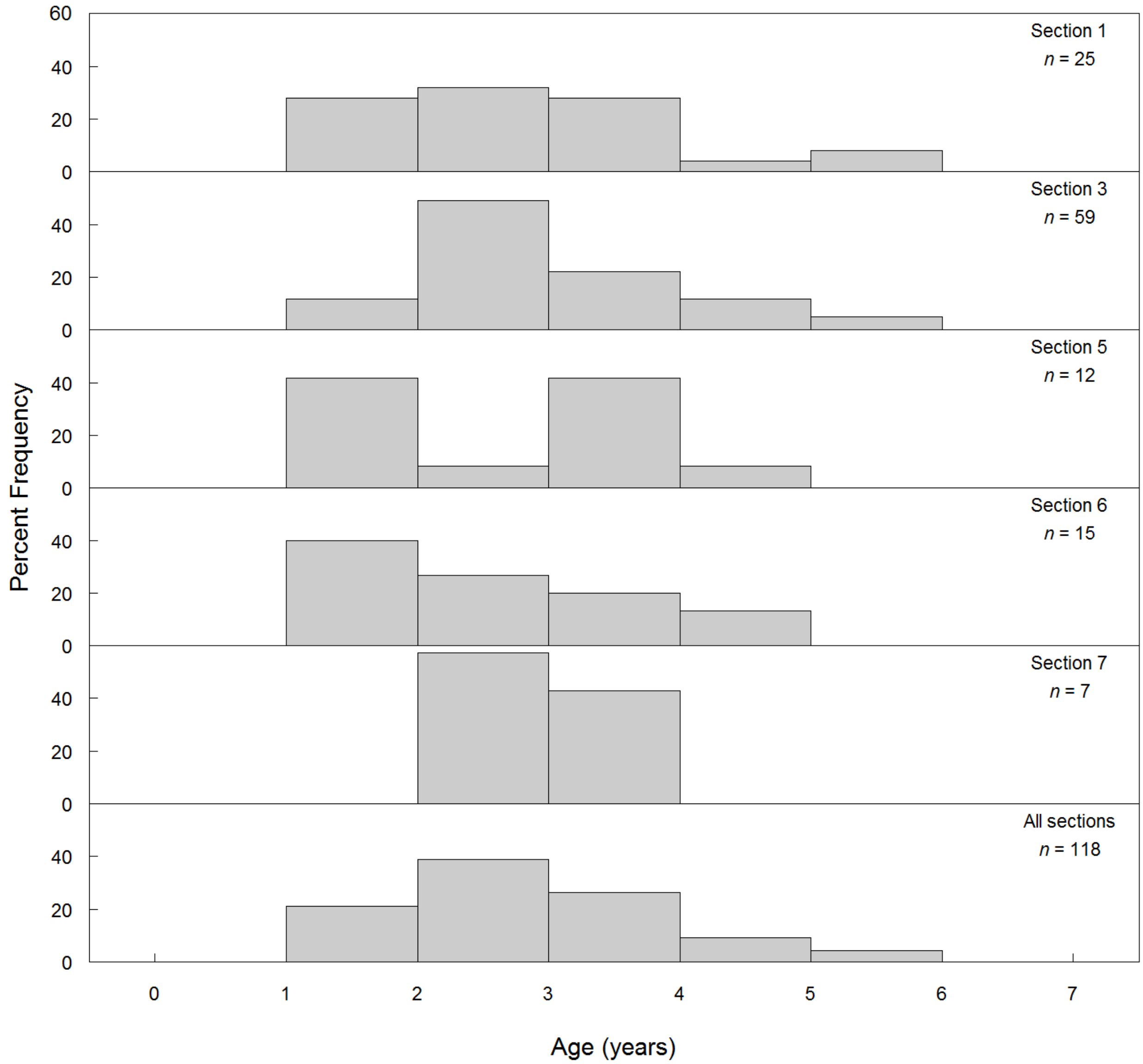


Figure 43: Age-frequency distributions for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

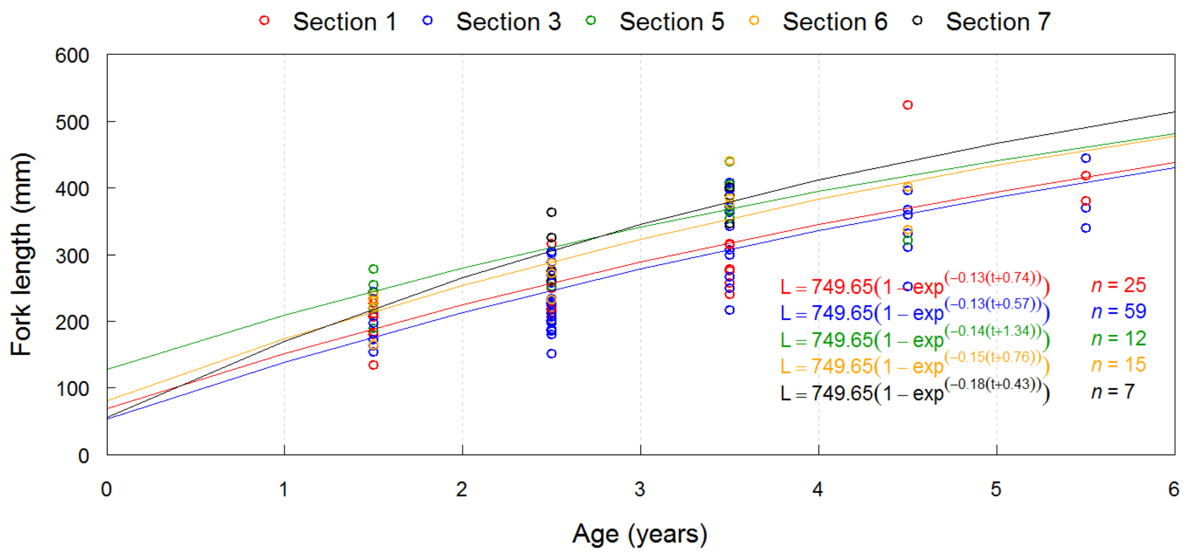


Figure 44: von Bertalanffy growth curve for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

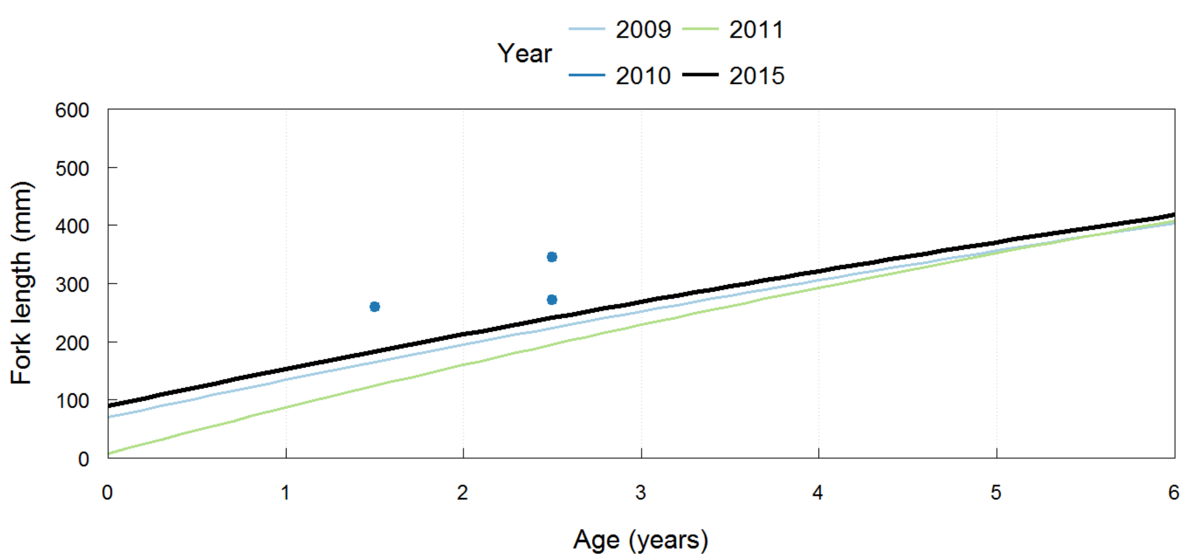


Figure 45: von Bertalanffy growth curve for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015.

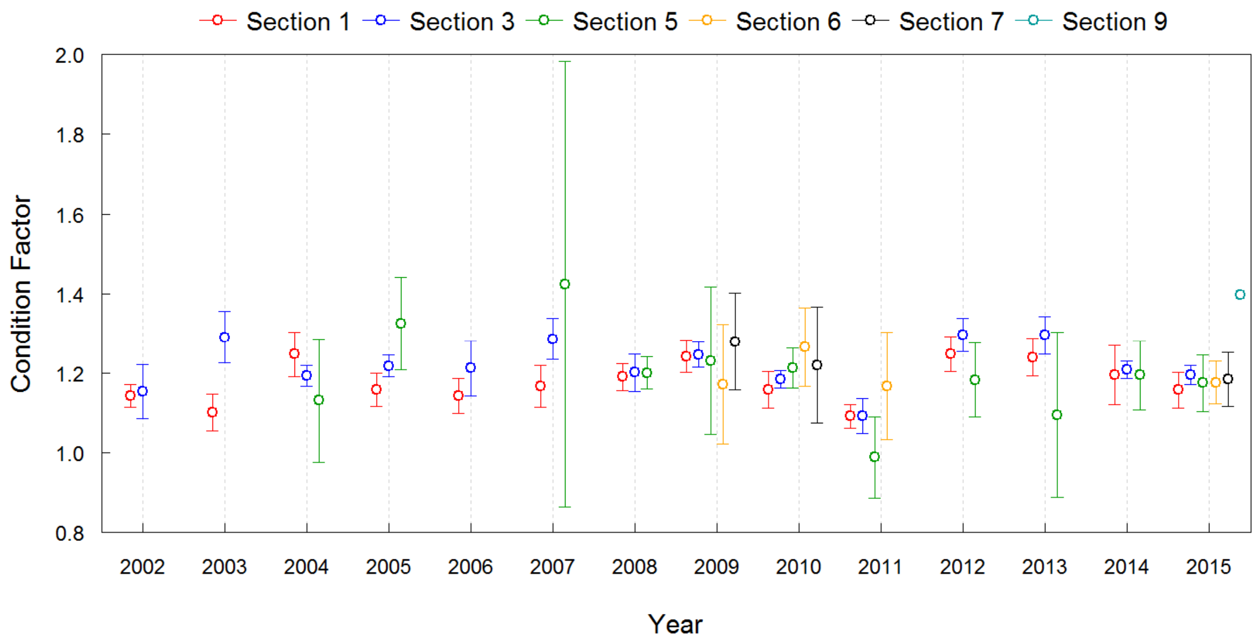


Figure 46: Mean body condition with 95% confidence intervals for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015.

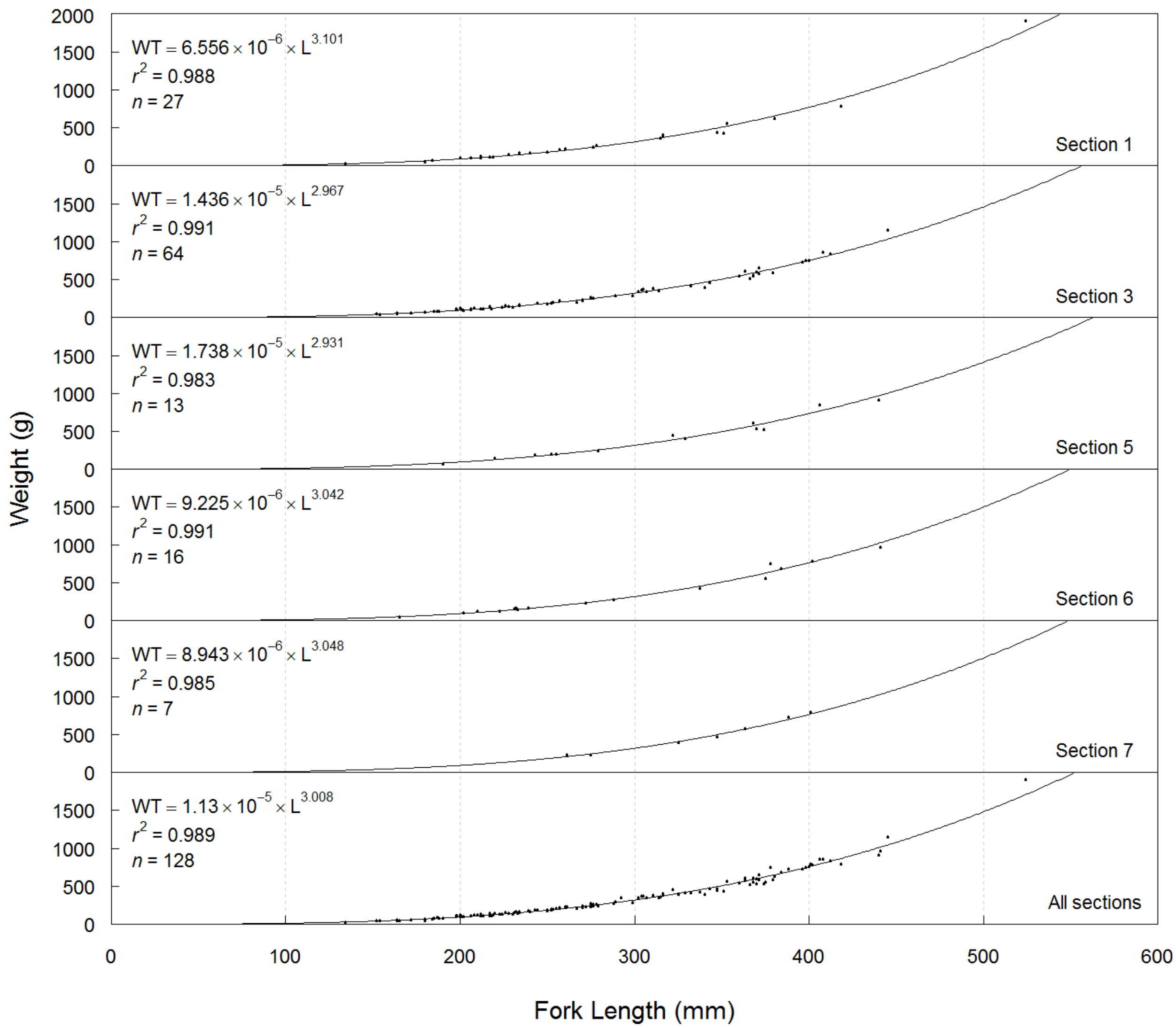


Figure 47: Length-weight regressions for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

3.11.2 Abundance and Spatial Distribution

The number of Rainbow Trout captured and observed in Sections 1, 3, and 5 combined ranged between 39 and 171 individuals between 2002 and 2014 and was 105 in 2015 (Appendix E, Table E1). In Sections 6, 7, and 9, 24 Rainbow Trout were captured in 2015 (Appendix E, Table E2). Catch data for Rainbow Trout do not suggest any large changes in abundance or catchability between 2002 and 2015.

3.12 Walleye

3.12.1 Biological Characteristics

During the 2015 survey, 114 Walleye were initially captured (i.e., excluding within-year recaptures) and measured for length and weight. Fork lengths ranged between 212 and 736 mm and weights ranged between 94 and 4650 g for fish that had ages assigned (Table 19). Ages were assigned to 72 Walleye based on analyses of scales and fin rays. Ages of Walleye ranged from age-1 to age-17. Lengths ranges overlapped adjacent age-classes.

The majority of Walleye captured were adults between 350 and 500 mm FL (Figure 48). The length-frequency histogram using all river sections combined (bottom panel; Figure 48) had modes centred around approximately 100 mm and approximately 250 mm. Age-6 and age-7 Walleye were the most abundant age-classes (Figure 49). Most juvenile Walleye, which were likely less than 300 mm FL, were captured in Section 6, 7, or 9; few juveniles were captured in Sections 1, 3, and 5 (Appendix F, Figures F32, F33).

Growth curves estimated using the von Bertalanffy method suggested that the oldest age-classes of the Walleye captured in 2015 had not yet reached their asymptotic length, as lengths continued to increase with increasing age (Figure 50). Growth curves from previous years when length-at-age data were available (2009 to 2011; Mainstream 2010, 2011, 2013a) suggested slow growth after age-5 and an asymptote at approximately age-10 (Figure 51). Mean body condition varied little among years and river sections (Figure 52). Length-weight regressions are provided in Figure 53.

Table 19: Average fork length, weight, and body condition by age for Walleye captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

Age	Fork Length (mm)		Weight (g)		Body Condition (K)		*n*[a]
	Average ± SD	Range	Average ± SD	Range	Average ± SD	Range	
1	238 ± 22	212 - 278	146 ± 46	94 - 235	1.1 ± 0.1	0.9 - 1.1	7
2	263 ± 3	260 - 266	199 ± 9	190 - 208	1.1 ± 0	1.1 - 1.1	3
3	308 ± 60	265 - 377	357 ± 239	195 - 632	1.1 ± 0.1	1 - 1.2	3
4	409 ± 86	341 - 614	908 ± 746	490 - 2717	1.2 ± 0.1	1 - 1.2	8
5	406 ± 19	382 - 429	804 ± 65	740 - 889	1.2 ± 0.1	1.1 - 1.3	4
6	427 ± 41	343 - 501	925 ± 267	634 - 1498	1.2 ± 0.1	1.1 - 1.6	14
7	439.6 ± 32	396 - 499	1021 ± 276	732 - 1629	1.2 ± 0.1	1 - 1.3	15
8	438 ± 38	403 - 490	1140 ± 415	834 - 1745	1.3 ± 0.2	1.2 - 1.5	4
9	477 ± 48	424 - 518	1216 ± 331	836 - 1442	1.1 ± 0.1	1 - 1.2	3
11	515 ± 71	429 - 601	1648 ± 718	922 - 2625	1.2 ± 0	1.1 - 1.2	4
12	634	634	3003	3003	1.2	1.2	1
13	581 ± 66	516 - 648	2525 ± 808	1868 - 3427	1.3 ± 0.1	1.2 - 1.4	3
14	679 ± 81	621 - 736	3827 ± 1164	3004 - 4650	1.2 ± 0.1	1.2 - 1.3	2
17	587	587	2243	2243	1.1	1.1	1

[a] Number of individuals sampled.

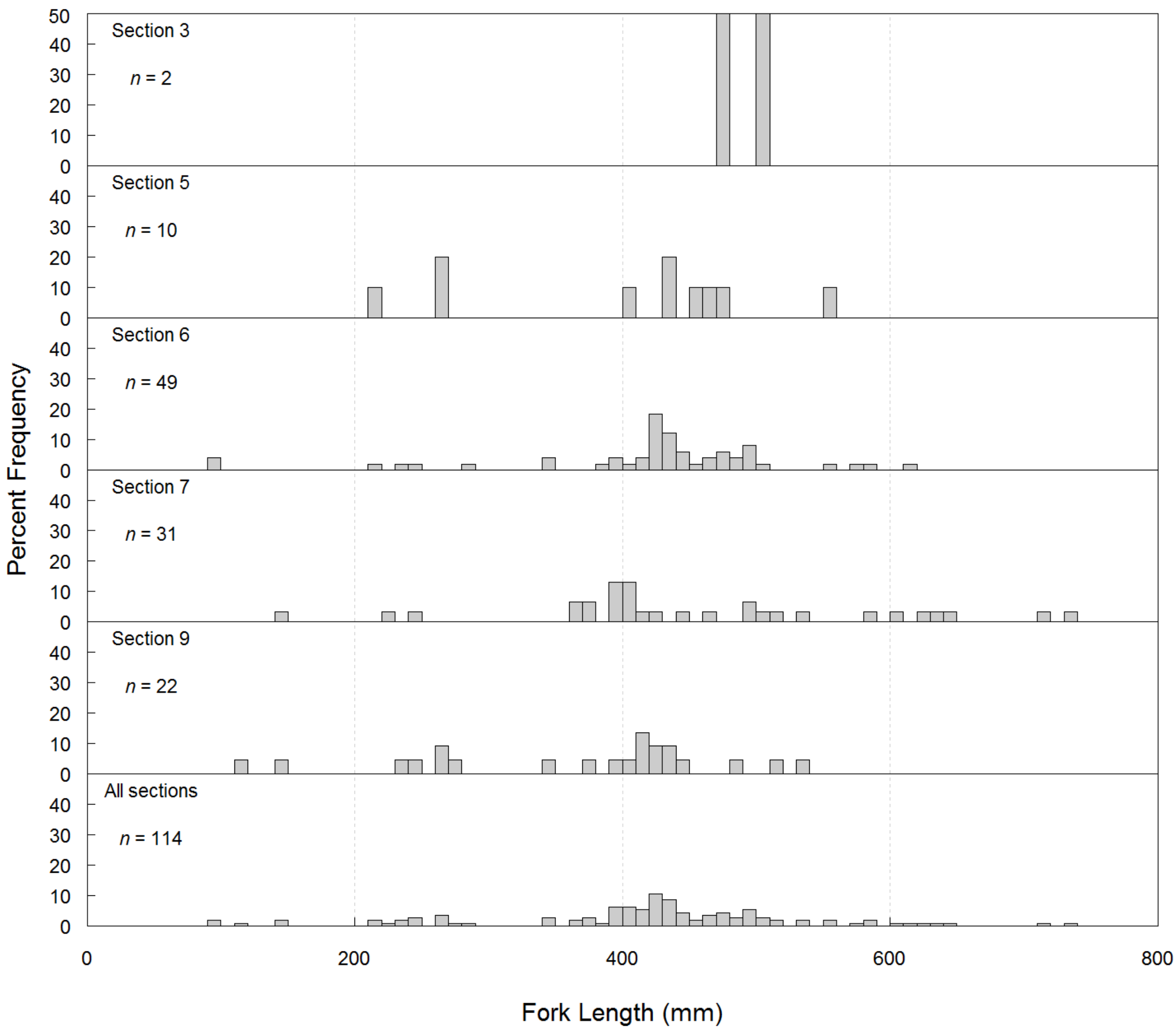


Figure 48: Length-frequency distributions for Walleye captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

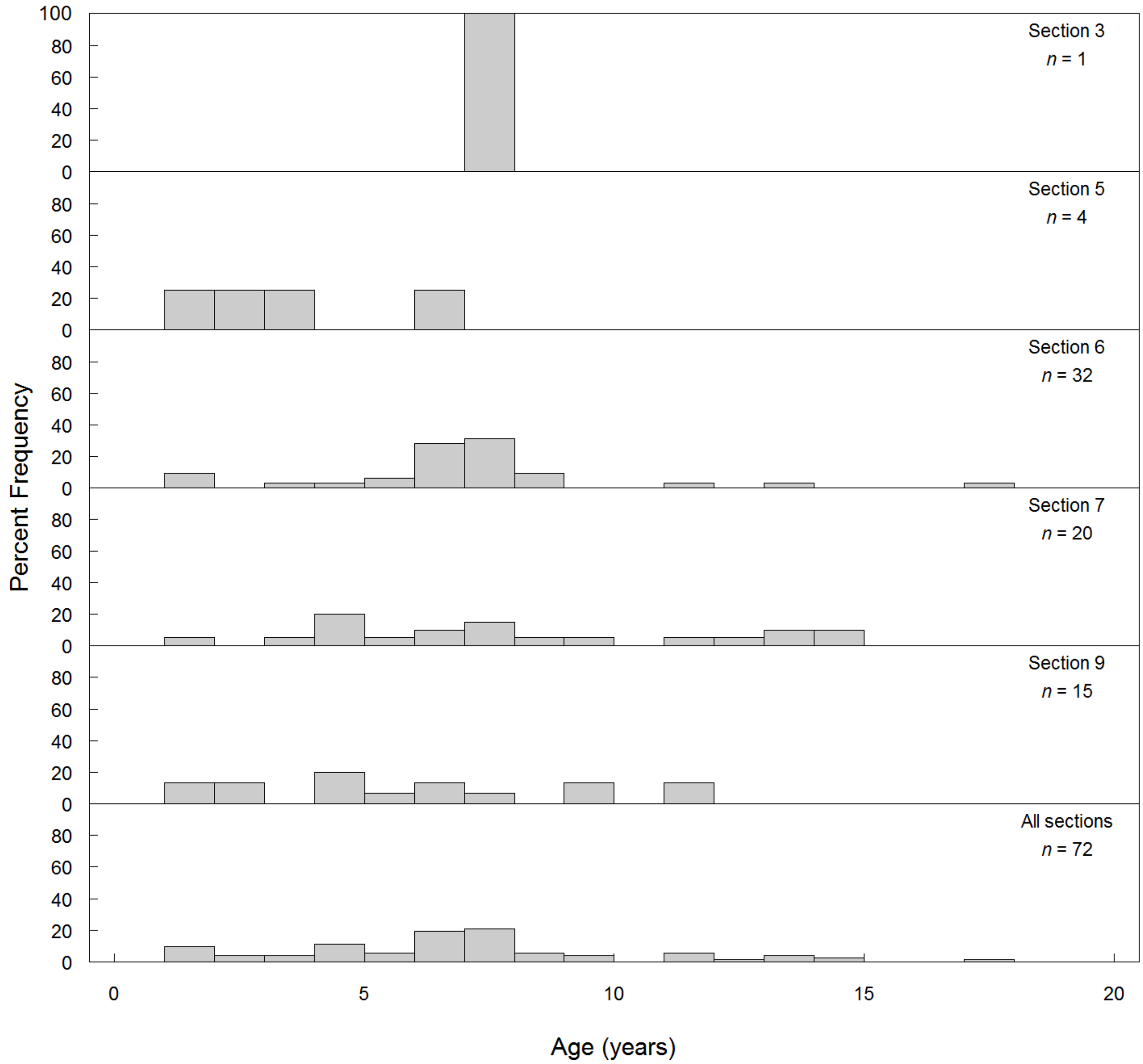


Figure 49: Age-frequency distributions for Walleye captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

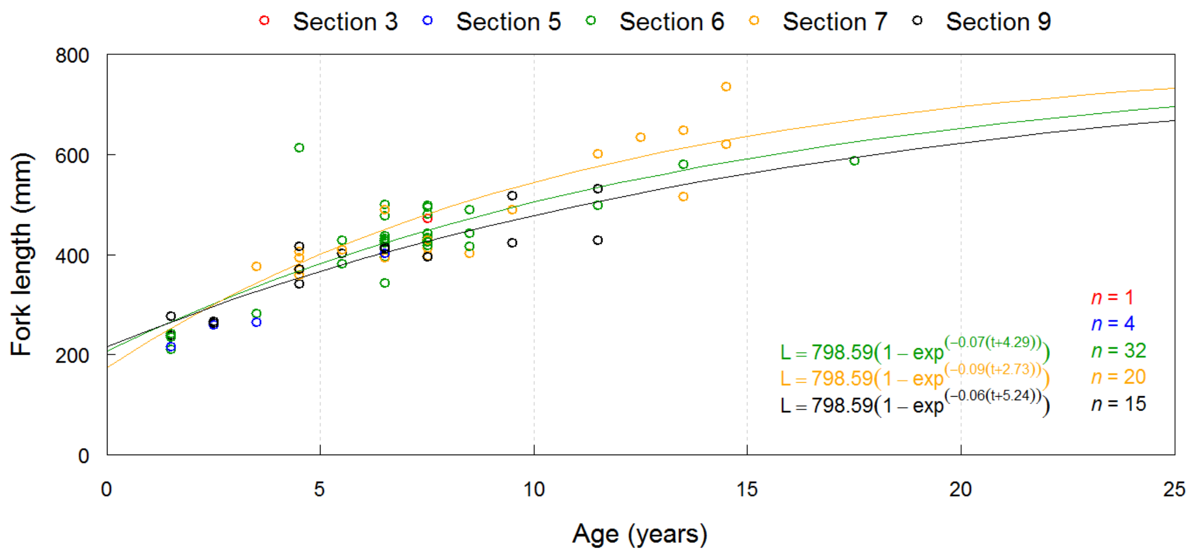


Figure 50: von Bertalanffy growth curve for Walleye captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

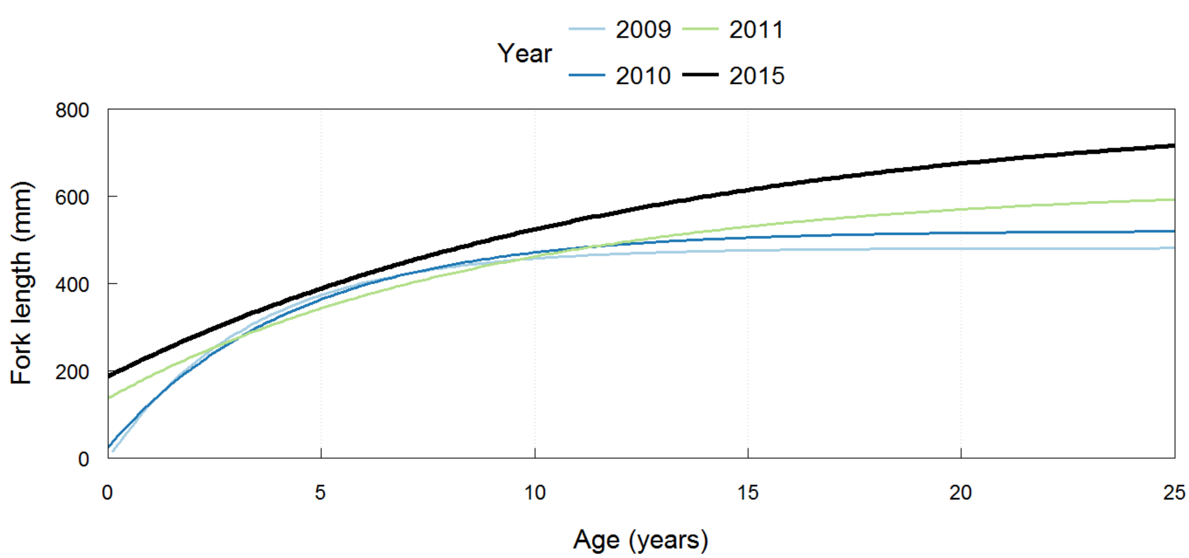


Figure 51: von Bertalanffy growth curve for Walleye captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015.

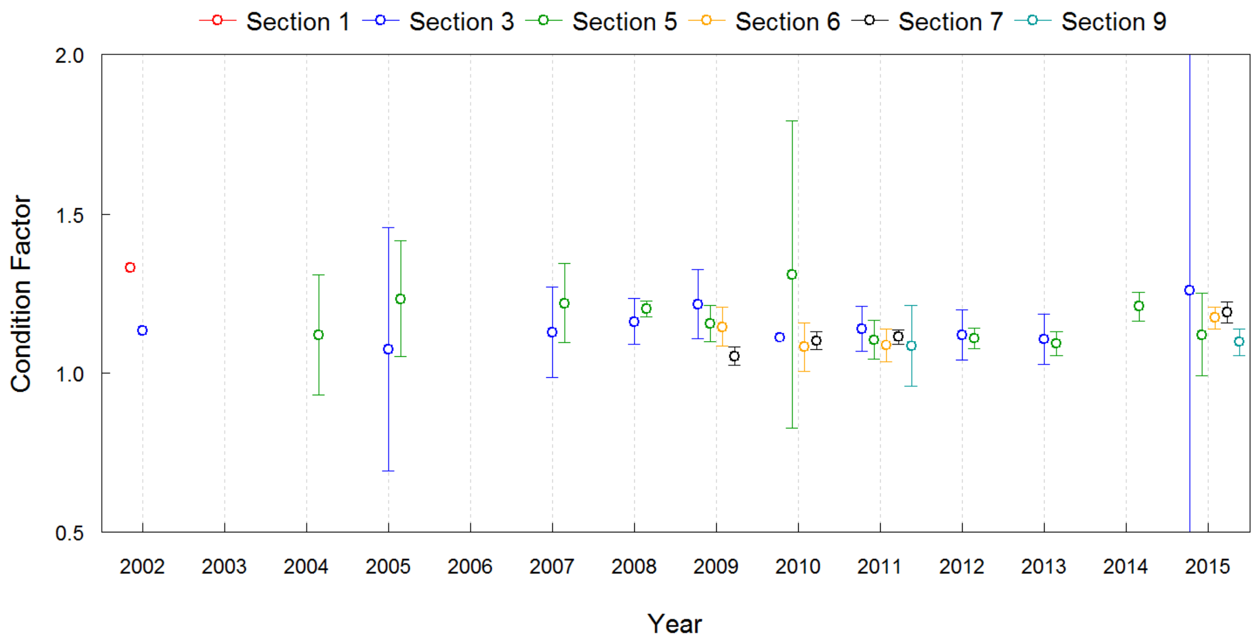


Figure 52: Mean body condition with 95% confidence intervals (CIs) for Walleye captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. The 95% CI of Section 3 values in 2015 extends from -0.39 to 2.91.

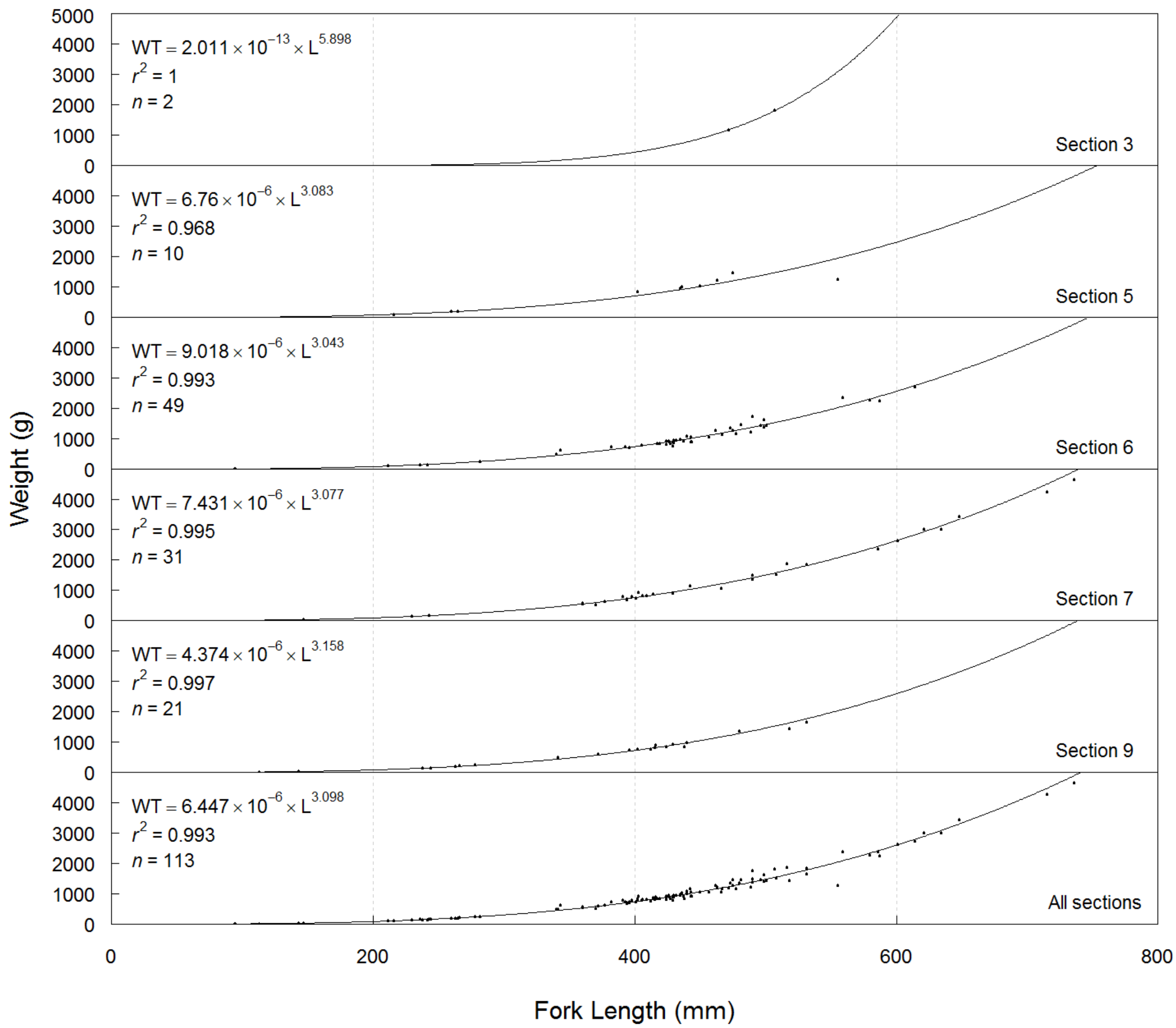


Figure 53: Length-weight regressions for Walleye captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015

3.12.2 Abundance and Spatial Distribution

In Sections 1, 3, and 5, which are the sections where sampling was conducted during historical years of the survey (2002-2014), the number of Walleye captured ranged from 0 to 58 individuals, with the greatest number recorded in 2008 (n = 58); 12 Walleye were captured in 2015 in those sections (Appendix E, Table E1). In Sections 6, 7, and 9, which were only sampled as part of this sampling program in 2015, 103 Walleye were captured (Appendix E, Table E2), which suggests a preference for the downstream portions of the study area for this species. The sparse catch data for Walleye between 2002 and 2015 do not suggest any trends over time.

3.13 White Sucker

3.13.1 Biological Characteristics

Fork lengths of captured White Sucker ranged from 71 mm to 532 mm; however, the majority of individuals were between 300 and 450 mm. Length-frequency histograms suggest similar length distributions among sections (Figure 54), except that White Sucker less than 120 mm, which are likely age-0, were only captured in Section 6. The mean body condition of White Sucker varied little among river sections or years (Figure 55). In 2015, the length-weight relationship for White Sucker (Figure 56) was similar to historical study years (Appendix F, Figure F41).

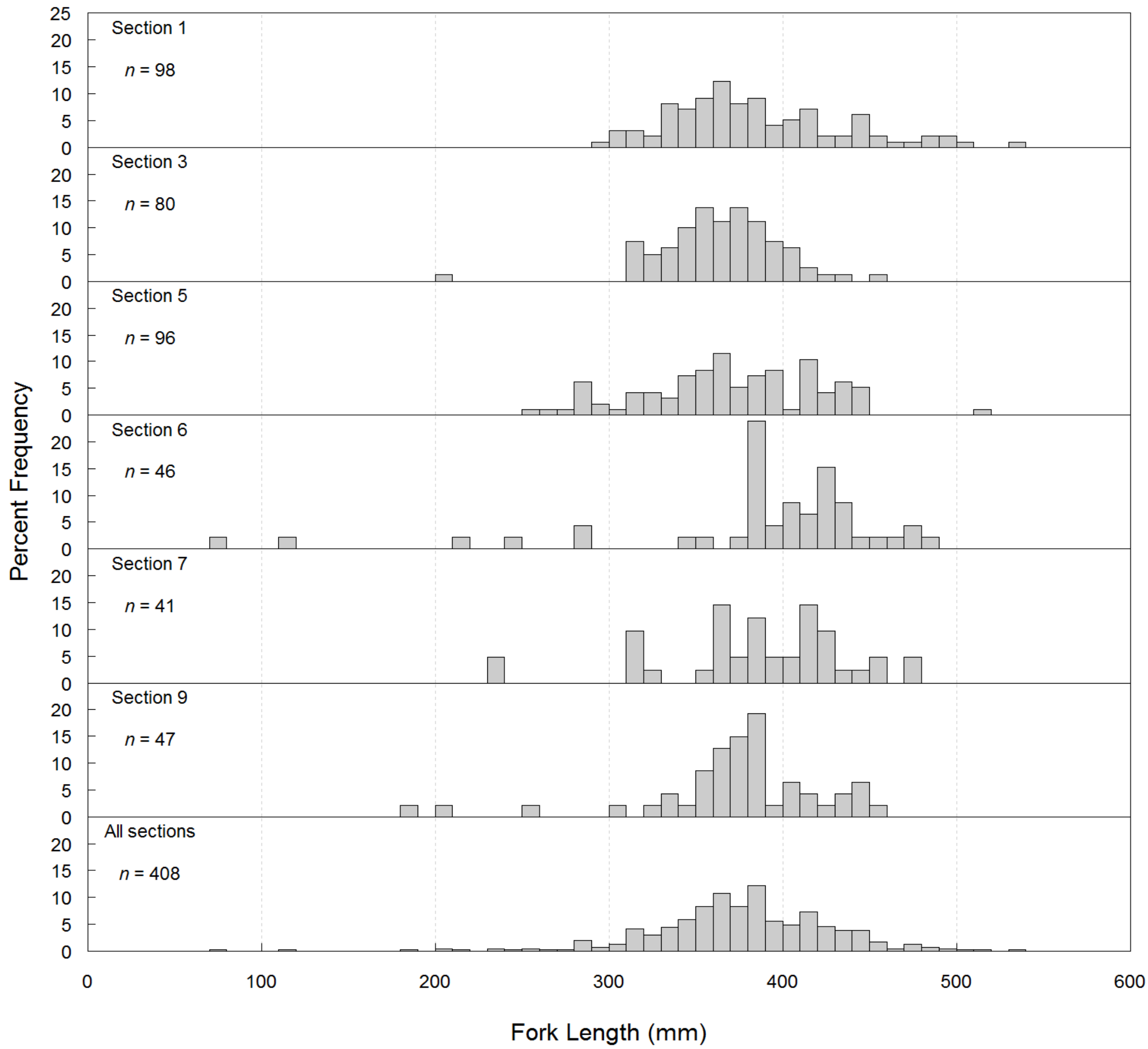


Figure 54: Length-frequency distributions for White Sucker captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

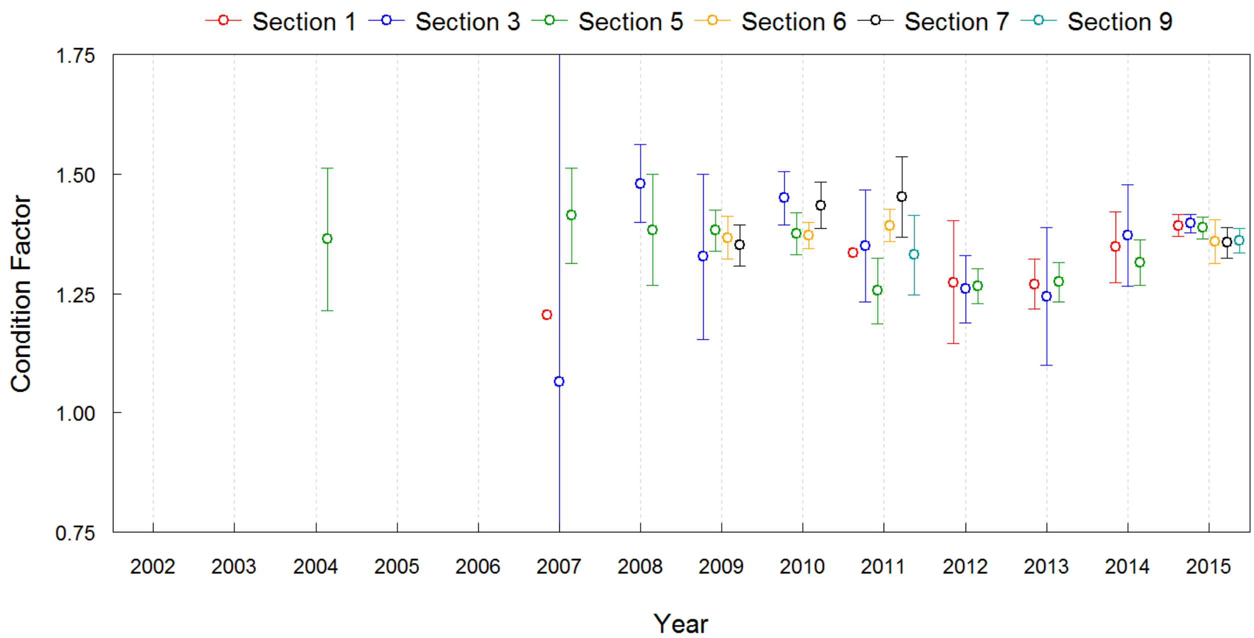


Figure 55: Mean body condition with 95% confidence intervals (CIs) for White Sucker captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. The 95% CI of Section 3 values in 2007 extends from -1.60 to 3.73.

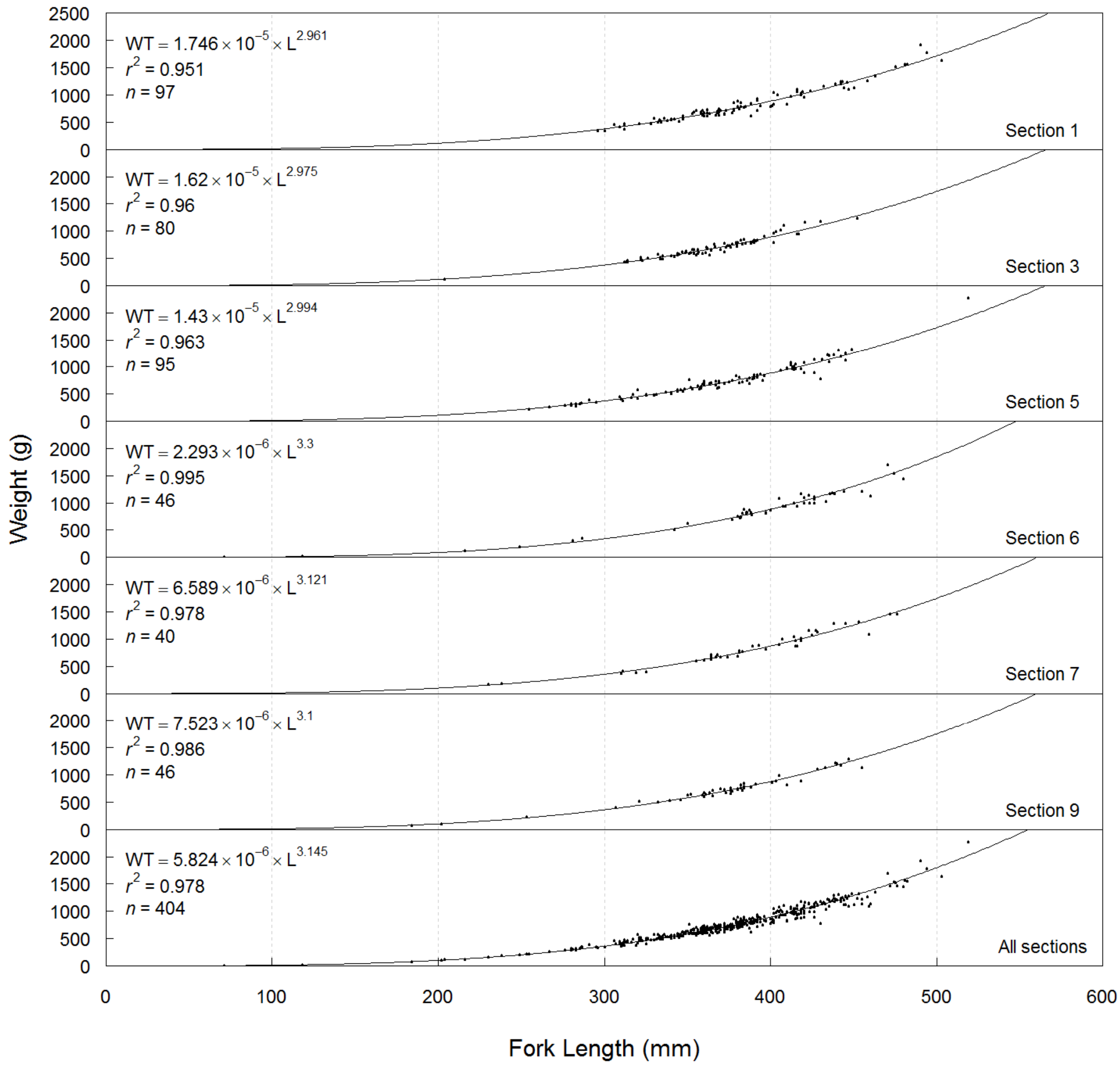


Figure 56: Length-weight regressions for White Sucker captured by boat electroshocking in sampled sections of the Peace River, 25 August to 07 October 2015.

3.13.2 Abundance and Spatial Distribution

In 2015, White Sucker were more abundant in Section 1 when compared to other sections based on the Bayes sequential model (Table 13). Population abundance estimates ranged from 1194 in Section 3 to 9979 in Section 1, although standard deviations were nearly as large as the estimates for many of the sections, indicating substantial uncertainty surrounding the estimates. Population abundance estimates were not available for other years because White Sucker were not PIT-tagged prior to 2015.

Table 20: Population abundance estimates generated using the Bayes sequential model for White Sucker captured by boat electroshocking in sampled sections of the Peace River, 2015.

Section	Bayes Mean	Maximum Likelihood	95% Highest Probability Density		Standard Deviation	Coefficient of Variation (%)
			Low	High		
1	9979	2900	780	29,660	8571	85.9
3	1194	750	320	2600	686	57.4
5	,656	1460	340	23,620	7322	110
6	1789	930	360	4105	1059	59.2
7	2599	500	120	9900	3270	125.8
Total	**22,217**	**6,540**	**1,920**	**45,354**	**11,805**	**53.1**

SD = standard deviation; CV = coefficient of variation

3.14 Catchability

Insufficient numbers of recaptured Arctic Grayling, Bull Trout, Largescale Sucker, Longnose Sucker, and White Sucker prevented the computation of catchability coefficients for these species.

For Mountain Whitefish, there was a sufficient number of recaptures to compute catchability coefficients based on the Bayesian sequential estimates. Catchability coefficients calculated using effort measured in distance or time suggested similar catchability among river sections in 2015, with confidence intervals overlapped among all sections (Figure 57). Catchability in 2015 was similar to estimates in 2010 and 2014 and lower than catchability in 2012 and 2013 (Figure 58). Catchability coefficients were consistent within year in 2015 and many other previous years (e.g., 2008 through 2012).

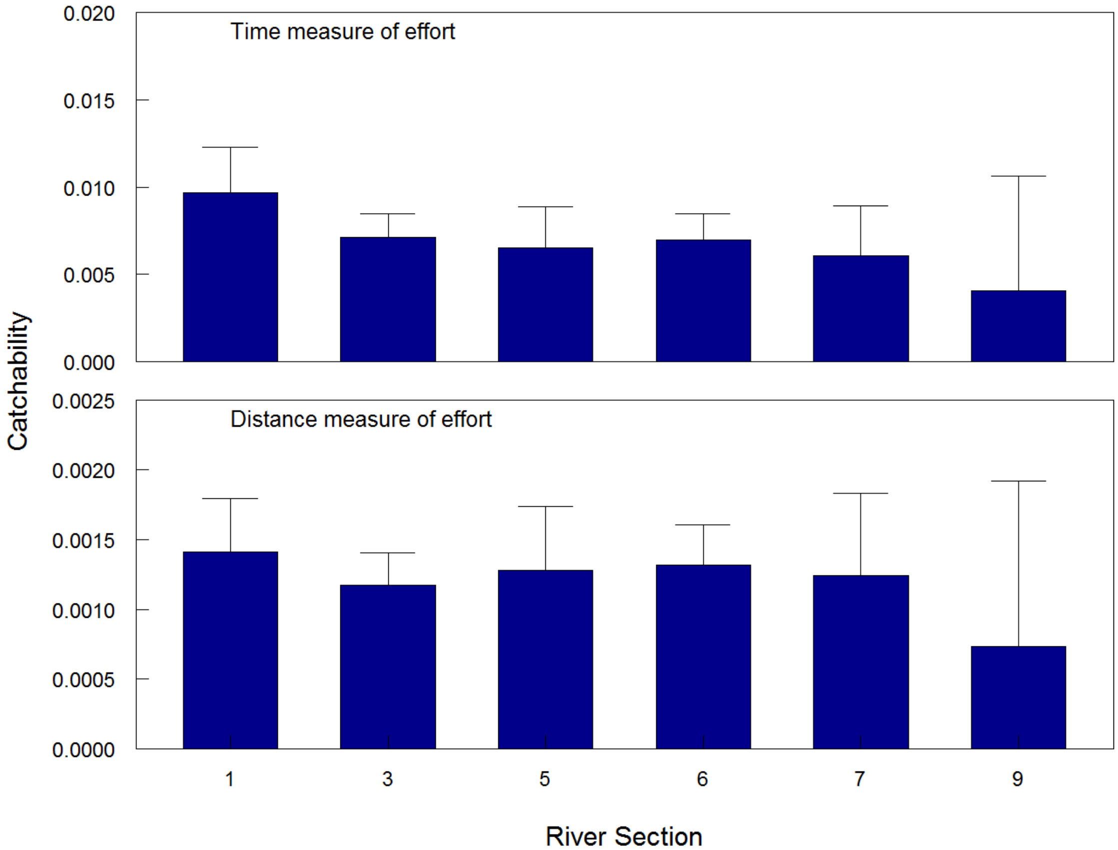


Figure 57: Catchability estimates by river section for Mountain Whitefish captured by boat electroshocking based on sampling effort measured in time (top panel) or distance (bottom panel) in the Peace River, 25 August to 07 October 2015.

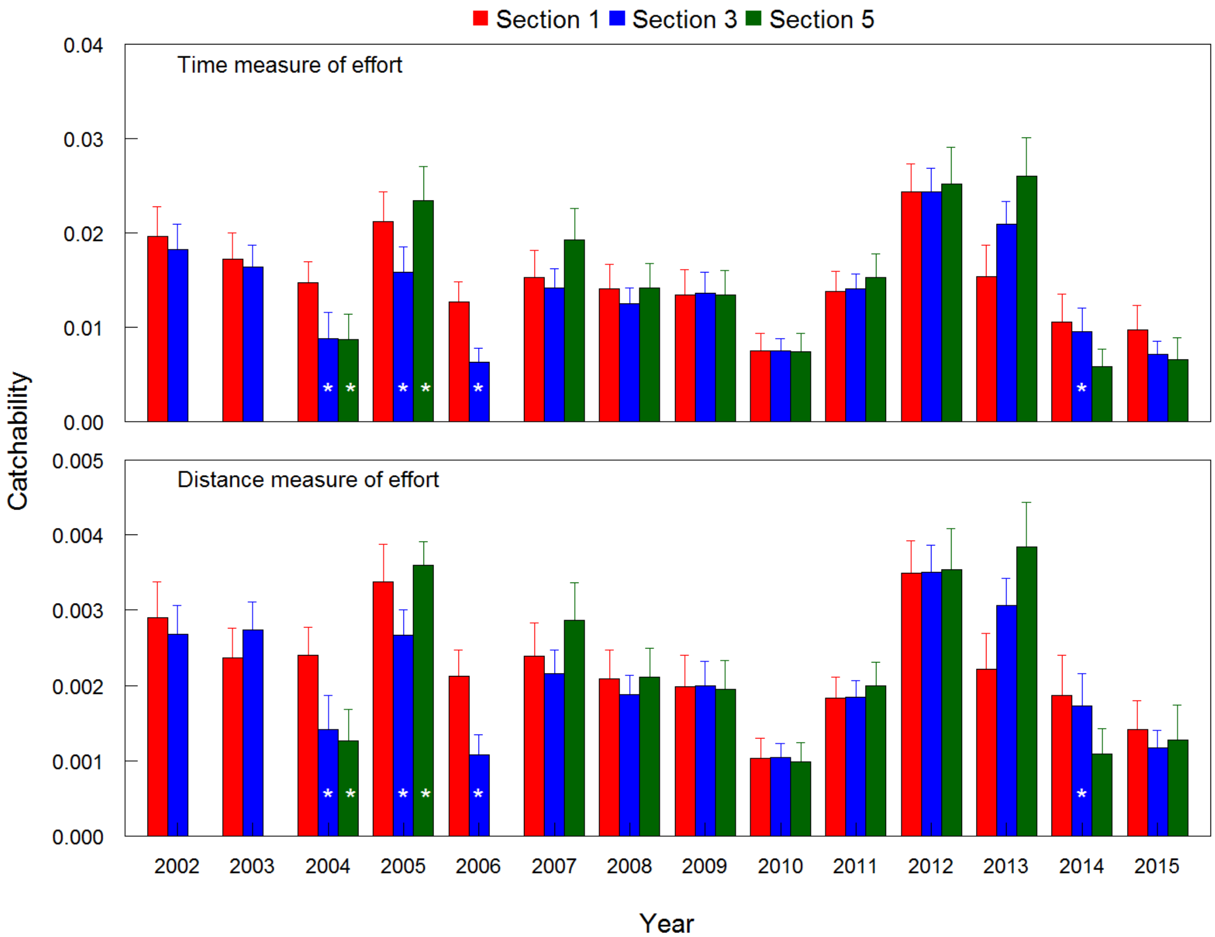


Figure 58: Catchability estimates by year and river section for Mountain Whitefish captured by boat electroshocking based on sampling effort measured in time (top panel) or distance (bottom panel) in the Peace River, 2002-2015. Vertical bars represent 95% confidence intervals; stars indicate suspect population abundance estimates.

3.15 Effort Required To Detect Change

The low number of Arctic Grayling and Bull Trout captured and recaptured in Section 1 over all study years prevented the generation of reliable power curves for these species; results are not presented for these species.

Sampling intensity can be isolated to each section because there is little movement of fish between sections. Figure 59 plots precision of populati on abundance estimates as a function of electroshocking effort (i.e., hours of electroshocker operation) for Mountain Whitefish in Section 1. The analysis was limited to Section 1 because it was the only section sampled each year between 2002 and 2015. Overall, power was low in 2013 to 2015 when compared to earlier study years. The analysis indicates that a reduction in effort in Section 1 may result in substantive loss of power and an increase in effort would likely result in modest gains in precision (Figure 59).

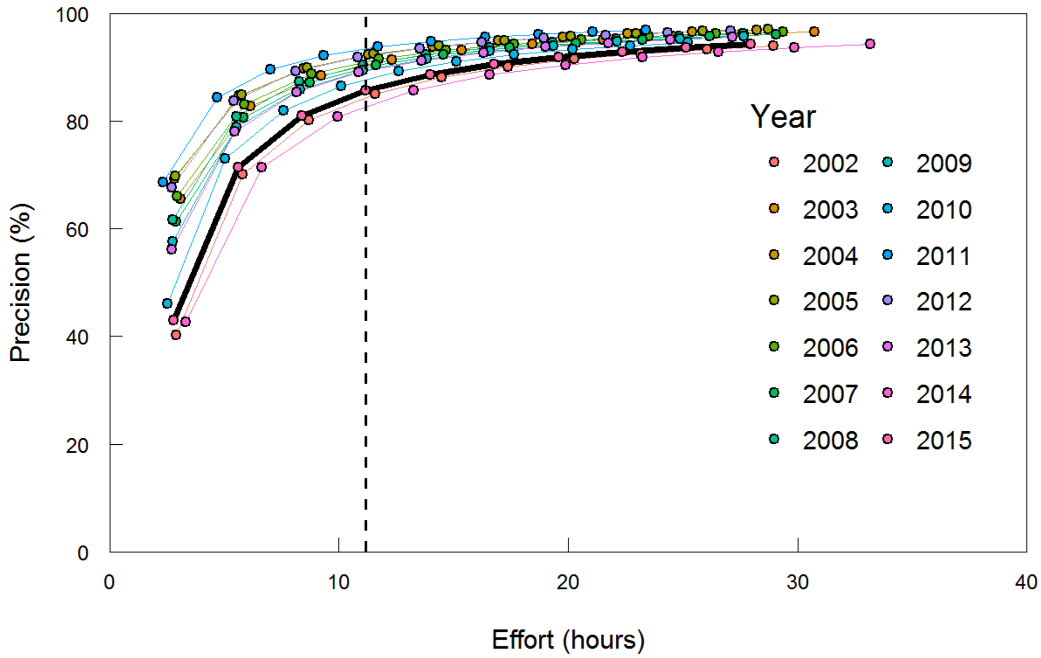


Figure 59: Precision of the Bayesian mean estimates of Mountain Whitefish abundance in Section 1 of the Peace River at various levels of effort, 2002 to 2015. The vertical dashed line represents the amount of effort (in hours) expended during the 2015 survey and the bold black line connects the estimates for 2015.

4.0 DISCUSSION

4.1 Management Hypotheses

Management hypotheses for this monitoring program relate to the predicted changes in the biomass and community composition of fish in the Peace River during the construction and operation of the Project. Data collected from 2002 to 2015 represent the baseline, pre-Project state of the fish community. Management hypotheses cannot be statistically tested until data are collected after the initiation of construction activities (i.e., after 2016).

4.2 Annual Sampling Consistency

Field methods employed during the Large River Fish Indexing program were standardized in 2002; these methods were carried over to the GMSMON-2 program when it commenced in 2008, and to the current program in 2015. Over this 14-year study period (2002 to 2015), small changes were occasionally made to the methods based on results of preceding study years or to better address each program's management objectives. Examples of some of these changes include the sections of river sampled and the types of tags deployed (T-bar anchor versus PIT tag). For a long-term monitoring program, changes to methods have the potential to confound results and hinder the identification of patterns and trends in the data. Changes made between 2002 and 2013 are discussed in previous reports. The field crew in 2014 and 2015 used the same methods as Mainstream and Gazey (2014) when possible; however, two substantial changes were made to electroshocker settings to reduce electroshocker related fish injury that had the potential to impact results; these were pulse frequency and amperage. These changes are discussed below.

Mainstream and Gazey (2014) employed a Smith-Root Type VIA electroshocker during the 2013 field survey; which has a minimum frequency setting of 60 Hz (Smith-Root pers. comm.). In 2014 and 2015, a Smith-Root GPP5.0 electroshocker was employed with the frequency manually set at 30 Hz. Studies from other river systems indicate that salmonids, particularly larger salmonids, are less likely to be injured (i.e., branding, internal hemorrhaging, and spinal injuries) at 30 Hz when compared to 60 Hz (Snyder 2003; Golder 2004, 2005).

The average electroshocker amperage output used in 2013 was 4.5 A (range 3.2 - 5.2 A; Attachment A). The average electroshocker amperage output used in 2014 and 2015 was 2.7 A (range 2.0 – 4.5 A; Attachment A). Based on the recommendations of Snyder (2003), the lowest possible amperage required to effectively catch fish was used in 2014 and 2015. Golder (2004, 2005) noted that Mountain Whitefish, Rainbow Trout, and Walleye that enter narcosis (i.e., are stunned) are more susceptible to internal injury than fish that remain in taxis (i.e., forced swimming). The probability of a fish experiencing narcosis increases with increased amperage.

It is not known whether the difference in electroshocker settings used in 2014-2015 versus 2002-2013 resulted in differences in the rates of injury, survival, and recapture of sampled fishes. If the lower amperage and lower frequency used in 2014-2015 resulted in fewer injuries and lower post-release mortality of sampled fishes than previous years, then we would expect that estimates of within-year recapture rate and growth would be greater in 2014-2015. However, the mean within-year recapture rates of Mountain Whitefish were lower in 2014-2015 (5.5-5.8%) than previous years (6.8-18.8%). These data suggest that the higher electroshocker setting employed between 2002 and 2013 may not have a measurable effect on short-term survival for any of the target species. Nevertheless, based on the literature and observations made by the field crew while conducting similar studies in other rivers, it is felt that the lower settings are more appropriate in that they would reduce the effects of the electroshocking program on the long-term sustainability of fish populations in the Peace River. Determining the effects that different electroshocker settings may have on other fish population metrics (e.g., body condition, growth) may be possible with additional years of data collected using settings similar to those used in 2014 and 2015.

The revised electroshocker setting described above may have resulted in changes in fish behavior that confound the data. At 30 Hz and 2.7 A, fish are more likely to remain in taxis and are less likely to enter narcosis. In general, fish are easier to identify and capture when they are in narcosis because they are not moving relative to the netter. Lower electroshocker settings used in 2014 and 2015 may have resulted in lower capture efficiencies when compared to earlier study years, particularly for Mountain Whitefish, which represent approximately 90% of the total catch during a typical year. Compared to 2013 (Mainstream and Gazey 2014), there were 15% fewer Mountain Whitefish captured in 2014 and 24% fewer captured in 2015. However, the gradual, successive decline in Mountain Whitefish catch between 2011 and 2015 makes it difficult to determine how much, if any, of the difference in catch between 2013 and 2014-2015 is due to the altered electroshocker settings. To date, there have been two years of data collected with the altered electroshocker settings. Additional years of data may provide insight into whether recent changes in catch rate represent differences in abundance or differences in electroshocker settings, and whether the change in settings affect the growth, survival, or body condition of sampled fish populations. The altered electroshocker setting did not likely bias populations estimates because catchability is estimated in the model and would be accounted for in population abundance estimates.

4.3 Arctic Grayling

The catch rate of Arctic Grayling suggested a decline in abundance during the monitoring period (Figure 5) with low numbers (<50) of Artic Grayling captured each year since 2012 (Appendix E, Table E1). There were insufficient mark-recapture data to generate population abundance estimates that could corroborate a declining trend in Arctic Grayling. Arctic Grayling were most common in Sections 3 and 5 but were also present in lower numbers in downstream sections. Age data indicated that all age-classes were present in the study area including age-0 and age-1 juveniles and adults up to age-4. Length-at-age analyses suggested larger body size in 2014 and 2015 than most previous study years, although the difference was not statistically significant.

During future study years, low catch rates and low recapture numbers will likely prevent the generation of absolute abundance estimates for Arctic Grayling during the construction and operation of the Project. Therefore, changes in abundance over time will likely need to be assessed using catch-per-unit effort metrics for this species. Statistical analyses of growth or body condition may be possible in future years of the study but will likely have low statistical power because of small sample sizes.

The bulk of the Arctic Grayling population spawns in Peace River tributaries, most notably the Moberly River (Mainstream 2012). After hatching, age-0 Arctic Grayling disperse downstream into the Peace River mainstem over the summer season. The success of both of these two life history phases (i.e., spawning and age-0 dispersal) is paramount to sustaining the Peace River Arctic Grayling population. These two life history phases also are very susceptible to environmental perturbation. Low abundance of a particular cohort is likely related to environmental conditions during the spring and summer of that cohort's spawning year. Catch data and age-frequencies suggested poor recruitment from the 2011 brood year and relatively strong recruitment from the 2014 brood year. Poor recruitment in 2011 coincided with substantially greater than normal daily average discharge of the Moberly River (Wateroffice 2014). Adult Peace River Arctic Grayling are known to migrate into the Moberly River as early as April and return to the Peace River in June (AMEC and LGL 2008); spawning likely occurs in May and June. Age-0 Arctic Grayling were recorded in the lower Moberly River and the Peace River immediately downstream of the Moberly River confluence from mid-July to mid-October (Mainstream 2013b). Based on these timing considerations, the high 2011 water levels in the Moberly River could have negatively impacted either spawning/incubation or the downstream dispersal of age-0 Arctic Grayling. In 2011, age-0 Arctic Grayling were recorded in a rotary screw trap near the confluence of the Moberly River by mid-May (Mainstream 2013c), which was early relative to data collected in 2012 (mid-July; Mainstream 2013b) and other northern systems (Scott and Crossman 1973; McPhail 2007). Higher discharge in 2011 may have caused Arctic Grayling to spawn or hatch earlier than normal or caused them to disperse downstream earlier than normal, which may have affected young-of-the-year survival.

4.4 Bull Trout

Population abundance estimates for Bull Trout were greatest in 2011 and 2012 although confidence intervals overlapped among most years and sections. Overall, neither population abundance estimates nor catch-per-unit effort data suggested any substantial or sustained changes in Bull Trout abundance during the monitoring period. The most common age-classes of captured Bull Trout were age-2 and age-3, as most younger individuals are rearing in spawning tributaries during the study period, and those that are present in the Peace River are not effectively sampled by boat electroshocking. Older, mature Bull Trout likely have migrated into spawning tributaries during the study period in late August and September. Population abundance estimates for Bull Trout were greatest in Section 3, which is located immediately downstream of the Halfway River confluence, and Section 6, which is immediately downstream of the Pine River confluence.

Length-at-age for Bull Trout was higher than average in 2014 and 2015 for most age-classes that were assessed (i.e., age-4 and younger), which was also observed for Mountain Whitefish. Although there are uncertainties in Bull Trout age assignments, the fact that a similar trend was observed in both Bull Trout and Mountain Whitefish suggests favourable growing conditions in the Peace River study area in 2014 and 2015.

Only fin rays were used to age Bull Trout because previous analyses indicated that scale-based ages were between one and three years younger than fin ray-based ages for the same fish (Golder and Gazey 2015). Other researchers reported that the precision of ages assigned using fin ray samples decreases with increased age (Erhardt and Scarnecchia 2013; Zymonas and McMahon 2009). Therefore, ages assigned to older Bull Trout using fin rays should be treated as suspect. In addition, the three Bull Trout that were classified as age-0 were almost certainly older than age-0 based on their fork lengths (206, 335, and 476 mm). These errors were likely because of damaged or poor quality fin ray cross-sections and suggest some degree of error and uncertainty in fin ray-based age assignments even for young Bull Trout. Accurate age assessment is important for stock assessments in the study area and to adequately address the management question, including assessments of length-at-age, growth, and year-class strength.

Otoliths are the preferred and most precise ageing structure for Bull Trout (MacKay et al. 1990; Erhardt and Scarnecchia 2013; Zymonas and McMahon 2009) but their collection requires lethal sampling. Based on the small population size, their long life span, and the wide range of sizes recorded for each age-class, it is unlikely that the benefits of more accurate ageing using otoliths for Bull Trout would outweigh negative impacts associated with lethally sampling a portion of the population. Another option for ageing is chemical ageing using microchemistry analyses on fin ray samples. A small dataset (n = 10) analyzed by Golder (2010) suggested that seasonal trends in element concentrations, particularly zinc, in fin rays could be used to age Bull Trout in the Duncan River watershed in interior BC, and that these ages agreed with ages assigned using otoliths from the same fish. Otolith microchemistry studies have recently been conducted for Bull Trout from the Peace River and found that the seasonal pattern in zinc concentrations in otoliths could be used to identify annuli and age fish but the study did not assess the microchemistry of fin rays (Earth Tone and Mainstream 2013). The feasibility of fin ray microchemistry analysis is watershed-specific and this approach would require a substantial level of investigation before it could be implemented under this program. However, if it does prove to be a valid option, it may be possible to analyze fin rays collected from all previous study years (depending on how they have been stored), providing precise ages for Bull Trout dating back to 2002.

4.5 Mountain Whitefish

Population abundance estimates for adult (greater than 250 mm FL) Mountain Whitefish suggested similar abundance in most years between 2002 and 2015, except for relatively greater abundance in 2011 and 2012. A greater proportion of small Mountain Whitefish (less than 150 mm FL) was captured in 2009 and 2010 when compared to most previous study years, which suggests strong recruitment from these brood years and may explain the greater estimated abundance of adults in 2011 and 2012. Higher than normal catch of age-1 fish in 2014 and 2015 suggests strong recruitment in 2013 and 2014. Alternatively, the change in electroshocking settings that occurred in 2014 and 2015 could also have contributed to greater catches of young Mountain Whitefish during those study years.

The abundance of Mountain Whitefish in the study area during the study period appears to be related to water levels, with higher densities generally observed when water levels are lower. Mainstream and Gazey (2011) postulated that at lower water levels, side channel habitat areas become isolated or unsuitable for use by Mountain Whitefish, thereby concentrating fish in remaining portions of the study area. This hypothesis was based on the two years with the highest Mountain Whitefish abundance estimates (2010 and 2011), which coincided with low PCD summer discharge rates (Appendix C, Figure C1). In recent years, population abundance estimates were lower in 2012 and 2013 when discharge was above average, and greater in 2014 and 2015 when discharge was near or below average during the study period. These data support the hypothesized relationship between abundance estimates and water levels. This hypothesis relates to the concentration of fish in areas that are sampled. To test this hypothesis, additional sampling would be required in side channel habitat areas in conjunction with existing sites. Presently, it is difficult to conclude whether variation in population abundance estimates represent true Peace River fish abundances or are indicative of changes in Peace River water levels and the concentration of fish in sampled areas.

Population models suggested constant catchability for Sections 1, 5, and 6 but time-varying catchability in Section 3. Section 3 is located immediately downstream of the Halfway River confluence. The Halfway River is a known spawning area for Mountain Whitefish (Mainstream 2012) and may serve as a holding area for this species prior to the spawning season. AMEC and LGL (2008) noted substantial movements of Mountain Whitefish as early as August, which they associated with pre-spawning migration. Spawning for this species likely occurs in October when water temperature declines to approximately 7°C (Northcote and Ennis 1994 cited in Mainstream and Gazey 2014). Therefore, differences in the catchability of Mountain Whitefish among sample sessions in Section 3 could be due to pre-spawning movements and migration into the Halfway River or other spawning tributaries.

Length-at-age data suggested larger Mountain Whitefish in 2014 and 2015 when compared to previous study years. A similar trend was observed for Bull Trout, and also to a lesser degree for Arctic Grayling. These similar increases in body size for three different salmonid species suggest favourable growing conditions for salmonids in the Peace River in 2014 and 2015. Reasons for greater length-at-age for Mountain Whitefish are not known but could be related variation in food availability or hydrological conditions.

4.6 Sucker species

Although none of the Sucker species are considered indicator species under this Program's objectives, all adult large-bodied fishes were monitored as part of the Program in 2015. Suckers may be useful for detecting changes in the fish community in the study area for several reasons. Suckers can contribute substantially to ecosystem function through nutrient cycling, affect the invertebrate communities through grazing, and serve as prey items (both as eggs and fish) for other fish species (Cooke et al. 2005). For these reasons, and their relatively low trophic position as grazers, Suckers can be an important sentinel species for monitoring changes in fish communities and ecosystems (Cooke et al. 2005). Suckers (all species combined) are common in the Peace River catch data. Their large sample sizes, coupled with large recapture rates, will likely result in greater precision in estimates of fish population metrics and greater power to detect change during and after construction of the project when compared to some of the indicator fish species.

Results suggested that the distribution of suckers varied by species, life-stage, and river section. Based on length-frequencies of Largescale Sucker and Longnose Sucker, nearly all of the individuals captured in Section 1 were adults; there was a large proportion of juvenile Largescale Sucker and Longnose Sucker in Section 9. Population abundance estimates for Largescale Sucker were more than three times greater in Section 1 when compared to all other sections. White Sucker also were most abundant in Section 1 but also were common in Section 5. Longnose Sucker appeared to have a different distribution than the other two Sucker species because their population abundance estimates were higher in Sections 5, 6, and 7 and lower in Sections 1, 3, and 9. Sucker species were not marked with PIT tags prior to 2015, therefore population abundance estimates are not available for previous study years. Population abundance estimates for 2015 provide baseline data for the pre-construction period and can be compared to abundance estimates generated during the construction and operation of the project and EIS predictions regarding changes in total fish biomass.

Mean values of body condition did not indicate any substantial changes among years during the monitoring period for any of the three Sucker species. Body condition was generally similar among river sections for all three species. One exception was greater mean body condition for Longnose Sucker in Section 1 in 2015 when compared to other river sections. Reasons for this minor spatial variation in the body condition of Longnose Sucker are not known. However, body condition also was greater in Section 1 for other species, including Bull Trout and Mountain Whitefish. Section 1 is immediately downstream of PCD. Greater body condition of Mountain Whitefish or Bull Trout at sites closest to dam outflows has also been reported in the lower Columbia River near Hugh L. Keenleyside Dam (Golder and Poisson 2014) and the middle Columbia River near Revelstoke Dam (ONA et al. 2014), which was hypothesized to be because of fish feeding on fish and invertebrates that are entrained through the dam. In the Peace River, it is unclear whether greater body condition of several fish species in Section 1 was related to availability of entrained food items or greater productivity from within this river section itself.

4.7 Other species

For four of the seven indicator species, there were not enough mark-recapture data to calculate population abundance estimates. These species were Burbot, Goldeye, Rainbow Trout, and Walleye. Burbot and Goldeye were captured in small numbers (five or less) in 2015 in the downstream portions of the study area (Sections 6, 7, and 9). These species were not captured upstream of the Beatton River confluence in 2015. Sporadic captures and small sample sizes will likely not allow meaningful inter-annual comparisons of catch rate or life history metrics in future years of the study for Burbot and Goldeye.

In 2015, 129 Rainbow Trout and 114 Walleye were captured. These numbers allow some inferences about the distribution and size structure of these populations. For instance, most of the juvenile Walleye (less than 300 mm FL) were captured in Sections 6, 7, and 9, suggesting that rearing areas are in downstream portions of the study area, whereas nearly all of the Walleye captured in Sections 1, 3 and 5 were adults (greater than 300 mm FL). Rainbow Trout that were captured ranged from age-1 to age-5, with no obvious differences in age-structure among river sections. Inter-year comparisons of abundance for these species must rely on catch rate data and assessments of year-class strength using length-frequencies due to limited mark-recapture data. There were no clear inter-annual trends in abundance or recruitment variability based on the data available for Rainbow Trout or Walleye from 2002 to 2015. If catch rates for Rainbow Trout and Walleye are similar in future study years, comparisons of relative abundance (i.e., catch rate) and life history metrics relative to management hypotheses may be possible; however, small sample sizes will likely result in low power for assessing any statistical differences.

Northern Pike is not an indicator species under the current Program but is a sport-fish that was captured in low numbers during most previous study years. In 2015, both juvenile and adult Northern Pike were present in the downstream portion of the study area (Sections 6, 7, and 9). Northern Pike were not captured in Sections 1, 3, or 5 in 2015, but have been captured in small numbers in these sections in previous study years.

In 2015, 15 Spottail Shiner were captured in Sections 5, 6, 7, and 9 combined. Spottail Shiner are a species of conservation concern and are on the provincial red list. However, Spottail Shiner are not native in the Peace River watershed, and those present originated from a population introduced into Charlie Lake, which flows into the Beatton River (McPhail 2007).

5.0 CONCLUSIONS

Sampling conducted since 2002 provides a long-term, baseline dataset regarding the abundance, spatial distribution, body condition, and growth rates of large-bodied fish populations in the Peace River prior to the construction and operation of the Project. During future study years, data from this program will be used to assess management hypotheses that relate to predicted changes in biomass and fish community composition in the Peace River during the construction and operation of the Project.

In 2015, discharge in the Peace River was below average during the summer growing season and during most of the study period. Fish population metrics were mostly similar to previous study years and indicated stable abundance, distribution, size structure, and body condition for most species. There were some trends over time in the data, including declining Arctic Grayling catches since 2012, suggesting a recent decline in abundance in the study area. However, a greater than normal proportion of age-1 Arctic Grayling and Mountain Whitefish in

2015 may indicate good recruitment from the 2014 brood year for these two species. Another recent trend was greater mean length-at-age in 2014 and 2015 when compared to previous study years for most age-classes (age-1 to age-4) of Arctic Grayling, Bull Trout, and Mountain Whitefish. Analyses suggest favourable growing conditions in the Peace River during the last two study years. Burbot, Goldeye, Rainbow Trout, and Walleye are considered indicator species under the Program but were captured in small numbers in 2015. For these four species, limited mark-recapture data prevented the calculation of population abundance estimates. During future study years, small sample sizes for these species will likely limit the Program's ability to detect changes in catch rates or life history metrics but will provide information on presence and distribution.

6.0 CLOSURE

We trust that this report meets your current requirements. If you have any further questions, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.

Dustin Ford, RPBio
Fisheries Biologist, Project Manager

Gary Ash, PBiol (Alberta)
Project Director

DF/GA/cmc

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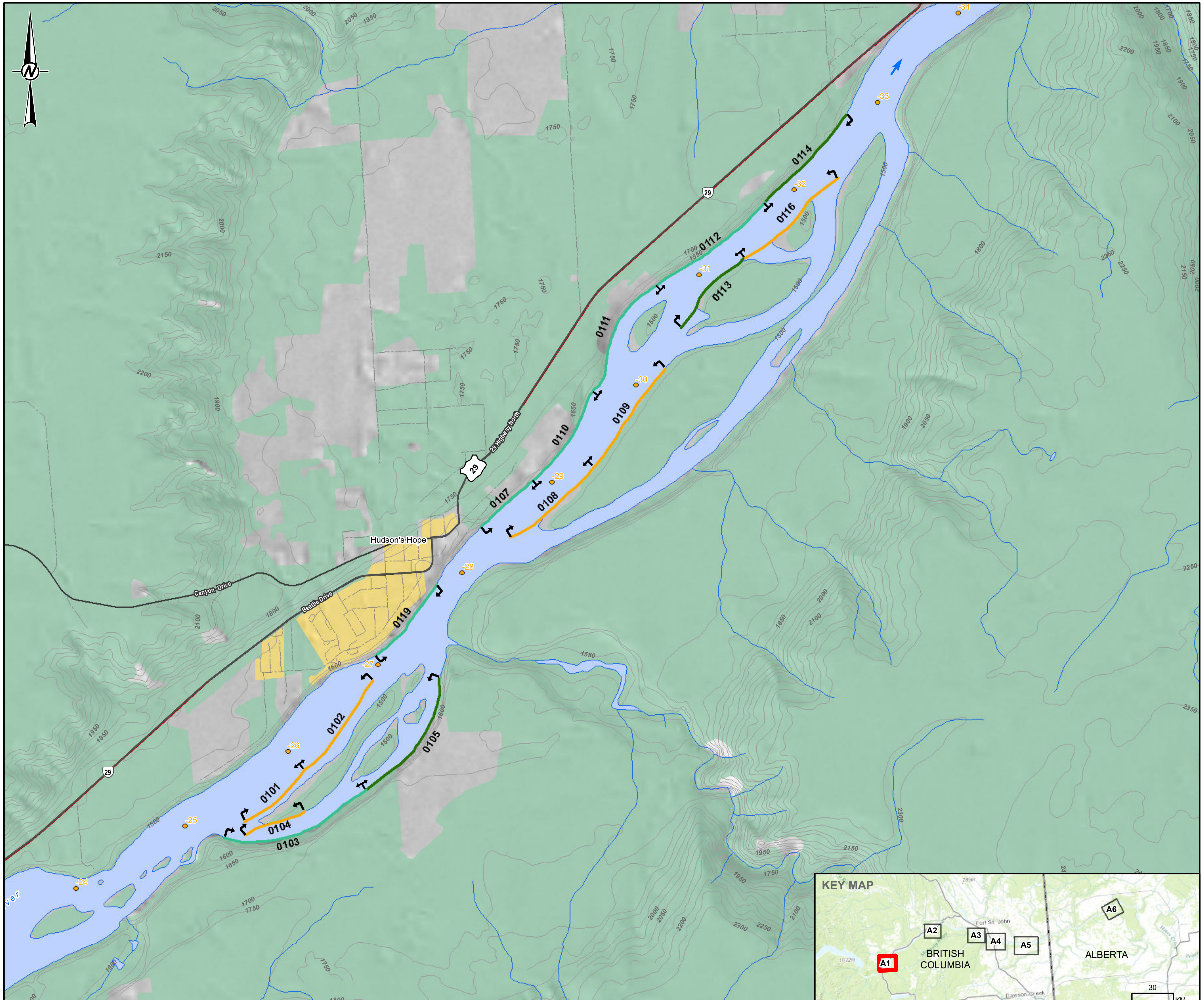
APPENDIX A

Maps and UTM Locations



LEGEND

- RIVER KILOMETRE AS MEASURED DOWNSTREAM FROM W.A.C. BENNETT DAM
- FLOW DIRECTION
- 0110 BOAT ELECTROSHOCKING SITE

SITE HABITAT CLASSIFICATION

- UNASSIGNED HABITAT CLASSIFICATION
- A1 WITH PHYSICAL COVER
- A2 WITH PHYSICAL COVER
- A3 WITHOUT PHYSICAL COVER

TRANSPORTATION

- ARTERIAL ROAD
- LOCAL ROAD
- HIGHWAY

HYDROLOGY

- WATERCOURSE
- WATER

TOPOGRAPHY

- CONTOUR (ft)
- URBAN AREA
- FOREST AREA
- PROVINCIAL PARK

0 590 1,180

1:30,000 METRES

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COORDINATE SYSTEM: NAD 1983 BC ENVIRONMENT ALBERS

CLIENT
BC HYDRO

PROJECT
PEACE RIVER FISH COMMUNITY MONITORING PROGRAM (MON-2)

TITLE
SECTION 1 - PEACE RIVER LARGE FISH INDEXING SURVEY (TASK 2A)

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-03-15
DESIGNED	DF
PREPARED	AD
REVIEWED	DF
APPROVED	GA

PROJECT NO.	CONTROL	REV.	FIGURE
1400753		0	A1

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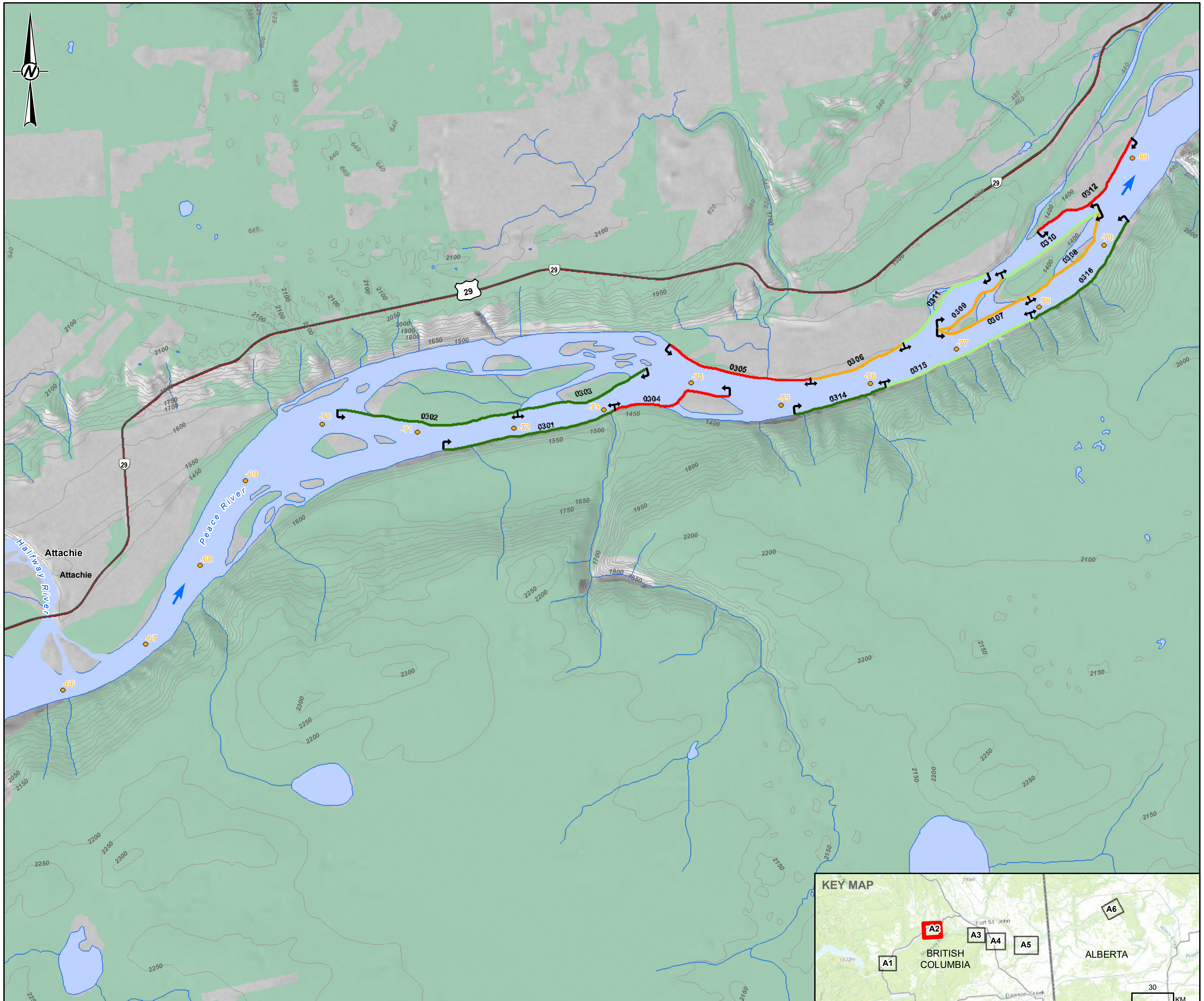
25mm



LEGEND

- RIVER KILOMETRE AS MEASURED DOWNSTREAM FROM W.A.C. BENNETT DAM
- FLOW DIRECTION
- 0110 BOAT ELECTROSHOCKING SITE

SITE HABITAT CLASSIFICATION

- UNASSIGNED HABITAT CLASSIFICATION
- A2 WITH PHYSICAL COVER
- A2 WITHOUT PHYSICAL COVER
- A3 WITH PHYSICAL COVER
- A3 WITHOUT PHYSICAL COVER
- LOCAL ROAD
- HIGHWAY

HYDROLOGY

- WATERCOURSE
- WATER

TOPOGRAPHY

- CONTOUR (ft)
- URBAN AREA
- FOREST AREA
- PROVINCIAL PARK

0 800 1,600

1:40,000 METRES

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COORDINATE SYSTEM: NAD 1983 BC ENVIRONMENT ALBERS

CLIENT
BC HYDRO

PROJECT
PEACE RIVER FISH COMMUNITY MONITORING PROGRAM (MON-2)

TITLE
SECTION 3 - PEACE RIVER LARGE FISH INDEXING SURVEY (TASK 2A)

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-03-15
DESIGNED	DF
PREPARED	AD
REVIEWED	DF
APPROVED	GA

PROJECT NO.	CONTROL	REV.	FIGURE
1400753		0	A2

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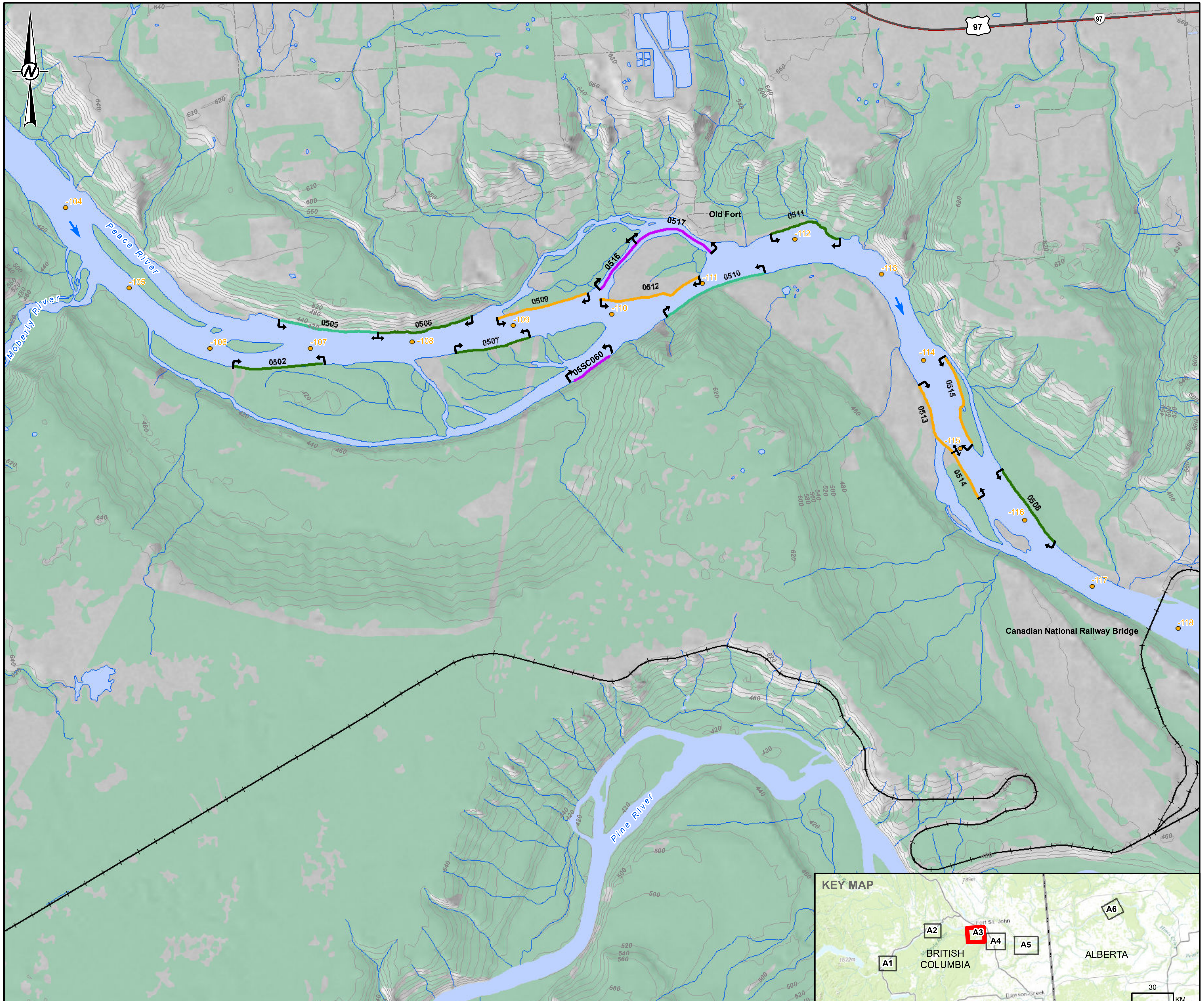

LEGEND

- RIVER KILOMETRE AS MEASURED DOWNSTREAM FROM W.A.C. BENNETT DAM
- FLOW DIRECTION
- 0110 BOAT ELECTROSHOCKING SITE

SITE HABITAT CLASSIFICATION

- UNASSIGNED HABITAT CLASSIFICATION
- A1 WITH PHYSICAL COVER
- A2 WITH PHYSICAL COVER
- A3 WITHOUT PHYSICAL COVER

TRANSPORTATION

- ARTERIAL ROAD
- LOCAL ROAD
- HIGHWAY
- RAILROAD

HYDROLOGY

- WATERCOURSE
- WATER

TOPOGRAPHY

- CONTOUR (ft)
- URBAN AREA
- FOREST AREA
- PROVINCIAL PARK

0 800 1,600
1:40,000 METRES

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COORDINATE SYSTEM: NAD 1983 BC ENVIRONMENT ALBERS

CLIENT
BC HYDRO

PROJECT
PEACE RIVER FISH COMMUNITY MONITORING PROGRAM (MON-2)

TITLE
SECTION 5 - PEACE RIVER LARGE FISH INDEXING SURVEY (TASK 2A)

CONSULTANT

Golder Associates

YYYY-MM-DD	2016-03-15
DESIGNED	DF
PREPARED	AD
REVIEWED	DF
APPROVED	GA

PROJECT NO.	CONTROL	REV.	FIGURE
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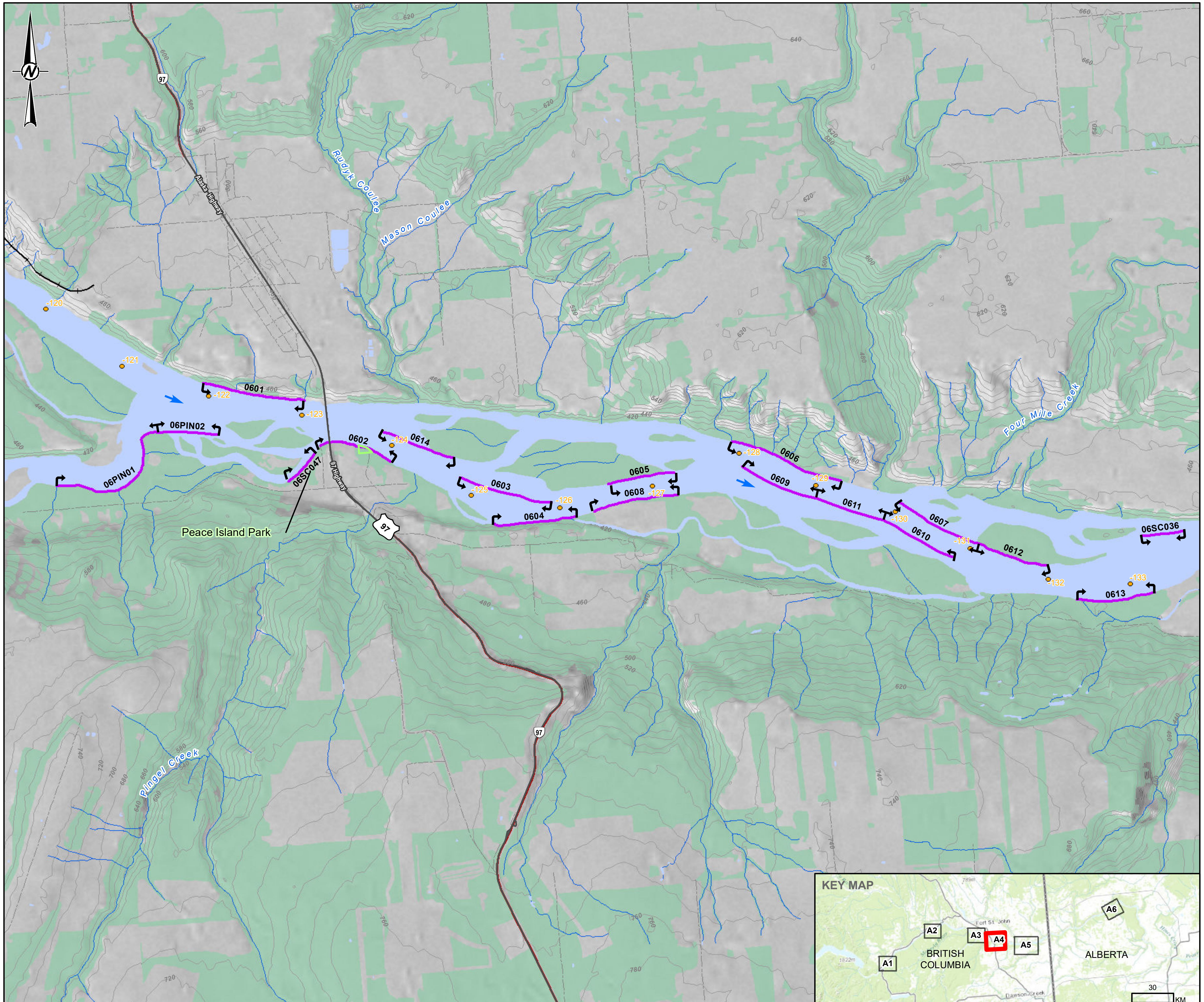

LEGEND

- RIVER KILOMETRE AS MEASURED DOWNSTREAM FROM W.A.C. BENNETT DAM
- FLOW DIRECTION
- 0110 BOAT ELECTROSHOCKING SITE

SITE HABITAT CLASSIFICATION

- UNASSIGNED HABITAT CLASSIFICATION

TRANSPORTATION

- ARTERIAL ROAD
- LOCAL ROAD
- HIGHWAY
- RAILROAD

HYDROLOGY

- WATERCOURSE
- WATER

TOPOGRAPHY

- CONTOUR (ft)
- URBAN AREA
- FOREST AREA
- PROVINCIAL PARK

0 890 1,780

1:45,000 METRES

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COORDINATE SYSTEM: NAD 1983 BC ENVIRONMENT ALBERS

CLIENT
BC HYDRO

PROJECT
PEACE RIVER FISH COMMUNITY MONITORING PROGRAM (MON-2)

TITLE
SECTION 6 - PEACE RIVER LARGE FISH INDEXING SURVEY (TASK 2A)

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-03-15
DESIGNED	DF
PREPARED	AD
REVIEWED	DF
APPROVED	GA

PROJECT NO.	CONTROL	REV.	FIGURE
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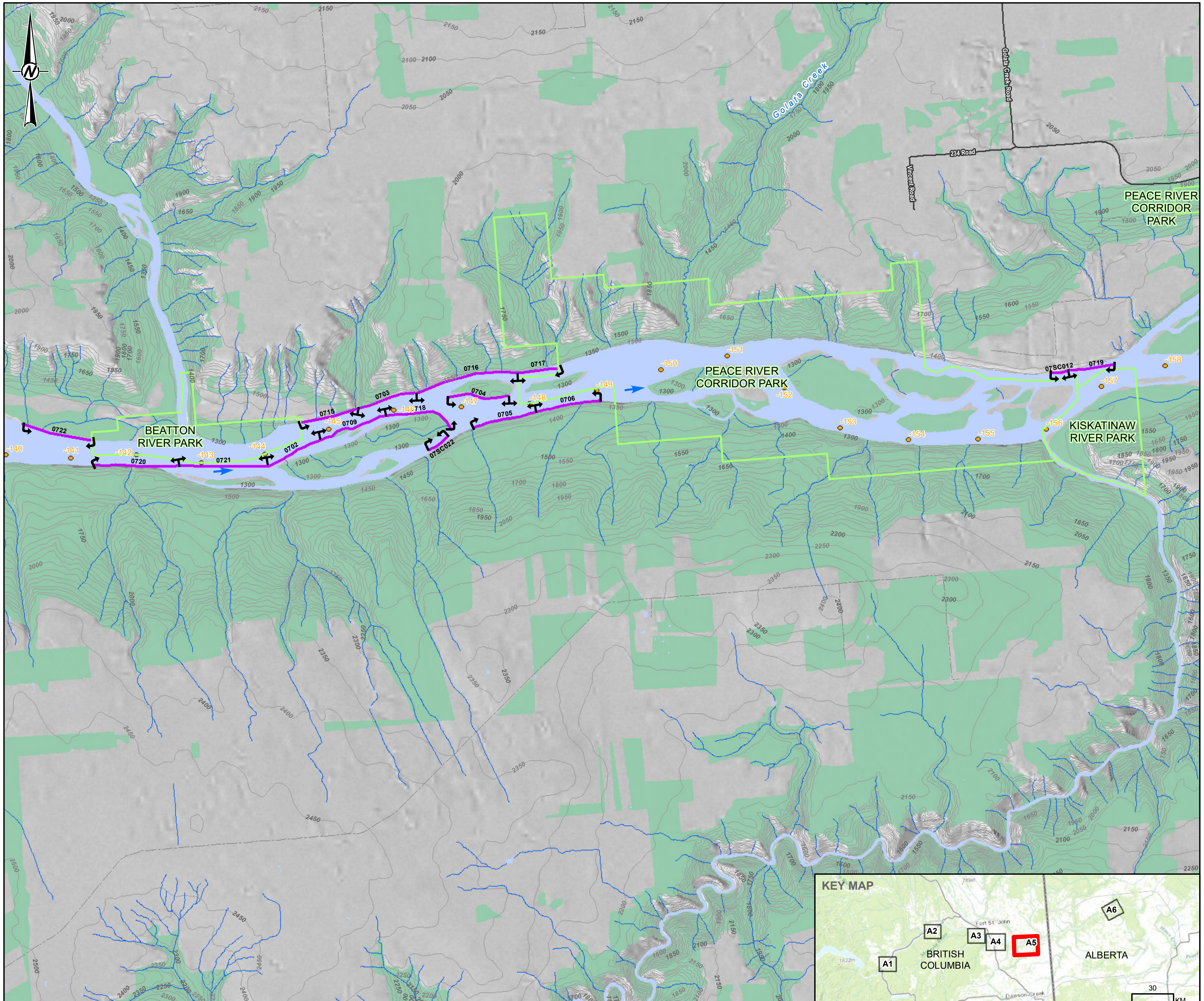

LEGEND

- RIVER KILOMETRE AS MEASURED DOWNSTREAM FROM W.A.C. BENNETT DAM
- FLOW DIRECTION
- 0110 BOAT ELECTROSHOCKING SITE

SITE HABITAT CLASSIFICATION

- UNASSIGNED HABITAT CLASSIFICATION

TRANSPORTATION

- ARTERIAL ROAD
- LOCAL ROAD

HYDROLOGY

- WATERCOURSE
- WATER

TOPOGRAPHY

- CONTOUR (ft)
- URBAN AREA
- FOREST AREA
- PROVINCIAL PARK

0 1,100 2,200
1:60,000 METRES

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COORDINATE SYSTEM: NAD 1983 BC ENVIRONMENT ALBERS

CLIENT
BC HYDRO

PROJECT
PEACE RIVER FISH COMMUNITY MONITORING PROGRAM (MON-2)

TITLE
SECTION 7 - PEACE RIVER LARGE FISH INDEXING SURVEY (TASK 2A)

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-03-15
DESIGNED	DF
PREPARED	AD
REVIEWED	DF
APPROVED	GA

PROJECT NO.	CONTROL	REV.	FIGURE
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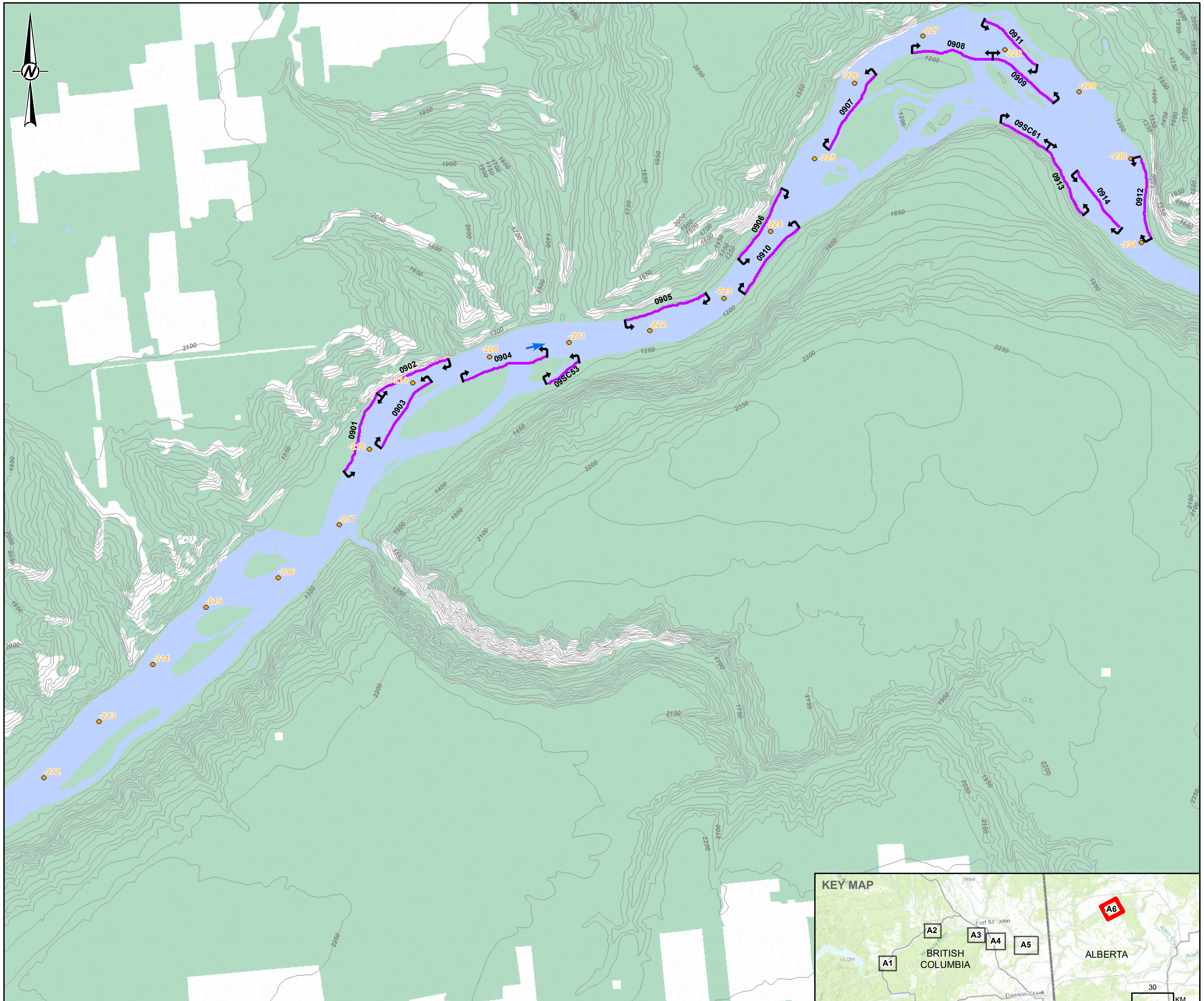

LEGEND

- RIVER KILOMETRE AS MEASURED DOWNSTREAM FROM W.A.C. BENNETT DAM
- FLOW DIRECTION
- 0110 BOAT ELECTROSHOCKING SITE

SITE HABITAT CLASSIFICATION

- UNASSIGNED HABITAT CLASSIFICATION

HYDROLOGY

- WATERCOURSE
- WATER

TOPOGRAPHY

- CONTOUR (ft)
- URBAN AREA
- FOREST AREA
- PROVINCIAL PARK

0 990 1,980

1:50,000 METRES

REFERENCES

1. TRANSPORTATION, HYDROLOGY AND TOPOGRPHY LAYERS CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
2. RAILROAD OBTAINED FROM IHS ENERGY.
3. RIVER KILOMETER MARKERS OBTAINED FROM BC HYDRO.
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COORDINATE SYSTEM: NAD 1983 BC ENVIRONMENT ALBERS

CLIENT
BC HYDRO

PROJECT
PEACE RIVER FISH COMMUNITY MONITORING PROGRAM (MON-2)

TITLE
SECTION 9 - PEACE RIVER LARGE FISH INDEXING SURVEY (TASK 2A)

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-03-15
DESIGNED	DF
PREPARED	AD
REVIEWED	DF
APPROVED	GA

PROJECT NO.	CONTROL	REV.	FIGURE
1400753		0	A6

Table A1. Location and distance from WAC Bennett Dam of Peace River boat electroshocking sites sampled in 2015.

Section	Site Name	Bank[a]	Bank Habitat Type[b]	Physical Habitat[c]	Upper Site Limit				Lower Site Limit				Site Length (m)
					Zone[d]	Easting	Northing	River Km[e]	Zone[d]	Easting	Northing	River Km[e]	
1	0101	ILDB	A3	Absent	10	566453	6207858	25.4	10	566936	6208239	25.9	600
	0102	ILDB	A3	Absent	10	566936	6208240	25.9	10	567497	6208907	26.9	975
	0103	RDB	A1	Present	10	566302	6207742	25.3	10	567401	6208075	26.2	1200
	0104	IRDB	A3	Absent	10	566460	6207754	25.4	10	566934	6207880	25.8	500
	0105	RDB	A2	Present	10	567402	6208074	26.2	10	568000	6208913	27.3	1100
	0107	LDB	A1	Present	10	568372	6210050	28.4	10	568798	6210402	28.9	550
	0108	RDB	A3	Absent	10	568605	6209966	28.5	10	569259	6210477	29.3	850
	0109	RDB	A3	Absent	10	569260	6210478	29.3	10	569850	6211235	30.3	975
	0110	LDB	A1	Present	10	568798	6210403	28.9	10	569302	6211053	29.7	650
	0111	LDB	A1	Present	10	569302	6211053	29.7	10	569825	6211869	30.7	1000
	0112	LDB	A1	Present	10	569824	6211868	30.7	10	570686	6212472	31.8	1070
	0113	RDB	A2	Present	10	569994	6211528	30.6	10	570510	6212043	31.3	750
	0114	LDB	A2	Present	10	570686	6212474	31.8	10	571342	6213121	32.8	950
	0116	RDB	A3	Absent	10	570511	6212043	31.3	10	571265	6212633	32.3	985
	0119	LDB	A1	Present	10	567516	6209096	27.0	10	568019	6209628	27.8	750
3	0301	RDB	A2	Present	10	600824	6232860	71.3	10	602606	6233198	73.1	1800
	0302	IRDB	A2	Present	10	599753	6233307	70.2	10	601597	6233232	72.0	1900
	0303	IRDB	A2	Present	10	601597	6233232	72.0	10	602930	6233597	73.6	1450
	0304	ILDB	A2	Absent	10	602583	6233193	73.1	10	603787	6233290	74.5	1350
	0305	LDB	A2	Absent	10	603204	6233827	73.8	10	604640	6233426	75.4	1550
	0306	LDB	A3	Absent	10	604655	6233435	75.4	10	605586	6233750	76.5	1000
	0307	IRDB	A3	Absent	10	605976	6233888	77.0	10	606935	6234160	78.0	950
	0308	IRDB	A3	Absent	10	606935	6234158	78.0	10	607692	6235034	79.4	1350
	0309	ILDB	A3	Absent	10	605976	6233878	77.0	10	606666	6234387	77.8	950
	0310	ILDB	A3	Present	10	606662	6234395	77.8	10	607691	6235034	79.4	1200
	0311	LDB	A3	Present	10	605585	6233743	76.5	10	606512	6234441	77.7	1250
	0312	LDB	A2	Absent	10	607058	6234840	78.6	10	608047	6235753	80.2	1170
	0314	RDB	A2	Present	10	604468	6233079	75.1	10	605400	6233321	76.1	975
	0315	RDB	A3	Present	10	605400	6233320	76.1	10	606956	6233951	77.9	1700
	0316	RDB	A2	Present	10	606956	6233951	77.9	10	607974	6234928	79.3	1475
5	0502	RDB	A2	Present	10	630016	6229305	106.2	10	630954	6229298	107.1	950
	0505	LDB	A1	Present	10	630553	6229765	106.7	10	631540	6229590	107.7	1000
	0506	LDB	A2	Present	10	631539	6229590	107.7	10	632491	6229713	108.6	1000
	0507	RDB	A2	Present	10	632339	6229356	108.4	10	633099	6229489	109.1	780
	0508	LDB	A2	Present	10	637926	6227901	115.5	10	638432	6227150	116.4	925
	0509	IRDB	A3	Absent	10	632785	6229686	108.9	10	633704	6229905	109.8	975
	0510	RDB	A1	Present	10	634530	6229634	110.5	10	635555	6230048	111.6	1130
	0511	LDB	A2	Present	10	635651	6230419	111.8	10	636334	6230361	112.4	720
	0512	IRDB	A3	Absent	10	633855	6229835	110.0	10	634872	6230026	111.0	1280
	0513	RDB	A3	Absent	10	637113	6228814	114.2	10	637433	6228125	115.0	770
	0514	ILDB	A3	Absent	10	637427	6228123	115.0	10	637735	6227647	115.5	560
	0515	IRDB	A3	Absent	10	637376	6229072	114.1	10	637591	6228192	115.0	970
	0516	ILDB	n/a	n/a	10	633861	6229939	58.2	10	634404	6230473	57.7	800
	0517	ILDB	n/a	n/a	10	634513	6230626	57.7	10	635000	6230250	56.8	700
	05SC060	RDB	n/a	n/a	10	633456	6229118	58.7	10	633909	6229258	58.3	530

[a] RDB=Right bank as viewed facing downstream; LDB=Left bank as viewed facing downstream; IRDB=Right bank of island as viewed facing downstream; ILDB=Left bank of island as viewed facing downstream.

[b] Bank Habitat Type as assigned by R.L.&L. (2001). See Appendix C, Table C2 for a description of each bank habitat type.

[c] Absent=Nearshore habitat without physical cover;
Present=Nearshore habitat with physical cover. Assigned by P&E and Gazey (2003).

[d] NAD 83.

[e] River kilometres measured downstream from WAC Bennett Dam (RiverKm 0.0).

Continued . . .

Table A1. Concluded.

Section	Site Name	Bank[a]	Bank Habitat Type[b]	Physical Habitat[c]	Upper Site Limit				Lower Site Limit				Site Length (m)
					Zone[d]	Easting	Northing	River Km[e]	Zone[d]	Easting	Northing	River Km[e]	
6	0601	LDB	n/a	n/a	10	643238	6224330	47.3	10	644400	6224099	46.1	1200
	0602	RDB	n/a	n/a	10	644567	6223590	46.0	10	645385	6223368	45.1	900
	0603	IRDB	n/a	n/a	10	646156	6223144	44.3	10	647208	6222813	43.1	1300
	0604	RDB	n/a	n/a	10	646546	6222599	43.7	10	647508	6222650	42.8	1000
	0605	IRDB	n/a	n/a	10	647888	6222979	42.4	10	648668	6223109	41.6	800
	0606	LDB	n/a	n/a	10	649302	6223371	41.1	10	650601	6222912	39.6	1400
	0607	IRDB	n/a	n/a	10	651250	6222649	39.1	10	652139	6222123	38.1	1000
	0608	RDB	n/a	n/a	10	647711	6222699	42.6	10	648681	6222855	41.6	1000
	0609	ILDB	n/a	n/a	10	649423	6223115	40.9	10	650300	6222732	39.9	1000
	0610	ILDB	n/a	n/a	10	650309	6222738	39.9	10	651089	6222427	39.1	850
	0611	ILDB	n/a	n/a	10	651070	6222442	39.2	10	651842	6221990	38.3	900
	0612	IRDB	n/a	n/a	10	652136	6222141	38.1	10	652937	6221822	37.2	850
	0613	RDB	n/a	n/a	10	653270	6221438	36.8	10	654182	6221491	35.9	900
	0614	IRDB	n/a	n/a	10	645301	6223722	45.3	10	646108	6223365	44.3	975
	06PIN01	RDB	n/a	n/a	10	641497	6223588	47.7	10	642638	6224067	47.7	1500
	06PIN02	RDB	n/a	n/a	10	642639	6224071	47.9	10	643433	6224055	47.1	1000
	06SC036	IRDB	n/a	n/a	10	654048	6222162	35.4	10	654522	6222203	35.4	500
	06SC047	RDB	n/a	n/a	10	644017	6223518	46.0	10	644510	6223546	46.0	550
7	0702	IRDB	n/a	n/a	10	664322	6219824	25.2	10	665185	6220188	24.3	950
	0703	LDB	n/a	n/a	10	665724	6220631	23.7	10	666643	6220828	22.8	950
	0704	IRDB	n/a	n/a	10	667149	6220752	22.3	10	668100	6220738	21.3	1000
	0705	RDB	n/a	n/a	10	667571	6220294	21.8	10	668547	6220497	20.9	1000
	0706	RDB	n/a	n/a	10	668544	6220498	20.9	10	669537	6220614	19.9	1000
	0709	IRDB	n/a	n/a	10	665176	6220191	24.3	10	666096	6220512	23.3	1000
	0715	LDB	n/a	n/a	10	664862	6220453	23.5	10	665722	6220631	22.7	900
	0716	LDB	n/a	n/a	10	666641	6220828	21.8	10	668284	6221090	20.3	1600
	0717	LDB	n/a	n/a	10	668284	6221090	20.3	10	668899	6221122	19.6	650
	0718	ILDB	n/a	n/a	10	666094	6220512	22.3	10	667189	6220254	21.2	1200
	0719	LDB	n/a	n/a	10	676792	6220831	11.5	10	677560	6220945	10.7	750
	0720	RDB	n/a	n/a	10	661649	6219951	26.7	10	663004	6219878	25.3	1400
	0721	RDB	n/a	n/a	10	663004	6219878	25.3	10	664320	6219824	24.1	1300
	0722	RDB	n/a	n/a	10	660554	6220625	27.8	10	661617	6220323	26.8	1100
	07SC012	LDB	n/a	n/a	10	676579	6220730	11.6	10	676792	6220831	11.4	220
	07SC022	RDB	n/a	n/a	10	666832	6219962	22.6	10	667130	6220145	22.3	360
9	0901	LDB	n/a	n/a	11	357843	6239030	-49.7	11	358391	6239968	-50.7	1100
	0902	LDB	n/a	n/a	11	358391	6239968	-50.7	11	359350	6240287	-51.7	1000
	0903	ILDB	n/a	n/a	11	358363	6239289	-50.3	11	359084	6240016	-51.3	1100
	0904	ILDB	n/a	n/a	11	359520	6240016	-51.2	11	360625	6240169	-52.3	1100
	0905	LDB	n/a	n/a	11	361692	6240512	-53.3	11	362771	6240709	-54.4	1100
	0906	RDB	n/a	n/a	11	363235	6241089	-55.5	11	363870	6241929	-56.6	1000
	0907	ILDB	n/a	n/a	11	364583	6242344	-57.5	11	365319	6243257	-58.7	1200
	0908	ILDB	n/a	n/a	11	365837	6243458	-59.5	11	366849	6243231	-60.5	1100
	0909	ILDB	n/a	n/a	11	366849	6243231	-55.7	11	367534	6242583	-56.7	950
	0910	LDB	n/a	n/a	11	363258	6240685	-59.8	11	364070	6241393	-60.7	1100
	0911	IRDB	n/a	n/a	11	366799	6243728	-59.7	11	367379	6243081	-60.7	1000
	0912	LDB	n/a	n/a	11	368560	6241724	-62.0	11	368549	6240689	-63.0	1100
	0913	RDB	n/a	n/a	11	367347	6241966	-61.0	11	367721	6241096	-62.0	1000
	0914	IRDB	n/a	n/a	11	367734	6241649	-61.1	11	368179	6240875	-62.0	950
	09SC53	RDB	n/a	n/a	11	360795	6239970	-53.0	11	361029	6240059	-53.0	260
	09SC61	RDB	n/a	n/a	11	366861	6242408	-60.5	11	367347	6241966	-61.0	675

[a] RDB=Right bank as viewed facing downstream; LDB=Left bank as viewed facing downstream; IRDB=Right bank of island as viewed facing downstream; ILDB=Left bank of island as viewed facing downstream.

[b] Bank Habitat Type as assigned by R.L.&L. (2001). See Appendix C, Table C2 for a description of each bank habitat type.

[c] Absent=Nearshore habitat without physical cover;
Present=Nearshore habitat with physical cover. Assigned by P&E and Gazey (2003).

[d] NAD 83.

[e] River kilometres measured downstream from WAC Bennett Dam (RiverKm 0.0).

APPENDIX B

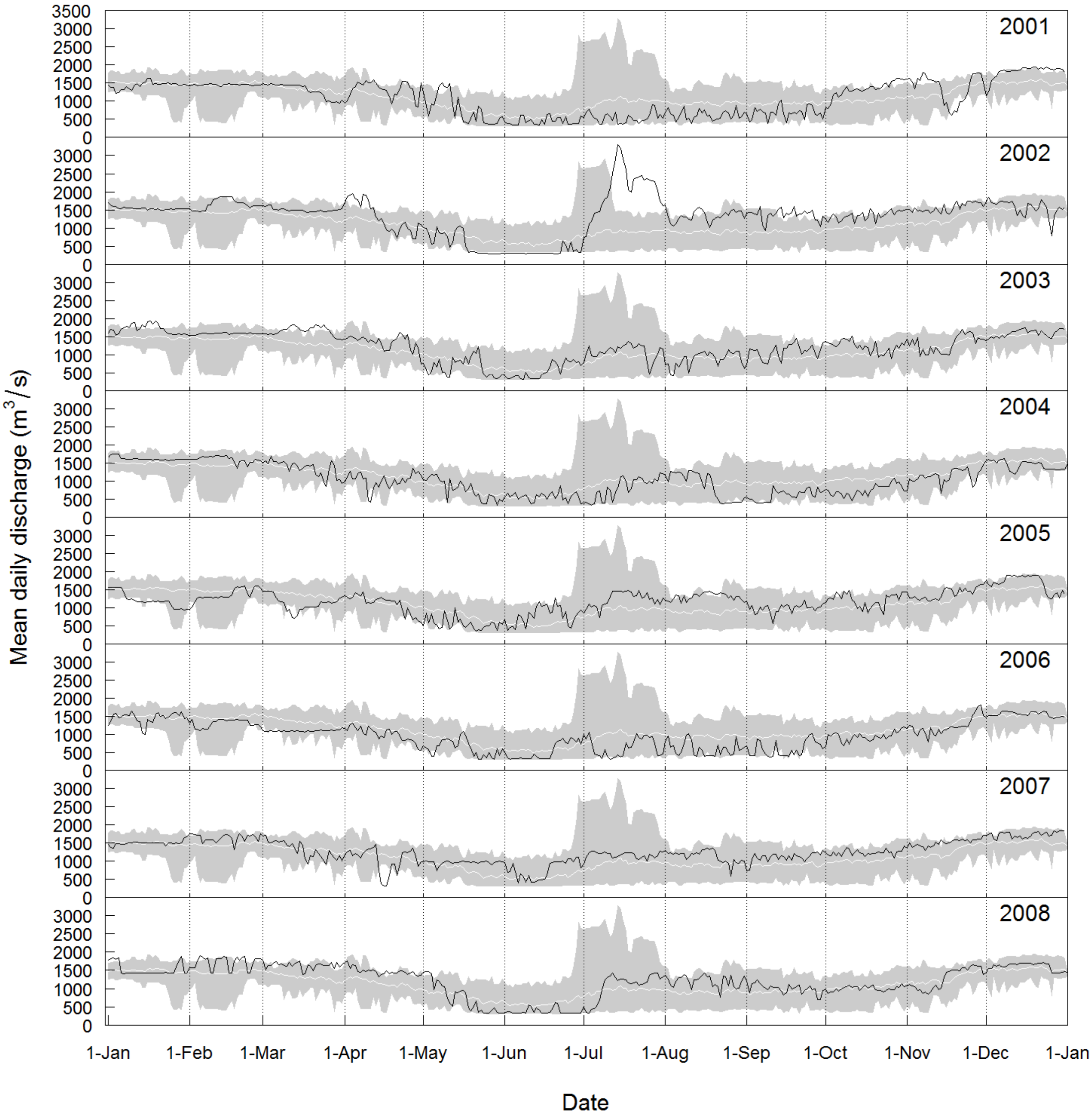
Historical Datasets

Table B1 Summary of historical datasets by sample section as delineated in Mainstream (2012). The summary is limited to studies that used similar capture techniques (i.e., boat electroshocking) during similar times of the year (i.e., August to October) when compared to the current program.

Year	Section									
	1a	1	2	3	4	5	6	7	8	9
2002		P&E and Gazey 2003	P&E and Gazey 2003	P&E and Gazey 2003	P&E and Gazey 2003					
2003		Mainstream and Gazey 2004	Mainstream and Gazey 2004	Mainstream and Gazey 2004	Mainstream and Gazey 2004					
2004		Mainstream and Gazey 2005		Mainstream and Gazey 2005		Mainstream and Gazey 2005				
2005		Mainstream and Gazey 2006		Mainstream and Gazey 2006		Mainstream and Gazey 2006				
2006		Mainstream and Gazey 2007	Mainstream and Gazey 2007	Mainstream and Gazey 2007						
2007		Mainstream and Gazey 2008		Mainstream and Gazey 2008		Mainstream and Gazey 2008				
2008		Mainstream and Gazey 2009		Mainstream and Gazey 2009		Mainstream and Gazey 2009				
2009	Mainstream 2010	Mainstream and Gazey 2010; Mainstream 2010	Mainstream 2010	Mainstream and Gazey 2010; Mainstream 2010		Mainstream and Gazey 2010; Mainstream 2010	Mainstream 2010	Mainstream 2010		
2010	Mainstream 2011	Mainstream and Gazey 2011; Mainstream 2011	Mainstream 2011	Mainstream and Gazey 2011; Mainstream 2011		Mainstream and Gazey 2011; Mainstream 2011	Mainstream 2011	Mainstream 2011	Mainstream 2011	
2011	Mainstream 2013a	Mainstream and Gazey 2012; Mainstream 2013a	Mainstream 2013a	Mainstream and Gazey 2012; Mainstream 2013a		Mainstream and Gazey 2012; Mainstream 2013a	Mainstream 2013a	Mainstream 2013a	Mainstream 2013a	Mainstream 2013a
2012		Mainstream and Gazey 2013		Mainstream and Gazey 2013		Mainstream and Gazey 2013				
2013		Mainstream and Gazey 2014		Mainstream and Gazey 2014		Mainstream and Gazey 2014				
2014		Golder and Gazey 2015		Golder and Gazey 2015		Golder and Gazey 2015				
2015		Current Study Year		Current Study Year		Current Study Year	Current Study Year	Current Study Year		Current Study Year

APPENDIX C

Discharge and Temperature



Continued...

Figure C1: Mean daily discharge (m³/s) for the Peace River at Peace Canyon Dam (PCD; black line), 2001 to 2015. The shaded area represents minimum and maximum mean daily discharge recorded at PCD during other study years between 2001 and 2015. The white line represents average mean daily discharge over the same time period.

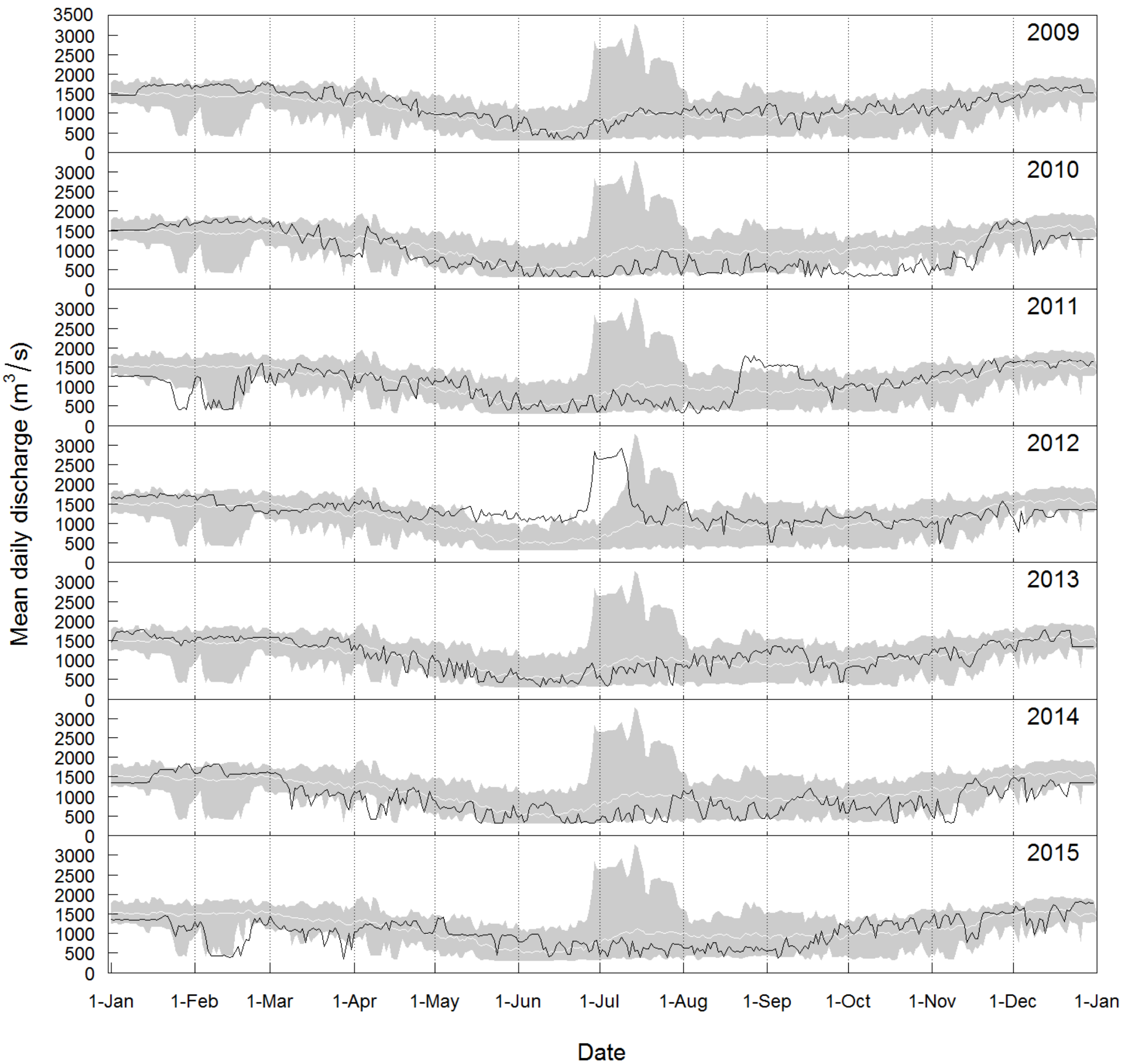


Figure C1: Concluded.

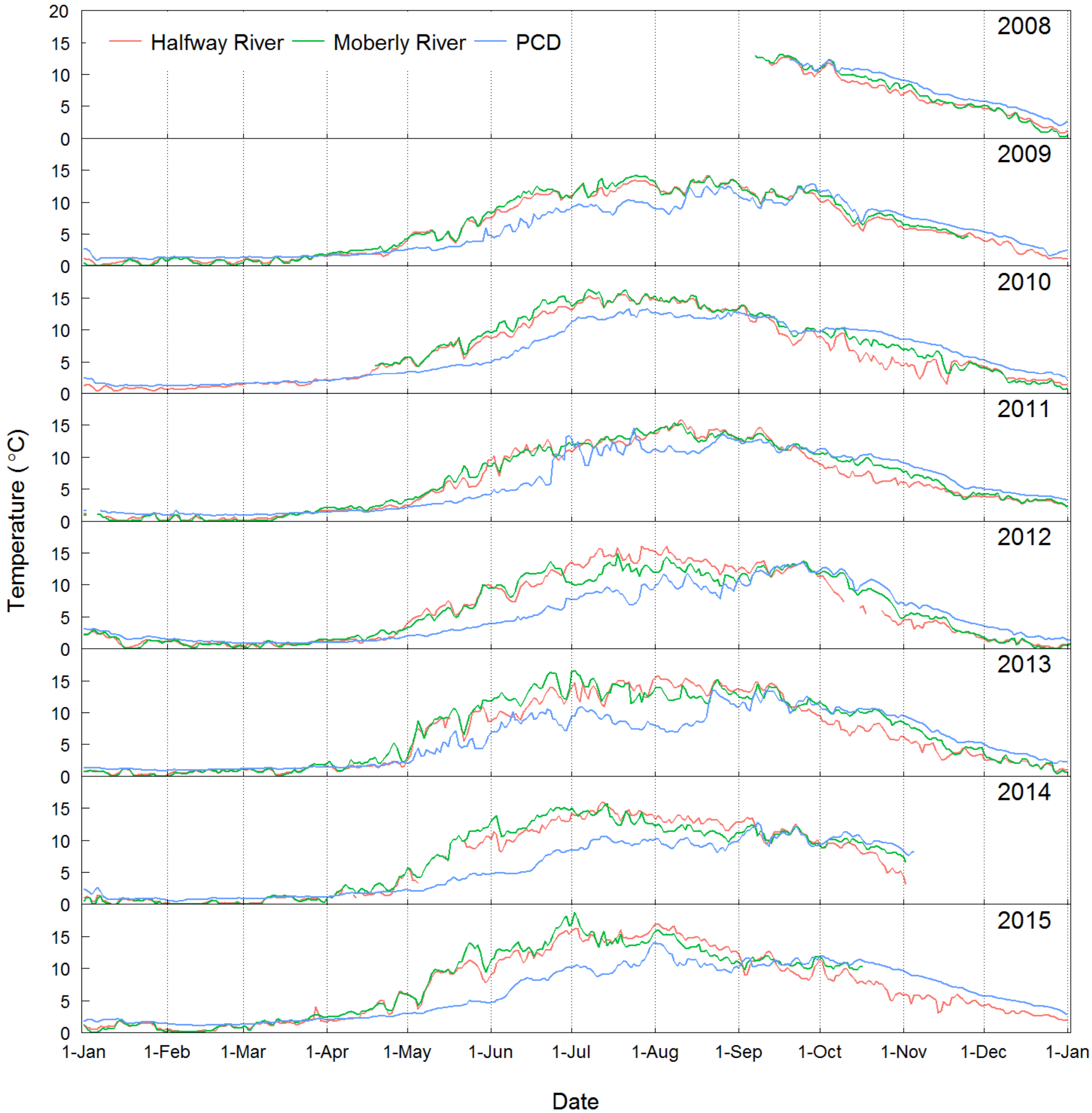


Figure C2: Mean daily water temperatures (°C) for the Peace River downstream of Peace Canyon Dam (PCD; blue line), downstream of the Halfway River confluence (red line) and downstream of the Moberly River confluence (green line), 2008 to 2015. Data were collected under GMSWORKS-2 (DES 2014).

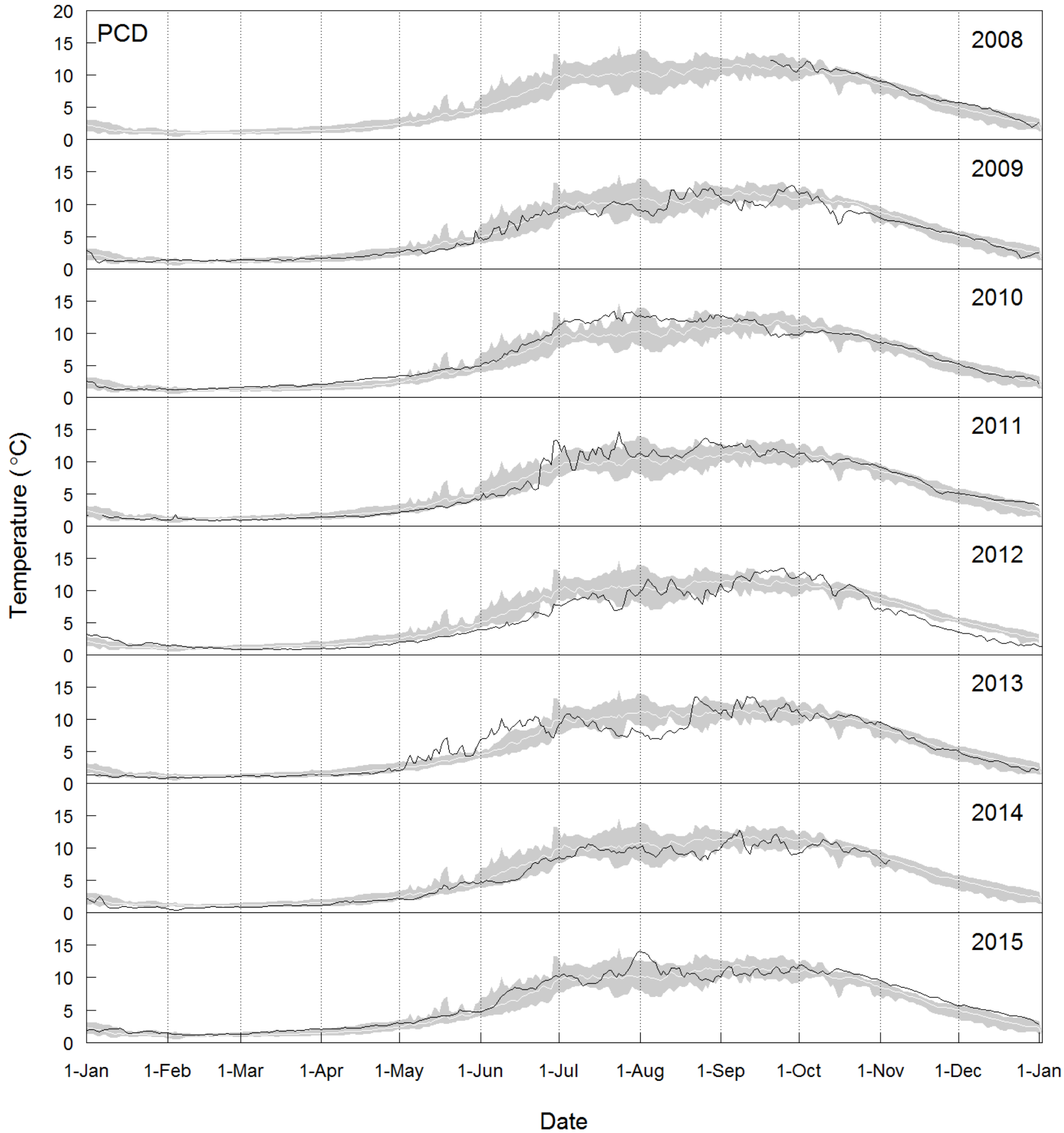


Figure C3: Mean daily water temperature (°C) for the Peace River at Peace Canyon Dam (PCD; black line), 2008 to 2015. The shaded area represents minimum and maximum water temperatures recorded at PCD during other study years between 2008 and 2015. The white line represents average mean daily water temperatures over the same time period. Data were collected under GMSWORKS-2 (DES 2014).

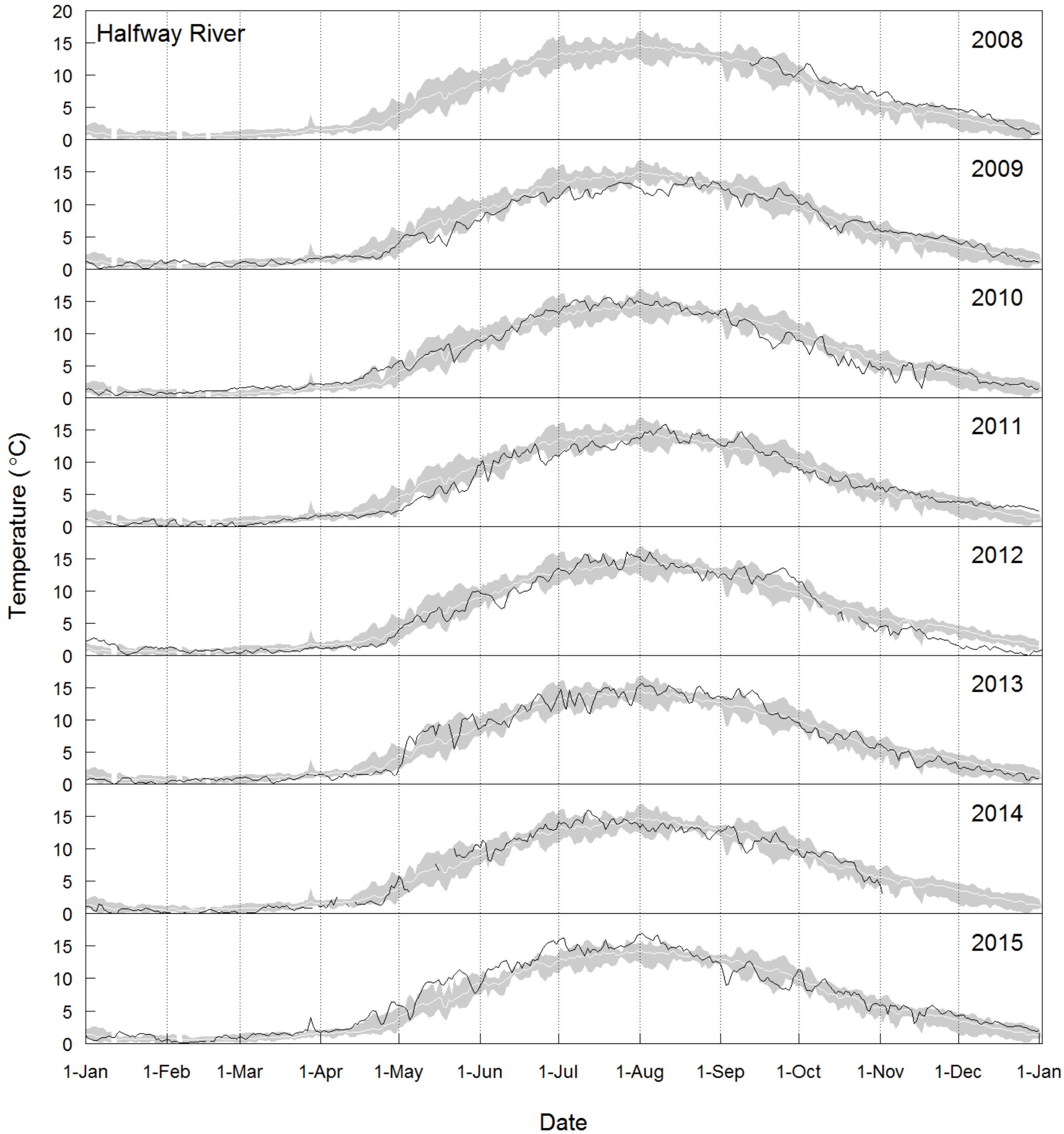


Figure C4: Mean daily water temperature (°C) for the Peace River downstream of the Halfway River confluence (black line), 2008 to 2015. The shaded area represents minimum and maximum water temperatures recorded at the site during other study years between 2008 and 2015. The white line represents average mean daily water temperatures over the same time period. Data were collected under GMSWORKS-2 (DES 2014).

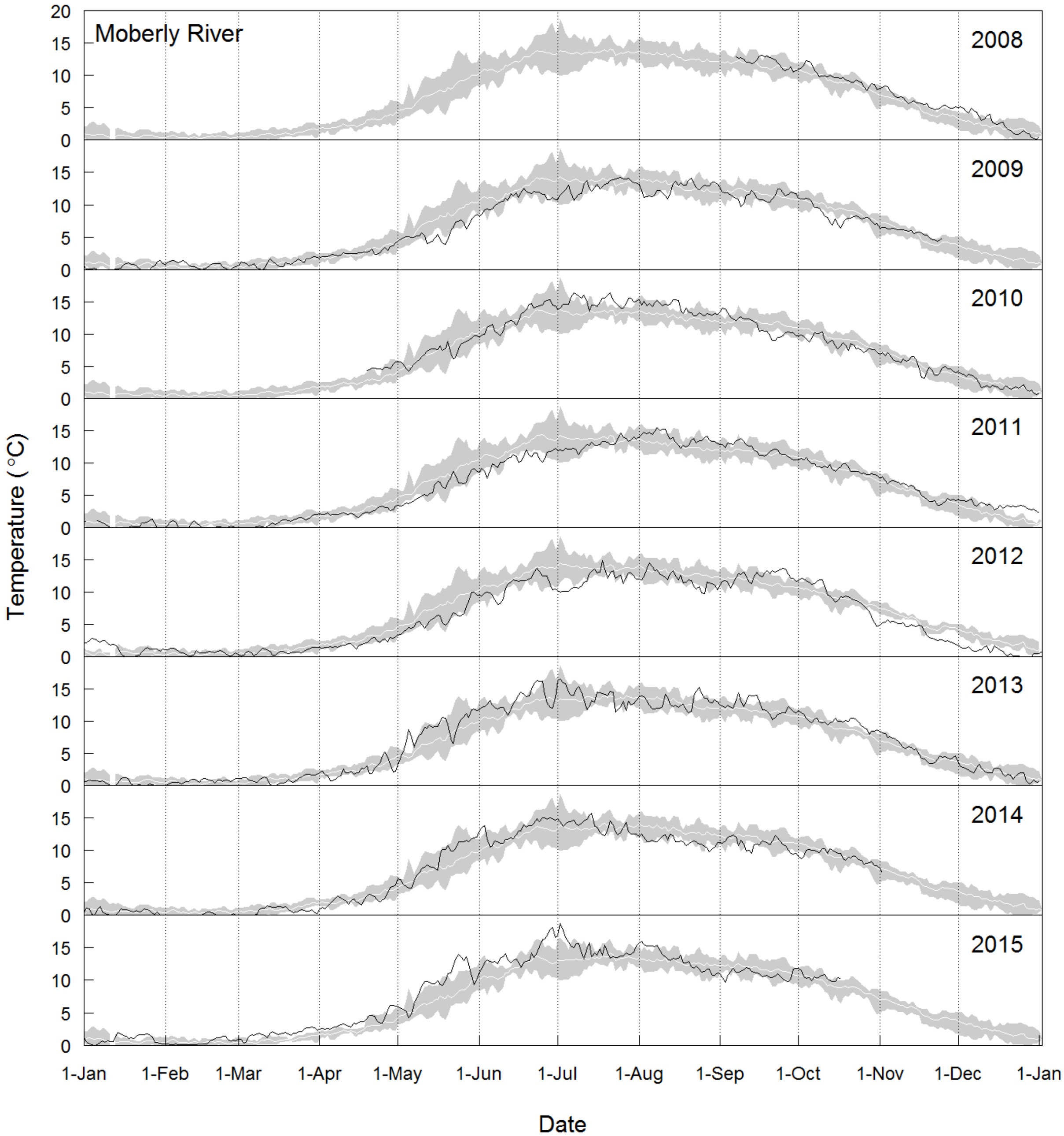


Figure C5: Mean daily water temperature (°C) for the Peace River downstream of the Moberly River confluence (black line), 2008 to 2015. The shaded area represents minimum and maximum water temperatures recorded at the site during other study years between 2008 and 2015. The white line represents average mean daily water temperatures over the same time period. Data were collected under GMSWORKS-2 (DES 2014).

APPENDIX D

Habitat Data

Table D1 Lengths of boat electroshocking sites by habitat type in the Peace River, 2015. Bank habitat data were not available for Sections 6, 7, or 9.

Section	Site[a]	Length (m) of Site							Total Length (m)
		Physical Cover Present[b]				Physical Cover Absent[b]			
		A1[c]	A2[c]	A3[c]	Total	A2[c]	A3[c]	Total	
1	0101				0		600	600	**600**
	0102				0		975	975	**975**
	0103	1200			1200			0	**1200**
	0104				0		500	500	**500**
	0105		1100		1100			0	**1100**
	0107	550			550			0	**550**
	0108				0		850	850	**850**
	0109				0		975	975	**975**
	0110	650			650			0	**650**
	0111	1000			1000			0	**1000**
	0112	1070			1070			0	**1070**
	0113		750		750			0	**750**
	0114		950		950			0	**950**
	0116				0		985	985	**985**
	0119	750			750			0	**750**
Section 1 Total		**5220**	**2800**	**0**	**8020**	**0**	**4885**	**4885**	**12905**
3	0301		1800		1800			0	**1800**
	0302		1900		1900			0	**1900**
	0303		1450		1450			0	**1450**
	0304				0	1350		1350	**1350**
	0305				0	1550		1550	**1550**
	0306				0		1000	1000	**1000**
	0307				0		950	950	**950**
	0308				0		1350	1350	**1350**
	0309				0		950	950	**950**
	0310			1200	1200			0	**1200**
	0311			1250	1250			0	**1250**
	0312				0	1170		1170	**1170**
	0314		975		975			0	**975**
	0315			1700	1700			0	**1700**
	0316		1475		1475			0	**1475**
Section 3 Total		**0**	**7600**	**4150**	**11750**	**4070**	**4250**	**8320**	**20070**
5	0502		950		950			0	**950**
	0505	1000			1000			0	**1000**
	0506		1000		1000			0	**1000**
	0507		780		780			0	**780**
	0508		925		925			0	**925**
	0509				0		975	975	**975**
	0510	1130			1130			0	**1130**
	0511		720		720			0	**720**
	0512				0		1280	1280	**1280**
	0513				0		770	770	**770**
	0514				0		560	560	**560**
	0515				0		970	970	**970**
	0516				0	800		800	**800**
	0517				0	700		700	**700**
	05SC060	530			530			0	**530**
Section 5 Total		**2660**	**4375**	**0**	**7035**	**1500**	**4555**	**6055**	**13090**
Grand Total		**7880**	**14775**	**4150**	**26805**	**5570**	**13690**	**19260**	**46065**

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Nearshore habitat with physical cover as assigned by P&E and Gazey (2003).

[c] Nearshore habitat with no physical cover as assigned by P&E and Gazey (2003).

[d] Bank Habitat Type as assigned by R.L.&L. (2001). See Appendix D, Table D2 for a description of each bank habitat type.

Table D2 Descriptions of categories used in the Bank Habitat Types Classification System as summarized from R.L.&L. (2001).

Category	Code	Description
Armoured/Stable	A1	Banks generally stable and at repose with cobble/small boulder/gravel substrates predominating; uniform shoreline configuration with few/minor bank irregularities; velocities adjacent to bank generally low-moderate, instream cover limited to substrate roughness (i.e., cobble/small boulder interstices).
	A2	Banks generally stable and at repose with cobble/small boulder and large boulder substrates predominating; irregular shoreline configuration generally consisting of a series of armoured cobble/boulder outcrops that produce Backwater habitats; velocities adjacent to bank generally moderate with low velocities provided in BW habitats: instream cover provided by BW areas and substrate roughness; overhead cover provided by depth and woody debris; occasionally associated with C2, E4, and E5 banks.
	A3	Similar to A2 in terms of bank configuration and composition although generally with higher composition of large boulders/bedrock fractures; very irregular shoreline produced by large boulders and bed rock outcrops; velocities adjacent to bank generally moderate to high; instream cover provided by numerous small BW areas, eddy pools behind submerged boulders, and substrate interstices; overhead cover provided by depth; exhibits greater depths offshore than found in A1 or A2 banks; often associated with C1 banks.
	A4	Gently sloping banks with predominantly small and large boulders (boulder garden) often embedded in finer materials; shallow depths offshore, generally exhibits moderate to high velocities; instream cover provided by “pocket eddies” behind boulders; overhead cover provided by surface turbulence.
	A5	Bedrock banks, generally steep in profile resulting in deep water immediately offshore; often with large bedrock fractures in channel that provide instream cover; usually associated with moderate to high current velocities; overhead cover provided by depth.
	A6	Man-made banks usually armoured with large boulder or concrete rip-rap; depths offshore generally deep and usually found in areas with moderate to high velocities; instream cover provided by rip-rap interstices; overhead cover provided by depth and turbulence.
Depositional	D1	Low relief, gently sloping bank type with shallow water depths offshore; substrate consists predominantly of fines (i.e., sand/silt); low current velocities offshore; instream cover generally absent or, if present, consisting of shallow depressions produced by dune formation (i.e., in sand substrates) or embedded cobble/boulders and vegetative debris; this bank type was generally associated with bar formations or large backwater areas.
	D2	Low relief, gently sloping bank type with shallow water depths offshore; substrate consists of coarse materials (i.e., gravels/cobbles); low-moderate current velocities offshore; areas with higher velocities usually producing riffle areas; overhead cover provided by surface turbulence in riffle areas; instream cover provided by substrate roughness; often associated with bar formations and shoal habitat.
	D3	Similar to D2 but with coarser substrates (i.e., large cobble/small boulder) more dominant; boulders often embedded in cobble/gravel matrix; generally found in areas with higher average flow velocities than D1 or D2 banks; instream cover abundantly available in form of substrate roughness; overhead cover provided by surface turbulence; often associated with fast riffle transitional bank type that exhibits characteristics of both Armoured and Depositional bank types.
SPECIAL HABITAT FEATURES		
BACKWATER POOLS	-	These areas represent discrete areas along the channel margin where backwater irregularities produce localized areas of counter-current flows or areas with reduced flow velocities relative to the mainstem; can be quite variable in size and are often an integral component of Armoured and erosional bank types. The availability and suitability of Backwater pools are determined by flow level. To warrant separate identification as a discrete unit, must be a minimum of 10 m in length; widths highly variable depending on bank irregularity that produces the pool. Three classes are identified:
	BW-P1	Highest quality pool habitat type for adult and subadult cohorts for feeding/holding functions. Maximum depth exceeding 2.5 m, average depth 2.0 m or greater; high availability of instream cover types (e.g., submerged boulders, bedrock fractures, depth, woody debris); usually with Moderate to High countercurrent flows that provide overhead cover in the form of surface turbulence.
	BW-P2	Moderate quality pool type for adult and subadult cohorts for feeding/holding; also provides moderate quality habitat for smaller juveniles for rearing. Maximum depths between 2.0 to 2.5 m, average depths generally in order of 1.5 m. Moderate availability of instream cover types; usually with Low to Moderate countercurrent flow velocities that provide limited overhead cover.

Continued.

Table D2 Concluded.

	BW-P3	Low quality pool type for adult/subadult classes; moderate-high quality habitat for y-o-y and small juveniles for rearing. Maximum depth <1.0 m. Low availability of instream cover types; usually with Low-Nil current velocities.
EDDY POOL	EDDY	Represent large (<30 m in diameter) areas of counter current flows with depths generally >5 m; produced by major bank irregularities and are available at all flow stages although current velocities within eddy are dependent on flow levels. High quality areas for adult and subadult life stages. High availability of instream cover.
SNYE	SN	A side channel area that is separated from the mainstem at the upstream end but retains a connection at the lower end. SN habitats generally present only at lower flow stages since area is a flowing side channel at higher flows: characterized by low-nil velocity, variable depths (generally <3 m) and predominantly depositional substrates (i.e., sand/silt/gravel); often supports growths of aquatic vegetation; very important areas for rearing and feeding.

<u>Velocity Classifications:</u>

Low: <0.5 m/s
Moderate: 0.5 to 1.0 m/s
High: >1.0 m/s

Table D3 Summary of habitat variables recorded at boat electroshocking sites in the Peace River, 25 August to 07 October 2015.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
1	119	1	20	9.80	190	Clear	Low	Medium	Medium	High	3.20	5	0	5	0	0	80	10	0
1	119	2	8	10.40	200	Overcast	Low	Medium	Medium	High	3.00	5	0	10	0	0	75	10	0
1	119	3	18	10.80	170	Partly cloudy	Transitional	High	Medium	High	1.60	5	0	10	0	0	65	20	0
1	119	4	15	11.50	190	Partly cloudy	Transitional	High	Medium	High	2.20	85	0	0	0	0	0	15	0
1	119	5	3	10.30	190	Overcast	Transitional	Medium	Medium	High	1.90	10	0	0	0	0	85	5	0
1	119	6	12	11.80	190	Partly cloudy	High	High	High	High	1.50	50	0	0	0	0	0	50	0
1	116	1	19	10.50	190	Mostly cloudy	Low	Medium	Medium	High	3.20	5	0	0	0	0	90	5	0
1	116	2	8	10.70	200	Overcast	Low	High	Medium	High	2.20	20	0	0	0	0	80	0	0
1	116	3	20	11.10	190	Partly cloudy	Transitional	High	Medium	High	1.70	14	0	0	0	0	85	1	0
1	116	4	15	10.90	220	Mostly cloudy	Transitional	High	Medium	High	1.35	5	0	0	0	0	90	5	0
1	116	5	5	10.50	190	Overcast	Transitional	High	Medium	High	1.90	10	0	0	0	0	90	0	0
1	116	6	15	11.80	190	Partly cloudy	Transitional	High	Medium	High	1.50	40	0	0	0	0	60	0	0
1	114	1	16	10.00	190	Mostly cloudy	Low	Medium	Medium	High	3.20	10	0	0	0	0	85	5	0
1	114	2	8	10.70	200	Mostly cloudy	Low	High	Medium	High	2.20	10	0	0	0	0	80	10	0
1	114	3	19	10.80	190	Partly cloudy	Transitional	High	Medium	High	1.70	10	0	0	0	0	90	0	0
1	114	4	7	10.80	220	Clear	Transitional	High	Medium	High	1.35	20	0	0	0	0	70	10	0
1	114	5	5	10.50	190	Overcast	Transitional	High	Medium	High	1.90	10	0	0	0	0	90	0	0
1	114	6	12	11.70	190	Partly cloudy	Transitional	High	Medium	High	1.50	10	0	1	0	0	89	0	0
1	113	1	21	10.70	190	Clear	Low	Medium	Medium	High	3.20	15	0	0	0	0	85	0	0
1	113	2	7	10.70	200	Overcast	Low	High	Medium	High	2.20	10	0	5	0	0	65	20	0
1	113	3	20	11.20	190	Partly cloudy	Transitional	High	Medium	High	1.70	15	0	0	0	0	85	0	0
1	113	4	15	10.90	220	Partly cloudy	Transitional	High	Medium	High	1.35	5	0	0	0	0	90	5	0
1	113	5	5	10.50	190	Overcast	Transitional	High	Medium	High	1.90	10	0	0	0	0	90	0	0
1	113	6	14	11.60	190	Partly cloudy	Transitional	High	Medium	High	1.50	10	0	0	0	0	90	0	0
1	112	1	21	10.70	190	Clear	Low	Medium	Medium	High	3.20	10	0	0	0	0	85	5	0
1	112	2	9	10.70	200	Overcast	Low	High	Medium	High	2.20	20	0	0	0	0	70	10	0
1	112	3	20	11.20	190	Partly cloudy	Transitional	High	Medium	High	1.70	10	0	0	0	0	90	0	0
1	112	4	15	11.40	220	Partly cloudy	Transitional	High	Medium	High	1.35	5	0	0	0	0	90	5	0
1	112	5	5	10.50	190	Overcast	Transitional	High	Medium	High	1.90	5	0	0	0	0	90	5	0
1	112	6	12	11.60	190	Clear	Transitional	High	Medium	High	1.50	20	0	1	0	0	79	0	0
1	111	1	21	10.70	190	Clear	Low	Medium	Low	High	3.20	15	0	0	0	0	80	5	0
1	111	2	7	10.70	200	Overcast	Low	High	Low	High	2.20	10	0	5	0	0	65	20	0
1	111	3	17	10.60	190	Partly cloudy	Transitional	High	Medium	High	1.70	10	0	0	0	0	90	0	0
1	111	4	12	11.20	220	Partly cloudy	Transitional	High	Medium	High	1.35	10	0	0	0	0	70	20	0
1	111	5	5	10.50	190	Overcast	Transitional	Medium	Medium	High	1.90	10	0	5	0	0	80	5	0
1	111	6	15	12.00	190	Partly cloudy	High	High	Medium	High	1.50	50	0	0	0	0	0	50	0
1	110	1	21	10.30	190	Clear	Low	Medium	Medium	High	3.20	5	0	0	0	0	80	15	0
1	110	2	7	10.90	200	Overcast	Low	High	Medium	High	2.20	10	0	5	0	0	75	10	0
1	110	3	16	10.30	190	Partly cloudy	Transitional	High	Medium	High	1.70	15	0	0	0	0	65	20	0
1	110	4	15	11.30	190	Partly cloudy	Transitional	High	Medium	High	2.20	80	0	0	0	0	0	20	0
1	110	5	5	10.60	190	Overcast	Transitional	High	Medium	High	1.90	10	0	0	0	0	80	10	0
1	110	6	14	11.90	190	Partly cloudy	High	High	High	High	1.50	50	0	0	0	0	25	25	0
1	109	1	20	9.80	190	Clear	Low	Medium	Medium	High	3.20	5	0	5	0	0	85	5	0
1	109	2	6	10.90	200	Overcast	Low	High	Medium	High	2.20	20	0	0	0	0	80	0	0
1	109	3	16	10.60	190	Partly cloudy	Transitional	High	Medium	High	1.70	5	0	0	0	0	90	5	0
1	109	4	0	10.00	220	Partly cloudy	Transitional	High	Medium	High	1.35	20	0	0	0	0	80	0	0
1	109	5	5	10.50	190	Overcast	Transitional	High	Medium	High	1.90	10	0	0	0	0	90	0	0

[a] See Appendix A, Figures A1 to A3 for sample site locations.
[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.
[c] Field Observation.
[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.
[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
1	109	6	15	12.00	150	Partly cloudy	High	High	Medium	High	1.50	10	0	0	0	10	80	0	0
1	108	1	20	9.80	190	Clear	Low	High	Low	High	3.20	5	0	0	0	0	95	0	0
1	108	2	6	10.90	200	Overcast	Low	High	Low	High	2.20	20	0	0	0	0	80	0	0
1	108	3	17	10.70	170	Partly cloudy	Transitional	High	Medium	High	1.60	10	0	0	0	0	90	0	0
1	108	4	2	9.90	220	Partly cloudy	Transitional	High	Medium	High	1.35	20	0	0	0	0	80	0	0
1	108	5	5	10.50	190	Overcast	Transitional	High	Medium	High	1.90	10	0	0	0	0	90	0	0
1	108	6	14	12.30	190	Partly cloudy	High	High	Medium	High	1.50	10	0	0	0	40	50	0	0
1	107	1	20	9.80	190	Clear	Low	Medium	Medium	High	3.20	5	0	5	0	0	70	20	0
1	107	2	8	10.70	200	Overcast	Low	Medium	Medium	High	3.00	5	0	0	0	0	90	5	0
1	107	3	16	10.30	190	Partly cloudy	Transitional	High	Medium	High	1.70	10	0	0	0	0	70	20	0
1	107	4	15	11.30	190	Partly cloudy	Transitional	High	Medium	High	2.20	80	0	0	0	0	0	20	0
1	107	5	5	10.60	190	Overcast	Transitional	High	Medium	High	1.90	10	0	0	0	0	90	0	0
1	107	6	14	11.90	190	Partly cloudy	High	High	High	High	1.50	20	0	0	0	0	0	80	0
1	105	1	20	9.90	190	Clear	Low	High	Medium	High	3.00	30	0	15	0	0	35	20	0
1	105	2	6	9.80	200	Overcast	Low	Medium	High	High	3.00	20	0	10	0	0	70	0	0
1	105	3	21	10.70	170	Partly cloudy	High	High	High	High	1.60	10	0	20	0	0	65	5	0
1	105	4	11	11.20	190	Partly cloudy	Transitional	Medium	High	Medium	2.20	15	0	15	0	0	70	0	0
1	105	5	5	10.60	190	Overcast	Transitional	High	Medium	High	1.90	10	0	10	0	0	80	0	0
1	105	6	10	11.60	160	Partly cloudy	High	High	High	High	1.50	10	10	10	0	0	70	0	0
1	104	1	19	9.90	190	Clear	Low	High	Medium	High	3.00	15	0	5	0	0	65	15	0
1	104	2	6	10.30	200	Overcast	Low	Medium	Medium	High	3.00	10	0	10	0	0	80	0	0
1	104	3	20	10.70	170	Partly cloudy	High	High	Medium	High	1.60	20	0	0	0	0	80	0	0
1	104	4	10	11.20	190	Partly cloudy	Transitional	High	Medium	High	2.20	10	0	0	0	0	90	0	0
1	104	5	5	10.50	190	Overcast	Transitional	High	Medium	High	1.90	15	0	0	0	0	85	0	0
1	104	6	10	11.60	190	Partly cloudy	High	High	High	High	1.50	0	0	0	60	0	40	0	0
1	103	1	16	9.70	190	Partly cloudy	Low	High	Medium	High	3.00	10	0	5	0	0	80	5	0
1	103	2	6	10.30	200	Overcast	Low	Medium	Low	High	3.00	20	0	0	0	0	80	0	0
1	103	3	20	10.70	170	Partly cloudy	High	High	High	High	1.60	10	1	14	0	0	50	25	0
1	103	4	8	11.20	190	Partly cloudy	Transitional	High	High	High	2.20	10	1	5	0	0	84	0	0
1	103	5	5	10.50	190	Overcast	Transitional	Medium	High	High	1.90	10	1	10	0	0	79	0	0
1	103	6	10	11.60	190	Partly cloudy	High	High	High	High	1.50	10	10	0	0	0	40	40	0
1	102	1	19	9.50	190	Clear	Low	Medium	Medium	High	3.20	15	0	15	0	0	70	0	0
1	102	2	6	10.60	200	Overcast	Low	Medium	Medium	High	3.00	20	0	10	0	0	65	5	0
1	102	3	21	10.70	170	Partly cloudy	Transitional	High	High	High	1.60	20	0	25	0	0	50	5	0
1	102	4	13	11.30	190	Partly cloudy	Transitional	Medium	High	High	2.20	10	0	10	0	0	80	0	0
1	102	5	2	10.50	190	Overcast	Transitional	Medium	High	High	1.90	25	0	25	0	0	50	0	0
1	102	6	10	12.20	190	Partly cloudy	High	High	High	High	1.50	10	0	0	0	30	60	0	0
1	101	1	16	9.50	190	Clear	Low	High	Medium	High	3.20	20	0	0	0	0	80	0	0
1	101	2	6	10.40	200	Overcast	Low	Medium	High	High	3.00	20	0	10	0	0	70	0	0
1	101	3	21	10.70	170	Partly cloudy	Transitional	High	High	High	1.60	20	0	30	0	0	50	0	0
1	101	4	13	11.20	190	Partly cloudy	Transitional	Medium	High	High	2.20	20	0	10	0	0	70	0	0
1	101	5	2	10.50	190	Overcast	Transitional	Medium	High	High	1.90	20	0	20	0	0	50	10	0
1	101	6	10	12.00	190	Partly cloudy	High	High	High	High	1.50	10	0	0	0	40	50	0	0
3	316	1	20	9.60	200	Partly cloudy	Low	High	Medium	High	1.90	40	0	0	1	0	39	20	0
3	316	2	10	11.80	200	Partly cloudy	Transitional	High	Medium	Low	0.55	0	15	5	0	0	0	10	70
3	316	3	16	10.80	210	Partly cloudy	Transitional	High	Medium	High	1.20	80	10	10	0	0	0	0	0
3	316	4	10	10.40	190	Partly cloudy	Transitional	High	High	High	1.40	5	0	5	0	0	85	5	0
3	316	5	8	9.90	220	Mostly cloudy	Transitional	Medium	Medium	High	1.40	10	0	10	0	0	70	10	0

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.

[c] Field Observation.

[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.

[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
3	316	6	15	11.10	180	Partly cloudy	Transitional	High	Medium	High	1.50	10	0	5	0	0	80	5	0
3	315	1	25	9.20	200	Partly cloudy	Low	High	Low	High	1.90	10	1	0	0	0	89	0	0
3	315	2	10	11.50	200	Mostly cloudy	Transitional	High	Medium	Low	0.55	20	5	0	0	5	0	0	70
3	315	3	14	10.80	200	Overcast	Transitional	High	Medium	High	1.20	90	10	0	0	0	0	0	0
3	315	4	10	10.30	190	Mostly cloudy	Transitional	High	Medium	High	1.40	5	0	0	0	0	90	5	0
3	315	5	8	9.90	220	Mostly cloudy	Transitional	High	Medium	High	1.40	10	0	0	0	0	50	40	0
3	315	6	15	11.10	190	Partly cloudy	Transitional	High	Medium	High	1.50	10	0	0	0	0	85	5	0
3	314	1	17	9.80	200	Overcast	Low	Medium	Low	Medium	1.70	15	0	0	0	0	45	40	0
3	314	2	20	11.80	210	Partly cloudy	Low	High	Low	Low	0.30	0	0	0	0	0	0	50	50
3	314	3	14	10.70	200	Overcast	Transitional	High	Medium	High	1.20	90	10	0	0	0	0	0	0
3	314	4	10	10.20	190	Mostly cloudy	Transitional	High	Medium	High	1.40	1	1	0	0	0	68	30	0
3	314	5	6	9.90	220	Mostly cloudy	Transitional	High	High	High	1.40	10	0	0	0	0	30	60	0
3	314	6	14	11.10	190	Partly cloudy	Transitional	High	Medium	High	1.50	5	0	0	0	0	90	5	0
3	312	1	18	10.80	230	Partly cloudy	Transitional	Medium	Medium	Medium	1.30	15	0	10	0	0	55	20	0
3	312	2	9	10.60	330	Overcast	Transitional	High	High	Low	0.15	10	0	5	0	0	0	0	85
3	312	3	15	12.80	200	Partly cloudy	Transitional	High	Medium	Low	1.00	5	0	0	0	0	65	10	20
3	312	4	14	10.90	320	Partly cloudy	Transitional	Medium	High	Medium	1.00	10	0	10	0	0	50	30	0
3	312	5	13	9.90	330	Clear	Transitional	Medium	Medium	Medium	0.55	10	0	5	0	0	80	5	0
3	312	6	19	11.80	180	Clear	Transitional	High	Medium	High	1.50	10	0	5	0	0	75	10	0
3	311	1	17	9.90	230	Partly cloudy	Low	High	Medium	Medium	1.30	5	0	5	0	0	85	5	0
3	311	2	7	9.30	340	Partly cloudy	Transitional	High	Medium	Low	0.15	25	0	0	0	0	25	0	50
3	311	3	11	11.50	200	Partly cloudy	Transitional	High	Medium	Low	1.00	0	98	2	0	0	0	0	0
3	311	4	13	9.90	310	Partly cloudy	Transitional	High	Medium	Medium	1.00	10	0	0	0	0	80	10	0
3	311	5	12	9.20	330	Clear	Transitional	Medium	Medium	Low	0.55	10	0	0	0	0	90	0	0
3	311	6	18	11.40	180	Clear	Transitional	High	Medium	High	1.50	15	0	5	0	0	80	0	0
3	310	1	18	10.40	230	Partly cloudy	Transitional	High	Medium	Medium	1.30	10	0	10	0	0	25	55	0
3	310	2	5	11.20	250	Mostly cloudy	Transitional	High	Medium	Low	0.15	40	0	5	0	0	0	0	55
3	310	3	15	11.20	200	Partly cloudy	Transitional	High	Medium	Low	1.00	0	0	0	0	0	95	5	0
3	310	4	13	10.50	190	Partly cloudy	Transitional	Medium	High	High	1.25	5	0	5	0	0	80	10	0
3	310	5	13	10.20	330	Clear	Transitional	Medium	High	Medium	0.55	5	0	5	0	0	90	0	0
3	310	6	19	11.80	180	Clear	Transitional	High	Medium	High	1.50	10	0	5	0	0	85	0	0
3	309	1	17	10.30	230	Partly cloudy	Transitional	High	Medium	Medium	1.30	15	0	5	0	0	50	30	0
3	309	2	7	11.20	250	Partly cloudy	Transitional	High	Medium	Low	0.15	9	1	0	0	0	20	0	70
3	309	3	14	10.80	200	Partly cloudy	Transitional	High	Medium	Low	1.00	0	0	10	0	0	50	0	40
3	309	4	13	10.40	190	Partly cloudy	Transitional	High	Low	Medium	1.25	10	0	0	0	0	85	5	0
3	309	5	13	10.30	330	Clear	Transitional	Medium	Medium	Medium	0.55	20	0	5	0	0	70	5	0
3	309	6	19	11.80	180	Clear	Transitional	High	Medium	High	1.50	20	0	5	0	0	75	0	0
3	308	1	20	10.10	200	Partly cloudy	Low	High	Low	High	1.90	30	0	0	0	0	60	10	0
3	308	2	9	11.80	200	Partly cloudy	Transitional	High	Medium	Low	0.55	25	0	0	0	25	25	0	25
3	308	3	18	10.80	200	Clear	Transitional	High	Medium	Low	0.50	50	0	0	0	0	10	0	40
3	308	4	10	10.00	190	Partly cloudy	Transitional	High	Medium	High	1.25	10	0	0	0	0	85	5	0
3	308	5	5	9.70	220	Partly cloudy	Transitional	High	Medium	High	1.40	5	0	0	0	0	90	5	0
3	308	6	17	12.80	180	Clear	Transitional	High	Medium	High	1.50	20	0	0	0	0	75	5	0
3	307	1	20	10.40	200	Partly cloudy	Low	High	Low	Medium	1.90	10	0	0	0	0	90	0	0
3	307	2	20	11.80	210	Clear	Low	High	Low	Low	0.30	0	0	0	0	0	30	0	70
3	307	3	14	11.30	250	Mostly cloudy	Transitional	High	Medium	Low	0.50	30	10	0	0	0	0	0	60
3	307	4	12	10.80	190	Partly cloudy	Transitional	High	Medium	High	1.40	0	0	0	0	0	100	0	0
3	307	5	3	9.70	220	Overcast	Transitional	High	Medium	High	1.40	5	0	0	0	0	90	5	0

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.

[c] Field Observation.

[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.

[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%) Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
3	0307	6	17.00	11.50	180	Clear	Transitional	High	Medium	High	1.50	20	0	0	0	0	80	0	0
3	0306	1	20.00	11.80	200	Mostly cloudy	Low	High	Low	Medium	1.70	5	0	0	0	0	95	0	0
3	0306	2	20.00	10.60	210	Partly cloudy	Low	High	Low	Low	0.30	0	0	0	0	0	0	0	100
3	0306	3	20.00	12.50	190	Partly cloudy	Transitional	High	Low	Low	0.80	0	0	0	0	0	100	0	0
3	0306	4	10.00	9.30	300	Mostly cloudy	Transitional	High	Low	Medium	0.75	0	0	0	0	0	80	0	20
3	0306	5	13.00	9.20	330	Clear	Transitional	Medium	Medium	Low	0.55	90	0	0	0	0	10	0	0
3	0306	6	20.00	11.60	180	Partly cloudy	Transitional	High	Medium	High	1.50	10	0	0	0	0	90	0	0
3	0305	1	20.00	11.40	200	Partly cloudy	Low	High	Medium	High	1.70	10	0	0	0	0	90	0	0
3	0305	2	15.00	10.00	210	Overcast	Low	High	Medium	Low	0.30	0	0	0	0	0	0	0	100
3	0305	3	10.00	11.30	200	Overcast	Transitional	High	Medium	Low	1.00	0	0	0	0	0	0	0	100
3	0305	4	14.00	10.20	340	Partly cloudy	Transitional	High	Medium	Low	0.60	5	0	0	0	0	45	0	50
3	0305	5	12.00	9.00	330	Clear	Transitional	Medium	Medium	Low	0.55	10	0	0	0	0	90	0	0
3	0305	6	20.00	11.30	180	Partly cloudy	Transitional	High	Medium	High	1.50	10	0	0	0	0	90	0	0
3	0304	1	18.00	9.10	200	Partly cloudy	Low	High	Medium	Medium	1.70	5	0	0	0	0	95	0	0
3	0304	2	15.00	11.30	210	Overcast	Low	High	Medium	Low	0.30	10	0	0	0	0	20	0	70
3	0304	3	17.00	10.70	190	Partly cloudy	Transitional	High	Low	Medium	2.40	30	0	0	0	0	70	0	0
3	0304	4	11.00	10.00	190	Partly cloudy	Transitional	High	Low	High	1.70	10	0	0	0	0	90	0	0
3	0304	5	7.00	9.80	270	Clear	Transitional	High	Low	High	1.60	10	0	0	0	0	90	0	0
3	0304	6	20.00	11.80	180	Partly cloudy	Transitional	High	Low	High	1.50	25	0	5	0	0	70	0	0
3	0303	1	17.00	9.20	200	Partly cloudy	Low	High	Medium	Medium	1.70	5	0	0	0	0	95	0	0
3	0303	2	17.00	10.70	210	Overcast	Low	High	Medium	Low	0.30	0	0	0	0	0	0	0	100
3	0303	3	17.00	11.30	230	Partly cloudy	Transitional	High	Medium	Medium	0.80	14	0	0	0	0	85	1	0
3	0303	4	14.00	10.40	190	Partly cloudy	Transitional	High	Medium	High	1.70	10	0	0	0	0	90	0	0
3	0303	5	11.00	9.50	270	Clear	Transitional	Medium	Medium	Low	0.70	10	0	0	0	0	90	0	0
3	0303	6	20.00	12.20	180	Partly cloudy	Transitional	High	Medium	High	1.50	20	0	5	0	0	75	0	0
3	0302	1	15.00	10.30	180	Mostly cloudy	Low	Medium	Medium	Medium	0.50	10	0	5	0	0	80	5	0
3	0302	2	10.00	9.80	210	Partly cloudy	Low	High	Medium	Low	0.30	0	0	0	0	0	0	0	100
3	0302	3	14.00	11.00	230	Overcast	Transitional	High	Medium	Medium	0.80	10	0	1	0	0	59	30	0
3	0302	4	2.00	9.10	190	Fog	Transitional	High	Medium	High	1.70	10	0	0	0	0	90	0	0
3	0302	5	7.00	8.80	270	Clear	Transitional	High	Medium	Medium	0.70	10	0	0	0	0	90	0	0
3	0302	6	20.00	11.60	180	Partly cloudy	Transitional	High	Medium	High	1.50	30	0	0	0	0	70	0	0
3	0301	1	20.00	10.50	190	Partly cloudy	Low	Medium	Medium	Low	0.50	5	0	0	0	0	15	10	70
3	0301	2	15.00	10.90	210	Partly cloudy	Low	High	Medium	Low	0.30	10	0	0	0	0	0	0	90
3	0301	3	14.00	10.60	190	Overcast	Transitional	High	Medium	Medium	2.40	20	0	0	0	0	70	10	0
3	0301	4	5.00	9.60	190	Partly cloudy	Transitional	High	Medium	High	1.70	20	0	0	0	0	80	0	0
3	0301	5	8.00	9.80	270	Clear	Transitional	High	Medium	Medium	1.60	10	0	0	0	0	90	0	0
3	0301	6	20.00	11.80	180	Partly cloudy	Transitional	High	Medium	High	1.50	10	0	0	0	0	85	5	0
5	05SC060	1	13.50	13.80	220	Partly cloudy	High	Medium	Low	Medium	0.50	0	0	0	100	0	0	0	0
5	05SC060	2	15.00	13.10	260	Overcast	Transitional	Medium	Low	High	2.00	0	0	0	100	0	0	0	0
5	05SC060	3	5.00	10.50	260	Overcast	High	High	Low	High	0.90	0	0	0	95	0	0	5	0
5	05SC060	4	5.00	9.90	250	Overcast	High	High	Low	Medium	0.90	0	0	0	40	0	60	0	0
5	05SC060	5	5.00	9.50	230	Clear	High	Medium	Low	Medium	1.00	0	5	0	60	0	0	5	30
5	05SC060	6	15.00	11.20	210	Clear	High	High	Low	High	1.55	0	0	0	95	0	0	0	5
5	0517	1	15.00	12.50	290	Partly cloudy	Transitional	High	Low	High		0	100	0	0	0	0	0	0
5	0517	2	10.00	12.00	240	Partly cloudy	Transitional	High	Low	Low	0.60	0	5	0	0	0	0	0	95
5	0517	3	5.00	12.60	230	Partly cloudy	Transitional	High	Low	Medium	0.95	0	3	0	0	0	0	0	97
5	0517	4	10.00	10.90	220	Overcast	Transitional	High	Low	Low	1.00	0	0	0	0	0	90	0	10
5	0517	5	5.00	9.70	210	Clear	High	Medium	Low	Medium	1.00	35	5	0	0	0	20	0	40

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.

[c] Field Observation.

[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.

[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
5	517	6	15.00	11.60	210	Partly cloudy	High	High	Medium	High	0.80	30	0	0	0	0	10	10	50
5	516	2	15.00	11.80	210	Overcast	Transitional	High	Low	High	0.90	50	0	0	0	0	50	0	0
5	516	3	3.00	10.50	220	Overcast	High	High	Low	High	1.00	85	5	0	0	10	0	0	0
5	516	4	5.00	9.90	250	Overcast	High	High	Medium	Medium	0.90	10	0	10	0	0	80	0	0
5	516	5	6.00	9.80	230	Clear	High	Medium	Low	Medium	1.00	50	5	5	0	10	30	0	0
5	516	6	14.00	11.40	210	Clear	High	High	High	High	0.80	30	0	0	0	0	60	0	10
5	515	1	10.00	11.20	210	Partly cloudy	Transitional	Medium	Medium	High		49	1	0	0	0	50	0	0
5	515	2	15.00	12.20	210	Overcast	Transitional	High	Low	High	0.90	50	0	0	0	0	50	0	0
5	515	3	12.00	11.80	220	Partly cloudy	Transitional	High	Low	High	0.90	50	0	0	0	0	50	0	0
5	515	4	12.00	11.40	250	Partly cloudy	Transitional	High	Medium	Medium	1.10	5	0	5	0	0	90	0	0
5	515	5	12.00	10.80	210	Clear	Transitional	Medium	High	High	1.20	50	0	10	0	0	40	0	0
5	515	6	18.00	12.40	210	Partly cloudy	High	High	Low	High	0.80	20	0	0	0	10	70	0	0
5	514	1	10.00	11.50	220	Partly cloudy	Transitional	High	Medium	High		50	0	0	0	0	50	0	0
5	514	2	15.00	12.20	210	Overcast	Transitional	High	Medium	High	0.90	70	0	0	0	0	30	0	0
5	514	3	12.00	11.80	220	Partly cloudy	Transitional	High	Medium	High	0.90	100	0	0	0	0	0	0	0
5	514	4	12.00	10.70	250	Clear	Transitional	High	Medium	Medium	1.10	5	0	0	0	0	95	0	0
5	514	5	12.00	10.80	210	Partly cloudy	Transitional	Medium	Medium	High	1.20	50	0	0	0	0	50	0	0
5	514	6	20.00	12.40	210	Clear	High	High	Medium	High	0.80	50	0	0	0	10	40	0	0
5	513	1	10.00	11.50	220	Partly cloudy	Transitional	High	Medium	High		0	0	0	0	0	0	0	100
5	513	2	14.00	12.20	210	Overcast	Transitional	High	Medium	High	0.90	100	0	0	0	0	0	0	0
5	513	3	12.00	11.80	210	Partly cloudy	Transitional	High	Medium	High	0.90	100	0	0	0	0	0	0	0
5	513	4	12.00	10.70	250	Clear	Transitional	High	Medium	Medium	1.10	5	0	0	0	0	95	0	0
5	513	5	12.00	10.80	210	Partly cloudy	Transitional	Medium	Medium	High	1.20	30	0	0	0	0	70	0	0
5	513	6	20.00	12.40	210	Clear	High	High	Medium	High	0.80	30	0	0	0	10	60	0	0
5	512	1	13.50	13.10	210	Mostly cloudy	High	Medium	High	Medium	1.25	85	0	0	0	0	10	5	0
5	512	2	12.00	12.10	210	Overcast	Transitional	Medium	Medium	High	0.90	85	0	0	0	0	10	5	0
5	512	3	10.00	11.80	220	Clear	Transitional	High	Medium	High	0.90	60	0	0	0	0	20	20	0
5	512	4	6.00	10.20	250	Partly cloudy	Transitional	High	Medium	Medium	1.20	0	0	10	0	0	90	0	0
5	512	5	10.00	10.40	210	Clear	Transitional	Medium	High	High	1.00	80	0	7	0	0	10	3	0
5	512	6	20.00	12.40	210	Clear	High	High	Medium	High	0.80	80	0	0	0	0	10	5	5
5	511	1	10.00	11.20	210	Partly cloudy	Transitional	High	High	High		100	0	0	0	0	0	0	0
5	511	2	15.00	12.40	210	Overcast	Transitional	High	Medium	High	0.90	75	0	10	0	0	10	5	0
5	511	3	12.00	11.50	220	Partly cloudy	Transitional	High	Medium	High	0.90	95	0	2	0	0	3	0	0
5	511	4	8.00	10.70	250	Partly cloudy	Transitional	High	Medium	Medium	1.10	5	0	5	0	0	90	0	0
5	511	5	12.00	10.50	210	Clear	Transitional	High	Medium	High	1.20	80	0	5	0	0	15	0	0
5	511	6	20.00	12.40	210	Partly cloudy	High	High	Medium	High	0.80	50	0	10	0	0	40	0	0
5	510	1	13.50	11.20	210	Partly cloudy	High	Medium	High	Medium	1.25	75	0	0	0	0	20	5	0
5	510	2	15.00	12.60	210	Overcast	Transitional	High	Medium	High	0.90	78	2	5	0	0	10	5	0
5	510	3	12.00	11.80	220	Partly cloudy	Transitional	High	Medium	High	0.90	90	0	0	0	0	10	0	0
5	510	4	8.00	10.00	250	Partly cloudy	Transitional	High	Medium	Medium	1.10	5	0	0	0	0	10	0	85
5	510	5	11.00	10.30	210	Clear	Transitional	High	Medium	High	1.00	100	0	0	0	0	0	0	0
5	510	6	18.00	12.40	210	Partly cloudy	High	High	High	High	0.80	30	5	10	0	15	40	0	0
5	509	1	13.50	11.20	210	Partly cloudy	High	Medium	High	Medium	1.25	85	0	0	0	0	0	5	10
5	509	2	15.00	12.10	210	Overcast	Transitional	Medium	High	High	0.90	75	0	10	0	0	10	5	0
5	509	3	6.00	10.80	220	Partly cloudy	High	High	Medium	High	0.90	100	0	0	0	0	0	0	0
5	509	4	6.00	10.00	250	Partly cloudy	Transitional	High	Medium	Medium	1.10	10	0	0	0	0	90	0	0
5	509	5	9.00	10.40	210	Clear	Transitional	Medium	Medium	High	1.00	85	0	10	0	0	0	5	0
5	509	6	18.00	12.00	200	Clear	High	High	High	High	0.80	85	5	0	0	0	5	5	0

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.

[c] Field Observation.

[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.

[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
5	0508	1	10.00	11.40	220	Mostly cloudy	Transitional	Medium	Medium	High		100	0	0	0	0	0	0	0
5	0508	2	21.00	12.60	220	Partly cloudy	Transitional	High	Medium	High	1.00	100	0	0	0	0	0	0	0
5	0508	3	5.00	11.70	220	Partly cloudy	Transitional	High	Medium	Medium	1.10	50	0	0	0	0	0	0	50
5	0508	4	14.00	10.50	220	Overcast	Transitional	High	Medium	Medium	1.00	10	0	0	0	0	90	0	0
5	0508	5	13.00	11.10	210	Partly cloudy	Transitional	Medium	Medium	High	1.20	50	0	0	0	0	50	0	0
5	0508	6	20.00	12.40	210	Partly cloudy	High	High	Medium	High	0.80	40	2	0	0	18	40	0	0
5	0507	1	13.50	11.20	210	Partly cloudy	High	Medium	High	Medium	1.25	70	0	0	0	0	10	0	20
5	0507	2	20.00	12.90	220	Partly cloudy	Transitional	High	High	High	1.00	90	0	0	0	0	10	0	0
5	0507	3	5.00	10.20	230	Partly cloudy	Transitional	High	High	Medium	1.10	95	0	0	0	0	0	5	0
5	0507	4	14.00	10.30	220	Overcast	Transitional	High	Medium	Medium	1.00	15	0	10	0	0	75	0	0
5	0507	5	9.00	10.20	210	Clear	Transitional	Medium	High	High	1.00	100	0	0	0	0	0	0	0
5	0507	6	18.00	11.70	210	Partly cloudy	High	High	High	High	1.55	80	0	0	0	0	20	0	0
5	0506	1	13.50	11.20	210	Partly cloudy	High	Low	Medium	Low	1.25	40	0	0	0	0	10	0	50
5	0506	2	16.00	13.30	220	Partly cloudy	Transitional	High	Low	Medium	1.05	80	1	0	0	0	19	0	0
5	0506	3	2.00	10.20	230	Partly cloudy	Transitional	High	Low	Medium	0.90	50	0	0	0	0	20	0	30
5	0506	4	13.00	10.40	220	Overcast	Transitional	High	Low	Medium	1.00	10	0	0	0	0	90	0	0
5	0506	5	7.00	10.30	210	Clear	High	High	Medium	High	0.90	100	0	0	0	0	0	0	0
5	0506	6	15.00	12.00	200	Partly cloudy	High	High	Medium	High	0.80	40	0	0	0	0	50	0	10
5	0505	1	13.50	11.10	210	Partly cloudy	High	Medium	High	Medium	1.25	90	0	5	0	0	0	5	0
5	0505	2	15.00	12.60	220	Partly cloudy	Transitional	High	High	Medium	1.05	90	0	10	0	0	0	0	0
5	0505	3	2.00	10.80	230	Partly cloudy	Transitional	High	Medium	Medium	0.90	60	0	5	0	0	5	0	30
5	0505	4	12.00	10.00	220	Overcast	Transitional	High	Medium	Medium	1.00	15	0	5	0	0	80	0	0
5	0505	5	7.00	10.40	210	Clear	High	Medium	High	High	0.90	100	0	0	0	0	0	0	0
5	0505	6	15.00	12.00	200	Partly cloudy	High	High	High	High	0.80	40	0	10	0	0	20	10	20
5	0502	1	13.50	11.20	210	Partly cloudy	High	High	High	Low	1.25	95	1	0	0	0	4	0	0
5	0502	2	10.00	11.70	220	Clear	Transitional	High	Medium	Medium	0.92	98	2	0	0	0	0	0	0
5	0502	3	1.00	10.10	240	Overcast	Transitional	High	Medium	Medium	1.10	60	0	0	0	0	10	0	30
5	0502	4	12.00	9.80	220	Overcast	Transitional	High	Medium	Medium	1.00	10	0	0	0	0	90	0	0
5	0502	5	7.00	9.80	210	Clear	High	High	Medium	Medium	0.94	100	0	0	0	0	0	0	0
5	0502	6	15.00	11.20	210	Partly cloudy	High	High	High	High	0.90	60	0	0	0	0	30	0	10
6	06SC047	1	8.00	13.30	260	Clear	Transitional	High	Low	Medium	1.40	0	5	0	0	0	0	0	95
6	06SC047	2	10.00	11.80	310	Overcast	Transitional	High	Low	Medium	0.20	0	20	0	0	0	60	0	20
6	06SC047	3	7.00	11.80	250	Overcast	Transitional	High	Low	Medium	0.80	0	80	0	0	0	0	0	20
6	06SC047	4	9.00	10.30	230	Overcast	Transitional	High	Low	Medium	1.30	0	100	0	0	0	0	0	0
6	06SC047	5	5.00	7.80	220	Partly cloudy	High	Medium	Low	Low	0.20	0	10	0	0	25	0	0	65
6	06SC047	6	4.00	8.10	260	Clear	High	High	Low	Medium	0.43	0	0	0	0	0	0	0	100
6	06SC036	1	16.00	16.90	400	Mostly cloudy	Transitional	High	Low	Low	0.45	0	5	0	95	0	0	0	0
6	06SC036	2	5.00	10.20	220	Clear	Transitional	High	Low	Low	0.60	0	10	0	30	0	0	0	60
6	06SC036	3	20.00	15.40	300	Partly cloudy	High	High	Low	Medium	0.90	0	0	0	25	0	50	25	0
6	06SC036	4	15.00	12.50	270	Partly cloudy	Transitional	High	Low	Medium	0.60	0	0	0	100	0	0	0	0
6	06SC036	5	7.00	11.60	220	Overcast	High	High	Low	Medium	0.55	0	5	0	50	0	30	0	15
6	06SC036	6	6.00	10.60	210	Partly cloudy	High	High	Low	Medium	0.63	0	0	0	95	0	0	5	0
6	06PIN02	1	18.00	16.90	330	Partly cloudy	Transitional	High	Medium	Medium	2.00	80	20	0	0	0	0	0	0
6	06PIN02	2	14.00	14.60	350	Mostly cloudy	Transitional	High	Medium	High		0	75	0	0	0	25	0	0
6	06PIN02	3	6.00	11.30	300	Overcast	Transitional	High	Medium	Medium	1.00	50	0	5	0	0	10	10	25
6	06PIN02	4	7.00	10.50	330	Overcast	Transitional	High	Medium	High	1.20	30	10	0	0	0	0	60	0
6	06PIN02	5	6.00	7.20	220	Partly cloudy	High	Medium	Medium	Low	0.20	0	10	25	0	5	10	10	40
6	06PIN02	6	5.00	7.20	250	Partly cloudy	High	Medium	High	Medium	0.55	10	0	0	0	0	90	0	0

[a] See Appendix A, Figures A1 to A3 for sample site locations.
[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.
[c] Field Observation.
[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.
[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

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Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
6	06PIN01	1	17	15.90	330	Partly cloudy	Transitional	High	Medium	High	2.00	90	10	0	0	0	0	0	0
6	06PIN01	2	15	14.60	350	Partly cloudy	Transitional	High	Medium	High		25	50	0	0	0	25	0	0
6	06PIN01	3	9	11.40	300	Overcast	Transitional	High	Medium	Medium	1.00	20	10	0	0	0	20	0	50
6	06PIN01	4	7	10.30	310	Overcast	Transitional	High	Medium	Medium	1.20	60	10	0	0	0	0	5	25
6	06PIN01	5	6	6.80	230	Clear	High	Medium	Medium	Low	0.20	0	5	0	0	15	0	30	50
6	06PIN01	6	5	7.50	280	Partly cloudy	High	High	Medium	Medium	0.55	20	20	0	0	0	50	0	10
6	0614	1	15	12.30	210	Clear	Transitional	High	High	Low	2.00	60	0	0	0	0	0	40	0
6	0614	2	10	10.50	220	Overcast	Transitional	High	Medium	Low	0.20	0	0	0	0	0	0	50	50
6	0614	3	7	12.50	210	Partly cloudy	Transitional	High	High	Medium	0.75	60	5	5	0	0	0	0	30
6	0614	4	12	12.70	210	Partly cloudy	Transitional	High	Medium	Medium	0.90	85	0	5	0	0	10	0	0
6	0614	5	7	11.20	210	Overcast	High	High	Medium	Medium	0.80	30	0	0	0	0	20	0	50
6	0614	6	5	10.00	210	Partly cloudy	High	High	Medium	Medium	0.55	10	0	0	0	0	90	0	0
6	0613	1	19	12.00	230	Mostly cloudy	Transitional	High	Low	Low	0.45	0	0	0	0	0	0	0	100
6	0613	2	3	10.20	240	Partly cloudy	Transitional	High	Low	Low	0.60	40	0	0	0	0	40	0	20
6	0613	3	13	12.70	230	Partly cloudy	Transitional	High	Medium	High	0.80	50	0	0	0	0	50	0	0
6	0613	4	15	11.30	230	Partly cloudy	Transitional	High	Medium	Medium	1.20	100	0	0	0	0	0	0	0
6	0613	5	9	11.00	220	Overcast	High	High	Medium	Medium	0.40	10	0	0	0	0	80	0	10
6	0613	6	5	7.70	230	Partly cloudy	High	High	Medium	Medium	0.65	60	10	0	0	0	20	0	10
6	0612	1	19	11.60	210	Partly cloudy	Transitional	High	Medium	Low	0.45	10	0	0	0	0	0	0	90
6	0612	2	1	10.20	220	Overcast	Transitional	High	Medium	Low	0.60	40	0	0	0	0	10	0	50
6	0612	3	20	11.80	210	Partly cloudy	High	High	Medium	Medium	0.80	10	0	0	0	0	60	30	0
6	0612	4	15	12.30	240	Partly cloudy	Transitional	High	Medium	Medium	0.95	100	0	0	0	0	0	0	0
6	0612	5	9	11.70	210	Mostly cloudy	High	High	Medium	Medium	0.50	10	0	0	0	0	70	0	20
6	0612	6	5	7.67	230	Clear	High	High	Medium	High	0.97	100	0	0	0	0	0	0	0
6	0611	1	18	14.10	230	Mostly cloudy	Transitional	High	Medium	High		100	0	0	0	0	0	0	0
6	0611	2	4	8.90	230	Overcast	Transitional	High	Medium	Low	0.20	0	0	0	0	0	30	0	70
6	0611	3	18	12.10	210	Partly cloudy	High	High	Medium	Medium	0.80	10	0	0	0	0	85	5	0
6	0611	4	5	12.30	240	Partly cloudy	Transitional	High	Low	Medium	1.20	80	0	0	0	0	20	0	0
6	0611	5	6	9.90	220	Partly cloudy	High	High	Low	Medium	0.50	0	0	0	0	0	50	0	50
6	0611	6	0	7.70	230	Clear	High	High	Low	Medium	0.60	45	0	0	0	0	20	5	30
6	0610	1	18	14.10	230	Mostly cloudy	Transitional	High	Medium	High		99	1	0	0	0	0	0	0
6	0610	2	4	8.90	230	Overcast	Transitional	High	Medium	Low	0.20	20	5	0	0	0	0	0	75
6	0610	3	20	12.10	210	Partly cloudy	High	High	Medium	Medium	0.80	0	0	0	0	0	50	50	0
6	0610	4	15	12.30	240	Overcast	Transitional	Medium	Medium	Medium	1.20	75	5	0	0	0	0	5	15
6	0610	5	8	10.40	220	Partly cloudy	High	High	Medium	Medium	0.50	5	5	0	0	0	80	0	10
6	0610	6	3	7.70	230	Clear	High	High	Medium	Medium	0.65	50	5	0	0	0	30	0	15
6	0609	1	22	12.60	220	Partly cloudy	Transitional	High	Medium	Medium	1.40	70	0	0	0	0	30	0	0
6	0609	2	4	8.90	230	Overcast	Transitional	High	Low	Low	0.20	0	0	0	0	0	50	0	50
6	0609	3	12	11.90	210	Partly cloudy	High	High	Low	High	0.80	15	0	0	0	0	85	0	0
6	0609	4	4	10.30	220	Partly cloudy	Transitional	High	Low	High	0.95	50	0	0	0	0	40	0	10
6	0609	5	5	9.20	220	Partly cloudy	High	High	Low	Low	0.50	5	0	0	0	0	70	0	25
6	0609	6	7	10.20	210	Overcast	High	High	Low	High	0.90	50	0	0	0	0	50	0	0
6	0608	1	24	13.50	230	Clear	Transitional	High	Medium	Medium	1.40	50	0	0	0	0	50	0	0
6	0608	2	10	11.60	240	Clear	Transitional	Medium	Medium	Low	0.60	33	0	0	0	0	33	0	34
6	0608	3	12	11.30	210	Fog	High	High	Medium	Medium	0.80	5	0	0	0	0	65	30	0
6	0608	4	12	12.50	220	Overcast	Transitional	High	Medium	High	0.90	50	0	0	0	0	50	0	0
6	0608	5	10	9.50	210	Partly cloudy	Transitional	High	Medium	Low	0.28	50	5	0	0	0	20	0	25
6	0608	6	6	9.10	240	Partly cloudy	High	High	Medium	Medium	0.55	20	0	0	0	0	60	0	20

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.

[c] Field Observation.

[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.

[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

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Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
6	0607	1	19	12.60	210	Mostly cloudy	Transitional	High	Medium	High		100	0	0	0	0	0	0	0
6	0607	2	4	8.90	230	Overcast	Transitional	High	Medium	Low	0.20	30	0	0	0	0	30	0	40
6	0607	3	20	11.70	210	Partly cloudy	High	High	Low	Medium	0.80	10	0	0	0	0	90	0	0
6	0607	4	15	12.30	240	Partly cloudy	Transitional	High	Medium	High	0.95	50	0	0	0	0	50	0	0
6	0607	5	8	11.90	210	Partly cloudy	High	High	Low	Medium	0.50	0	0	0	0	0	60	0	40
6	0607	6	3	7.70	230	Clear	High	High	Medium	High	0.97	40	0	0	0	0	40	0	20
6	0606	1	24	12.90	210	Clear	Transitional	High	Medium	Medium	1.40	50	0	0	0	0	50	0	0
6	0606	2	4	8.90	230	Overcast	Transitional	High	Medium	Low	0.20	0	0	0	0	0	40	0	60
6	0606	3	12	11.40	210	Partly cloudy	High	High	Medium	High	0.80	5	0	0	0	0	65	30	0
6	0606	4	4	10.30	230	Overcast	Transitional	High	Medium	Medium	0.95	70	0	0	0	0	0	0	30
6	0606	5	4	10.50	210	Partly cloudy	High	High	Medium	Medium	0.70	10	0	0	0	0	70	0	20
6	0606	6	7	10.20	210	Overcast	High	High	High	High	0.90	50	0	0	0	0	50	0	0
6	0605	1	14	12.80	210	Clear	Transitional	High	Medium	Medium	1.40	50	0	0	0	0	50	0	0
6	0605	2	4	9.10	220	Overcast	Transitional	Medium	Medium	Low	0.20	20	0	0	0	0	30		
6	0605	3	7	12.50	210	Partly cloudy	Transitional	High	Medium	Medium	0.80	75	0	0	0	0	20	5	0
6	0605	4	12	12.50	220	Overcast	Transitional	High	Medium	High	0.90	50	0	0	0	0	48	2	0
6	0605	5	11	10.50	220	Partly cloudy	Transitional	High	Medium	Low	0.30	40	0	0	0	0	10	0	50
6	0605	6	7	10.20	210	Mostly cloudy	High	High	High	High	0.90	50	0	0	0	0	50	0	0
6	0604	1	10	13.50	240	Clear	Transitional	High	Medium	Medium	1.40	50	10	0	0	0	0	0	40
6	0604	2	10	11.50	220	Overcast	Transitional	High	Medium	Low	0.20	45	5	0	0	0	0	0	50
6	0604	3	7	11.80	240	Partly cloudy	Transitional	High	Medium	Medium	0.75	50	10	0	0	0	10	5	25
6	0604	4	12	12.50	220	Overcast	Transitional	High	Medium	Medium	0.90	85	5	0	0	0	10	0	0
6	0604	5	9	9.50	210	Partly cloudy	Transitional	Medium	Medium	Low	0.30	30	10	0	0	0	0	0	60
6	0604	6	6	8.80	240	Overcast	High	High	Medium	Low	0.55	10	30	0	0	20	10	0	30
6	0603	1	15	12.30	210	Clear	Transitional	High	Medium	Medium	2.00	45	0	0	0	0	50	5	0
6	0603	2	10	11.50	220	Overcast	Transitional	High	Medium	Low	0.20	20	0	0	0	0	30	0	50
6	0603	3	7	12.50	210	Partly cloudy	Transitional	High	Medium	Medium	0.75	50	0	0	0	0	50	0	0
6	0603	4	12	12.50	210	Partly cloudy	Transitional	Medium	Medium	High	0.90	60	0	10	0	0	30	0	0
6	0603	5	8	10.80	220	Partly cloudy	Transitional	High	Medium	Medium	0.80	60	5	0	0	0	10	5	20
6	0603	6	6	10.30	210	Partly cloudy	High	High	High	High	0.90	20	0	0	0	0	80	0	0
6	0602	1	8	12.60	240	Clear	Transitional	High	High	Medium	1.40	30	10	5	0	0	0	20	35
6	0602	2	10	11.00	250	Overcast	Transitional	Medium	High	Medium	0.20	30	10	10	0	0	0	50	0
6	0602	3	6	11.30	240	Partly cloudy	Transitional	High	High	Medium	0.70	0	10	20	0	0	0	60	10
6	0602	4	12	10.60	240	Partly cloudy	Transitional	High	High	Medium	0.95	15	5	20	0	0	0	60	0
6	0602	5	7	8.80	210	Overcast	High	High	High	Low	0.20	10	10	0	0	0	0	40	40
6	0602	6	5	8.60	250	Mostly cloudy	High	High	High	Medium	0.48	0	20	0	0	10	0	30	40
6	0601	1	11	11.20	210	Partly cloudy	Low	High	High	Medium		85	5	0	0	0	5	0	5
6	0601	2	10	10.50	220	Overcast	Transitional	Medium	Medium	Low	0.20	24	1	0	0	0	0	0	75
6	0601	3	6	10.40	220	Overcast	Transitional	High	High	Medium	0.67	70	0	0	0	0	5	5	20
6	0601	4	8	10.60	210	Overcast	High	High	High	Medium	0.90	80	5	0	5	0	0	5	5
6	0601	5	7	10.30	210	Partly cloudy	High	High	High	Medium	1.00	0	5	20	0	10	0	30	35
6	0601	6	4	10.10	210	Overcast	High	Medium	High	Medium	0.90	20	0	0	0	0	70	0	10
7	07SC022	1	12	12.30	230	Partly cloudy	High	High	Low	Low	0.55	0	5	0	0	0	0	0	95
7	07SC022	2	7	13.60	240	Partly cloudy	Transitional	High	Low	Medium	1.15	0	5	0	0	0	0	95	0
7	07SC022	3	10	12.50	240	Overcast	Transitional	High	Low	Medium	0.73	0	10	0	0	0	0	20	70
7	07SC022	4	5	10.80	220	Overcast	High	High	Low	Medium	1.00	5	40	0	0	0	0	5	50
7	07SC022	5	5	10.80	220	Overcast	Transitional	High	Low	Medium	0.65	40	10	0	0	0	0	50	0
7	07SC022	6	17	11.30	210	Clear	High	High	Low	Low	0.50	0	5	0	0	0	0	10	85

[a] See Appendix A, Figures A1 to A3 for sample site locations.
[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.
[c] Field Observation.
[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.
[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
7	07SC012	2	16	12.40	210	Clear	High	High	Low	Low	0.57	10	20	0	0	0	0	0	70
7	07SC012	4	15	11.20	220	Partly cloudy	High	High	Low	Medium	1.15	0	0	0	0	0	0	50	50
7	07SC012	5	10	11.20	210	Overcast	High	High	Low	Medium	0.77	0	0	0	0	0	0	50	50
7	07SC012	6	17	12.30	200	Clear	High	High	Low	Low	0.40	0	0	0	0	0	0	0	100
7	0722	1	9	11.90	280	Partly cloudy	High	High	Low	Low	0.70	20	0	0	0	0	10	0	70
7	0722	2	8	11.80	220	Clear	Transitional	Medium	Medium	Low	0.60	30	0	0	0	0	35	0	35
7	0722	3	6	11.30	230	Overcast	Transitional	Medium	Low	Medium	0.82	50	0	0	0	0	20	0	30
7	0722	4	2	10.20	210	Partly cloudy	High	High	Low	Medium	0.70	50	0	0	0	0	10	0	40
7	0722	5	0	10.20	220	Overcast	Transitional	High	Low	Medium	0.70	90	0	0	0	0	0	5	5
7	0722	6	5	11.10	200	Partly cloudy	High	High	Medium	High	0.90	100	0	0	0	0	0	0	0
7	0721	1	14	11.10	230	Partly cloudy	Low	High	Low	High	2.30	10	0	0	0	0	90	0	0
7	0721	2	13	12.40	220	Partly cloudy	High	High	Medium	Medium	0.60	50	0	0	0	0	50	0	0
7	0721	3	14	12.00	240	Mostly cloudy	Transitional	High	Low	Medium	0.90	20	0	0	0	0	80	0	0
7	0721	4	5	10.20	210	Overcast	High	High	Medium	Medium	0.80	30	0	0	0	0	60	0	10
7	0721	5	2	10.20	220	Overcast	Transitional	High	Medium	Medium	0.52	70	0	0	0	0	30	0	0
7	0721	6	5	9.70	210	Partly cloudy	High	High	Medium	Medium	0.55	50	5	0	0	0	40	0	5
7	0720	1	9	11.40	230	Partly cloudy	High	High	Low	Low	0.70	5	4	0	0	0	0	1	90
7	0720	2	10	11.10	220	Clear	Transitional	Medium	Medium	Low	0.60	0	10	0	0	0	0	40	50
7	0720	3	7	11.60	240	Overcast	Transitional	Medium	Low	Medium	0.82	5	10	0	0	0	2	10	73
7	0720	4	5	10.40	220	Partly cloudy	High	High	Low	Medium	0.90	30	5	0	0	0	0	5	60
7	0720	5	2	9.60	230	Overcast	Transitional	High	Low	Medium	0.52	40	5	0	0	0	0	5	50
7	0720	6	6	9.70	210	Partly cloudy	High	High	Medium	Medium	0.55	45	5	0	0	0	10	5	35
7	0719	1	18	11.50	220	Partly cloudy	Low	Medium	Medium	Medium	1.20	5	1	0	0	0	15	79	0
7	0719	2	16	12.40	210	Clear	High	High	High	Low	0.57	0	20	30	0	0	0	0	50
7	0719	3	12	12.10	230	Mostly cloudy	Transitional	High	Low	Medium	0.60	5	1	0	0	0	64	30	0
7	0719	4	15	11.20	220	Partly cloudy	High	High	High	Medium	1.10	10	0	5	0	0	0	60	25
7	0719	5	9	11.20	220	Overcast	High	High	Medium	Medium	0.77	10	0	10	0	0	70	0	10
7	0719	6	17	12.30	210	Clear	High	High	Medium	Low	0.40	10	0	0	0	0	0	0	90
7	0718	1	10	11.70	220	Partly cloudy	High	High	Medium	Low	0.70	70	0	2	0	0	0	3	25
7	0718	2	7	12.40	250	Partly cloudy	Transitional	High	Medium	Medium	0.95	45	0	0	0	0	50	5	0
7	0718	3	10	11.90	230	Overcast	Transitional	High	Medium	Medium	1.00	100	0	0	0	0	0	0	0
7	0718	4	15	11.10	230	Partly cloudy	High	Low	High	Medium	1.30	40	0	0	0	0	0	10	50
7	0718	5	4	10.20	220	Overcast	Transitional	High	Medium	Medium	0.60	100	0	0	0	0	0	0	0
7	0718	6	12	11.10	210	Clear	High	Medium	Medium	Low	0.45	10	0	0	0	0	20	20	50
7	0717	1	20	12.30	220	Partly cloudy	Low	High	Medium	Medium	1.50	10	0	0	0	0	85	5	0
7	0717	2	15	12.70	210	Clear	High	High	Low	Low	0.40	0	0	0	0	0	10	0	90
7	0717	3	15	12.20	230	Partly cloudy	Transitional	High	Low	Medium	0.90	5	0	0	0	0	95	0	0
7	0717	4	15	10.50	230	Overcast	High	High	Low	Medium	1.10	10	0	0	0	0	20	30	40
7	0717	5	5	10.80	220	Overcast	Transitional	Medium	Low	Medium	0.65	50	0	0	0	0	50	0	0
7	0717	6	17	12.00	200	Clear	High	High	Low	Low	0.45	0	0	0	0	0	0	0	100
7	0716	1	20	12.00	220	Partly cloudy	Low	High	Medium	Medium	1.50	20	0	0	0	0	75	5	0
7	0716	2	10	11.60	220	Clear	High	Medium	High	Low	0.40	20	20	20	0	0	0	0	40
7	0716	3	16	12.20	230	Partly cloudy	Transitional	High	Medium	Medium	0.90	5	0	0	0	0	90	5	0
7	0716	4	11	10.50	230	Overcast	High	Medium	Medium	Medium	1.10	5	0	5	0	0	20	20	50
7	0716	5	5	10.80	220	Overcast	Transitional	High	Medium	Medium	0.62	90	0	5	0	0	5	0	0
7	0716	6	15	11.90	200	Clear	High	High	Medium	Low	0.52	10	10	5	0	0	0	5	70
7	0715	1	15	12.80	220	Overcast	Transitional	High	High	Low	0.50	50	0	0	0	0	0	0	50
7	0715	2	5	12.20	240	Partly cloudy	Transitional	High	Medium	Medium	0.80	50	0	0	0	0	10	0	40

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.

[c] Field Observation.

[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.

[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
7	0715	3	10	12.40	240	Partly cloudy	Transitional	High	Medium	Medium	0.70	25	0	0	0	0	0	5	70
7	0715	4	5	10.80	220	Overcast	High	High	Medium	Low	0.45	30	0	0	0	0	0	0	70
7	0715	5	4	10.80	230	Overcast	Transitional	High	Medium	Medium	0.65	50	0	0	0	0	0	0	50
7	0715	6	10	11.40	210	Clear	High	Medium	Medium	Low	0.45	5	2	0	0	0	0	0	93
7	0709	1	10	11.80	220	Partly cloudy	High	High	Medium	Low	0.70	50	0	0	0	0	0	0	50
7	0709	2	5	11.30	250	Clear	Transitional	High	Low	Medium	0.80	50	0	0	0	0	50	0	0
7	0709	3	7	12.20	230	Partly cloudy	Transitional	High	Medium	Medium	0.80	95	0	0	0	0	0	0	5
7	0709	4	15	10.10	220	Partly cloudy	High	Medium	Medium	Medium	1.30	30	0	0	0	0	50	0	20
7	0709	5	3	10.90	220	Overcast	Transitional	High	Low	Medium	0.50	100	0	0	0	0	0	0	0
7	0709	6	6	9.70	210	Mostly cloudy	High	High	Medium	Medium	0.55	50	0	0	0	0	50	0	0
7	0706	1	17	11.20	230	Partly cloudy	Low	High	Low	High	2.30	5	1	0	0	0	79	15	0
7	0706	2	5	11.20	230	Clear	High	High	Medium	Medium	0.60	20	50	0	0	0	0	5	25
7	0706	3	6	11.30	250	Mostly cloudy	Transitional	High	Low	Medium	1.10	10	0	0	0	0	90	0	0
7	0706	4	20	11.10	230	Partly cloudy	High	Medium	Low	Medium	1.20	20	10	0	0	0	0	20	50
7	0706	5	5	10.80	220	Overcast	Transitional	Medium	Low	High	0.65	50	10	0	0	0	40	0	0
7	0706	6	17	11.40	210	Partly cloudy	High	High	Medium	Low	0.52	10	30	0	0	0	0	0	60
7	0705	1	15	11.10	230	Partly cloudy	Low	High	Low	High	2.30	5	1	0	0	0	69	25	0
7	0705	2	5	11.20	230	Fog	High	High	Medium	Medium	0.60	90	5	0	0	0	0	5	0
7	0705	3	6	11.30	250	Mostly cloudy	Transitional	High	Low	Medium	1.10	5	1	0	0	0	64	30	0
7	0705	4	15	11.10	230	Partly cloudy	High	Medium	High	Medium	1.20	30	5	0	0	0	5	20	40
7	0705	5	5	10.80	220	Overcast	Transitional	High	Low	Medium	0.65	90	10	0	0	0	0	0	0
7	0705	6	18	11.40	210	Partly cloudy	High	High	Medium	Low	0.52	5	20	10	0	5	0	0	60
7	0704	1	14	12.20	220	Partly cloudy	High	High	Medium	Low	0.70	30	5	0	0	0	35	0	30
7	0704	2	5	12.50	230	Partly cloudy	Transitional	High	Medium	Medium	0.80	50	1	0	0	0	49	0	0
7	0704	3	12	11.90	230	Mostly cloudy	Transitional	High	Medium	Medium	0.90	10	1	0	0	0	89	0	0
7	0704	4	15	11.20	220	Clear	High	High	High	Medium	1.30	40	6	0	0	0	50	4	0
7	0704	5	5	10.80	220	Overcast	Transitional	Medium	Medium	Medium	0.65	50	0	0	0	0	50	0	0
7	0704	6	17	12.20	200	Partly cloudy	High	High	Medium	Medium	7.30	80	10	0	0	0	0	0	10
7	0703	1	15	12.30	220	Overcast	Transitional	High	Medium	Low	0.50	10	0	0	0	0	0	0	90
7	0703	2	5	12.30	230	Partly cloudy	Transitional	High	Low	Medium	0.80	20	0	0	0	0	30	0	50
7	0703	3	10	12.10	230	Overcast	Transitional	High	Low	Medium	0.80	20	0	0	0	0	0	0	80
7	0703	4	5	11.20	220	Overcast	High	High	Low	Low	0.45	20	0	0	0	0	10	0	70
7	0703	5	4	10.90	220	Overcast	Transitional	High	Low	Medium	0.65	50	0	0	0	0	0	0	50
7	0703	6	12	11.40	210	Clear	High	Medium	Medium	Low	0.45	0	0	0	0	0	0	0	100
7	0702	1	9	11.90	230	Partly cloudy	High	High	Medium	Low	0.70	50	0	0	0	0	0	0	50
7	0702	2	5	11.30	250	Clear	Transitional	High	Medium	Medium	0.80	50	0	0	0	0	50	0	0
7	0702	3	7	11.70	240	Partly cloudy	Transitional	High	Medium	Medium	0.80	90	0	0	0	0	5	0	5
7	0702	4	5	10.30	210	Overcast	High	High	High	Medium	0.80	100	0	0	0	0	0	0	0
7	0702	5	3	9.90	220	Overcast	Transitional	High	Medium	Medium	0.52	100	0	0	0	0	0	0	0
7	0702	6	6	9.70	210	Partly cloudy	High	High	High	Medium	0.55	50	0	0	0	0	50	0	0
9	09SC61	2	12	9.90	220	Partly cloudy	Transitional	High	Low	Low	0.60	5	0	0	0	0	45	0	50
9	09SC61	3	4	9.40	220	Partly cloudy	Transitional	High	Low	Medium	0.90	0	0	0	0	0	60	0	40
9	09SC61	4	15	12.20	210	Overcast	High	High	Low	Low	0.65	0	4	0	1	0	0	0	95
9	09SC61	5	7	9.40	220	Clear	High	High	Low	Medium	1.05	0	0	0	0	0	0	50	50
9	09SC61	6	8	9.20	210	Clear	High	High	Low	Medium	1.10	10	3	0	0	0	0	30	57
9	09SC53	2	15	9.70	240	Partly cloudy	High	High	Low	Low	0.40	10	1	0	0	0	0	10	79
9	09SC53	3	4	9.10	220	Partly cloudy	Transitional	High	Low	Medium	0.90	10	0	0	5	0	20	0	65
9	09SC53	4	12	12.00	210	Partly cloudy	Transitional	High	Low	Medium	0.75	1	1	0	0	0	49	0	49

[a] See Appendix A, Figures A1 to A3 for sample site locations.

[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.

[c] Field Observation.

[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.

[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Continued.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
9	09SC53	5	-3	8.70	220	Clear	Transitional	High	Low	Medium	1.05	0	5	0	0	0	20	0	75
9	09SC53	6	4	8.80	220	Clear	High	High	Low	High	1.10	95	5	0	0	0	0	0	0
9	0914	1																	
9	0914	2	12	10.30	190	Partly cloudy	Transitional	High	Medium	Low	0.60	5	0	0	0	0	45	0	50
9	0914	3	10	9.80	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	0	0	0	0	0	0	5	95
9	0914	4	15	12.10	210	Overcast	High	High	Low	Medium	0.70	0	0	0	0	0	30	5	65
9	0914	5	7	9.50	220	Clear	High	High	Medium	Medium	1.05	60	0	0	0	0	40	0	0
9	0914	6	8	9.30	210	Clear	High	High	Medium	Medium	1.10	50	3	0	0	0	0	20	27
9	0913	1																	
9	0913	2	12	10.00	190	Partly cloudy	Transitional	High	Medium	Low	0.60	5	0	0	0	0	35	0	60
9	0913	3	8	9.40	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	0	1	0	0	0	0	20	79
9	0913	4	15	12.20	210	Overcast	High	High	Medium	Medium	0.70	5	0	0	0	0	10	5	80
9	0913	5	7	9.50	220	Clear	High	High	High	Medium	1.05	0	0	0	0	0	0	25	75
9	0913	6	8	9.20	210	Clear	High	High	Medium	Medium	1.10	30	10	0	0	0	0	10	50
9	0912	2	15	10.40	190	Partly cloudy	Transitional	High	Low	Low	0.60	20	0	0	0	0	50	0	30
9	0912	3	10	9.60	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	15	0	0	0	0	85	0	0
9	0912	4	15	12.10	210	Overcast	High	High	Medium	Medium	0.70	10	0	0	0	0	30	20	40
9	0912	5	7	9.60	220	Clear	High	High	Low	Medium	1.05	70	0	0	0	0	30	0	0
9	0912	6	8	9.30	210	Clear	High	High	Medium	Medium	1.10	50	5	5	3	0	7	30	0
9	0911	1																	
9	0911	2	10	9.90	180	Partly cloudy	Transitional	High	Low	Low	0.55	5	0	0	0	0	45	0	50
9	0911	3	12	9.80	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	20	0	0	0	0	80	0	0
9	0911	4	15	11.10	210	Overcast	High	High	Low	Medium	0.71	10	0	0	0	0	20	10	60
9	0911	5	7	9.80	220	Clear	High	High	Low	Medium	1.05	80	0	0	0	0	0	20	0
9	0911	6	7	9.30	210	Partly cloudy	High	High	Medium	Medium	1.10	30	0	0	0	0	0	30	40
9	0910	1																	
9	0910	2	15	15.00	250	Partly cloudy	High	Medium	Low	Low	0.30	0	0	0	0	0	0	0	100
9	0910	3	4	9.10	220	Partly cloudy	Transitional	High	Low	Medium	0.90	10	0	0	0	0	90	0	0
9	0910	4	17	12.70	210	Partly cloudy	Transitional	High	Medium	Medium	0.75	10	0	0	0	0	90	0	0
9	0910	5	4	9.20	220	Clear	High	High	Medium	Medium	1.05	0	0	0	0	0	30	0	70
9	0910	6	5	8.60	220	Clear	High	High	Medium	Medium	1.10	50	0	0	0	0	0	0	50
9	0909	1																	
9	0909	2	17	10.40	250	Partly cloudy	High	Medium	Low	Low	0.30	0	0	0	0	0	0	0	100
9	0909	3	7	9.70	220	Partly cloudy	Transitional	High	Low	Medium	0.90	10	0	0	1	0	89	0	0
9	0909	4	16	11.10	210	Overcast	High	High	Low	Medium	0.71	0		0	0	0	40	10	
9	0909	5	7	9.40	220	Clear	Transitional	High	Medium	Medium	1.05	50	0	0	0	0	50	0	0
9	0909	6	8	10.10	210	Clear	High	High	Medium	Medium	1.10	30	0	0	0	0	20	10	40
9	0908	1																	
9	0908	2	17	10.00	250	Partly cloudy	High	Medium	Low	Low	0.30	0	0	0	0	0	0	0	100
9	0908	3	4	9.10	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	10	0	0	0	0	90	0	0
9	0908	4	15	11.10	210	Partly cloudy	High	High	Low	Medium	0.71	0	0	0	0	0	30	0	70
9	0908	5	5	9.40	220	Clear	High	High	Medium	Medium	1.05	20	0	0	0	0	0	0	80
9	0908	6	7	10.70	210	Clear	High	High	Medium	Medium	1.10	30	0	0	0	0	30	0	40
9	0907	1																	
9	0907	2	15	10.00	250	Partly cloudy	High	Medium	Low	Low	0.30	0	0	0	0	0	0	0	100
9	0907	3	4	9.10	220	Partly cloudy	Transitional	High	Low	Medium	0.90	0	0	0	0	0	20	0	80
9	0907	4	12	11.70	210	Partly cloudy	High	High	Low	Medium	0.71	0	0	0	0	0	0	0	100
9	0907	5	5	9.50	220	Clear	High	High	Low	Medium	1.05	50	0	0	0	0	0	0	50

[a] See Appendix A, Figures A1 to A3 for sample site locations.
[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.
[c] Field Observation.
[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.
[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

Continued...

Table D3 Concluded.

Reach	Site[a]	Session	Air Temperature (°C)	Water Temperature (°C)	Conductivity (µS)	Cloud Cover[b]	Estimated Flow Category[c]	Water Surface Visibility	Instream Velocity[d]	Water Clarity[e]	Secchi Depth (m)	Cover Types (%)							
												Substrate Interstices	Woody Debris	Turbulence	Aquatic Vegetation	Terrestrial Vegetation	Shallow Water	Deep Water	Other Cover
9	907	6	5	8.60	220	Partly cloudy	High	High	Medium	Medium	1.10	30	0	0	0	0	30	0	40
9	906	1																	
9	906	2	15	9.60	250	Partly cloudy	High	Medium	Low	Low	0.30	0	5	0	0	0	0	0	95
9	906	3	4	9.10	220	Partly cloudy	Transitional	High	Low	Medium	0.90	5	1	0	0	0	94	0	0
9	906	4	17	12.30	210	Partly cloudy	Transitional	Medium	Low	Medium	0.75	0	0	0	0	0	90	0	10
9	906	5	4	9.10	220	Clear	High	High	Medium	Medium	1.05	25	20	0	0	0	0	0	55
9	906	6	6	8.60	220	Partly cloudy	High	High	Medium	Medium	1.10	10	0	0	0	0	40	0	50
9	905	1																	
9	905	2	15	9.90	250	Partly cloudy	High	Medium	Medium	Low	0.30	0	0	0	0	0	0	0	100
9	905	3	4	9.10	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	10	0	0	0	0	90	0	0
9	905	4	17	12.60	210	Partly cloudy	Transitional	High	Medium	Medium	0.75	0	0	0	0	0	50	0	50
9	905	5	2	8.60	220	Clear	High	High	Medium	Medium	1.05	30	0	0	0	0	20	0	50
9	905	6	5	8.60	220	Clear	High	High	Medium	Medium	1.10	30	0	0	0	0	0	10	60
9	904	1																	
9	904	2	15	9.60	250	Clear	High	Medium	Medium	Low	0.30	0	0	0	0	0	0	0	100
9	904	3	4	8.80	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	5	0	0	0	0	0	5	90
9	904	4	12	11.80	210	Partly cloudy	Transitional	High	Medium	Medium	0.75	10	0	0	0	0	50	1	39
9	904	5	1	9.60	220	Clear	High	High	Medium	Medium	1.05	15	0	0	0	0	65	10	10
9	904	6	4	8.60	220	Clear	High	Low	Medium	Medium	1.10	20	0	0	0	0	20	20	40
9	903	1		10.30	225														
9	903	2	15	9.60	250	Clear	High	Medium	Medium	Low	0.30	0	0	0	0	0	0	0	100
9	903	3	4	8.90	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	5	0	0	0	0	0		
9	903	4	11	11.80	210	Mostly cloudy	Transitional	High	Medium	Medium	0.75	10	0	0	0	0	50	0	40
9	903	5	0	9.50	220	Partly cloudy	High	High	Medium	Medium	1.05	0	0	0	0	0	0	0	100
9	903	6	4	8.60	220	Clear	High	High	Medium	Medium	1.10	25	0	0	0	0	0	0	75
9	902	1																	
9	902	2	13	9.60	250	Clear	High	Medium	Medium	Low	0.30	0	0	0	0	0	0	0	100
9	902	3	4	9.00	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	0	0	0	0	0	50	0	50
9	902	4	10	11.90	210	Partly cloudy	Transitional	High	Medium	Medium	0.75	5	0	5	0	0	70	10	10
9	902	5	-1	9.40	220	Partly cloudy	High	High	Medium	Medium	1.05	5	0	0	0	0	0	5	90
9	902	6	3	8.60	220	Partly cloudy	High	High	Medium	Medium	1.10	15	0	0	0	0	0	30	55
9	901	1																	
9	901	2	12	9.60	250	Clear	High	Medium	Medium	Low	0.30	0	0	0	0	0	0	0	100
9	901	3	4	9.00	220	Partly cloudy	Transitional	High	Medium	Medium	0.90	1	0	0	0	0	49	0	50
9	901	4	10	11.90	210	Partly cloudy	Transitional	High	Medium	Medium	0.75	10	0	0	0	0	50	0	40
9	901	5	-2	8.90	220	Partly cloudy	High	High	Medium	Medium	1.00	0	0	0	0	0	0	0	100
9	901	6	3	8.60	220	Partly cloudy	High	High	Medium	Medium	1.10	15	0	0	0	0	0	0	85

[a] See Appendix A, Figures A1 to A3 for sample site locations.
[b] Clear = <10%; Partly Cloudy = 10-50%; Mostly Cloudy = 50-90%; Overcast = >90%.
[c] Field Observation.
[d] High = >1.0 m/s; Medium = 0.5-1.0 m/s; Low = <0.5 m/s.
[e] High = >3.0 m; Medium = 1.0-3.0 m; Low = <1.0 m.

APPENDIX E

Catch and Effort Data

Table E1 Number of fish caught during boat electroshocking surveys and their frequency of occurrence in sections 1, 3, and 5 of Peace River, 2002 to 2015.

	2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015	
Species	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]	n^a	%[b]
Sportfish		0		0		0		0		0		0		0		0		0		0		0		0		0		0
Arctic Grayling	13	<1	54	1	270	3	282	3	93	1	344	3	202	2	122	1	36	<1	114	1	43	<1	27	<1	10	<1	48	1
Bull Trout	105	2	91	2	122	1	176	2	76	1	158	1	170	1	155	1	97	1	198	1	187	2	182	2	144	2	169	2
Burbot					5	<1	2	<1	5	<1	4	<1			2	<1	2	<1			3	<1	1	<1	1	<1		
Kokanee	24	<1	5	<1	18	<1	43	<1	16	<1	154	1	49	<1	28	<1	26	<1	59	<1	99	1	27	<1	20	<1	20	<1
Lake Trout					1	<1	1	<1			2	<1			3	<1	1	<1	2	<1	4	<1	5	<1	2	<1	3	<1
Lake Whitefish	2	<1	2	<1	13	<1			1	<1	4	<1	1	<1	3	<1			7	<1	3	<1					1	<1
Mountain Whitefish	5485	97	5674	96	10 217	95	10 628	95	6309	96	10 391	93	11 539	95	9949	95	10 525	97	13 077	96	10 792	95	8349	96	7275	96	6735	95
Northern Pike					1	<1	4	<1	1	<1	7	<1	8	<1	8	<1	4	<1	11	<1	7	<1	5	<1	4	<1		
Rainbow Trout	50	1	63	1	107	1	94	1	39	1	102	1	169	1	171	2	131	1	146	1	138	1	67	1	106	1	105	1
Walleye	3	<1			6	<1	5	<1			17	<1	58	<1	17	<1	3	<1	49	<1	47	<1	43	<1	19	<1	12	<1
Yellow Perch											1	<1															8	<1
Sportfish subtotal	5682	91	5889	93	10 760	92	11 235	91	6540	96	11 184	93	12 196	92	10 458	93	10 825	96	13 663	95	11 323	91	8706	89	7581	87	7101	70
Non-sportfish		0		0		0		0		0		0		0		0		0		0		0		0		0		0
Finescale Dace																							1	<1				
Lake Chub																									4	<1	1	<1
Northern Pikeminnow	20	4	25	5	57	6	34	3	6	2	24	3	28	2	16	2	13	3	21	3	41	4	37	4	39	4	102	3
Peamouth	3	1																			1	<1						
Redside Shiner	2	<1																							1	<1	15	<1
Sculpin spp.[d]	2	<1																							78	7	44	1
Spottail Shiner																											5	<1
Sucker spp.[d]	533	95	435	95	879	94	1087	97	238	98	835	97	1102	98	791	98	491	97	712	97	1118	96	1011	96	963	89	2836	94
Non-sportfish subtotal	560	9	460	7	936	8	1121	9	244	4	859	7	1130	8	807	7	504	4	733	5	1160	9	1049	11	1085	13	3003	30
All species	6242		6349		11 696		12 356		6784		12 043		13 326		11 265		11 329		14 396		12 483		9755		8668		10 107	

[a] Includes fish captured and identified to species; does not include fish recaptured within the year.
[b] Percent composition of sportfish or non-sportfish catch.
[c] Species combined for table or not identified to species.

Table E2 Number of fish caught during boat electroshocking surveys and their frequency of occurrence in sections 6, 7, and 9 of Peace River, 2015.

	2015	
Species	*n*[a]	%[b]
Sportfish		*0*
Arctic Grayling	7	*<1*
Bull Trout	88	*3*
Burbot	3	*<1*
Goldeye	1	*<1*
Kokanee	1	*<1*
Lake Trout	1	*<1*
Mountain Whitefish	3253	*93*
Northern Pike	13	*<1*
Rainbow Trout	24	*1*
Walleye	103	*3*
Yellow Perch	3	*<1*
Sportfish subtotal	3497	*44*
Non-sportfish		*0*
Finescale Dace	1	*<1*
Flathead Chub	3	*<1*
Lake Chub	41	*1*
Northern Pikeminnow	152	*3*
Redside Shiner	137	*3*
Sculpin spp.[d]	6	*<1*
Spottail Shiner	10	*<1*
Sucker spp.[d]	4087	*92*
Troutperch	5	*<1*
Non-sportfish subtotal	4442	*56*
All species	7948	

[a] Includes fish captured and identified to species; does not include fish recaptured within the year.
[b] Percent composition of sportfish or non-sportfish catch.
[c] Species combined for table or not identified to species.

Table E3 Summary of boat electroshocking sportfish catch (includes fish captured and observed and identified to species) and catch-per-unit-effort (CPUE = no. fish/km/hour) in the Peace River, 25 August to 07 October 2015.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Arctic Grayling No.	Arctic Grayling CPUE	Bull Trout No.	Bull Trout CPUE	Burbot No.	Burbot CPUE	Goldeye No.	Goldeye CPUE	Kokanee No.	Kokanee CPUE	Lake Trout No.	Lake Trout CPUE	Lake Whitefish No.	Lake Whitefish CPUE	Mountain Whitefish No.	Mountain Whitefish CPUE	Northern Pike No.	Northern Pike CPUE	Rainbow Trout No.	Rainbow Trout CPUE	Walleye No.	Walleye CPUE	Yellow Perch No.	Yellow Perch CPUE	All Species No.	All Species CPUE
Section 1	1	00101	27-Aug-2015	301	0.60									1	19.93					27	538.21									28	558.14
		00102	27-Aug-2015	252	0.98															44	644.69									44	644.69
		00103	26-Aug-2015	639	1.20			1	4.69											72	338.03									73	342.72
		00104	26-Aug-2015	319	0.50															6	135.42									6	135.42
		00105	26-Aug-2015	346	0.80			1	13.01											40	520.23									41	533.24
		00107	27-Aug-2015	400	0.55															37	605.45			5	81.82					42	687.27
		00108	27-Aug-2015	555	0.85															16	122.1									16	122.1
		00109	27-Aug-2015	482	0.98			1	7.66											66	505.59									67	513.25
		00110	27-Aug-2015	439	0.65			1	12.62									22	277.55	29	365.87									52	656.04
		00111	27-Aug-2015	448	1.00			2	16.07					13	104.46					6	48.21			2	16.07					23	184.82
		00112	27-Aug-2015	507	1.07			3	19.91											136	902.51									139	922.41
		00113	27-Aug-2015	321	0.75			1	14.95											73	1091.59									74	1106.54
		00114	27-Aug-2015	449	0.95			1	8.44											190	1603.56			2	16.88					193	1628.88
		00116	27-Aug-2015	449	0.98			1	8.14											185	1505.88									186	1514.02
		00119	27-Aug-2015	583	0.75															50	411.66									50	411.66
	Session Summary			**433**	**12.60**	**0**	**0**	**12**	**7.92**	**0**	**0**	**0**	**0**	**14**	**9.24**	**0**	**0**	**22**	**14.52**	**977**	**644.67**	**0**	**0**	**9**	**5.94**	**0**	**0**	**0**	**0**	**1034**	**682.28**
Section 1	2	00101	02-Sep-2015	244	0.60															198	4868.85									198	4868.85
		00102	02-Sep-2015	339	0.98			1	10.89											132	1437.71									133	1448.6
		00103	02-Sep-2015	380	1.20			1	7.89											22	173.68									23	181.58
		00104	02-Sep-2015	590	0.45			1	13.56											51	691.53									52	705.08
		00105	02-Sep-2015	524	1.10															99	618.32									99	618.32
		00107	02-Sep-2015	437	0.55									1	14.98					54	808.82			2	29.96					57	853.75
		00108	03-Sep-2015	645	0.85															38	249.52									38	249.52
		00109	03-Sep-2015	504	0.98			4	29.3											145	1062.27									149	1091.58
		00110	03-Sep-2015	581	0.65									1	9.53					70	667.28			3	28.6					74	705.42
		00111	03-Sep-2015	656	0.90			1	6.1											57	347.56			1	6.1					59	359.76
		00112	03-Sep-2015	532	1.07			1	6.32											184	1163.66									185	1169.98
		00113	03-Sep-2015	329	0.75															60	875.38									60	875.38
		00114	03-Sep-2015	440	0.95															112	964.59			3	25.84					115	990.43
		00116	03-Sep-2015	515	0.98			1	7.1											56	397.42									57	404.51
		00119	02-Sep-2015	560	0.75									2	17.14					49	420			3	25.71					54	462.86
	Session Summary			**485**	**12.80**	**0**	**0**	**10**	**5.8**	**0**	**0**	**0**	**0**	**4**	**2.32**	**0**	**0**	**0**	**0**	**1327**	**769.52**	**0**	**0**	**12**	**6.96**	**0**	**0**	**0**	**0**	**1353**	**784.6**
Section 1	3	00101	10-Sep-2015	229	0.60															170	4454.15									170	4454.15
		00102	10-Sep-2015	313	0.98															72	849.35									72	849.35
		00103	10-Sep-2015	572	1.20															55	288.46									55	288.46
		00104	10-Sep-2015	351	0.50			2	41.03											21	430.77									23	471.79
		00105	10-Sep-2015	391	1.10			1	8.37											64	535.69									65	544.06
		00107	11-Sep-2015	427	0.55			1	15.33					1	15.33					45	689.8									47	720.46
		00108	10-Sep-2015	535	0.85			2	15.83							1	7.92			27	213.74									30	237.49
		00109	11-Sep-2015	606	0.98			3	18.28							1	6.09			155	944.4			1	6.09					160	974.87
		00110	11-Sep-2015	552	0.65															67	672.24			1	10.03					68	682.27
		00111	11-Sep-2015	561	0.60			5	53.48					12	128.34					47	502.67			1	10.7					65	695.19
		00112	11-Sep-2015	535	1.07			2	12.58											169	1062.8			5	31.44					176	1106.82
		00113	11-Sep-2015	333	0.75			1	14.41											30	432.43									31	446.85
		00114	11-Sep-2015	431	0.95			2	17.58											136	1195.75			2	17.58					140	1230.92
		00116	11-Sep-2015	383	0.98															23	219.48									23	219.48
		00119	10-Sep-2015	535	0.75			2	17.94											49	439.63									51	457.57
	Session Summary			**450**	**12.50**	**0**	**0**	**21**	**13.44**	**0**	**0**	**0**	**0**	**13**	**8.32**	**2**	**1.28**	**0**	**0**	**1130**	**723.2**	**0**	**0**	**10**	**6.4**	**0**	**0**	**0**	**0**	**1176**	**752.64**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Arctic Grayling		Bull Trout		Burbot		Goldeye		Kokanee		Lake Trout		Lake Whitefish		Mountain Whitefish		Northern Pike		Rainbow Trout		Walleye		Yellow Perch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 1	4	00101	15-Sep-2015	279	0.60															127	2731.18									127	2731.18
		00102	15-Sep-2015	318	0.98															73	847.61									73	847.61
		00103	15-Sep-2015	616	1.20			1	4.87											43	209.42									44	214.29
		00104	15-Sep-2015	390	0.50									1	18.46					19	350.77									20	369.23
		00105	15-Sep-2015	452	1.10															53	383.75									53	383.75
		00107	15-Sep-2015	442	0.55			1	14.81											5	74.04									6	88.85
		00108	16-Sep-2015	559	0.85															8	60.61									8	60.61
		00109	16-Sep-2015	570	0.98			1	6.48											153	991.09									154	997.57
		00110	15-Sep-2015	504	0.65			1	10.99											19	208.79									20	219.78
		00111	16-Sep-2015	593	1.00															12	72.85			1	6.07					13	78.92
		00112	16-Sep-2015	585	1.07			6	34.51											94	540.62									100	575.13
		00113	16-Sep-2015	343	0.75			2	27.99											62	867.64									64	895.63
		00114	16-Sep-2015	603	0.95			1	6.28											155	974.08			1	6.28					157	986.65
		00116	16-Sep-2015	508	0.98															35	251.81									35	251.81
		00119	15-Sep-2015	523	0.75											1	9.18			25	229.45									26	238.62
	Session Summary			**486**	**12.90**	**0**	**0**	**13**	**7.46**	**0**	**0**	**0**	**0**	**1**	**0.57**	**1**	**0.57**	**0**	**0**	**883**	**507.03**	**0**	**0**	**2**	**1.15**	**0**	**0**	**0**	**0**	**900**	**516.8**
Section 1	5	00101	24-Sep-2015	255	0.60															74	1741.18									74	1741.18
		00102	24-Sep-2015	286	0.98															99	1278.11									99	1278.11
		00103	24-Sep-2015	703	1.20			8	34.14											91	388.34			1	4.27					100	426.74
		00104	24-Sep-2015	332	0.50			2	43.37											68	1474.7			1	21.69					71	1539.76
		00105	24-Sep-2015	401	1.10															34	277.49									34	277.49
		00107	24-Sep-2015	363	0.55			1	18.03					2	36.06					67	1208.11			5	90.16					75	1352.37
		00108	24-Sep-2015	484	0.85															29	253.77									29	253.77
		00109	24-Sep-2015	444	0.98															130	1081.08									130	1081.08
		00110	24-Sep-2015	441	0.65															56	703.3			1	12.56					57	715.86
		00111	24-Sep-2015	479	1.00			1	7.52					3	22.55					80	601.25			1	7.52					85	638.83
		00112	24-Sep-2015	441	1.07									2	15.26					96	732.41			1	7.63					99	755.29
		00113	24-Sep-2015	342	0.75															72	1010.53									72	1010.53
		00114	24-Sep-2015	432	0.95			3	26.32											124	1087.72									127	1114.04
		00116	24-Sep-2015	440	0.98															39	323.95									39	323.95
		00119	24-Sep-2015	426	0.75									2	22.54					88	991.55									90	1014.08
	Session Summary			**418**	**12.90**	**0**	**0**	**15**	**10.01**	**0**	**0**	**0**	**0**	**9**	**6.01**	**0**	**0**	**0**	**0**	**1147**	**765.77**	**0**	**0**	**10**	**6.68**	**0**	**0**	**0**	**0**	**1181**	**788.47**
Section 1	6	00101	28-Sep-2015	223	0.60															115	3094.17									115	3094.17
		00102	28-Sep-2015	298	0.98															23	284.98									23	284.98
		00103	28-Sep-2015	509	1.20															21	123.77									21	123.77
		00104	28-Sep-2015	243	0.50															40	1185.19					1	29.63			41	1214.81
		00105	28-Sep-2015	390	1.10															25	209.79									25	209.79
		00107	28-Sep-2015	293	0.55															19	424.45									19	424.45
		00108	28-Sep-2015	535	0.85			2	15.83											31	245.41									33	261.24
		00109	28-Sep-2015	481	0.98															46	353.11									46	353.11
		00110	28-Sep-2015	386	0.65			2	28.7											13	186.53									15	215.23
		00111	28-Sep-2015	429	1.00															8	67.13									8	67.13
		00112	29-Sep-2015	585	1.07			1	5.75					1	5.75					153	879.94			3	17.25					158	908.7
		00113	29-Sep-2015	407	0.75			1	11.79											106	1250.12									107	1261.92
		00114	29-Sep-2015	522	0.95															155	1125.23			1	7.26					156	1132.49
		00116	29-Sep-2015	487	0.98			2	15.01											42	315.2									44	330.21
		00119	28-Sep-2015	385	0.75															11	137.14									11	137.14
	Session Summary			**412**	**12.90**	**0**	**0**	**8**	**5.42**	**0**	**0**	**0**	**0**	**1**	**0.68**	**0**	**0**	**0**	**0**	**808**	**547.3**	**0**	**0**	**4**	**2.71**	**1**	**0.68**	**0**	**0**	**822**	**556.78**
Section Total All Samples				**40247**	**76.58**	**0**	**0**	**79**	**0**	**0**	**0**	**0**	**0**	**42**	**0**	**3**	**0**	**22**	**0**	**6272**	**0**	**0**	**0**	**47**	**0**	**1**	**0**	**0**	**0**	**6466**	**0**
Section Average All Samples				**447**	**0.85**	**0**	**0**	**1**	**8.31**	**0**	**0**	**0**	**0**	**0**	**4.42**	**0**	**0.32**	**0**	**2.31**	**70**	**659.61**	**0**	**0**	**1**	**4.94**	**0**	**0.11**	**0**	**0**	**72**	**680.01**
Section Standard Error of Mean						**0**	**0**	**0.14**	**1.2**	**0**	**0**	**0**	**0**	**0.2**	**1.92**	**0.02**	**0.15**	**0.24**	**3.08**	**5.36**	**83.8**	**0**	**0**	**0.12**	**1.52**	**0.01**	**0.33**	**0**	**0**	**5.38**	**83.6**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Arctic Grayling		Bull Trout		Burbot		Goldeye		Kokanee		Lake Trout		Lake Whitefish		Mountain Whitefish		Northern Pike		Rainbow Trout		Walleye		Yellow Perch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 3	1	00301	28-Aug-2015	958	1.80			11	22.96											115	240.08			3	6.26					129	269.31
		00302	28-Aug-2015	1031	1.90			5	9.19											104	191.13									109	200.32
		00303	29-Aug-2015	670	1.45			3	11.12											88	326.09			2	7.41					93	344.62
		00304	29-Aug-2015	800	1.35	1	3.33	3	10											145	483.33									149	496.67
		00305	29-Aug-2015	782	1.55															154	457.39									154	457.39
		00306	29-Aug-2015	717	0.95			1	5.29											61	322.4									62	327.68
		00307	30-Aug-2015	571	0.95	1	6.64	4	26.55											57	378.28									62	411.47
		00308	30-Aug-2015	568	1.35															116	544.6									116	544.6
		00309	31-Aug-2015	533	0.95	1	7.11	1	7.11											27	191.96			1	7.11					30	213.29
		00310	31-Aug-2015	734	1.20	3	12.26													39	159.4			2	8.17					44	179.84
		00311	31-Aug-2015	699	1.25			1	4.12											84	346.09									85	350.21
		00312	31-Aug-2015	794	0.92	6	29.57	7	34.5					1	4.93					76	374.55			10	49.28					100	492.83
		00314	29-Aug-2015	651	0.98	1	5.67													35	198.51									36	204.18
		00315	30-Aug-2015	1099	1.70	2	3.85	2	3.85											77	148.37									81	156.08
		00316	30-Aug-2015	757	1.48			1	3.22											76	245.04			3	9.67					80	257.93
	Session Summary			**758**	**19.80**	**15**	**3.6**	**39**	**9.35**	**0**	**0**	**0**	**0**	**1**	**0.24**	**0**	**0**	**0**	**0**	**1254**	**300.79**	**0**	**0**	**21**	**5.04**	**0**	**0**	**0**	**0**	**1330**	**319.02**
Section 3	2	00301	04-Sep-2015	1094	1.80	1	1.83	1	1.83											119	217.55			8	14.63	1	1.83			130	237.66
		00302	04-Sep-2015	981	1.90			1	1.93											179	345.73			1	1.93					181	349.59
		00303	04-Sep-2015	836	1.45	3	8.91	2	5.94											288	855.3			6	17.82					299	887.97
		00304	04-Sep-2015	952	1.35															232	649.86									232	649.86
		00305	04-Sep-2015	851	1.55			1	2.73											141	384.82									142	387.55
		00306	04-Sep-2015	781	1.00			1	4.61											101	465.56									102	470.17
		00307	04-Sep-2015	650	0.95			1	5.83											296	1725.67									297	1731.5
		00308	04-Sep-2015	705	1.35			1	3.78											275	1040.19									276	1043.97
		00309	04-Sep-2015	750	0.95															117	591.16			3	15.16					120	606.32
		00310	04-Sep-2015	919	1.20															146	476.61			2	6.53					148	483.13
		00311	04-Sep-2015	742	1.25			1	3.88									1	3.88	122	473.53			3	11.64					127	492.94
		00312	04-Sep-2015	1071	1.17			3	8.62											224	643.54									227	652.16
		00314	04-Sep-2015	668	0.98			1	5.53											57	315.06			1	5.53					59	326.12
		00315	04-Sep-2015	1159	1.70	2	3.65													121	221.08			1	1.83					124	226.56
		00316	04-Sep-2015	857	1.48			3	8.54											175	498.39			4	11.39					182	518.32
	Session Summary			**868**	**20.10**	**6**	**1.24**	**16**	**3.3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0.21**	**2593**	**535.04**	**0**	**0**	**29**	**5.98**	**1**	**0.21**	**0**	**0**	**2646**	**545.98**
Section 3	3	00301	12-Sep-2015	1125	1.80															70	124.44			2	3.56					72	128
		00302	12-Sep-2015	921	1.90			2	4.11											63	129.61									65	133.72
		00303	12-Sep-2015	774	1.45															79	253.41			1	3.21					80	256.62
		00304	12-Sep-2015	880	1.35															86	260.61									86	260.61
		00305	13-Sep-2015	794	1.55															67	195.99									67	195.99
		00306	12-Sep-2015	758	1.00															75	356.2									75	356.2
		00307	12-Sep-2015	744	0.95			1	5.09											107	544.99									108	550.08
		00308	12-Sep-2015	725	1.35	2	7.36	2	7.36											173	636.32									177	651.03
		00309	13-Sep-2015	600	0.95	2	12.63	4	25.26											63	397.89			3	18.95					72	454.74
		00310	13-Sep-2015	769	1.20	1	3.9	2	7.8											46	179.45			1	3.9					50	195.06
		00311	13-Sep-2015	664	1.25			2	8.67											34	147.47									36	156.14
		00312	13-Sep-2015	888	1.17	3	10.4	2	6.93											76	263.34			3	10.4					84	291.06
		00314	12-Sep-2015	846	0.98	1	4.36	1	4.36											28	122.2			1	4.36					31	135.3
		00315	12-Sep-2015	1366	1.70			1	1.55											59	91.46			1	1.55					61	94.57
		00316	12-Sep-2015	1055	1.48															54	124.93			1	2.31					55	127.24
	Session Summary			**861**	**20.10**	**9**	**1.87**	**17**	**3.54**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1080**	**224.66**	**0**	**0**	**13**	**2.7**	**0**	**0**	**0**	**0**	**1119**	**232.77**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Arctic Grayling No.	Arctic Grayling CPUE	Bull Trout No.	Bull Trout CPUE	Burbot No.	Burbot CPUE	Goldeye No.	Goldeye CPUE	Kokanee No.	Kokanee CPUE	Lake Trout No.	Lake Trout CPUE	Lake Whitefish No.	Lake Whitefish CPUE	Mountain Whitefish No.	Mountain Whitefish CPUE	Northern Pike No.	Northern Pike CPUE	Rainbow Trout No.	Rainbow Trout CPUE	Walleye No.	Walleye CPUE	Yellow Perch No.	Yellow Perch CPUE	All Species No.	All Species CPUE
						Number Caught (CPUE = no. fish/km/h)																									
Section 3	4	00301	17-Sep-2015	1241	1.80			2	3.22											120	193.39									122	196.62
		00302	17-Sep-2015	1105	1.90			2	3.43											195	334.37			5	8.57					202	346.37
		00303	17-Sep-2015	806	1.45	1	3.08	1	3.08											124	381.96			7	21.56					133	409.69
		00304	17-Sep-2015	844	1.35	2	6.32	1	3.16											51	161.14									54	170.62
		00305	17-Sep-2015	1048	1.55			2	4.43					1	2.22					263	582.86			5	11.08					271	600.59
		00306	18-Sep-2015	771	1.00			1	4.67											82	382.88					1	4.67			84	392.22
		00307	18-Sep-2015	514	0.95															43	317.02									43	317.02
		00308	19-Sep-2015	590	1.35															113	510.73									113	510.73
		00309	19-Sep-2015	500	0.95	1	7.58	1	7.58											55	416.84									57	432
		00310	19-Sep-2015	672	1.20	2	8.93													66	294.64			1	4.46					69	308.04
		00311	19-Sep-2015	567	1.25			1	5.08											32	162.54			1	5.08					34	172.7
		00312	19-Sep-2015	618	1.17	1	4.98	2	9.96											74	368.43									77	383.37
		00314	18-Sep-2015	685	0.98			2	10.78											32	172.49			3	16.17					37	199.44
		00315	18-Sep-2015	1085	1.70			1	1.95											88	171.75									89	173.71
		00316	18-Sep-2015	663	1.48															23	84.67			2	7.36					25	92.03
	Session Summary			**781**	**20.10**	**7**	**1.61**	**16**	**3.67**	**0**	**0**	**0**	**0**	**1**	**0.23**	**0**	**0**	**0**	**0**	**1361**	**312.11**	**0**	**0**	**24**	**5.5**	**1**	**0.23**	**0**	**0**	**1410**	**323.35**
Section 3	5	00301	25-Sep-2015	1033	1.80															75	145.21			1	1.94					76	147.14
		00302	25-Sep-2015	978	1.90			2	3.87											102	197.61									104	201.49
		00303	25-Sep-2015	692	1.45															79	283.44			1	3.59					80	287.02
		00304	25-Sep-2015	925	1.35	3	8.65	1	2.88											65	187.39									69	198.92
		00305	25-Sep-2015	876	1.55			1	2.65											155	410.96									156	413.61
		00306	25-Sep-2015	621	1.00															67	388.41									67	388.41
		00307	26-Sep-2015	567	0.95															105	701.75			1	6.68					106	708.44
		00308	26-Sep-2015	658	1.35	1	4.05													142	575.48									143	579.53
		00309	25-Sep-2015	477	0.95	1	7.94	1	7.94											103	818.27			1	7.94					106	842.11
		00310	25-Sep-2015	666	1.20															65	292.79									65	292.79
		00311	25-Sep-2015	615	1.25			3	14.05											78	365.27			1	4.68					82	384
		00312	25-Sep-2015	719	1.17	3	12.84	4	17.12					2	8.56					118	504.97			2	8.56					129	552.05
		00314	26-Sep-2015	519	0.98															49	348.6			4	28.46					53	377.06
		00315	26-Sep-2015	1065	1.70			2	3.98											105	208.78									107	212.76
		00316	26-Sep-2015	803	1.48			3	9.12											149	452.88			4	12.16					156	474.15
	Session Summary			**748**	**20.10**	**8**	**1.92**	**17**	**4.07**	**0**	**0**	**0**	**0**	**2**	**0.48**	**0**	**0**	**0**	**0**	**1457**	**348.87**	**0**	**0**	**15**	**3.59**	**0**	**0**	**0**	**0**	**1499**	**358.93**
Section 3	6	00301	29-Sep-2015	886	1.80															63	142.21			1	2.26					64	144.47
		00302	29-Sep-2015	1119	1.90			3	5.08											301	509.67			5	8.47					309	523.21
		00303	29-Sep-2015	778	1.45															144	459.53									144	459.53
		00304	29-Sep-2015	629	1.35															62	262.85									62	262.85
		00305	29-Sep-2015	919	1.55			3	7.58											293	740.5			4	10.11					300	758.19
		00306	29-Sep-2015	640	1.00			1	5.62											76	427.5			2	11.25					79	444.38
		00307	30-Sep-2015	565	0.95			2	13.41											109	731.07									111	744.48
		00308	30-Sep-2015	633	1.35															130	547.66									130	547.66
		00309	30-Sep-2015	483	0.95	1	7.85	2	15.69					2	15.69					76	596.27			1	7.85					82	643.35
		00310	30-Sep-2015	752	1.20			1	3.99											61	243.35			1	3.99					63	251.33
		00311	30-Sep-2015	552	1.25			2	10.43											48	250.43			5	26.09					55	286.96
		00312	30-Sep-2015	690	1.17	1	4.46	1	4.46											88	392.42			3	13.38					93	414.72
		00314	30-Sep-2015	617	0.98			1	5.98											42	251.34									43	257.32
		00315	30-Sep-2015	1140	1.70	1	1.86	2	3.72											87	161.61			3	5.57					93	172.76
		00316	30-Sep-2015	743	1.48			1	3.28											83	272.65			9	29.56					93	305.5
	Session Summary			**743**	**20.10**	**3**	**0.72**	**19**	**4.58**	**0**	**0**	**0**	**0**	**2**	**0.48**	**0**	**0**	**0**	**0**	**1663**	**400.88**	**0**	**0**	**34**	**8.2**	**0**	**0**	**0**	**0**	**1721**	**414.86**
Section Total All Samples				**71358**	**120.12**	**48**	**0**	**124**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**1**	**0**	**9408**	**0**	**0**	**0**	**136**	**0**	**2**	**0**	**0**	**0**	**9725**	**0**
Section Average All Samples				**793**	**1.33**	**1**	**1.81**	**1**	**4.69**	**0**	**0**	**0**	**0**	**0**	**0.23**	**0**	**0**	**0**	**0.04**	**105**	**355.56**	**0**	**0**	**2**	**5.14**	**0**	**0.08**	**0**	**0**	**108**	**367.54**
Section Standard Error of Mean						**0.11**	**0.47**	**0.17**	**0.67**	**0**	**0**	**0**	**0**	**0.03**	**0.21**	**0**	**0**	**0.01**	**0.04**	**6.86**	**25.23**	**0**	**0**	**0.23**	**0.87**	**0.02**	**0.06**	**0**	**0**	**6.93**	**25.4**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h) Arctic Grayling No.	Arctic Grayling CPUE	Bull Trout No.	Bull Trout CPUE	Burbot No.	Burbot CPUE	Goldeye No.	Goldeye CPUE	Kokanee No.	Kokanee CPUE	Lake Trout No.	Lake Trout CPUE	Lake Whitefish No.	Lake Whitefish CPUE	Mountain Whitefish No.	Mountain Whitefish CPUE	Northern Pike No.	Northern Pike CPUE	Rainbow Trout No.	Rainbow Trout CPUE	Walleye No.	Walleye CPUE	Yellow Perch No.	Yellow Perch CPUE	All Species No.	All Species CPUE
Section 5	1	00502	31-Aug-2015	450	0.95															131	1103.16									131	1103.16
		00505	31-Aug-2015	585	1.00															22	135.38									22	135.38
		00506	31-Aug-2015	661	1.00															3	16.34									3	16.34
		00507	31-Aug-2015	417	0.78			1	11.07											41	453.79	1	11.07							43	475.93
		00508	01-Sep-2015	730	0.92															51	271.9									51	271.9
		00509	31-Aug-2015	417	0.98															86	761.48									86	761.48
		00510	31-Aug-2015	677	1.13	1	4.71													43	202.35			2	9.41	1	4.71			47	221.17
		00511	01-Sep-2015	530	0.72															18	169.81			2	18.87					20	188.68
		00512	31-Aug-2015	537	1.28															16	83.8									16	83.8
		00513	01-Sep-2015	436	0.77															10	107.23									10	107.23
		00514	01-Sep-2015	546	0.56			1	11.77											8	94.19									9	105.97
		00515	01-Sep-2015	769	0.97															11	53.09									11	53.09
		00517	01-Sep-2015	928	0.42															1	9.24									1	9.24
	Session Summary			**591**	**11.50**	**1**	**0.53**	**2**	**1.06**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**441**	**233.59**	**1**	**0.53**	**4**	**2.12**	**1**	**0.53**	**0**	**0**	**450**	**238.36**
Section 5	2	00502	10-Sep-2015	691	0.95															57	312.59									57	312.59
		00505	10-Sep-2015	882	1.00			3	12.24											84	342.86			1	4.08					88	359.18
		00506	10-Sep-2015	1015	1.00	1	3.55													18	63.84					1	3.55			20	70.94
		00507	10-Sep-2015	494	0.78			1	9.34											36	336.34									37	345.69
		00508	10-Sep-2015	778	0.92															142	710.35			2	10					144	720.35
		00509	11-Sep-2015	582	0.98	1	6.34	1	6.34											107	678.83			2	12.69					111	704.2
		00510	11-Sep-2015	810	1.13			1	3.93											61	239.92			2	7.87					64	251.72
		00511	11-Sep-2015	570	0.72	1	8.77	1	8.77											34	298.25					2	17.54			38	333.33
		00512	11-Sep-2015	1066	1.28	1	2.64	1	2.64											95	250.64			1	2.64					98	258.56
		00513	11-Sep-2015	667	0.77			1	7.01											109	764.03									110	771.04
		00514	11-Sep-2015	506	0.56									1	12.7					77	978.26									78	990.97
		00515	11-Sep-2015	801	0.97															52	240.94									52	240.94
		00516	11-Sep-2015	821	0.80															16	87.7					1	5.48			17	93.18
		00517	10-Sep-2015	560	0.42			1	15.31											7	107.14									8	122.45
		005SC060	11-Sep-2015	993	0.53																							19	129.97	19	129.97
	Session Summary			**749**	**12.80**	**4**	**1.5**	**10**	**3.76**	**0**	**0**	**0**	**0**	**1**	**0.38**	**0**	**0**	**0**	**0**	**895**	**336.07**	**0**	**0**	**8**	**3**	**4**	**1.5**	**19**	**7.13**	**941**	**353.35**
Section 5	3	00502	15-Sep-2015	544	0.95	1	6.97	1	6.97											96	668.73									98	682.66
		00505	15-Sep-2015	654	1.00													25	137.61	11	60.55			1	5.5					37	203.67
		00506	15-Sep-2015	897	1.00															9	36.12					1	4.01			10	40.13
		00507	15-Sep-2015	442	0.78			1	10.44											34	355.03									35	365.47
		00508	15-Sep-2015	770	0.92			1	5.05											92	465.01			1	5.05					94	475.11
		00509	16-Sep-2015	625	0.98	1	5.91													117	691.2									118	697.11
		00510	16-Sep-2015	806	1.13			2	7.91											61	241.11			1	3.95					64	252.97
		00511	16-Sep-2015	465	0.72			1	10.75											39	419.35			1	10.75					41	440.86
		00512	16-Sep-2015	877	1.28			2	6.41											70	224.49									72	230.9
		00513	16-Sep-2015	597	0.77															39	305.42									39	305.42
		00514	16-Sep-2015	433	0.56			1	14.85											30	445.4									31	460.24
		00515	16-Sep-2015	669	0.97															73	404.97			29	160.88					102	565.85
		00516	16-Sep-2015	630	0.80															11	78.57									11	78.57
		00517	15-Sep-2015	533	0.42															2	32.16									2	32.16
		005SC060	16-Sep-2015	573	0.53															1	11.85							2	23.71	3	35.56
	Session Summary			**634**	**12.80**	**2**	**0.89**	**9**	**3.99**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**25**	**11.09**	**685**	**303.87**	**0**	**0**	**33**	**14.64**	**1**	**0.44**	**2**	**0.89**	**757**	**335.81**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Arctic Grayling		Bull Trout		Burbot		Goldeye		Kokanee		Lake Trout		Lake Whitefish		Mountain Whitefish		Northern Pike		Rainbow Trout		Walleye		Yellow Perch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 5	4	00502	20-Sep-2015	541	0.95	2	14.01													96	672.44									98	686.45
		00505	20-Sep-2015	747	1.00			1	4.82											30	144.58			1	4.82					32	154.22
		00506	20-Sep-2015	885	1.00															15	61.02			1	4.07					16	65.08
		00507	20-Sep-2015	460	0.78			1	10.03											38	381.27									39	391.3
		00508	20-Sep-2015	666	0.92	2	11.69	2	11.69											214	1250.55			1	5.84					219	1279.77
		00509	21-Sep-2015	491	0.98			2	15.04											85	639.2			2	15.04					89	669.28
		00510	21-Sep-2015	607	1.13															53	278.17									53	278.17
		00511	21-Sep-2015	371	0.72	1	13.48													35	471.7									36	485.18
		00512	21-Sep-2015	636	1.28			1	4.42											72	318.4									73	322.82
		00513	21-Sep-2015	441	0.77			1	10.6											67	710.31									68	720.91
		00514	21-Sep-2015	396	0.56															79	1282.47									79	1282.47
		00515	21-Sep-2015	452	0.97			1	8.21											46	377.7									47	385.91
		00516	21-Sep-2015	419	0.80															26	279.24									26	279.24
		00517	20-Sep-2015	565	0.40			1	15.93											8	127.43									9	143.36
		005SC060	21-Sep-2015	601	0.53													1	11.3	1	11.3							2	22.6	4	45.21
	Session Summary			**552**	**12.80**	**5**	**2.55**	**10**	**5.1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0.51**	**865**	**440.73**	**0**	**0**	**5**	**2.55**	**0**	**0**	**2**	**1.02**	**888**	**452.45**
Section 5	5	00502	25-Sep-2015	497	0.95															101	770.09									101	770.09
		00505	25-Sep-2015	556	1.00															10	64.75									10	64.75
		00506	25-Sep-2015	765	1.00															25	117.65									25	117.65
		00507	25-Sep-2015	377	0.78															28	342.79									28	342.79
		00508	25-Sep-2015	697	0.92															89	496.96									89	496.96
		00509	25-Sep-2015	555	0.98															64	425.78			2	13.31					66	439.09
		00510	25-Sep-2015	741	1.13			1	4.3											53	227.87									54	232.17
		00511	25-Sep-2015	433	0.72	1	11.55													38	438.8			1	11.55					40	461.89
		00512	25-Sep-2015	784	1.28			3	10.76											64	229.59					1	3.59			68	243.94
		00513	25-Sep-2015	633	0.77			1	7.39											60	443.16									61	450.54
		00514	25-Sep-2015	462	0.56			1	13.91											31	431.35									32	445.27
		00515	25-Sep-2015	695	0.97	2	10.68	2	10.68											98	523.33									102	544.69
		00516	25-Sep-2015	625	0.80															19	136.8									19	136.8
		00517	25-Sep-2015	507	0.70			1	10.14											12	121.72									13	131.87
		005SC060	25-Sep-2015	594	0.53															3	34.31	1	11.44					2	22.87	6	68.61
	Session Summary			**595**	**13.10**	**3**	**1.39**	**9**	**4.16**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**695**	**321**	**1**	**0.46**	**3**	**1.39**	**1**	**0.46**	**2**	**0.92**	**714**	**329.77**
Section 5	6	00502	30-Sep-2015	487	0.95	1	7.78	1	7.78					1	7.78					96	747									99	770.34
		00505	30-Sep-2015	600	1.00			3	18											42	252									45	270
		00506	30-Sep-2015	717	1.00			1	5.02											6	30.13					1	5.02			8	40.17
		00507	30-Sep-2015	436	0.78															45	476.36									45	476.36
		00508	30-Sep-2015	589	0.92	1	6.61													120	792.92									121	799.52
		00509	30-Sep-2015	572	0.98			2	12.91											101	651.96			1	6.46					104	671.33
		00510	30-Sep-2015	615	1.13															65	336.71									65	336.71
		00511	30-Sep-2015	423	0.72															22	260.05									22	260.05
		00512	30-Sep-2015	687	1.28			2	8.19											87	356.17					1	4.09			90	368.45
		00513	30-Sep-2015	480	0.77	1	9.74	2	19.48											67	652.6									70	681.82
		00514	30-Sep-2015	397	0.56															65	1052.54									65	1052.54
		00515	30-Sep-2015	685	0.97			1	5.42											80	433.44					1	5.42			82	444.28
		00516	30-Sep-2015	412	0.80															26	283.98									26	283.98
		00517	30-Sep-2015	547	0.70															13	122.23									13	122.23
		005SC060	30-Sep-2015	650	0.53							1	10.45																	1	10.45
	Session Summary			**553**	**13.10**	**3**	**1.49**	**12**	**5.96**	**0**	**0**	**1**	**0.5**	**1**	**0.5**	**0**	**0**	**0**	**0**	**835**	**414.95**	**0**	**0**	**1**	**0.5**	**3**	**1.49**	**0**	**0**	**856**	**425.38**
Section Total All Samples				**53930**	**76.07**	**18**	**0**	**52**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**26**	**0**	**4416**	**0**	**2**	**0**	**54**	**0**	**10**	**0**	**25**	**0**	**4606**	**0**
Section Average All Samples				**613**	**0.86**	**0**	**1.39**	**1**	**4.01**	**0**	**0**	**0**	**0.08**	**0**	**0.15**	**0**	**0**	**0**	**2.01**	**50**	**340.92**	**0**	**0.15**	**1**	**4.17**	**0**	**0.77**	**0**	**1.93**	**52**	**355.59**
Section Standard Error of Mean						**0.05**	**0.37**	**0.08**	**0.58**	**0**	**0**	**0.01**	**0.12**	**0.02**	**0.17**	**0**	**0**	**0.28**	**1.57**	**4.27**	**31.44**	**0.02**	**0.18**	**0.33**	**1.86**	**0.04**	**0.24**	**0.22**	**1.53**	**4.31**	**31.38**

Table E3 Continued.

Number Caught (CPUE = no. fish/km/h)

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Arctic Grayling		Bull Trout		Burbot		Goldeye		Kokanee		Lake Trout		Lake Whitefish		Mountain Whitefish		Northern Pike		Rainbow Trout		Walleye		Yellow Perch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 6	1	00601	25-Aug-2015	989	1.20			1	3.03											27	81.9			1	3.03					29	87.97
		00602	27-Aug-2015	518	0.90															6	46.33									6	46.33
		00603	26-Aug-2015	1008	1.30			1	2.75											61	167.58									62	170.33
		00604	27-Aug-2015	644	1.00															31	173.29					1	5.59			32	178.88
		00605	27-Aug-2015	392	0.80															73	838.01									73	838.01
		00606	27-Aug-2015	909	1.40	1	2.83													81	229.14			3	8.49					85	240.45
		00607	28-Aug-2015	420	1.00															13	111.43									13	111.43
		00608	27-Aug-2015	515	1.00															39	272.62									39	272.62
		00609	27-Aug-2015	684	1.00															35	184.21					1	5.26			36	189.47
		00610	28-Aug-2015	665	0.85															3	19.11									3	19.11
		00611	28-Aug-2015	618	0.90															3	19.42									3	19.42
		00612	29-Aug-2015	525	0.85			1	8.07											87	701.85									88	709.92
		00613	29-Aug-2015	651	0.90															11	67.59	1	6.14							12	73.73
		00614	26-Aug-2015	371	0.98															9	89.57									9	89.57
		006PIN01	26-Aug-2015	1201	1.50															25	49.96	2	4			8	15.99			35	69.94
		006PIN02	26-Aug-2015	798	1.00			2	9.02											9	40.6					21	94.74			32	144.36
		006SC036	29-Aug-2015	680	0.20																	1	26.47			4	105.88			5	132.35
		006SC047	27-Aug-2015	467	0.55															1	14.02	3	42.05							4	56.06
	Session Summary			**670**	**17.30**	**1**	**0.31**	**5**	**1.55**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**514**	**159.64**	**7**	**2.17**	**4**	**1.24**	**35**	**10.87**	**0**	**0**	**566**	**175.79**
Section 6	2	00601	02-Sep-2015	826	1.20	1	3.63													56	203.39									57	207.02
		00602	02-Sep-2015	529	0.90			1	7.56											4	30.25									5	37.81
		00603	02-Sep-2015	629	1.30															74	325.79									74	325.79
		00604	02-Sep-2015	638	1.00			2	11.29											115	648.9									117	660.19
		00605	03-Sep-2015	458	0.80															93	913.76									93	913.76
		00606	03-Sep-2015	1062	1.40															251	607.75			1	2.42	2	4.84			254	615.01
		00607	03-Sep-2015	844	1.00			1	4.27											161	686.73									162	691
		00608	05-Sep-2015	856	1.00															103	433.18									103	433.18
		00609	03-Sep-2015	867	1.00			2	8.3											74	307.27									76	315.57
		00610	03-Sep-2015	705	0.85															30	180.23									30	180.23
		00611	03-Sep-2015	671	0.90															44	262.3					1	5.96			45	268.26
		00612	05-Sep-2015	556	0.85	4	30.47													127	967.41			1	7.62					132	1005.5
		00613	05-Sep-2015	806	0.90															50	248.14									50	248.14
		00614	02-Sep-2015	439	0.98															5	42.05									5	42.05
		006PIN01	01-Sep-2015	1082	1.50															2	4.44					1	2.22			3	6.65
		006PIN02	01-Sep-2015	870	1.00															3	12.41					4	16.55			7	28.97
		006SC036	05-Sep-2015	332	0.20																	3	162.65							3	162.65
		006SC047	02-Sep-2015	591	0.55															1	11.08									1	11.08
	Session Summary			**709**	**17.30**	**5**	**1.47**	**6**	**1.76**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1193**	**350.15**	**3**	**0.88**	**2**	**0.59**	**8**	**2.35**	**0**	**0**	**1217**	**357.19**
Section 6	3	00601	08-Sep-2015	824	1.20			1	3.64											72	262.14			1	3.64					74	269.42
		00602	08-Sep-2015	477	0.90															3	25.16									3	25.16
		00603	08-Sep-2015	1458	1.30															67	127.26					1	1.9			68	129.15
		00604	08-Sep-2015	674	1.00															33	176.26			2	10.68					35	186.94
		00605	08-Sep-2015	414	0.80															47	510.87									47	510.87
		00606	09-Sep-2015	790	1.40															57	185.53			2	6.51					59	192.04
		00607	09-Sep-2015	748	1.00			1	4.81											86	413.9									87	418.72
		00608	09-Sep-2015	602	1.00			1	5.98											62	370.76									63	376.74
		00609	09-Sep-2015	677	1.00			1	5.32											23	122.3					4	21.27			28	148.89
		00610	09-Sep-2015	580	0.85															26	189.86									26	189.86
		00611	09-Sep-2015	530	0.90															24	181.13									24	181.13
		00612	09-Sep-2015	437	0.85															57	552.43									57	552.43
		00613	09-Sep-2015	733	0.90															49	267.39	1	5.46							50	272.85
		00614	08-Sep-2015	630	0.98															34	199.27									34	199.27
		006PIN01	08-Sep-2015	1182	1.50															36	73.1					1	2.03			37	75.13
		006PIN02	08-Sep-2015	574	1.00															24	150.52									24	150.52
		006SC036	09-Sep-2015	275	0.25															3	157.09					1	52.36			4	209.45
		006SC047	08-Sep-2015	728	0.55															3	26.97									3	26.97
	Session Summary			**685**	**17.40**	**0**	**0**	**4**	**1.21**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**706**	**213.24**	**1**	**0.3**	**5**	**1.51**	**7**	**2.11**	**0**	**0**	**723**	**218.37**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Arctic Grayling		Bull Trout		Burbot		Goldeye		Kokanee		Lake Trout		Lake Whitefish		Mountain Whitefish		Northern Pike		Rainbow Trout		Walleye		Yellow Perch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 6	4	00601	18-Sep-2015	688	1.20	1	4.36	1	4.36											69	300.87			1	4.36	1	4.36			73	318.31
		00602	18-Sep-2015	485	0.84			3	26.67											14	124.45									17	151.12
		00603	18-Sep-2015	641	1.30			1	4.32											72	311.05									73	315.37
		00604	18-Sep-2015	619	1.00			2	11.63											90	523.42									92	535.06
		00605	18-Sep-2015	431	0.80															126	1315.55									126	1315.55
		00606	17-Sep-2015	718	1.40			1	3.58											136	487.07					1	3.58			138	494.23
		00607	17-Sep-2015	731	1.00															71	349.66									71	349.66
		00608	18-Sep-2015	532	1.00															128	866.17									128	866.17
		00609	17-Sep-2015	742	1.00															38	184.37			1	4.85	1	4.85			40	194.07
		00610	17-Sep-2015	646	0.85															31	203.24					1	6.56			32	209.8
		00611	17-Sep-2015	603	0.90															30	199									30	199
		00612	17-Sep-2015	548	0.85			1	7.73											99	765.14									100	772.86
		00613	17-Sep-2015	671	0.90															25	149.03									25	149.03
		00614	18-Sep-2015	525	0.98															24	168.79									24	168.79
		006PIN01	18-Sep-2015	1172	1.50															42	86.01									42	86.01
		006PIN02	18-Sep-2015	502	1.00															41	294.02									41	294.02
		006SC036	17-Sep-2015	343	0.30																					3	104.96	6	209.91	9	314.87
	Session Summary			**623**	**16.80**	**1**	**0.34**	**9**	**3.1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1036**	**356.34**	**0**	**0**	**2**	**0.69**	**7**	**2.41**	**6**	**2.06**	**1061**	**364.94**
Section 6	5	00601	22-Sep-2015	755	1.20			1	3.97											83	329.8					1	3.97			85	337.75
		00602	22-Sep-2015	493	0.90			2	16.23											9	73.02									11	89.25
		00603	22-Sep-2015	752	1.30			1	3.68											100	368.25									101	371.93
		00604	22-Sep-2015	647	1.00															59	328.28									59	328.28
		00605	22-Sep-2015	495	0.80															86	781.82									86	781.82
		00606	23-Sep-2015	957	1.40	1	2.69	1	2.69											118	317.06			1	2.69					121	325.12
		00607	23-Sep-2015	794	1.00			2	9.07											62	281.11	1	4.53							65	294.71
		00608	22-Sep-2015	601	1.00															143	856.57									143	856.57
		00609	23-Sep-2015	999	1.00			2	7.21											73	263.06	1	3.6			1	3.6			77	277.48
		00610	23-Sep-2015	709	0.85			1	5.97											50	298.68									51	304.65
		00611	23-Sep-2015	685	0.90															45	262.77									45	262.77
		00612	23-Sep-2015	521	0.85			2	16.26											109	886.08									111	902.34
		00613	23-Sep-2015	717	0.90			1	5.58											69	384.94									70	390.52
		00614	22-Sep-2015	788	0.98			3	14.06											49	229.6					7	32.8			59	276.45
		006PIN01	22-Sep-2015	977	1.50					1	2.46									136	334.08									137	336.54
		006PIN02	22-Sep-2015	496	1.00															16	116.13									16	116.13
		006SC036	23-Sep-2015	340	0.50																	1	21.18							1	21.18
		006SC047	22-Sep-2015	441	0.55			1	14.84											10	148.42									11	163.27
	Session Summary			**676**	**17.60**	**1**	**0.3**	**17**	**5.14**	**1**	**0.3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1217**	**368.24**	**3**	**0.91**	**1**	**0.3**	**9**	**2.72**	**0**	**0**	**1249**	**377.92**
Section 6	6	00601	26-Sep-2015	566	1.20															131	694.35			1	5.3					132	699.65
		00602	26-Sep-2015	455	0.90			6	52.75											26	228.57									32	281.32
		00603	26-Sep-2015	640	1.30			2	8.65											113	488.94			1	4.33					116	501.92
		00604	26-Sep-2015	559	1.00			1	6.44											77	495.89			1	6.44					79	508.77
		00605	26-Sep-2015	419	0.80															121	1299.52									121	1299.52
		00606	26-Sep-2015	813	1.40															89	281.5									89	281.5
		00607	28-Sep-2015	685	1.00			1	5.26											38	199.71									39	204.96
		00608	26-Sep-2015	516	1.00			1	6.98											80	558.14									81	565.12
		00609	26-Sep-2015	706	1.00			1	5.1											82	418.13					1	5.1			84	428.33
		00610	28-Sep-2015	654	0.85			1	6.48											51	330.28									52	336.75
		00611	28-Sep-2015	684	0.90			4	23.39											51	298.25									55	321.64
		00612	28-Sep-2015	564	0.85			2	15.02											102	765.96									104	780.98
		00613	28-Sep-2015	619	0.90															49	316.64									49	316.64
		00614	26-Sep-2015	625	0.98			1	5.91											74	437.17	1	5.91			5	29.54			81	478.52
		006PIN01	26-Sep-2015	964	1.50			3	7.47											190	473.03									193	480.5
		006PIN02	26-Sep-2015	435	1.00			1	8.28											23	190.34					1	8.28			25	206.9
		006SC036	28-Sep-2015	564	0.50															2	25.53	1	12.77							3	38.3
		006SC047	26-Sep-2015	452	0.55			2	28.96											4	57.92									6	86.89
	Session Summary			**607**	**17.60**	**0**	**0**	**26**	**8.76**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1303**	**439.08**	**2**	**0.67**	**3**	**1.01**	**7**	**2.36**	**0**	**0**	**1341**	**451.89**
Section Total All Samples				**70833**	**104.08**	**8**	**0**	**67**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5969**	**0**	**16**	**0**	**17**	**0**	**73**	**0**	**6**	**0**	**6157**	**0**
Section Average All Samples				**662**	**0.97**	**0**	**0.42**	**1**	**3.5**	**0**	**0.05**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**56**	**311.86**	**0**	**0.84**	**0**	**0.89**	**1**	**3.81**	**0**	**0.31**	**58**	**321.68**
Section Standard Error of Mean						**0.04**	**0.29**	**0.1**	**0.72**	**0.01**	**0.02**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4.5**	**26.81**	**0.05**	**1.6**	**0.05**	**0.19**	**0.23**	**1.74**	**0.06**	**1.96**	**4.5**	**26.3**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Arctic Grayling No.	Arctic Grayling CPUE	Bull Trout No.	Bull Trout CPUE	Burbot No.	Burbot CPUE	Goldeye No.	Goldeye CPUE	Kokanee No.	Kokanee CPUE	Lake Trout No.	Lake Trout CPUE	Lake Whitefish No.	Lake Whitefish CPUE	Mountain Whitefish No.	Mountain Whitefish CPUE	Northern Pike No.	Northern Pike CPUE	Rainbow Trout No.	Rainbow Trout CPUE	Walleye No.	Walleye CPUE	Yellow Perch No.	Yellow Perch CPUE	All Species No.	All Species CPUE
						Number Caught (CPUE = no. fish/km/h)																									
Section 7	1	00702	30-Aug-2015	506	0.95															15	112.34									15	112.34
		00703	29-Aug-2015	777	0.95															14	68.28					1	4.88			15	73.16
		00704	30-Aug-2015	601	1.00															51	305.49									51	305.49
		00705	01-Sep-2015	683	1.00			1	5.27											12	63.25									13	68.52
		00706	01-Sep-2015	894	1.00					1	4.03									2	8.05									3	12.08
		00709	30-Aug-2015	775	1.00															4	18.58									4	18.58
		00715	29-Aug-2015	717	0.90															1	5.58									1	5.58
		00716	01-Sep-2015	1109	1.60							1	2.03							74	150.14					6	12.17			81	164.34
		00717	01-Sep-2015	417	0.65															27	358.61					1	13.28			28	371.89
		00718	30-Aug-2015	855	1.20															14	49.12									14	49.12
		00719	01-Sep-2015	534	0.75															13	116.85									13	116.85
		00720	30-Aug-2015	1165	1.40															4	8.83			1	2.21					5	11.04
		00721	01-Sep-2015	929	1.30			1	2.98											3	8.94									4	11.92
		00722	30-Aug-2015	908	1.10															41	147.78	1	3.6							42	151.38
	Session Summary			776	14.80	0	0	2	0.63	1	0.31	1	0.31	0	0	0	0	0	0	275	86.2	1	0.31	1	0.31	8	2.51	0	0	289	90.59
Section 7	2	00702	07-Sep-2015	604	0.95															21	131.75			1	6.27					22	138.03
		00703	07-Sep-2015	744	0.95															6	30.56									6	30.56
		00704	07-Sep-2015	585	1.00			1	6.15											32	196.92									33	203.08
		00705	09-Sep-2015	641	1.00			1	5.62											19	106.71			1	5.62					21	117.94
		00706	09-Sep-2015	1065	1.00															3	10.14	1	3.38							4	13.52
		00709	07-Sep-2015	844	1.00															14	59.72					1	4.27			15	63.98
		00715	07-Sep-2015	671	0.90															5	29.81									5	29.81
		00716	09-Sep-2015	1126	1.60															27	53.95									27	53.95
		00717	09-Sep-2015	389	0.65															20	284.75									20	284.75
		00718	07-Sep-2015	984	1.20															16	48.78									16	48.78
		00719	09-Sep-2015	444	0.75			1	10.81											14	151.35									15	162.16
		00720	05-Sep-2015	1365	1.40															9	16.95					2	3.77			11	20.72
		00721	09-Sep-2015	851	1.30															39	126.91									39	126.91
		00722	05-Sep-2015	892	1.10			1	3.67											22	80.72									23	84.39
		007SC022	07-Sep-2015	400	0.36															1	25.35									1	25.35
	Session Summary			774	15.20	0	0	4	1.22	0	0	0	0	0	0	0	0	0	0	248	75.89	1	0.31	2	0.61	3	0.92	0	0	258	78.95
Section 7	3	00702	13-Sep-2015	483	0.95															11	86.3									11	86.3
		00703	13-Sep-2015	916	0.95															14	57.92									14	57.92
		00704	14-Sep-2015	491	1.00															44	322.61									44	322.61
		00705	14-Sep-2015	671	1.00															11	59.02									11	59.02
		00706	14-Sep-2015	944	1.00			1	3.81											1	3.81	1	3.81							3	11.44
		00709	13-Sep-2015	804	1.00					1	4.48									8	35.82									9	40.3
		00715	13-Sep-2015	708	0.90															5	28.25									5	28.25
		00716	14-Sep-2015	1050	1.60															41	87.86									41	87.86
		00717	14-Sep-2015	430	0.65															31	399.28					1	12.88			32	412.16
		00718	13-Sep-2015	1074	1.20											1	2.79			14	39.11			2	5.59					17	47.49
		00719	14-Sep-2015	584	0.75															17	139.73			1	8.22	1	8.22			19	156.16
		00720	13-Sep-2015	1445	1.40			3	5.34											6	10.68									9	16.02
		00721	14-Sep-2015	879	1.30															24	75.61									24	75.61
		00722	13-Sep-2015	905	1.10			1	3.62											44	159.12									45	162.73
	Session Summary			813	14.80	0	0	5	1.5	1	0.3	0	0	0	0	1	0.3	0	0	271	81.08	1	0.3	3	0.9	2	0.6	0	0	284	84.97

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h) Arctic Grayling		Bull Trout		Burbot		Goldeye		Kokanee		Lake Trout		Lake Whitefish		Mountain Whitefish		Northern Pike		Rainbow Trout		Walleye		Yellow Perch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 7	4	00702	20-Sep-2015	542	0.95			1	6.99											92	643.23									93	650.22
		00703	20-Sep-2015	705	0.95															14	75.25									14	75.25
		00704	19-Sep-2015	468	1.00															35	269.23					1	7.69			36	276.92
		00705	19-Sep-2015	585	1.00															18	110.77									18	110.77
		00706	19-Sep-2015	958	1.00															3	11.27	1	3.76							4	15.03
		00709	19-Sep-2015	709	1.00															16	81.24									16	81.24
		00715	20-Sep-2015	462	0.90															21	181.82					3	25.97			24	207.79
		00716	19-Sep-2015	1028	1.60															77	168.53									77	168.53
		00717	19-Sep-2015	452	0.65															11	134.79					3	36.76			14	171.55
		00718	19-Sep-2015	757	1.20															24	95.11			1	3.96					25	99.08
		00719	19-Sep-2015	425	0.75															7	79.06									7	79.06
		00720	20-Sep-2015	1139	1.40			1	2.26											10	22.58					1	2.26			12	27.09
		00721	20-Sep-2015	731	1.30															23	87.13									23	87.13
		00722	20-Sep-2015	774	1.10															50	211.42	2	8.46							52	219.87
		007SC012	19-Sep-2015	236	0.22															1	69.34									1	69.34
		007SC022	20-Sep-2015	421	0.36															1	23.75									1	23.75
	Session Summary			**650**	**15.40**	**0**	**0**	**2**	**0.72**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**403**	**144.94**	**3**	**1.08**	**1**	**0.36**	**8**	**2.88**	**0**	**0**	**417**	**149.97**
Section 7	5	00702	24-Sep-2015	560	0.95			1	6.77											18	121.8									19	128.57
		00703	24-Sep-2015	760	0.95															8	39.89					1	4.99			9	44.88
		00704	24-Sep-2015	653	1.00	1	5.51	1	5.51											127	700.15					1	5.51			130	716.69
		00705	24-Sep-2015	696	1.00															15	77.59			2	10.34					17	87.93
		00706	24-Sep-2015	912	1.00			1	3.95											5	19.74					1	3.95			7	27.63
		00709	24-Sep-2015	721	1.00			1	4.99											23	114.84									24	119.83
		00715	24-Sep-2015	800	0.90															13	65					2	10			15	75
		00716	24-Sep-2015	1136	1.60															46	91.11					2	3.96			48	95.07
		00717	24-Sep-2015	468	0.65															34	402.37					2	23.67			36	426.04
		00718	24-Sep-2015	884	1.20															26	88.24									26	88.24
		00719	23-Sep-2015	467	0.75															26	267.24									26	267.24
		00720	24-Sep-2015	1197	1.40															12	25.78	1	2.15			1	2.15			14	30.08
		00721	24-Sep-2015	921	1.30															49	147.33					1	3.01			50	150.34
		00722	24-Sep-2015	835	1.10			1	3.92											33	129.34									34	133.26
		007SC012	23-Sep-2015	254	0.22																					1	64.42			1	64.42
	Session Summary			**751**	**15.00**	**1**	**0.32**	**5**	**1.6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**435**	**139.01**	**1**	**0.32**	**2**	**0.64**	**12**	**3.83**	**0**	**0**	**456**	**145.73**
Section 7	6	00702	28-Sep-2015	464	0.95															45	367.51									45	367.51
		00703	29-Sep-2015	647	0.95															27	158.14									27	158.14
		00704	29-Sep-2015	469	1.00															42	322.39									42	322.39
		00705	29-Sep-2015	605	1.00															8	47.6									8	47.6
		00706	29-Sep-2015	923	1.00			1	3.9											3	11.7									4	15.6
		00709	28-Sep-2015	574	1.00															35	219.51									35	219.51
		00715	29-Sep-2015	584	0.90			1	6.85											8	54.79					2	13.7			11	75.34
		00716	29-Sep-2015	1010	1.60			3	6.68											21	46.78									24	53.47
		00718	29-Sep-2015	985	1.20			1	3.05											23	70.05									24	73.1
		00719	29-Sep-2015	445	0.75			1	10.79											10	107.87					1	10.79			12	129.44
		00720	28-Sep-2015	1174	1.40			2	4.38											12	26.28					3	6.57			17	37.24
		00721	28-Sep-2015	686	1.30			3	12.11											30	121.1									33	133.21
		00722	28-Sep-2015	761	1.10			2	8.6											41	176.32									43	184.92
		007SC012	29-Sep-2015	252	0.22																					1	64.94			1	64.94
	Session Summary			**684**	**14.40**	**0**	**0**	**14**	**5.12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**305**	**111.48**	**0**	**0**	**0**	**0**	**7**	**2.56**	**0**	**0**	**326**	**119.15**
Section Total All Samples				**65094**	**89.53**	**1**	**0**	**32**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1937**	**0**	**7**	**0**	**9**	**0**	**40**	**0**	**0**	**0**	**2030**	**0**
Section Average All Samples				**740**	**1.02**	**0**	**0.05**	**0**	**1.74**	**0**	**0.11**	**0**	**0.05**	**0**	**0**	**0**	**0.05**	**0**	**0**	**22**	**105.26**	**0**	**0.38**	**0**	**0.49**	**0**	**2.17**	**0**	**0**	**23**	**110.31**
Section Standard Error of Mean						**0.01**	**0.06**	**0.07**	**0.31**	**0.02**	**0.07**	**0.01**	**0.02**	**0**	**0**	**0.01**	**0.03**	**0**	**0**	**2.25**	**13.75**	**0.03**	**0.13**	**0.04**	**0.19**	**0.1**	**1.19**	**0**	**0**	**2.28**	**13.85**

Table E3 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Arctic Grayling		Bull Trout		Burbot		Goldeye		Kokanee		Lake Trout		Lake Whitefish		Mountain Whitefish		Northern Pike		Rainbow Trout		Walleye		Yellow Perch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 9	1	00901	17-Sep-2015	516	0.80															7	61.05									7	61.05
		00902	17-Sep-2015	620	0.90															10	64.52			1	6.45					11	70.97
		00903	17-Sep-2015	558	0.90															11	78.85									11	78.85
		00904	17-Sep-2015	602	1.00															5	29.9									5	29.9
		00905	17-Sep-2015	558	1.10			2	11.73	1	5.87									4	23.46									7	41.06
		00906	17-Sep-2015	682	1.00															3	15.84									3	15.84
		00907	17-Sep-2015	587	0.90															3	20.44									3	20.44
		00908	17-Sep-2015	479	0.90															8	66.81									8	66.81
		00909	17-Sep-2015	593	0.80															3	22.77									3	22.77
		00910	17-Sep-2015	718	1.10															4	18.23	1	4.56			1	4.56			6	27.35
		00911	17-Sep-2015	525	0.70															5	48.98									5	48.98
		00913	17-Sep-2015	510	1.00			2	14.12											5	35.29									7	49.41
		00914	17-Sep-2015	480	0.80			1	9.38											10	93.75									11	103.12
	Session Summary			**571**	**11.90**	**0**	**0**	**5**	**2.65**	**1**	**0.53**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**78**	**41.33**	**1**	**0.53**	**1**	**0.53**	**1**	**0.53**	**0**	**0**	**87**	**46.09**
Section 9	2	00901	22-Sep-2015	638	1.10															16	82.07									16	82.07
		00902	22-Sep-2015	621	1.00															4	23.19									4	23.19
		00903	22-Sep-2015	604	1.10															10	54.18									10	54.18
		00904	22-Sep-2015	554	1.10															19	112.24									19	112.24
		00905	22-Sep-2015	754	1.10															9	39.06									9	39.06
		00906	22-Sep-2015	790	1.00															2	9.11									2	9.11
		00907	22-Sep-2015	745	1.20															9	36.24									9	36.24
		00908	22-Sep-2015	567	1.10															17	98.12									17	98.12
		00909	22-Sep-2015	588	0.95															14	90.23									14	90.23
		00910	22-Sep-2015	758	1.10															4	17.27					3	12.95			7	30.22
		00911	23-Sep-2015	609	1.00															21	124.14									21	124.14
		00912	23-Sep-2015	794	1.10															43	177.24									43	177.24
		00913	23-Sep-2015	495	0.90			1	8.08											7	56.57									8	64.65
		00914	23-Sep-2015	438	0.95															10	86.52									10	86.52
		009SC61	23-Sep-2015	674	0.68															2	15.83									2	15.83
	Session Summary			**642**	**15.40**	**0**	**0**	**1**	**0.36**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**187**	**68.09**	**0**	**0**	**0**	**0**	**3**	**1.09**	**0**	**0**	**191**	**69.55**
Section 9	3	00901	27-Sep-2015	578	1.10															12	67.95									12	67.95
		00902	27-Sep-2015	468	1.00															4	30.77									4	30.77
		00903	27-Sep-2015	554	1.10															11	64.98					1	5.91			12	70.89
		00904	27-Sep-2015	602	1.10															6	32.62									6	32.62
		00905	27-Sep-2015	616	1.10															4	21.25									4	21.25
		00907	27-Sep-2015	731	1.20															5	20.52									5	20.52
		00908	27-Sep-2015	523	1.10			1	6.26											12	75.09									13	81.35
		00909	27-Sep-2015	523	0.95			1	7.25											17	123.18									18	130.42
		00910	27-Sep-2015	634	1.10															5	25.81									5	25.81
		00911	27-Sep-2015	482	1.00			1	7.47											11	82.16									12	89.63
		00912	27-Sep-2015	553	1.10															5	29.59									5	29.59
		00914	27-Sep-2015	486	0.95			1	7.8											1	7.8									2	15.59
		009SC61	27-Sep-2015	576	0.68			1	9.26																					1	9.26
	Session Summary			**564**	**13.50**	**0**	**0**	**5**	**2.36**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**93**	**43.97**	**0**	**0**	**0**	**0**	**1**	**0.47**	**0**	**0**	**99**	**46.81**

Table E3 Concluded.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Arctic Grayling No.	Arctic Grayling CPUE	Bull Trout No.	Bull Trout CPUE	Burbot No.	Burbot CPUE	Goldeye No.	Goldeye CPUE	Kokanee No.	Kokanee CPUE	Lake Trout No.	Lake Trout CPUE	Lake Whitefish No.	Lake Whitefish CPUE	Mountain Whitefish No.	Mountain Whitefish CPUE	Northern Pike No.	Northern Pike CPUE	Rainbow Trout No.	Rainbow Trout CPUE	Walleye No.	Walleye CPUE	Yellow Perch No.	Yellow Perch CPUE	All Species No.	All Species CPUE
						Number Caught (CPUE = no. fish/km/h)																									
Section 9	4	00901	01-Oct-2015	635	1.10															8	41.23									8	41.23
		00902	01-Oct-2015	662	1.00			1	5.44											2	10.88									3	16.31
		00903	01-Oct-2015	620	1.10			1	5.28											2	10.56					3	15.84			6	31.67
		00904	01-Oct-2015	645	1.10															13	65.96					1	5.07			14	71.04
		00905	01-Oct-2015	702	1.10			1	4.66			1	4.66							4	18.65									6	27.97
		00906	01-Oct-2015	984	1.00															1	3.66					2	7.32			3	10.98
		00907	01-Oct-2015	1133	1.20															6	15.89					1	2.65			7	18.53
		00908	01-Oct-2015	719	1.10			1	4.55											9	40.97									10	45.52
		00909	01-Oct-2015	774	0.95			2	9.79	1	4.9									7	34.27									10	48.96
		00910	01-Oct-2015	818	1.10															11	44.01					3	12			14	56.01
		00911	01-Oct-2015	660	1.00			1	5.45											11	60					1	5.45			13	70.91
		00912	01-Oct-2015	729	1.10															15	67.34									15	67.34
		00913	01-Oct-2015	571	0.90															3	21.02									3	21.02
		00914	01-Oct-2015	604	0.95															5	31.37									5	31.37
		009SC61	01-Oct-2015	732	0.68															1	7.29					1	7.29			2	14.57
	Session Summary			**733**	**15.40**	**0**	*0*	**7**	2.23	**1**	0.32	**1**	0.32	**0**	*0*	**0**	*0*	**0**	*0*	**98**	31.25	**0**	*0*	**0**	*0*	**12**	3.83	**0**	*0*	**119**	37.95
Section 9	5	00901	04-Oct-2015	666	1.10															11	54.05									11	54.05
		00902	04-Oct-2015	704	1.00			2	10.23																					2	10.23
		00903	04-Oct-2015	706	1.10															6	27.81					1	4.64			7	32.45
		00904	04-Oct-2015	641	1.10			2	10.21											3	15.32									5	25.53
		00905	04-Oct-2015	800	1.10			2	8.18											3	12.27					1	4.09			6	24.55
		00907	04-Oct-2015	854	1.20			1	3.51											4	14.05					2	7.03			7	24.59
		00908	04-Oct-2015	624	1.10															4	20.98					1	5.24			5	26.22
		00909	04-Oct-2015	650	0.95															3	17.49									3	17.49
		00910	04-Oct-2015	812	1.10															1	4.03									1	4.03
		00911	04-Oct-2015	563	1.00															3	19.18									3	19.18
		00912	04-Oct-2015	711	1.10			1	4.6					1	4.6					6	27.62					1	4.6			9	41.43
		00913	04-Oct-2015	538	0.90															2	14.87									2	14.87
		00914	04-Oct-2015	537	0.95			1	7.06											11	77.62									12	84.68
	Session Summary			**677**	**13.70**	**0**	*0*	**9**	3.49	**0**	*0*	**0**	*0*	**1**	0.39	**0**	*0*	**0**	*0*	**57**	22.12	**0**	*0*	**0**	*0*	**6**	2.33	**0**	*0*	**73**	28.33
Section 9	6	00901	07-Oct-2015	655	1.10			1	5											4	19.99									5	24.98
		00902	07-Oct-2015	588	1.00															4	24.49					1	6.12			5	30.61
		00903	07-Oct-2015	596	1.10															4	21.96					2	10.98			6	32.95
		00904	07-Oct-2015	617	1.10															5	26.52									5	26.52
		00905	07-Oct-2015	704	1.10															8	37.19					1	4.65			9	41.84
		00906	07-Oct-2015	861	1.00															2	8.36									2	8.36
		00907	07-Oct-2015	815	1.20															4	14.72					1	3.68			5	18.4
		00908	07-Oct-2015	609	1.10															7	37.62									7	37.62
		00909	07-Oct-2015	616	0.95															6	36.91									6	36.91
		00910	07-Oct-2015	676	1.10			1	4.84											3	14.52									4	19.37
		00911	07-Oct-2015	541	1.00															4	26.62									4	26.62
		00912	07-Oct-2015	676	1.10			1	4.84											8	38.73									9	43.57
		00913	07-Oct-2015	539	0.90															2	14.84									2	14.84
		00914	07-Oct-2015	449	0.95															1	8.44									1	8.44
		009SC53	07-Oct-2015	343	0.26																					1	40.37			1	40.37
	Session Summary			**619**	**15.00**	**0**	*0*	**3**	1.16	**0**	*0*	**0**	*0*	**0**	*0*	**0**	*0*	**0**	*0*	**62**	24.04	**0**	*0*	**0**	*0*	**6**	2.33	**0**	*0*	**71**	27.53
Section Total All Samples				**53462**	**84.78**	**0**	*0*	**30**	*0*	**2**	*0*	**1**	*0*	**1**	*0*	**0**	*0*	**0**	*0*	**575**	*0*	**1**	*0*	**1**	*0*	**29**	*0*	**0**	*0*	**640**	*0*
Section Average All Samples				**636**	**1.01**	**0**	*0*	**0**	*2*	**0**	*0.13*	**0**	*0.07*	**0**	*0.07*	**0**	*0*	**0**	*0*	**7**	*38.39*	**0**	*0.07*	**0**	*0.07*	**0**	*1.94*	**0**	*0*	**8**	*42.73*
Section Standard Error of Mean						**0**	*0*	**0.07**	*0.39*	**0.02**	*0.09*	**0.01**	*0.06*	**0.01**	*0.05*	**0**	*0*	**0**	*0*	**0.67**	*3.6*	**0.01**	*0.05*	**0.01**	*0.08*	**0.08**	*0.59*	**0**	*0*	**0.65**	*3.51*
All Sections Total All Samples				**354924**	**551.16**	*29624*	*0.55*	*75*	*0*	*384*	*0.01*	*5*	*0*	*3*	*0*	*51*	*0*	*4*	*0*	*49*	*0*	*28577*	*0.53*	*26*	*0*	*264*	*0*	*155*	*0*	*31*	*0*
All Sections Average All Samples						*54*	*298.21*	*0*	*0.75*	*1*	*3.87*	*0*	*0.05*	*0*	*0.03*	*0*	*0.51*	*0*	*0.04*	*0*	*0.49*	*52*	*287.67*	*0*	*0.26*	*0*	*2.66*	*0*	*1.56*	*0*	*0.31*
All Sections Standard Error of Mean						*2.31*	*18.99*	*0.02*	*0.12*	*0.05*	*0.3*	*0*	*0.02*	*0*	*0.02*	*0.03*	*0.33*	*0*	*0.03*	*0.06*	*0.57*	*2.28*	*18.92*	*0.01*	*0.32*	*0.07*	*0.43*	*0.05*	*0.41*	*0.04*	*0.46*

Table E4 Summary of boat electroshocking non-sportfish catch (includes fish captured and observed and identified to species) and catch-per-unit-effort (CPUE = no. fish/km/hour) in the Peace River, 25 August to 07 October 2015.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 1	1	00104	26-Aug-2015	319	0.50																					1	22.57			1	22.57
		00105	26-Aug-2015	346	0.80															1	13.01									1	13.01
		00107	27-Aug-2015	400	0.55																					27	441.82			27	441.82
		00109	27-Aug-2015	482	0.98											7	53.62									24	183.85			31	237.47
		00110	27-Aug-2015	439	0.65																					29	365.87			29	365.87
		00111	27-Aug-2015	448	1.00																					7	56.25			7	56.25
		00112	27-Aug-2015	507	1.07																					16	106.18			16	106.18
		00114	27-Aug-2015	449	0.95															1	8.44					30	253.19			31	261.63
		00116	27-Aug-2015	449	0.98																					6	48.84			6	48.84
		00119	27-Aug-2015	583	0.75															1	8.23									1	8.23
	Session Summary			**442**	**8.20**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**6.95**	**0**	**0**	**3**	**2.98**	**0**	**0**	**0**	**0**	**140**	**139.06**	**0**	**0**	**150**	**148.99**
Section 1	2	00103	02-Sep-2015	380	1.20															1	7.89									1	7.89
		00105	02-Sep-2015	524	1.10															1	6.25									1	6.25
		00107	02-Sep-2015	437	0.55																					19	284.58			19	284.58
		00108	03-Sep-2015	645	0.85											2	13.13			1	6.57					26	170.73			29	190.42
		00109	03-Sep-2015	504	0.98															1	7.33					40	293.04			41	300.37
		00110	03-Sep-2015	581	0.65																					35	333.64			35	333.64
		00111	03-Sep-2015	656	0.90															1	6.1					9	54.88			10	60.98
		00112	03-Sep-2015	532	1.07																					53	335.18			53	335.18
		00113	03-Sep-2015	329	0.75																					26	379.33			26	379.33
		00114	03-Sep-2015	440	0.95															1	8.61					12	103.35			13	111.96
		00116	03-Sep-2015	515	0.98																					8	56.77			8	56.77
		00119	02-Sep-2015	560	0.75															1	8.57					2	17.14			3	25.71
	Session Summary			**509**	**10.70**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1.32**	**0**	**0**	**7**	**4.63**	**0**	**0**	**0**	**0**	**230**	**152.03**	**0**	**0**	**239**	**157.98**
Section 1	3	00101	10-Sep-2015	229	0.60																					1	26.2			1	26.2
		00103	10-Sep-2015	572	1.20																					5	26.22			5	26.22
		00104	10-Sep-2015	351	0.50																					38	779.49			38	779.49
		00105	10-Sep-2015	391	1.10																					2	16.74			2	16.74
		00107	11-Sep-2015	427	0.55																					15	229.93			15	229.93
		00108	10-Sep-2015	535	0.85																					48	379.99			48	379.99
		00109	11-Sep-2015	606	0.98											1	6.09									49	298.55			50	304.65
		00110	11-Sep-2015	552	0.65																					28	280.94			28	280.94
		00111	11-Sep-2015	561	0.60																					25	267.38			25	267.38
		00112	11-Sep-2015	535	1.07																					35	220.11			35	220.11
		00113	11-Sep-2015	333	0.75																					3	43.24			3	43.24
		00114	11-Sep-2015	431	0.95																					32	281.35			32	281.35
		00116	11-Sep-2015	383	0.98																					2	19.09			2	19.09
		00119	10-Sep-2015	535	0.75																					18	161.5			18	161.5
	Session Summary			**460**	**11.50**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0.68**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**301**	**204.84**	**0**	**0**	**302**	**205.52**

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 1	4	00101	15-Sep-2015	279	0.60															2	43.01									2	43.01
		00103	15-Sep-2015	616	1.20																					9	43.83			9	43.83
		00104	15-Sep-2015	390	0.50																					12	221.54			12	221.54
		00107	15-Sep-2015	442	0.55																					11	162.9			11	162.9
		00108	16-Sep-2015	559	0.85																					1	7.58			1	7.58
		00109	16-Sep-2015	570	0.98																					28	181.38			28	181.38
		00110	15-Sep-2015	504	0.65															2	21.98					15	164.84			17	186.81
		00111	16-Sep-2015	593	1.00															4	24.28					22	133.56			26	157.84
		00112	16-Sep-2015	585	1.07																					26	149.53			26	149.53
		00113	16-Sep-2015	343	0.75															1	13.99					2	27.99			3	41.98
		00114	16-Sep-2015	603	0.95																					20	125.69			20	125.69
		00119	15-Sep-2015	523	0.75																					22	201.91			22	201.91
	Session Summary			**501**	**9.80**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**9**	***6.6***	**0**	***0***	**0**	***0***	**168**	***123.18***	**0**	***0***	**177**	***129.78***
Section 1	5	00103	24-Sep-2015	703	1.20																					25	106.69			25	106.69
		00104	24-Sep-2015	332	0.50																					27	585.54			27	585.54
		00107	24-Sep-2015	363	0.55											1	18.03									5	90.16			6	108.19
		00108	24-Sep-2015	484	0.85																					1	8.75			1	8.75
		00109	24-Sep-2015	444	0.98																					46	382.54			46	382.54
		00110	24-Sep-2015	441	0.65																					15	188.38			15	188.38
		00111	24-Sep-2015	479	1.00																					16	120.25			16	120.25
		00112	24-Sep-2015	441	1.07																					53	404.35			53	404.35
		00113	24-Sep-2015	342	0.75																					16	224.56			16	224.56
		00114	24-Sep-2015	432	0.95																					37	324.56			37	324.56
		00116	24-Sep-2015	440	0.98																					5	41.53			5	41.53
		00119	24-Sep-2015	426	0.75																					11	123.94			11	123.94
	Session Summary			**444**	**10.20**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**1**	***0.79***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**257**	***204.29***	**0**	***0***	**258**	***205.09***
Section 1	6	00101	28-Sep-2015	223	0.60																					2	53.81			2	53.81
		00103	28-Sep-2015	509	1.20															1	5.89					2	11.79			3	17.68
		00104	28-Sep-2015	243	0.50																					8	237.04			8	237.04
		00108	28-Sep-2015	535	0.85											1	7.92									35	277.08			36	284.99
		00109	28-Sep-2015	481	0.98																					15	115.14			15	115.14
		00110	28-Sep-2015	386	0.65																					4	57.39			4	57.39
		00111	28-Sep-2015	429	1.00																					3	25.17			3	25.17
		00112	29-Sep-2015	585	1.07																					2	11.5			2	11.5
		00113	29-Sep-2015	407	0.75																					25	294.84			25	294.84
		00114	29-Sep-2015	522	0.95											1	7.26													1	7.26
		00116	29-Sep-2015	487	0.98																					3	22.51			3	22.51
		00119	28-Sep-2015	385	0.75																					1	12.47			1	12.47
	Session Summary			**433**	**10.30**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**2**	***1.61***	**0**	***0***	**1**	***0.81***	**0**	***0***	**0**	***0***	**100**	***80.72***	**0**	***0***	**103**	***83.14***
Section Total All Samples				**33492**	**60.84**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**13**	***0***	**0**	***0***	**20**	***0***	**0**	***0***	**0**	***0***	**1196**	***0***	**0**	***0***	**1229**	***0***
Section Average All Samples				**465**	**0.85**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***1.65***	**0**	***0***	**0**	***2.54***	**0**	***0***	**0**	***0***	**17**	***152.18***	**0**	***0***	**17**	***156.38***
Section Standard Error of Mean						**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0.1**	***0.81***	**0**	***0***	**0.08**	***0.81***	**0**	***0***	**0**	***0***	**1.75**	***18.26***	**0**	***0***	**1.76**	***18.12***

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Finescale Dace No.	Finescale Dace CPUE	Flathead Chub No.	Flathead Chub CPUE	Lake Chub No.	Lake Chub CPUE	Longnose Dace No.	Longnose Dace CPUE	Northern Pearl Dace No.	Northern Pearl Dace CPUE	Northern Pikeminnow No.	Northern Pikeminnow CPUE	Redside Shiner No.	Redside Shiner CPUE	Sculpin spp. No.	Sculpin spp. CPUE	Shiner species No.	Shiner species CPUE	Spottail Shiner No.	Spottail Shiner CPUE	Sucker spp. No.	Sucker spp. CPUE	Troutperch No.	Troutperch CPUE	All Species No.	All Species CPUE
Section 3	1	00301	28-Aug-2015	958	1.80																					41	85.59			41	85.59
		00302	28-Aug-2015	1031	1.90																					72	132.32			72	132.32
		00303	29-Aug-2015	670	1.45																					68	251.98			68	251.98
		00304	29-Aug-2015	800	1.35																					4	13.33			4	13.33
		00305	29-Aug-2015	782	1.55											4	11.88									280	831.61			284	843.49
		00306	29-Aug-2015	717	0.95											14	73.99									88	465.1			102	539.09
		00307	30-Aug-2015	571	0.95																					40	265.46			40	265.46
		00308	30-Aug-2015	568	1.35																					19	89.2			19	89.2
		00309	31-Aug-2015	533	0.95																					26	184.85			26	184.85
		00310	31-Aug-2015	734	1.20																					11	44.96			11	44.96
		00311	31-Aug-2015	699	1.25																					45	185.41			45	185.41
		00312	31-Aug-2015	794	0.92											5	24.64			1	4.93					71	349.91			77	379.48
		00314	29-Aug-2015	651	0.98																					13	73.73			13	73.73
		00315	30-Aug-2015	1099	1.70															2	3.85					30	57.81			32	61.66
		00316	30-Aug-2015	757	1.48															1	3.22					18	58.03			19	61.26
	Session Summary			**758**	**19.80**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**5.52**	**0**	**0**	**4**	**0.96**	**0**	**0**	**0**	**0**	**826**	**198.13**	**0**	**0**	**853**	**204.61**
Section 3	2	00301	04-Sep-2015	1094	1.80																					12	21.94			12	21.94
		00302	04-Sep-2015	981	1.90																					9	17.38			9	17.38
		00303	04-Sep-2015	836	1.45											1	2.97			1	2.97					40	118.79			42	124.73
		00304	04-Sep-2015	952	1.35																					74	207.28			74	207.28
		00305	04-Sep-2015	851	1.55																					40	109.17			40	109.17
		00306	04-Sep-2015	781	1.00											2	9.22									36	165.94			38	175.16
		00307	04-Sep-2015	650	0.95											1	5.83									125	728.74			126	734.57
		00308	04-Sep-2015	705	1.35																					45	170.21			45	170.21
		00309	04-Sep-2015	750	0.95															1	5.05	1	5.05			34	171.79			36	181.89
		00310	04-Sep-2015	919	1.20															4	13.06					25	81.61			29	94.67
		00311	04-Sep-2015	742	1.25															1	3.88					16	62.1			17	65.98
		00312	04-Sep-2015	1071	1.17																					15	43.09			15	43.09
		00314	04-Sep-2015	668	0.98											3	16.58									46	254.26			49	270.84
		00315	04-Sep-2015	1159	1.70															2	3.65					58	105.97			60	109.63
		00316	04-Sep-2015	857	1.48											3	8.54									136	387.32			139	395.86
	Session Summary			**868**	**20.10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**2.06**	**0**	**0**	**9**	**1.86**	**1**	**0.21**	**0**	**0**	**711**	**146.71**	**0**	**0**	**731**	**150.84**
Section 3	3	00301	12-Sep-2015	1125	1.80															2	3.56					19	33.78			21	37.33
		00302	12-Sep-2015	921	1.90											1	2.06									6	12.34			7	14.4
		00303	12-Sep-2015	774	1.45											1	3.21									13	41.7			14	44.91
		00304	12-Sep-2015	880	1.35																					16	48.48			16	48.48
		00305	13-Sep-2015	794	1.55											2	5.85									17	49.73			19	55.58
		00306	12-Sep-2015	758	1.00											1	4.75									43	204.22			44	208.97
		00307	12-Sep-2015	744	0.95																					20	101.87			20	101.87
		00308	12-Sep-2015	725	1.35							2	7.36													19	69.89			21	77.24
		00309	13-Sep-2015	600	0.95																					17	107.37			17	107.37
		00310	13-Sep-2015	769	1.20																					13	50.72			13	50.72
		00311	13-Sep-2015	664	1.25											1	4.34									27	117.11			28	121.45
		00312	13-Sep-2015	888	1.17											1	3.47									24	83.16			25	86.63
		00314	12-Sep-2015	846	0.98															1	4.36					14	61.1			15	65.47
		00315	12-Sep-2015	1366	1.70															17	26.35					20	31.01			37	57.36
		00316	12-Sep-2015	1055	1.48															4	9.25					13	30.07			17	39.33
	Session Summary			**861**	**20.10**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0.42**	**0**	**0**	**7**	**1.46**	**0**	**0**	**24**	**4.99**	**0**	**0**	**0**	**0**	**281**	**58.45**	**0**	**0**	**314**	**65.32**

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 3	4	00301	17-Sep-2015	1241	1.80																					16	*25.79*			16	*25.79*
		00302	17-Sep-2015	1105	1.90																					34	*58.3*			34	*58.3*
		00303	17-Sep-2015	806	1.45																					87	*267.99*			87	*267.99*
		00305	17-Sep-2015	1048	1.55											2	*4.43*									105	*232.7*			107	*237.13*
		00306	18-Sep-2015	771	1.00											3	*14.01*									26	*121.4*			29	*135.41*
		00307	18-Sep-2015	514	0.95																					7	*51.61*			7	*51.61*
		00308	19-Sep-2015	590	1.35																					11	*49.72*			11	*49.72*
		00309	19-Sep-2015	500	0.95																					11	*83.37*			11	*83.37*
		00310	19-Sep-2015	672	1.20											1	*4.46*									16	*71.43*			17	*75.89*
		00311	19-Sep-2015	567	1.25																					4	*20.32*			4	*20.32*
		00312	19-Sep-2015	618	1.17											1	*4.98*									8	*39.83*			9	*44.81*
		00314	18-Sep-2015	685	0.98																					18	*97.02*			18	*97.02*
		00315	18-Sep-2015	1085	1.70															3	*5.86*					31	*60.5*			34	*66.36*
		00316	18-Sep-2015	663	1.48																					4	*14.73*			4	*14.73*
	Session Summary			**776**	**18.70**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**7**	***1.74***	**0**	***0***	**3**	***0.74***	**0**	***0***	**0**	***0***	**378**	***93.78***	**0**	***0***	**388**	***96.26***
Section 3	5	00301	25-Sep-2015	1033	1.80																					8	*15.49*			8	*15.49*
		00302	25-Sep-2015	978	1.90																					19	*36.81*			19	*36.81*
		00303	25-Sep-2015	692	1.45																					18	*64.58*			18	*64.58*
		00304	25-Sep-2015	925	1.35											1	*2.88*									10	*28.83*			11	*31.71*
		00305	25-Sep-2015	876	1.55																					9	*23.86*			9	*23.86*
		00306	25-Sep-2015	621	1.00																					27	*156.52*			27	*156.52*
		00307	26-Sep-2015	567	0.95																					39	*260.65*			39	*260.65*
		00308	26-Sep-2015	658	1.35																					35	*141.84*			35	*141.84*
		00309	25-Sep-2015	477	0.95											1	*7.94*									24	*190.67*			25	*198.61*
		00310	25-Sep-2015	666	1.20																					23	*103.6*			23	*103.6*
		00311	25-Sep-2015	615	1.25																					24	*112.39*			24	*112.39*
		00312	25-Sep-2015	719	1.17																					21	*89.87*			21	*89.87*
		00314	26-Sep-2015	519	0.98																					13	*92.49*			13	*92.49*
		00315	26-Sep-2015	1065	1.70																					30	*59.65*			30	*59.65*
		00316	26-Sep-2015	803	1.48																					23	*69.91*			23	*69.91*
	Session Summary			**748**	**20.10**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**2**	***0.48***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**323**	***77.34***	**0**	***0***	**325**	***77.82***
Section 3	6	00301	29-Sep-2015	886	1.80																					3	*6.77*			3	*6.77*
		00302	29-Sep-2015	1119	1.90											1	*1.69*	1	*1.69*							23	*38.94*			25	*42.33*
		00303	29-Sep-2015	778	1.45																					18	*57.44*			18	*57.44*
		00304	29-Sep-2015	629	1.35																					2	*8.48*			2	*8.48*
		00305	29-Sep-2015	919	1.55											1	*2.53*			1	*2.53*					23	*58.13*			25	*63.18*
		00306	29-Sep-2015	640	1.00					1	*5.62*					1	*5.62*									53	*298.12*			55	*309.38*
		00307	30-Sep-2015	565	0.95																					10	*67.07*			10	*67.07*
		00308	30-Sep-2015	633	1.35																					17	*71.62*			17	*71.62*
		00309	30-Sep-2015	483	0.95											1	*7.85*									15	*117.69*			16	*125.53*
		00310	30-Sep-2015	752	1.20											1	*3.99*									21	*83.78*			22	*87.77*
		00311	30-Sep-2015	552	1.25											1	*5.22*									11	*57.39*			12	*62.61*
		00312	30-Sep-2015	690	1.17																					26	*115.94*			26	*115.94*
		00314	30-Sep-2015	617	0.98											1	*5.98*									14	*83.78*			15	*89.76*
		00315	30-Sep-2015	1140	1.70															1	*1.86*					16	*29.72*			17	*31.58*
		00316	30-Sep-2015	743	1.48																					8	*26.28*			8	*26.28*
	Session Summary			**743**	**20.10**	**0**	***0***	**0**	***0***	**1**	***0.24***	**0**	***0***	**0**	***0***	**7**	***1.69***	**1**	***0.24***	**2**	***0.48***	**0**	***0***	**0**	***0***	**260**	***62.67***	**0**	***0***	**271**	***65.33***
Section Total All Samples				**70514**	**118.77**	**0**	***0***	**0**	***0***	**1**	***0***	**2**	***0***	**0**	***0***	**56**	***0***	**1**	***0***	**42**	***0***	**1**	***0***	**0**	***0***	**2779**	***0***	**0**	***0***	**2882**	***0***
Section Average All Samples				**792**	**1.33**	**0**	***0***	**0**	***0***	**0**	***0.04***	**0**	***0.08***	**0**	***0***	**1**	***2.14***	**0**	***0.04***	**0**	***1.61***	**0**	***0.04***	**0**	***0***	**31**	***106.36***	**0**	***0***	**32**	***110.3***
Section Standard Error of Mean						**0**	***0***	**0**	***0***	**0.01**	***0.06***	**0.02**	***0.08***	**0**	***0***	**0.18**	***0.92***	**0.01**	***0.02***	**0.21**	***0.36***	**0.01**	***0.06***	**0**	***0***	**3.91**	***14.28***	**0**	***0***	**3.99**	***14.71***

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																											
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 5	1	00502	31-Aug-2015	450	0.95																					31	261.05			31	261.05
		00505	31-Aug-2015	585	1.00																					23	141.54			23	141.54
		00506	31-Aug-2015	661	1.00																					37	201.51			37	201.51
		00507	31-Aug-2015	417	0.78																					9	99.61			9	99.61
		00508	01-Sep-2015	730	0.92											1	5.33									9	47.98			10	53.31
		00509	31-Aug-2015	417	0.98																					22	194.8			22	194.8
		00510	31-Aug-2015	677	1.13																					20	94.12			20	94.12
		00511	01-Sep-2015	530	0.72																					12	113.21			12	113.21
		00512	31-Aug-2015	537	1.28																					10	52.37			10	52.37
		00513	01-Sep-2015	436	0.77													3	32.17							3	32.17			6	64.34
		00514	01-Sep-2015	546	0.56													1	11.77	6	70.64					2	23.55			9	105.97
		00515	01-Sep-2015	769	0.97															3	14.48					2	9.65			5	24.13
		00517	01-Sep-2015	928	0.42											4	36.95					500	4618.23	2	18.47	36	332.51			542	5006.16
		005SC060	31-Aug-2015	372	0.45													9	193.55							13	279.57			22	473.12
	Session Summary			**575**	**11.90**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**2.63**	**13**	**6.84**	**9**	**4.74**	**500**	**263.06**	**2**	**1.05**	**229**	**120.48**	**0**	**0**	**758**	**398.8**
Section 5	2	00502	10-Sep-2015	691	0.95											1	5.48									15	82.26			16	87.74
		00505	10-Sep-2015	882	1.00											1	4.08									56	228.57			57	232.65
		00506	10-Sep-2015	1015	1.00															1	3.55					82	290.84			83	294.38
		00507	10-Sep-2015	494	0.78							1	9.34					4	37.37					1	9.34	2	18.69			8	74.74
		00508	10-Sep-2015	778	0.92											3	15.01									51	255.12			54	270.13
		00509	11-Sep-2015	582	0.98															1	6.34					24	152.26			25	158.6
		00510	11-Sep-2015	810	1.13											2	7.87	1	3.93	1	3.93					41	161.26			45	176.99
		00511	11-Sep-2015	570	0.72											1	8.77									38	333.33			39	342.11
		00512	11-Sep-2015	1066	1.28											1	2.64									58	153.03			59	155.66
		00513	11-Sep-2015	667	0.77											1	7.01			8	56.08					18	126.17			27	189.26
		00514	11-Sep-2015	506	0.56															19	241.39					39	495.48			58	736.87
		00515	11-Sep-2015	801	0.97							1	4.63			3	13.9			3	13.9					87	403.1			94	435.54
		00516	11-Sep-2015	821	0.80											2	10.96									25	137.03			27	147.99
		00517	10-Sep-2015	560	0.42											1	15.31	2	30.61							13	198.98			16	244.9
		005SC060	11-Sep-2015	993	0.53													4	27.36					1	6.84	12	82.08			17	116.29
	Session Summary			**749**	**12.80**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0.75**	**0**	**0**	**16**	**6.01**	**11**	**4.13**	**33**	**12.39**	**0**	**0**	**2**	**0.75**	**561**	**210.66**	**0**	**0**	**625**	**234.69**
Section 5	3	00502	15-Sep-2015	544	0.95																					17	118.42			17	118.42
		00505	15-Sep-2015	654	1.00																					32	176.15			32	176.15
		00506	15-Sep-2015	897	1.00											3	12.04	1	4.01							109	437.46			113	453.51
		00507	15-Sep-2015	442	0.78							3	31.33							1	10.44					4	41.77			8	83.54
		00508	15-Sep-2015	770	0.92											3	15.16	2	10.11							32	161.74			37	187.01
		00509	16-Sep-2015	625	0.98															1	5.91					41	242.22			42	248.12
		00510	16-Sep-2015	806	1.13											2	7.91			1	3.95					17	67.2			20	79.05
		00511	16-Sep-2015	465	0.72																					30	322.58			30	322.58
		00512	16-Sep-2015	877	1.28											2	6.41							1	3.21	38	121.86			41	131.49
		00513	16-Sep-2015	597	0.77																					16	125.3			16	125.3
		00514	16-Sep-2015	433	0.56																					16	237.55			16	237.55
		00515	16-Sep-2015	669	0.97																					40	221.9			40	221.9
		00516	16-Sep-2015	630	0.80																					3	21.43			3	21.43
		00517	15-Sep-2015	533	0.42											1	16.08									22	353.79			23	369.87
		005SC060	16-Sep-2015	573	0.53																					10	118.54			10	118.54
	Session Summary			**634**	**12.80**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1.33**	**0**	**0**	**11**	**4.88**	**3**	**1.33**	**3**	**1.33**	**0**	**0**	**1**	**0.44**	**427**	**189.42**	**0**	**0**	**448**	**198.74**

Table E4 Continued.

Section	Session	Site	Date	Time Sampled	Length Sampled	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
				(s)	(km)	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 5	4	00502	20-Sep-2015	541	0.95											1	7									6	42.03			7	49.03
		00505	20-Sep-2015	747	1.00											2	9.64			1	4.82					34	163.86			37	178.31
		00506	20-Sep-2015	885	1.00											1	4.07	1	4.07	1	4.07					90	366.1			93	378.31
		00507	20-Sep-2015	460	0.78																					4	40.13			4	40.13
		00508	20-Sep-2015	666	0.92																					40	233.75			40	233.75
		00509	21-Sep-2015	491	0.98																					14	105.28			14	105.28
		00510	21-Sep-2015	607	1.13											2	10.5									7	36.74			9	47.24
		00511	21-Sep-2015	371	0.72																					13	175.2			13	175.2
		00512	21-Sep-2015	636	1.28																					14	61.91			14	61.91
		00513	21-Sep-2015	441	0.77											3	31.8									7	74.21			10	106.02
		00514	21-Sep-2015	396	0.56																					13	211.04			13	211.04
		00515	21-Sep-2015	452	0.97																					40	328.44			40	328.44
		00516	21-Sep-2015	419	0.80																					5	53.7			5	53.7
		00517	20-Sep-2015	565	0.40											1	15.93	1	15.93							13	207.08			15	238.94
		005SC060	21-Sep-2015	601	0.53																					17	192.13			17	192.13
	Session Summary			**552**	**12.80**	**0**	*0*	**0**	*0*	**0**	*0*	**0**	*0*	**0**	*0*	**10**	*5.1*	**2**	*1.02*	**2**	*1.02*	**0**	*0*	**0**	*0*	**317**	*161.51*	**0**	*0*	**331**	*168.65*
Section 5	5	00502	25-Sep-2015	497	0.95																					5	38.12			5	38.12
		00505	25-Sep-2015	556	1.00																					57	369.06			57	369.06
		00506	25-Sep-2015	765	1.00													1	4.71							64	301.18			65	305.88
		00507	25-Sep-2015	377	0.78																					3	36.73			3	36.73
		00508	25-Sep-2015	697	0.92											6	33.5									41	228.93			47	262.44
		00509	25-Sep-2015	555	0.98																					29	192.93			29	192.93
		00510	25-Sep-2015	741	1.13											1	4.3									25	107.48			26	111.78
		00511	25-Sep-2015	433	0.72																					14	161.66			14	161.66
		00512	25-Sep-2015	784	1.28																					24	86.1			24	86.1
		00513	25-Sep-2015	633	0.77																					12	88.63			12	88.63
		00514	25-Sep-2015	462	0.56															5	69.57					4	55.66			9	125.23
		00515	25-Sep-2015	695	0.97																					46	245.64			46	245.64
		00516	25-Sep-2015	625	0.80															1	7.2					4	28.8			5	36
		00517	25-Sep-2015	507	0.70													4	40.57							8	81.15			12	121.72
		005SC060	25-Sep-2015	594	0.53																					15	171.53			15	171.53
	Session Summary			**595**	**13.10**	**0**	*0*	**0**	*0*	**0**	*0*	**0**	*0*	**0**	*0*	**7**	*3.23*	**5**	*2.31*	**6**	*2.77*	**0**	*0*	**0**	*0*	**351**	*162.11*	**0**	*0*	**369**	*170.43*
Section 5	6	00502	30-Sep-2015	487	0.95											1	7.78									9	70.03			10	77.81
		00505	30-Sep-2015	600	1.00											1	6			1	6					31	186			33	198
		00506	30-Sep-2015	717	1.00											4	20.08	1	5.02							62	311.3			67	336.4
		00507	30-Sep-2015	436	0.78							1	10.59			2	21.17									8	84.69			11	116.44
		00508	30-Sep-2015	589	0.92													1	6.61							39	257.7			40	264.31
		00509	30-Sep-2015	572	0.98											2	12.91									28	180.74			30	193.65
		00510	30-Sep-2015	615	1.13											2	10.36									26	134.69			28	145.05
		00511	30-Sep-2015	423	0.72																					11	130.02			11	130.02
		00512	30-Sep-2015	687	1.28																					40	163.76			40	163.76
		00513	30-Sep-2015	480	0.77											1	9.74									19	185.06			20	194.81
		00514	30-Sep-2015	397	0.56											1	16.19									22	356.24			23	372.44
		00515	30-Sep-2015	685	0.97															1	5.42					36	195.05			37	200.47
		00516	30-Sep-2015	412	0.80																					4	43.69			4	43.69
		00517	30-Sep-2015	547	0.70											1	9.4									7	65.81			8	75.22
		005SC060	30-Sep-2015	650	0.53													3	31.35							12	125.4			15	156.75
	Session Summary			**553**	**13.10**	**0**	*0*	**0**	*0*	**0**	*0*	**1**	*0.5*	**0**	*0*	**15**	*7.45*	**5**	*2.48*	**2**	*0.99*	**0**	*0*	**0**	*0*	**354**	*175.92*	**0**	*0*	**377**	*187.35*
Section Total All Samples				**54302**	**76.52**	**0**	*0*	**0**	*0*	**0**	*0*	**6**	*0*	**0**	*0*	**64**	*0*	**39**	*0*	**55**	*0*	**500**	*0*	**5**	*0*	**2239**	*0*	**0**	*0*	**2908**	*0*
Section Average All Samples				**610**	**0.86**	**0**	*0*	**0**	*0*	**0**	*0*	**0**	*0.46*	**0**	*0*	**1**	*4.94*	**0**	*3.01*	**1**	*4.24*	**6**	*38.56*	**0**	*0.39*	**25**	*172.68*	**0**	*0*	**33**	*224.28*
Section Standard Error of Mean						**0**	*0*	**0**	*0*	**0**	*0*	**0.04**	*0.39*	**0**	*0*	**0.12**	*0.84*	**0.14**	*2.33*	**0.25**	*2.97*	**5.62**	*51.89*	**0.03**	*0.24*	**2.27**	*11.55*	**0**	*0*	**6.24**	*55.71*

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 6	1	00601	25-Aug-2015	989	1.20											1	3.03									25	75.83			26	78.87
		00602	27-Aug-2015	518	0.90																					6	46.33			6	46.33
		00603	26-Aug-2015	1008	1.30																					64	175.82			64	175.82
		00604	27-Aug-2015	644	1.00											1	5.59									89	497.52			90	503.11
		00605	27-Aug-2015	392	0.80																					124	1423.47			124	1423.47
		00606	27-Aug-2015	909	1.40																					82	231.97			82	231.97
		00607	28-Aug-2015	420	1.00															1	8.57					6	51.43			7	60
		00608	27-Aug-2015	515	1.00																					62	433.4			62	433.4
		00609	27-Aug-2015	684	1.00											2	10.53									35	184.21			37	194.74
		00610	28-Aug-2015	665	0.85																					14	89.16			14	89.16
		00612	29-Aug-2015	525	0.85																					65	524.37			65	524.37
		00613	29-Aug-2015	651	0.90											3	18.43	1	6.14					1	6.14	90	553			95	583.72
		006PIN01	26-Aug-2015	1201	1.50							1	2			1	2			1	2					17	33.97			20	39.97
		006PIN02	26-Aug-2015	798	1.00											2	9.02									25	112.78			27	121.8
		006SC036	29-Aug-2015	680	0.20													25	661.76					2	52.94	25	661.76			52	1376.47
		006SC047	27-Aug-2015	467	0.55																					12	168.19			12	168.19
	Session Summary			**692**	**15.40**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0.34**	**0**	**0**	**10**	**3.38**	**26**	**8.78**	**2**	**0.68**	**0**	**0**	**3**	**1.01**	**741**	**250.32**	**0**	**0**	**783**	**264.51**
Section 6	2	00601	02-Sep-2015	826	1.20																					126	457.63			126	457.63
		00603	02-Sep-2015	629	1.30																					80	352.21			80	352.21
		00604	02-Sep-2015	638	1.00													1	5.64							88	496.55			89	502.19
		00605	03-Sep-2015	458	0.80																					80	786.03			80	786.03
		00606	03-Sep-2015	1062	1.40					1	2.42					1	2.42	8	19.37			4	9.69	1	2.42	110	266.34			125	302.66
		00607	03-Sep-2015	844	1.00															1	4.27	3	12.8			109	464.93			113	481.99
		00608	05-Sep-2015	856	1.00															4	16.82					21	88.32			25	105.14
		00609	03-Sep-2015	867	1.00											1	4.15									66	274.05	1	4.15	68	282.35
		00610	03-Sep-2015	705	0.85															1	6.01	2	12.02			75	450.56			78	468.59
		00611	03-Sep-2015	671	0.90											1	5.96									65	387.48			66	393.44
		00612	05-Sep-2015	556	0.85					2	15.23					5	38.09			1	7.62					41	312.31			49	373.25
		00613	05-Sep-2015	806	0.90					1	4.96					1	4.96									37	183.62			39	193.55
		00614	02-Sep-2015	439	0.98																					21	176.63			21	176.63
		006PIN01	01-Sep-2015	1082	1.50							1	2.22													3	6.65			4	8.87
		006PIN02	01-Sep-2015	870	1.00											1	4.14									12	49.66			13	53.79
		006SC036	05-Sep-2015	332	0.20											1	54.22	4	216.87							1	54.22			6	325.3
		006SC047	02-Sep-2015	591	0.55																					9	99.68			9	99.68
	Session Summary			**720**	**16.40**	**0**	**0**	**0**	**0**	**4**	**1.22**	**1**	**0.3**	**0**	**0**	**11**	**3.35**	**13**	**3.96**	**7**	**2.13**	**9**	**2.74**	**1**	**0.3**	**944**	**287.8**	**1**	**0.3**	**991**	**302.13**
Section 6	3	00601	08-Sep-2015	824	1.20											1	3.64									80	291.26			81	294.9
		00602	08-Sep-2015	477	0.90																					4	33.54			4	33.54
		00603	08-Sep-2015	1458	1.30																					137	260.21			137	260.21
		00604	08-Sep-2015	674	1.00											2	10.68									61	325.82			63	336.5
		00605	08-Sep-2015	414	0.80											1	10.87									56	608.7			57	619.57
		00606	09-Sep-2015	790	1.40											1	3.25									51	166			52	169.26
		00607	09-Sep-2015	748	1.00											1	4.81	1	4.81							72	346.52			74	356.15
		00608	09-Sep-2015	602	1.00											2	11.96	1	5.98							62	370.76			65	388.7
		00609	09-Sep-2015	677	1.00											1	5.32	1	5.32					1	5.32	46	244.61			49	260.56
		00610	09-Sep-2015	580	0.85													1	7.3							35	255.58			36	262.88
		00611	09-Sep-2015	530	0.90													6	45.28							18	135.85			24	181.13
		00612	09-Sep-2015	437	0.85																					52	503.97			52	503.97
		00613	09-Sep-2015	733	0.90											1	5.46	14	76.4							50	272.85			65	354.71
		00614	08-Sep-2015	630	0.98																					16	93.77			16	93.77
		006PIN01	08-Sep-2015	1182	1.50							1	2.03			2	4.06									5	10.15			8	16.24
		006PIN02	08-Sep-2015	574	1.00											1	6.27									13	81.53			14	87.8
		006SC036	09-Sep-2015	275	0.25											1	52.36	15	785.45							29	1518.55			45	2356.36
		006SC047	08-Sep-2015	728	0.55											1	8.99									11	98.9			12	107.89
	Session Summary			**685**	**17.40**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0.3**	**0**	**0**	**15**	**4.53**	**39**	**11.78**	**0**	**0**	**0**	**0**	**1**	**0.3**	**798**	**241.03**	**0**	**0**	**854**	**257.94**

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h): Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 6	4	00601	18-Sep-2015	688	1.20											2	8.72									73	318.31			75	327.03
		00602	18-Sep-2015	485	0.84																					5	44.45			5	44.45
		00603	18-Sep-2015	641	1.30																					82	354.25			82	354.25
		00604	18-Sep-2015	619	1.00											6	34.89	1	5.82							70	407.11			77	447.82
		00605	18-Sep-2015	431	0.80																					87	908.35			87	908.35
		00606	17-Sep-2015	718	1.40											1	3.58									137	490.65			138	494.23
		00607	17-Sep-2015	731	1.00											1	4.92									70	344.73			71	349.66
		00608	18-Sep-2015	532	1.00																					21	142.11			21	142.11
		00609	17-Sep-2015	742	1.00											1	4.85									42	203.77			43	208.63
		00610	17-Sep-2015	646	0.85																					38	249.13			38	249.13
		00611	17-Sep-2015	603	0.90																					10	66.33			10	66.33
		00612	17-Sep-2015	548	0.85											1	7.73									135	1043.37			136	1051.09
		00613	17-Sep-2015	671	0.90											3	17.88	11	65.57							95	566.32			109	649.78
		00614	18-Sep-2015	525	0.98											1	7.03									73	513.41			74	520.44
		006PIN01	18-Sep-2015	1172	1.50																					6	12.29			6	12.29
		006PIN02	18-Sep-2015	502	1.00																					9	64.54			9	64.54
		006SC036	17-Sep-2015	343	0.30													8	279.88	3	104.96			1	34.99	18	629.74			30	1049.56
		006SC047	18-Sep-2015	393	0.55																					2	33.31			2	33.31
	Session Summary			**611**	**17.40**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**5.42**	**20**	**6.77**	**3**	**1.02**	**0**	**0**	**1**	**0.34**	**973**	**329.48**	**0**	**0**	**1013**	**343.02**
Section 6	5	00601	22-Sep-2015	755	1.20											3	11.92			1	3.97					25	99.34			29	115.23
		00602	22-Sep-2015	493	0.90																					1	8.11			1	8.11
		00603	22-Sep-2015	752	1.30																					37	136.25			37	136.25
		00604	22-Sep-2015	647	1.00											1	5.56			1	5.56					15	83.46			17	94.59
		00605	22-Sep-2015	495	0.80																					36	327.27			36	327.27
		00606	23-Sep-2015	957	1.40							1	2.69			4	10.75									58	155.84			63	169.28
		00607	23-Sep-2015	794	1.00											1	4.53									81	367.25			82	371.79
		00608	22-Sep-2015	601	1.00																					4	23.96			4	23.96
		00609	23-Sep-2015	999	1.00													1	3.6							49	176.58			50	180.18
		00610	23-Sep-2015	709	0.85											1	5.97	1	5.97	1	5.97					33	197.13			36	215.05
		00611	23-Sep-2015	685	0.90																					23	134.31			23	134.31
		00612	23-Sep-2015	521	0.85													2	16.26							32	260.13			34	276.39
		00613	23-Sep-2015	717	0.90					2	11.16					3	16.74	39	217.57							46	256.62			90	502.09
		00614	22-Sep-2015	788	0.98											3	14.06									107	501.37			110	515.42
		006PIN01	22-Sep-2015	977	1.50											1	2.46									2	4.91			3	7.37
		006PIN02	22-Sep-2015	496	1.00											1	7.26													1	7.26
		006SC036	23-Sep-2015	340	0.50													1	21.18							14	296.47			15	317.65
		006SC047	22-Sep-2015	441	0.55											1	14.84									4	59.37			5	74.21
	Session Summary			**676**	**17.60**	**0**	**0**	**0**	**0**	**2**	**0.61**	**1**	**0.3**	**0**	**0**	**19**	**5.75**	**44**	**13.31**	**3**	**0.91**	**0**	**0**	**0**	**0**	**567**	**171.56**	**0**	**0**	**636**	**192.44**
Section 6	6	00601	26-Sep-2015	566	1.20											2	10.6									38	201.41			40	212.01
		00602	26-Sep-2015	455	0.90											1	8.79	1	8.79											2	17.58
		00603	26-Sep-2015	640	1.30																					27	116.83			27	116.83
		00604	26-Sep-2015	559	1.00													2	12.88	1	6.44					9	57.96			12	77.28
		00605	26-Sep-2015	419	0.80																					66	708.83			66	708.83
		00606	26-Sep-2015	813	1.40																					61	192.94			61	192.94
		00607	28-Sep-2015	685	1.00																					86	451.97			86	451.97
		00608	26-Sep-2015	516	1.00													1	6.98							16	111.63			17	118.6
		00609	26-Sep-2015	706	1.00																					45	229.46			45	229.46
		00610	28-Sep-2015	654	0.85					1	6.48							2	12.95							15	97.14			18	116.57
		00611	28-Sep-2015	684	0.90											2	11.7									8	46.78			10	58.48
		00612	28-Sep-2015	564	0.85																					25	187.73			25	187.73
		00613	28-Sep-2015	619	0.90											3	19.39									49	316.64			52	336.03
		00614	26-Sep-2015	625	0.98																					94	555.32			94	555.32
		006PIN01	26-Sep-2015	964	1.50																					3	7.47			3	7.47
		006PIN02	26-Sep-2015	435	1.00																					1	8.28			1	8.28
		006SC036	28-Sep-2015	564	0.50																					9	114.89			9	114.89
		006SC047	26-Sep-2015	452	0.55																					1	14.48			1	14.48
	Session Summary			**607**	**17.60**	**0**	**0**	**0**	**0**	**1**	**0.34**	**0**	**0**	**0**	**0**	**8**	**2.7**	**6**	**2.02**	**1**	**0.34**	**0**	**0**	**0**	**0**	**553**	**186.35**	**0**	**0**	**569**	**191.74**
Section Total All Samples				**69708**	**101.86**	**0**	**0**	**0**	**0**	**7**	**0**	**4**	**0**	**0**	**0**	**79**	**0**	**148**	**0**	**16**	**0**	**9**	**0**	**6**	**0**	**4576**	**0**	**1**	**0**	**4846**	**0**
Section Average All Samples				**664**	**0.97**	**0**	**0**	**0**	**0**	**0**	**0.37**	**0**	**0.21**	**0**	**0**	**1**	**4.2**	**1**	**7.88**	**0**	**0.85**	**0**	**0.48**	**0**	**0.32**	**44**	**243.57**	**0**	**0.05**	**46**	**257.94**
Section Standard Error of Mean						**0**	**0**	**0**	**0**	**0.03**	**0.19**	**0.02**	**0.04**	**0**	**0**	**0.11**	**0.93**	**0.5**	**10.4**	**0.05**	**1.02**	**0.05**	**0.19**	**0.03**	**0.61**	**3.54**	**26.42**	**0.01**	**0.04**	**3.61**	**33.03**

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 7	1	00702	30-Aug-2015	506	0.95													7	52.42							4	29.96			11	82.38
		00703	29-Aug-2015	777	0.95											4	19.51	1	4.88							17	82.91			22	107.3
		00704	30-Aug-2015	601	1.00											1	5.99	1	5.99							134	802.66			136	814.64
		00705	01-Sep-2015	683	1.00											1	5.27									13	68.52			14	73.79
		00706	01-Sep-2015	894	1.00					1	4.03									8	32.21					8	32.21			17	68.46
		00709	30-Aug-2015	775	1.00			1	4.65											2	9.29					13	60.39			16	74.32
		00715	29-Aug-2015	717	0.90											2	11.16	1	5.58							29	161.79			32	178.52
		00716	01-Sep-2015	1109	1.60											6	12.17									85	172.45			91	184.63
		00717	01-Sep-2015	417	0.65																					21	278.92			21	278.92
		00718	30-Aug-2015	855	1.20							1	3.51													12	42.11			13	45.61
		00719	01-Sep-2015	534	0.75											3	26.97							1	8.99	44	395.51			48	431.46
		00720	30-Aug-2015	1165	1.40																					27	59.6			27	59.6
		00721	01-Sep-2015	929	1.30																					1	2.98			1	2.98
		00722	30-Aug-2015	908	1.10							1	3.6					1	3.6	7	25.23					54	194.63			63	227.07
		007SC022	30-Aug-2015	479	0.36																					11	229.65			11	229.65
	Session Summary			**757**	**15.20**	**0**	**0**	**1**	**0.31**	**1**	**0.31**	**2**	**0.63**	**0**	**0**	**17**	**5.32**	**11**	**3.44**	**17**	**5.32**	**0**	**0**	**1**	**0.31**	**473**	**147.99**	**0**	**0**	**523**	**163.63**
Section 7	2	00702	07-Sep-2015	604	0.95											1	6.27	3	18.82							8	50.19	1	6.27	13	81.56
		00703	07-Sep-2015	744	0.95											3	15.28	2	10.19	2	10.19					50	254.67			57	290.32
		00704	07-Sep-2015	585	1.00													1	6.15							81	498.46			82	504.62
		00705	09-Sep-2015	641	1.00											3	16.85									28	157.25			31	174.1
		00706	09-Sep-2015	1065	1.00					2	6.76					2	6.76	1	3.38							36	121.69			41	138.59
		00709	07-Sep-2015	844	1.00													10	42.65							20	85.31			30	127.96
		00715	07-Sep-2015	671	0.90					1	5.96					1	5.96	8	47.69							44	262.3			54	321.91
		00716	09-Sep-2015	1126	1.60					3	5.99					5	9.99	53	105.91							49	97.91			110	219.8
		00717	09-Sep-2015	389	0.65					1	14.24					1	14.24									5	71.19			7	99.66
		00718	07-Sep-2015	984	1.20					1	3.05					1	3.05	5	15.24							22	67.07			29	88.41
		00719	09-Sep-2015	444	0.75					2	21.62							2	21.62							6	64.86	1	10.81	11	118.92
		00720	05-Sep-2015	1365	1.40											1	1.88	2	3.77	1	1.88					41	77.24			45	84.77
		00721	09-Sep-2015	851	1.30											1	3.25									22	71.59			23	74.84
		00722	05-Sep-2015	892	1.10							1	3.67			2	7.34			1	3.67					30	110.07			34	124.75
		007SC012	09-Sep-2015	273	0.22											1	59.94									15	899.1			16	959.04
		007SC022	07-Sep-2015	400	0.36																					4	101.41			4	101.41
	Session Summary			**742**	**15.40**	**0**	**0**	**0**	**0**	**10**	**3.15**	**1**	**0.32**	**0**	**0**	**22**	**6.93**	**87**	**27.41**	**4**	**1.26**	**0**	**0**	**0**	**0**	**461**	**145.24**	**2**	**0.63**	**587**	**184.93**
Section 7	3	00702	13-Sep-2015	483	0.95											2	15.69									12	94.15			14	109.84
		00703	13-Sep-2015	916	0.95	1	4.14									4	16.55	1	4.14							76	314.41			82	339.23
		00704	14-Sep-2015	491	1.00																					63	461.91			63	461.91
		00705	14-Sep-2015	671	1.00											3	16.1									10	53.65			13	69.75
		00706	14-Sep-2015	944	1.00											1	3.81									20	76.27			21	80.08
		00709	13-Sep-2015	804	1.00																					24	107.46	1	4.48	25	111.94
		00715	13-Sep-2015	708	0.90											1	5.65	1	5.65							76	429.38			78	440.68
		00716	14-Sep-2015	1050	1.60											1	2.14	1	2.14							71	152.14			73	156.43
		00717	14-Sep-2015	430	0.65																					19	244.72			19	244.72
		00718	13-Sep-2015	1074	1.20											3	8.38	1	2.79							41	114.53			45	125.7
		00719	14-Sep-2015	584	0.75																					45	369.86			45	369.86
		00720	13-Sep-2015	1445	1.40					1	1.78					2	3.56	7	12.46	1	1.78					40	71.18			51	90.76
		00721	14-Sep-2015	879	1.30											2	6.3									9	28.35			11	34.65
		00722	13-Sep-2015	905	1.10													12	43.4							52	188.05			64	231.44
		007SC022	13-Sep-2015	491	0.36											1	20.37	5	101.83							1	20.37			7	142.57
	Session Summary			**792**	**15.20**	**1**	**0.3**	**0**	**0**	**1**	**0.3**	**0**	**0**	**0**	**0**	**20**	**5.98**	**28**	**8.37**	**1**	**0.3**	**0**	**0**	**0**	**0**	**559**	**167.17**	**1**	**0.3**	**611**	**182.72**

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 7	4	00702	20-Sep-2015	542	0.95					1	6.99	1	6.99			3	20.97	1	6.99			1	6.99			17	118.86			24	167.8
		00703	20-Sep-2015	705	0.95											5	26.88									93	499.89			98	526.76
		00704	19-Sep-2015	468	1.00																					75	576.92			75	576.92
		00705	19-Sep-2015	585	1.00											2	12.31									8	49.23			10	61.54
		00706	19-Sep-2015	958	1.00											3	11.27	2	7.52							35	131.52			40	150.31
		00709	19-Sep-2015	709	1.00															2	10.16					13	66.01			15	76.16
		00715	20-Sep-2015	462	0.90			1	8.66							2	17.32									51	441.56			54	467.53
		00716	19-Sep-2015	1028	1.60											3	6.57			1	2.19					91	199.17			95	207.93
		00717	19-Sep-2015	452	0.65																					5	61.27			5	61.27
		00718	19-Sep-2015	757	1.20																					21	83.22			21	83.22
		00719	19-Sep-2015	425	0.75																					23	259.76			23	259.76
		00720	20-Sep-2015	1139	1.40											1	2.26	3	6.77							48	108.37			52	117.4
		00721	20-Sep-2015	731	1.30											1	3.79									25	94.71			26	98.5
		00722	20-Sep-2015	774	1.10											1	4.23									30	126.85			31	131.08
		007SC012	19-Sep-2015	236	0.22													1	69.34							4	277.35			5	346.69
		007SC022	20-Sep-2015	421	0.36																					2	47.51			2	47.51
	Session Summary			**650**	**15.40**	**0**	**0**	**1**	**0.36**	**1**	**0.36**	**1**	**0.36**	**0**	**0**	**21**	**7.55**	**7**	**2.52**	**3**	**1.08**	**1**	**0.36**	**0**	**0**	**541**	**194.57**	**0**	**0**	**576**	**207.15**
Section 7	5	00702	24-Sep-2015	560	0.95																					22	148.87			22	148.87
		00703	24-Sep-2015	760	0.95											2	9.97	1	4.99							91	453.74			94	468.7
		00704	24-Sep-2015	653	1.00															1	5.51					171	942.73			172	948.24
		00705	24-Sep-2015	696	1.00											2	10.34	3	15.52							7	36.21			12	62.07
		00706	24-Sep-2015	912	1.00											1	3.95	1	3.95							27	106.58			29	114.47
		00709	24-Sep-2015	721	1.00																					30	149.79			30	149.79
		00715	24-Sep-2015	800	0.90											2	10	6	30	2	10					37	185			47	235
		00716	24-Sep-2015	1136	1.60																					224	443.66			224	443.66
		00717	24-Sep-2015	468	0.65																					25	295.86			25	295.86
		00718	24-Sep-2015	884	1.20					1	3.39															66	223.98			67	227.38
		00719	23-Sep-2015	467	0.75																					17	174.73			17	174.73
		00720	24-Sep-2015	1197	1.40													3	6.44							55	118.15			58	124.6
		00721	24-Sep-2015	921	1.30									1	3.01	1	3.01									34	102.23			36	108.24
		00722	24-Sep-2015	835	1.10											2	7.84	38	148.94							46	180.29			86	337.07
		007SC012	23-Sep-2015	254	0.22																					3	193.27			3	193.27
		007SC022	24-Sep-2015	377	0.36													2	53.05							5	132.63			7	185.68
	Session Summary			**728**	**15.40**	**0**	**0**	**0**	**0**	**1**	**0.32**	**0**	**0**	**1**	**0.32**	**10**	**3.21**	**54**	**17.34**	**3**	**0.96**	**0**	**0**	**0**	**0**	**860**	**276.15**	**0**	**0**	**929**	**298.31**
Section 7	6	00702	28-Sep-2015	464	0.95							1	8.17					4	32.67							18	147.01			23	187.84
		00703	29-Sep-2015	647	0.95											1	5.86			1	5.86					59	345.56			61	357.28
		00704	29-Sep-2015	469	1.00											1	7.68									57	437.53			58	445.2
		00705	29-Sep-2015	605	1.00																					16	95.21			16	95.21
		00706	29-Sep-2015	923	1.00											2	7.8	2	7.8							25	97.51			29	113.11
		00709	28-Sep-2015	574	1.00													5	31.36							28	175.61			33	206.97
		00715	29-Sep-2015	584	0.90																					36	246.58			36	246.58
		00716	29-Sep-2015	1010	1.60											4	8.91	1	2.23							81	180.45			86	191.58
		00717	29-Sep-2015	391	0.65											1	14.16									24	339.96			25	354.12
		00718	29-Sep-2015	985	1.20					2	6.09					1	3.05	2	6.09			3	9.14			25	76.14	1	3.05	34	103.55
		00719	29-Sep-2015	445	0.75																					15	161.8			15	161.8
		00720	28-Sep-2015	1174	1.40													2	4.38	12	26.28					35	76.66			49	107.33
		00721	28-Sep-2015	686	1.30													3	12.11							20	80.74			23	92.85
		00722	28-Sep-2015	761	1.10																					24	103.21	1	4.3	25	107.51
		007SC012	29-Sep-2015	252	0.22											1	64.94	5	324.68							9	584.42			15	974.03
		007SC022	29-Sep-2015	390	0.36											1	25.64									2	51.28			3	76.92
	Session Summary			**648**	**15.40**	**0**	**0**	**0**	**0**	**2**	**0.72**	**1**	**0.36**	**0**	**0**	**12**	**4.33**	**24**	**8.66**	**13**	**4.69**	**3**	**1.08**	**0**	**0**	**474**	**171**	**2**	**0.72**	**531**	**191.56**
Section Total All Samples				**67495**	**91.83**	**1**	**0**	**2**	**0**	**16**	**0**	**5**	**0**	**1**	**0**	**102**	**0**	**211**	**0**	**41**	**0**	**4**	**0**	**1**	**0**	**3368**	**0**	**5**	**0**	**3757**	**0**
Section Average All Samples				**718**	**0.98**	**0**	**0.05**	**0**	**0.11**	**0**	**0.87**	**0**	**0.27**	**0**	**0.05**	**1**	**5.57**	**2**	**11.52**	**0**	**2.24**	**0**	**0.22**	**0**	**0.05**	**36**	**183.88**	**0**	**0.27**	**40**	**205.12**
Section Standard Error of Mean						**0.01**	**0.04**	**0.01**	**0.1**	**0.05**	**0.31**	**0.02**	**0.13**	**0.01**	**0.03**	**0.14**	**1.12**	**0.71**	**4.18**	**0.17**	**0.55**	**0.03**	**0.12**	**0.01**	**0.1**	**3.66**	**19.08**	**0.02**	**0.15**	**3.79**	**20.37**

Table E4 Continued.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h) Finescale Dace No.	CPUE	Flathead Chub No.	CPUE	Lake Chub No.	CPUE	Longnose Dace No.	CPUE	Northern Pearl Dace No.	CPUE	Northern Pikeminnow No.	CPUE	Redside Shiner No.	CPUE	Sculpin spp. No.	CPUE	Shiner species No.	CPUE	Spottail Shiner No.	CPUE	Sucker spp. No.	CPUE	Troutperch No.	CPUE	All Species No.	CPUE
Section 9	1	00901	17-Sep-2015	516	0.80																					4	*34.88*			4	*34.88*
		00902	17-Sep-2015	620	0.90																					6	*38.71*			6	*38.71*
		00903	17-Sep-2015	558	0.90																					2	*14.34*			2	*14.34*
		00904	17-Sep-2015	602	1.00																					5	*29.9*			5	*29.9*
		00905	17-Sep-2015	558	1.10											1	*5.87*									20	*117.3*			21	*123.17*
		00906	17-Sep-2015	682	1.00																					7	*36.95*			7	*36.95*
		00907	17-Sep-2015	587	0.90																					6	*40.89*			6	*40.89*
		00908	17-Sep-2015	479	0.90																					1	*8.35*			1	*8.35*
		00909	17-Sep-2015	593	0.80																					2	*15.18*			2	*15.18*
		00910	17-Sep-2015	718	1.10																					6	*27.35*			6	*27.35*
		00911	17-Sep-2015	525	0.70																					5	*48.98*			5	*48.98*
		00913	17-Sep-2015	510	1.00											1	*7.06*									3	*21.18*			4	*28.24*
		00914	17-Sep-2015	480	0.80																					8	*75*			8	*75*
	Session Summary			**571**	**11.90**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**2**	***1.06***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**75**	***39.74***	**0**	***0***	**77**	***40.8***
Section 9	2	00901	22-Sep-2015	638	1.10																					2	*10.26*			2	*10.26*
		00902	22-Sep-2015	621	1.00																					14	*81.16*			14	*81.16*
		00903	22-Sep-2015	604	1.10																					6	*32.51*			6	*32.51*
		00904	22-Sep-2015	554	1.10																					1	*5.91*			1	*5.91*
		00905	22-Sep-2015	754	1.10																					10	*43.4*			10	*43.4*
		00906	22-Sep-2015	790	1.00																					13	*59.24*			13	*59.24*
		00907	22-Sep-2015	745	1.20																					16	*64.43*			16	*64.43*
		00908	22-Sep-2015	567	1.10																					7	*40.4*			7	*40.4*
		00909	22-Sep-2015	588	0.95																					1	*6.44*			1	*6.44*
		00910	22-Sep-2015	758	1.10																					10	*43.18*			10	*43.18*
		00911	23-Sep-2015	609	1.00											5	*29.56*	1	*5.91*					1	*5.91*	15	*88.67*			22	*130.05*
		00912	23-Sep-2015	794	1.10					4	*16.49*															11	*45.34*			15	*61.83*
		00913	23-Sep-2015	495	0.90																					4	*32.32*			4	*32.32*
		00914	23-Sep-2015	438	0.95																					6	*51.91*			6	*51.91*
		009SC53	22-Sep-2015	263	0.26																					5	*263.23*			5	*263.23*
		009SC61	23-Sep-2015	674	0.68													2	*15.83*							18	*142.43*			20	*158.26*
	Session Summary			**618**	**15.60**	**0**	***0***	**0**	***0***	**4**	***1.49***	**0**	***0***	**0**	***0***	**5**	***1.87***	**3**	***1.12***	**0**	***0***	**0**	***0***	**1**	***0.37***	**139**	***51.9***	**0**	***0***	**152**	***56.76***
Section 9	3	00901	27-Sep-2015	578	1.10																					3	*16.99*			3	*16.99*
		00902	27-Sep-2015	468	1.00																					8	*61.54*			8	*61.54*
		00903	27-Sep-2015	554	1.10											1	*5.91*									5	*29.54*			6	*35.44*
		00904	27-Sep-2015	602	1.10													2	*10.87*							3	*16.31*			5	*27.18*
		00905	27-Sep-2015	616	1.10																					10	*53.13*			10	*53.13*
		00906	27-Sep-2015	814	1.00											1	*4.42*									11	*48.65*			12	*53.07*
		00907	27-Sep-2015	731	1.20																					12	*49.25*			12	*49.25*
		00908	27-Sep-2015	523	1.10																					3	*18.77*			3	*18.77*
		00909	27-Sep-2015	523	0.95													1	*7.25*							5	*36.23*			6	*43.47*
		00910	27-Sep-2015	634	1.10																					14	*72.27*			14	*72.27*
		00911	27-Sep-2015	482	1.00																					6	*44.81*			6	*44.81*
		00912	27-Sep-2015	553	1.10																					5	*29.59*			5	*29.59*
		00913	27-Sep-2015	623	0.90											1	*6.42*													1	*6.42*
		009SC53	27-Sep-2015	419	0.26																					2	*66.09*			2	*66.09*
		009SC61	27-Sep-2015	576	0.68																					9	*83.33*			9	*83.33*
	Session Summary			**580**	**14.70**	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**0**	***0***	**3**	***1.27***	**3**	***1.27***	**0**	***0***	**0**	***0***	**0**	***0***	**96**	***40.53***	**0**	***0***	**102**	***43.07***

Table E4 Concluded.

Section	Session	Site	Date	Time Sampled (s)	Length Sampled (km)	Number Caught (CPUE = no. fish/km/h)																									
						Finescale Dace		Flathead Chub		Lake Chub		Longnose Dace		Northern Pearl Dace		Northern Pikeminnow		Redside Shiner		Sculpin spp.		Shiner species		Spottail Shiner		Sucker spp.		Troutperch		All Species	
						No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE	No.	CPUE
Section 9	4	00901	01-Oct-2015	635	1.10					1	5.15															9	46.39			10	51.54
		00902	01-Oct-2015	662	1.00													1	5.44							28	152.27			29	157.7
		00903	01-Oct-2015	620	1.10																					6	31.67			6	31.67
		00904	01-Oct-2015	645	1.10					1	5.07															7	35.52			8	40.59
		00905	01-Oct-2015	702	1.10																					35	163.17			35	163.17
		00906	01-Oct-2015	984	1.00																					24	87.8			24	87.8
		00907	01-Oct-2015	1133	1.20					3	7.94							2	5.3					1	2.65	15	39.72			21	55.6
		00908	01-Oct-2015	719	1.10							1	4.55													4	18.21			5	22.76
		00909	01-Oct-2015	774	0.95											1	4.9	2	9.79							6	29.38			9	44.06
		00910	01-Oct-2015	818	1.10					1	4							1	4							39	156.03			41	164.04
		00911	01-Oct-2015	660	1.00			1	5.45	1	5.45					1	5.45	3	16.36			2	10.91	1	5.45	18	98.18			27	147.27
		00912	01-Oct-2015	729	1.10																					6	26.94			6	26.94
		00913	01-Oct-2015	571	0.90					1	7.01							1	7.01							1	7.01			3	21.02
		00914	01-Oct-2015	604	0.95																					14	87.84			14	87.84
		009SC53	01-Oct-2015	363	0.26																					4	152.57			4	152.57
		009SC61	01-Oct-2015	732	0.68													4	29.14							9	65.57			13	94.72
	Session Summary			**709**	**15.60**	**0**	0	**1**	0.33	**8**	2.6	**1**	0.33	**0**	0	**2**	0.65	**14**	4.56	**0**	0	**2**	0.65	**2**	0.65	**225**	73.23	**0**	0	**255**	83
Section 9	5	00901	04-Oct-2015	666	1.10																					6	29.48			6	29.48
		00902	04-Oct-2015	704	1.00											1	5.11									6	30.68			7	35.8
		00903	04-Oct-2015	706	1.10																					5	23.18			5	23.18
		00904	04-Oct-2015	641	1.10																					1	5.11			1	5.11
		00905	04-Oct-2015	800	1.10																					12	49.09			12	49.09
		00906	04-Oct-2015	1013	1.00											2	7.11									12	42.65			14	49.75
		00907	04-Oct-2015	854	1.20					1	3.51							1	3.51							6	21.08			8	28.1
		00908	04-Oct-2015	624	1.10													1	5.24							2	10.49			3	15.73
		00909	04-Oct-2015	650	0.95											1	5.83													1	5.83
		00910	04-Oct-2015	812	1.10													1	4.03							12	48.37			13	52.4
		00911	04-Oct-2015	563	1.00																					8	51.15			8	51.15
		00912	04-Oct-2015	711	1.10					3	13.81							1	4.6							12	55.24			16	73.65
		00913	04-Oct-2015	538	0.90																					2	14.87			2	14.87
		009SC53	04-Oct-2015	383	0.26													50	1807.59							1	36.15			51	1843.74
		009SC61	04-Oct-2015	601	0.68																					6	53.24			6	53.24
	Session Summary			**684**	**14.70**	**0**	0	**0**	0	**4**	1.43	**0**	0	**0**	0	**4**	1.43	**54**	19.33	**0**	0	**0**	0	**0**	0	**91**	32.58	**0**	0	**153**	54.78
Section 9	6	00901	07-Oct-2015	655	1.10																					7	34.98			7	34.98
		00902	07-Oct-2015	588	1.00																					9	55.1			9	55.1
		00903	07-Oct-2015	596	1.10																					2	10.98			2	10.98
		00904	07-Oct-2015	617	1.10																					1	5.3			1	5.3
		00905	07-Oct-2015	704	1.10																					12	55.79			12	55.79
		00906	07-Oct-2015	861	1.00																					10	41.81			10	41.81
		00907	07-Oct-2015	815	1.20																					10	36.81			10	36.81
		00908	07-Oct-2015	609	1.10																					1	5.37			1	5.37
		00910	07-Oct-2015	676	1.10																					9	43.57			9	43.57
		00911	07-Oct-2015	541	1.00																					7	46.58			7	46.58
		00912	07-Oct-2015	676	1.10					3	14.52															6	29.05			9	43.57
		00913	07-Oct-2015	539	0.90																					4	29.68			4	29.68
		00914	07-Oct-2015	449	0.95																					1	8.44			1	8.44
		009SC61	07-Oct-2015	588	0.68											1	9.07									2	18.14			3	27.21
	Session Summary			**637**	**14.40**	**0**	0	**0**	0	**3**	1.18	**0**	0	**0**	0	**1**	0.39	**0**	0	**0**	0	**0**	0	**0**	0	**81**	31.79	**0**	0	**85**	33.36
Section Total All Samples				**56547**	**86.97**	**0**	0	**1**	0	**19**	0	**1**	0	**0**	0	**17**	0	**74**	0	**0**	0	**2**	0	**3**	0	**707**	0	**0**	0	**824**	0
Section Average All Samples				**635**	**0.98**	**0**	0	**0**	0.07	**0**	1.24	**0**	0.07	**0**	0	**0**	1.11	**1**	4.82	**0**	0	**0**	0.13	**0**	0.2	**8**	46.09	**0**	0	**9**	53.72
Section Standard Error of Mean						**0**	0	**0.01**	0.06	**0.08**	0.32	**0.01**	0.05	**0**	0	**0.07**	0.39	**0.56**	20.3	**0**	0	**0.02**	0.12	**0.02**	0.09	**0.74**	4.49	**0**	0	**0.93**	20.68
All Sections Total All Samples				**352058**	**536.79**	16446	0.31	1	0	3	0	43	0	18	0	1	0	331	0.01	473	0.01	174	0	516	0.01	15	0	14865	0.28	6	0
All Sections Average All Samples						31	168.55	0	0.01	0	0.03	0	0.44	0	0.18	0	0.01	1	3.39	1	4.85	0	1.78	1	5.29	0	0.15	28	152.34	0	0.06
All Sections Standard Error of Mean						1.67	13.15	0	0.01	0	0.02	0.02	0.09	0.01	0.07	0	0.01	0.05	0.37	0.19	4.01	0.06	0.56	0.93	8.58	0.01	0.13	1.33	7.91	0	0.03

APPENDIX F

Life History Information

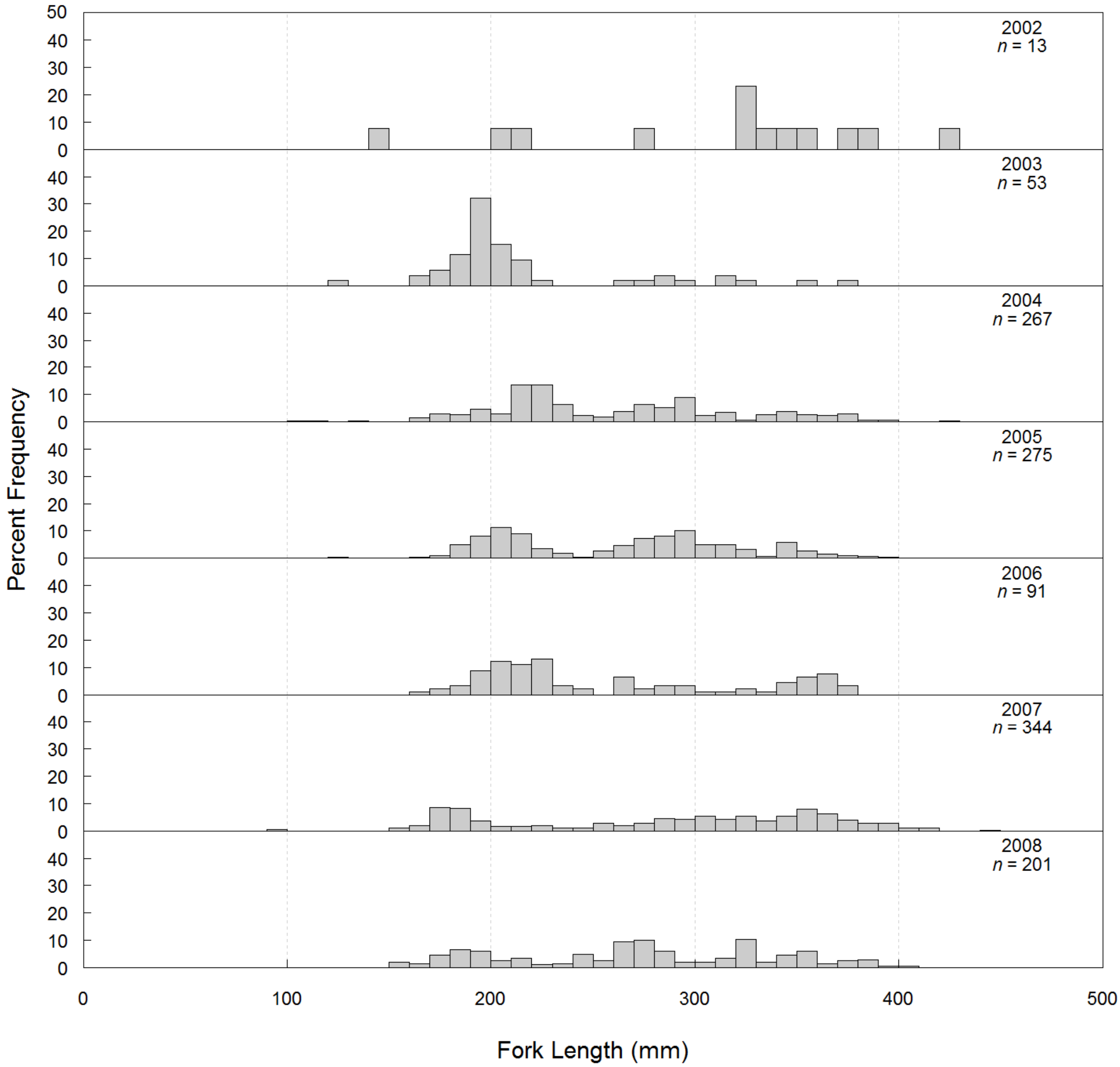
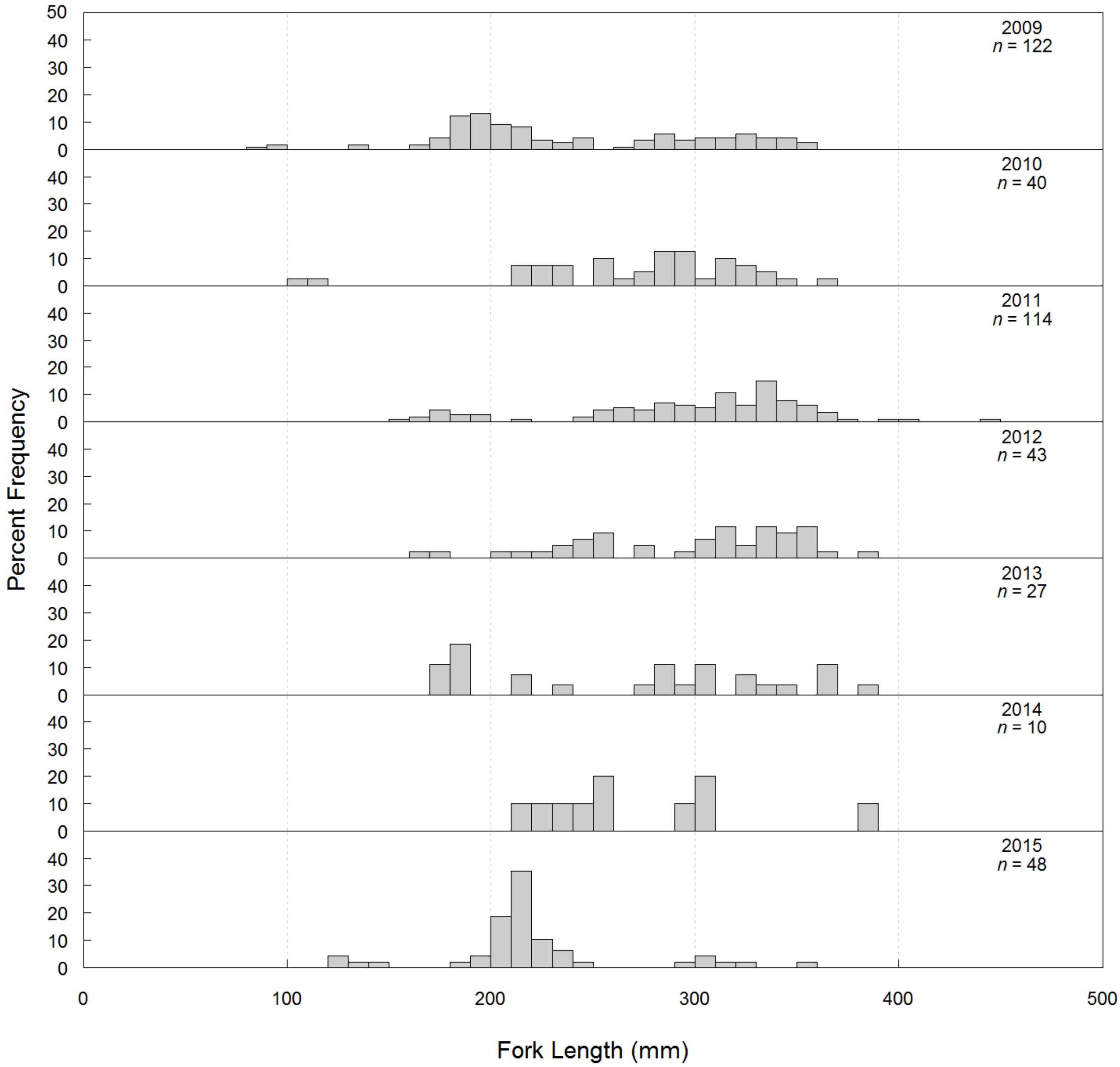


Figure F1 Length-frequency distributions by year for Arctic Grayling captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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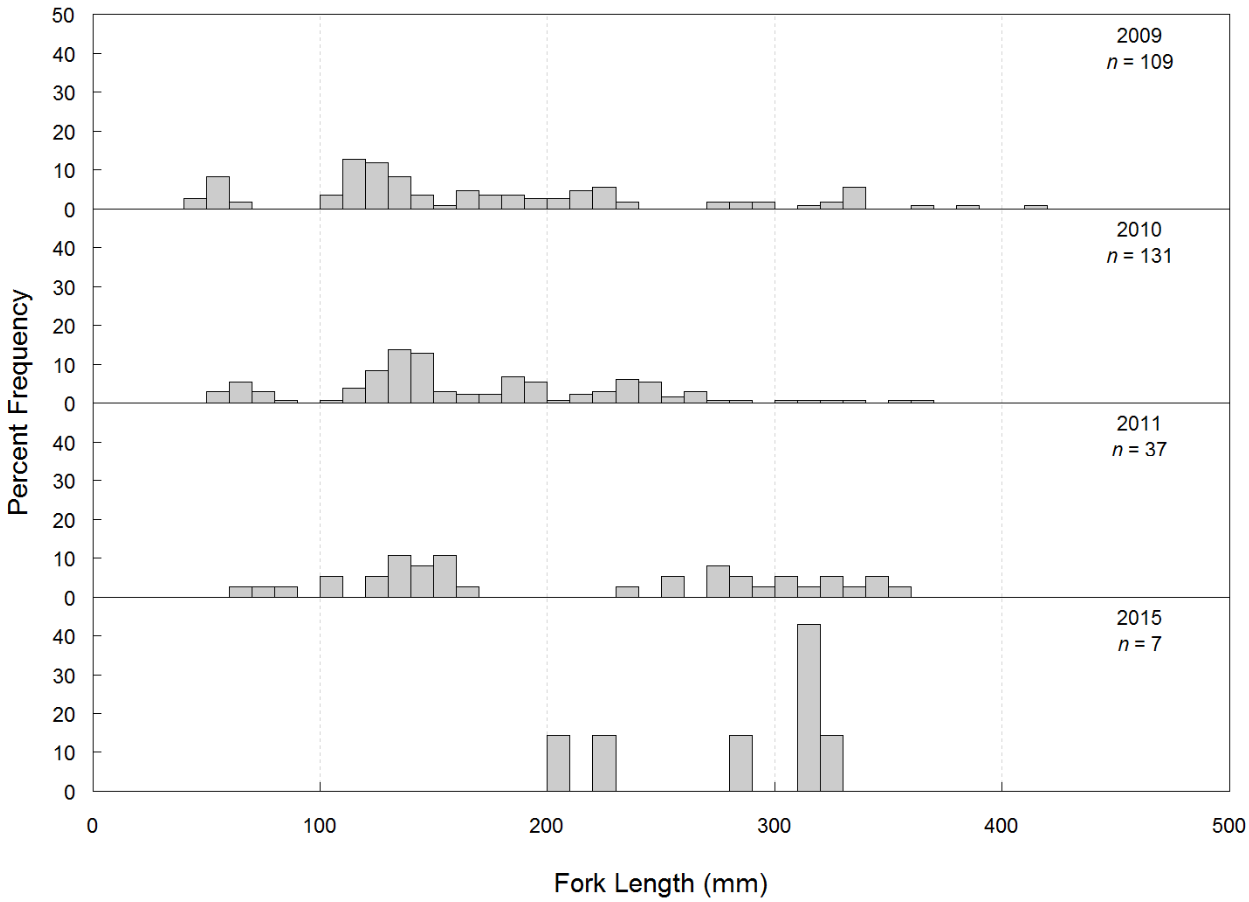


Figure F2 *Length-frequency distributions by year for Arctic Grayling captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2009 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).*

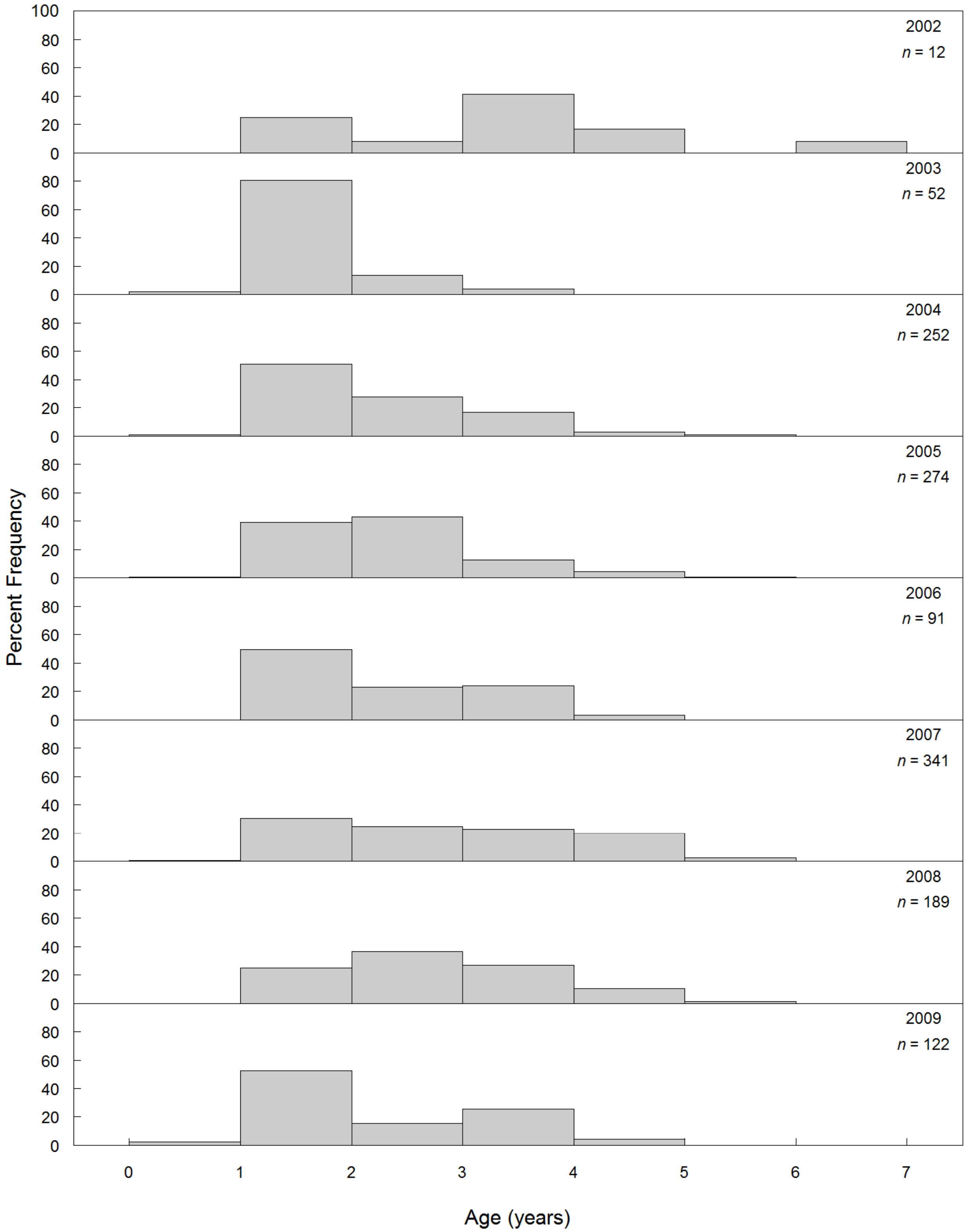
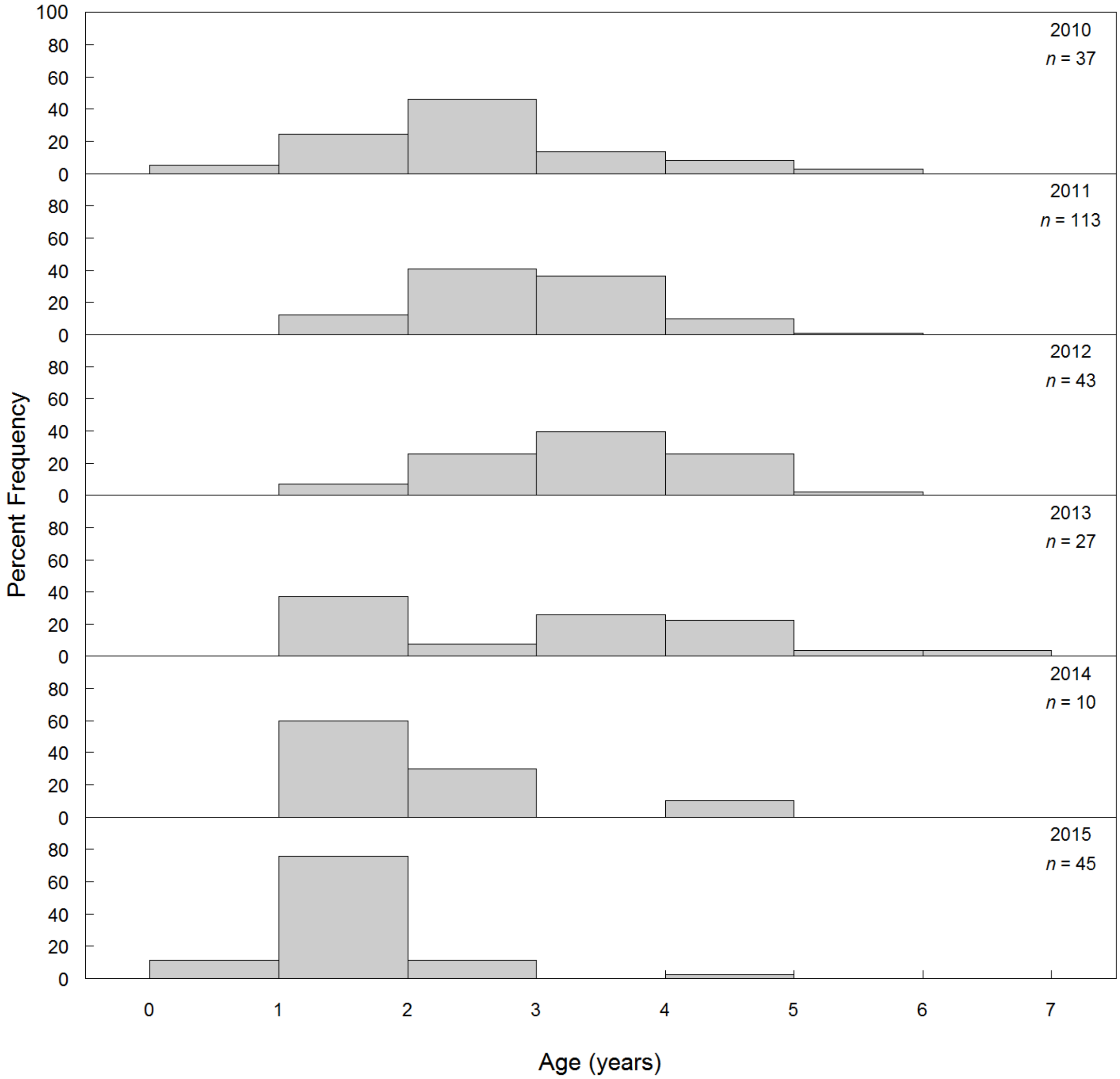


Figure F3 Age-frequency distributions by year for Arctic Grayling captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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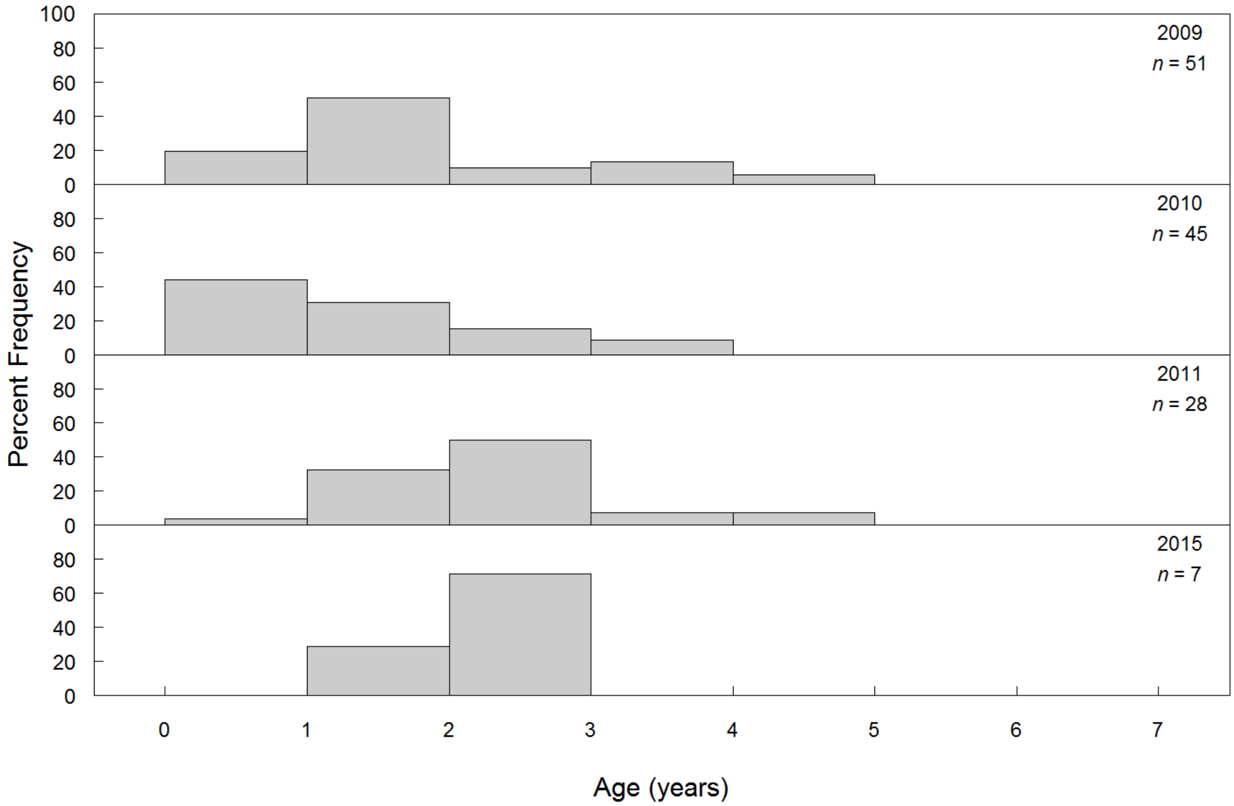

Figure F4 Age-frequency distributions by year for Arctic Grayling captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2009 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

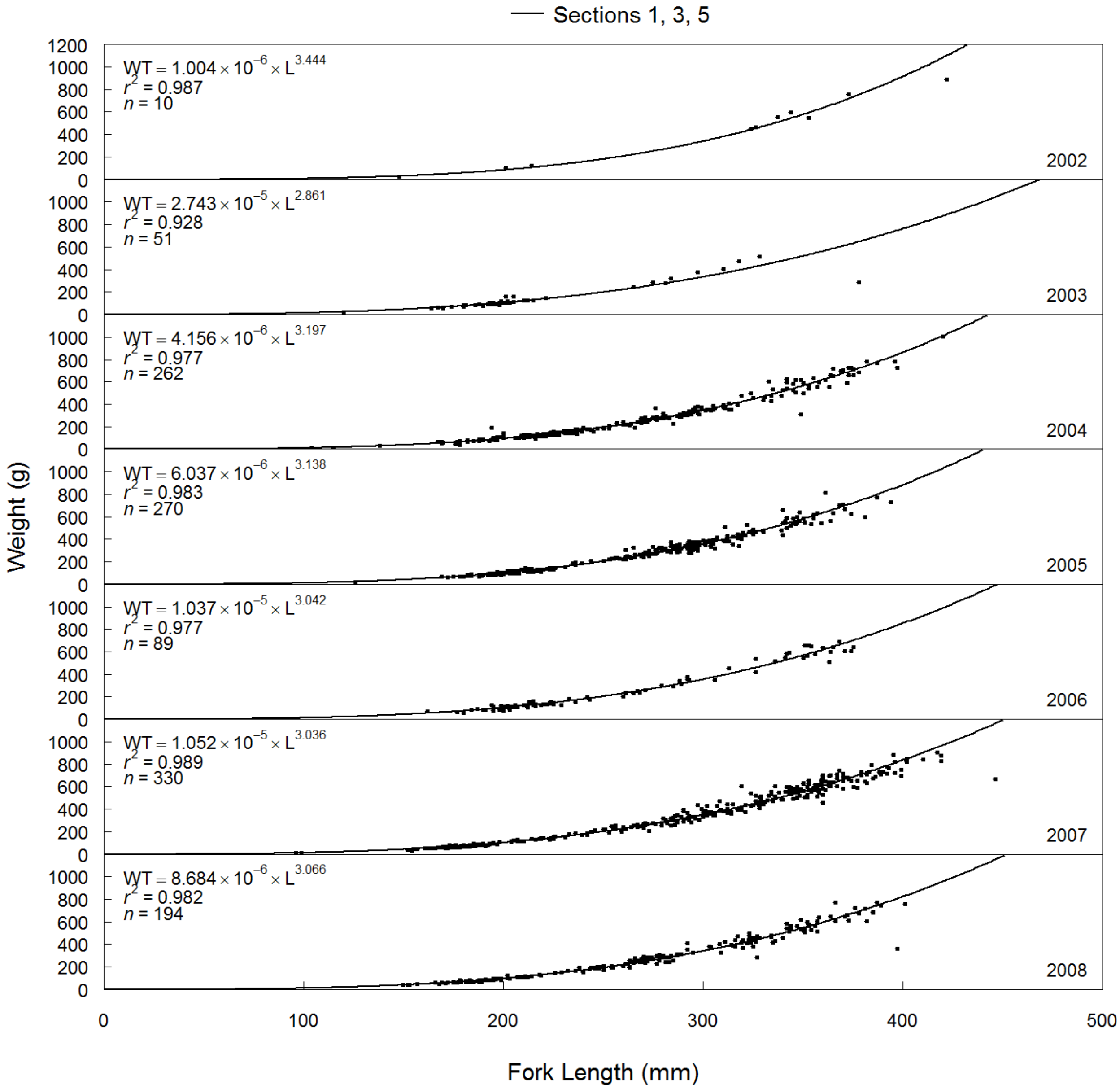

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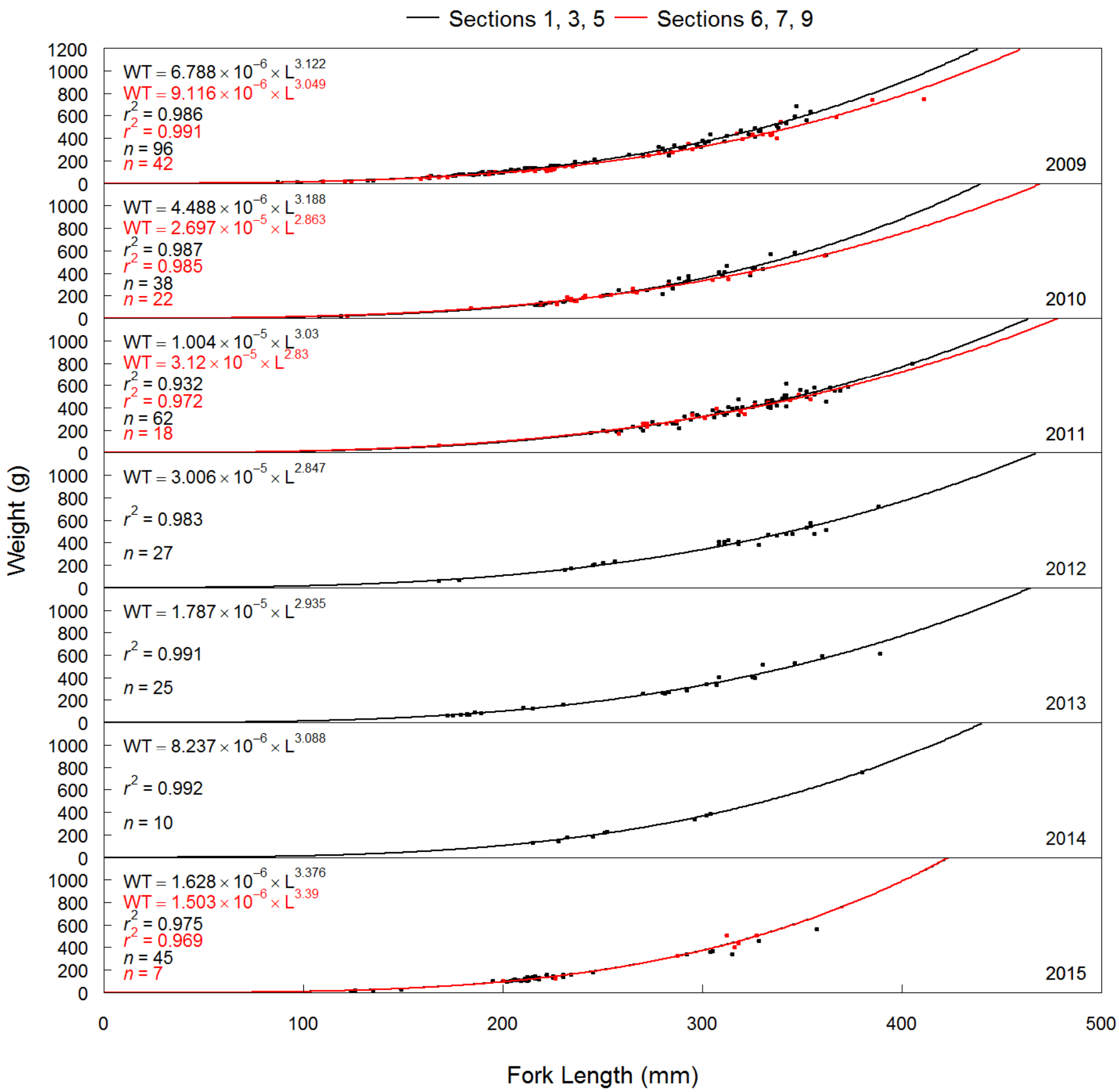
Figure F5 *Length-weight regressions for Arctic Grayling captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).*



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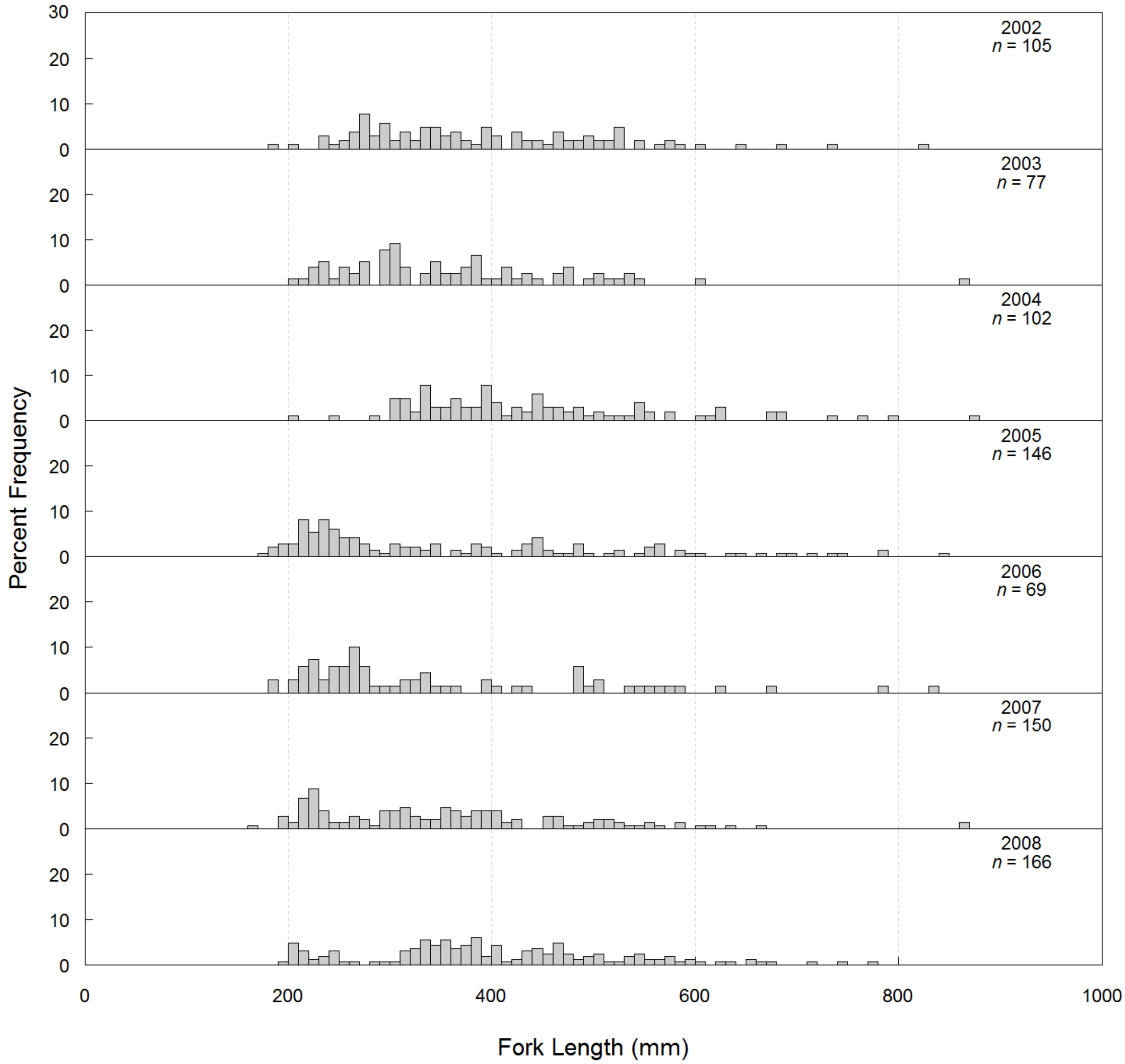
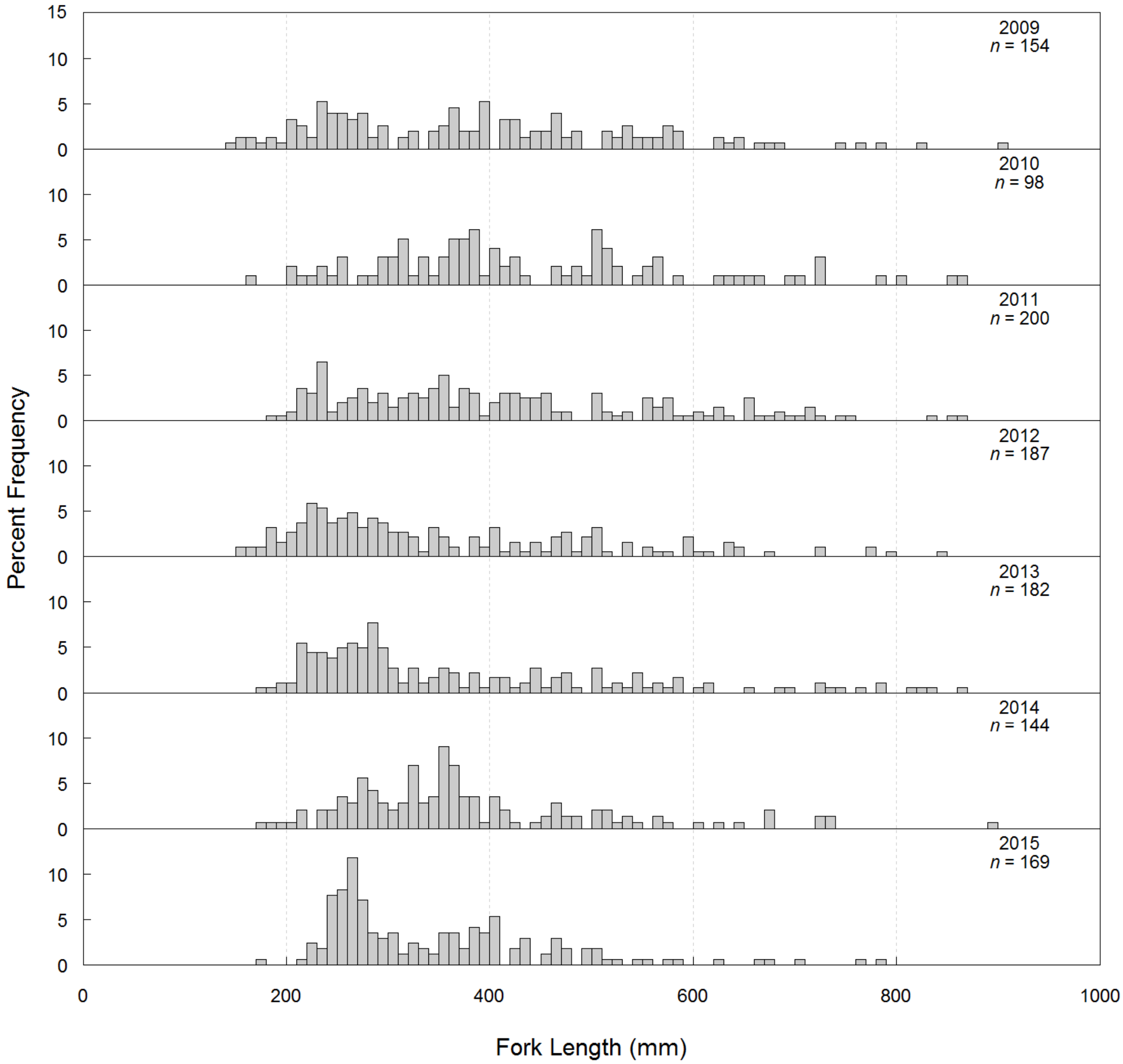


Figure F6 Length-frequency distributions by year for Bull Trout captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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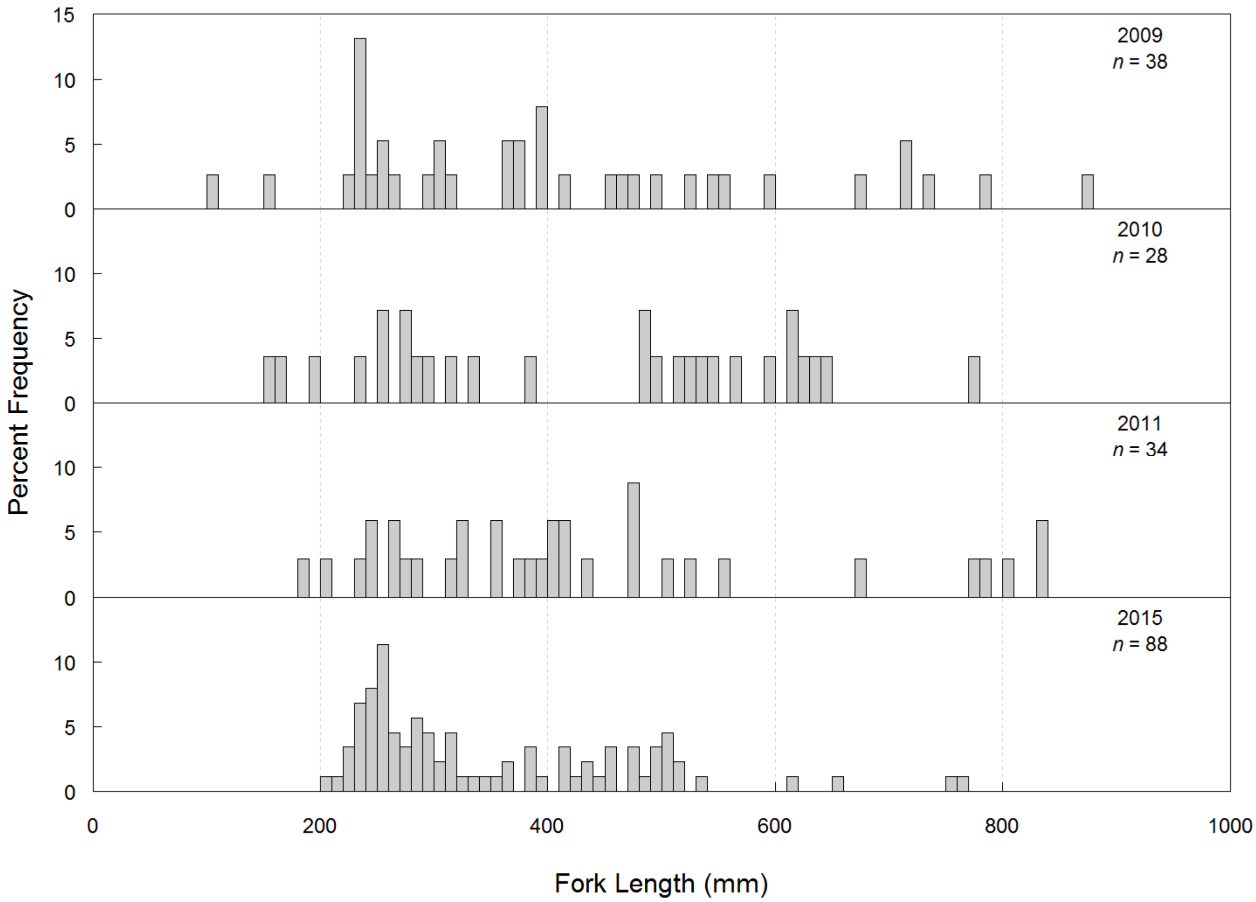


Figure F7 *Length-frequency distributions by year for Bull Trout captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2002 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).*

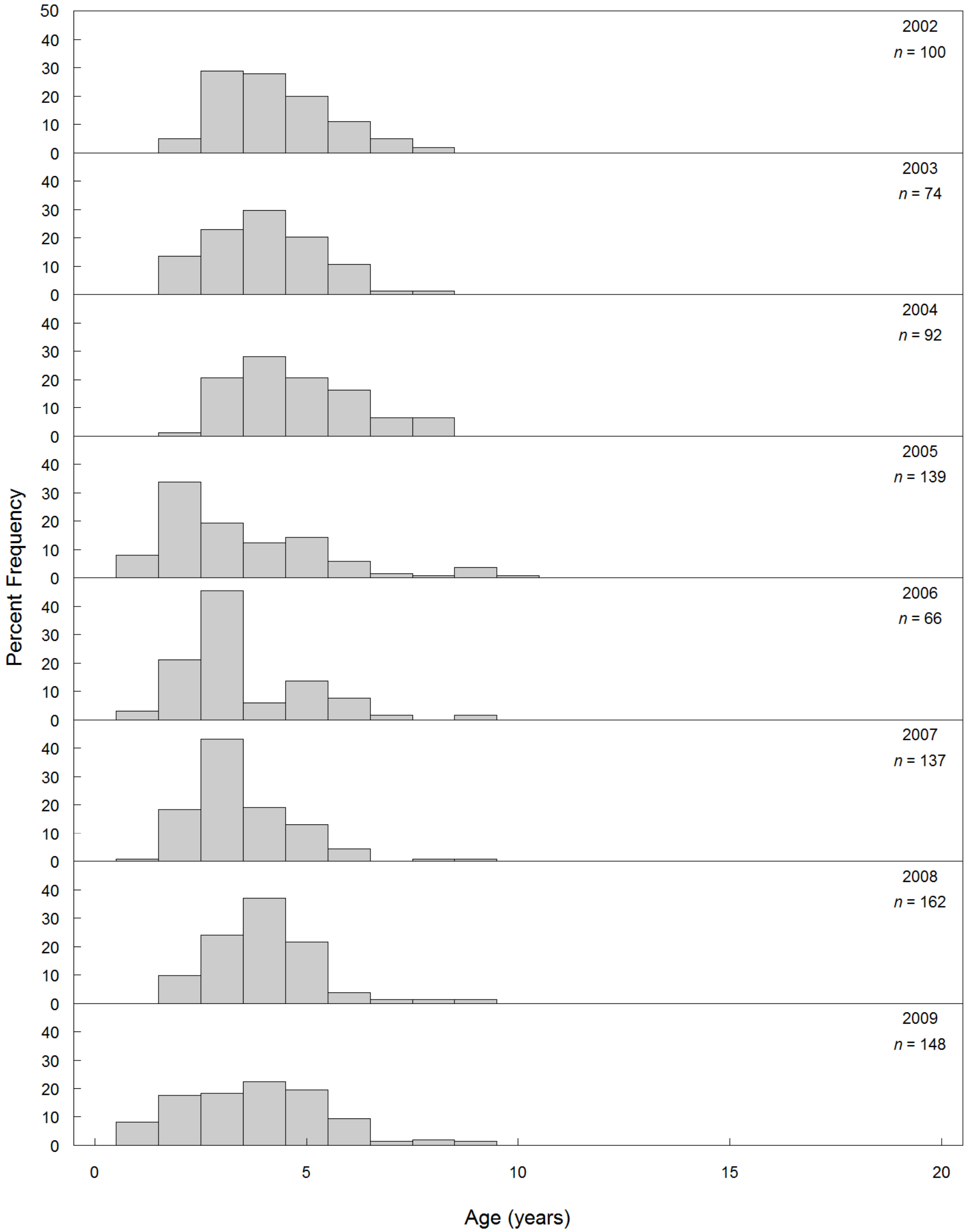
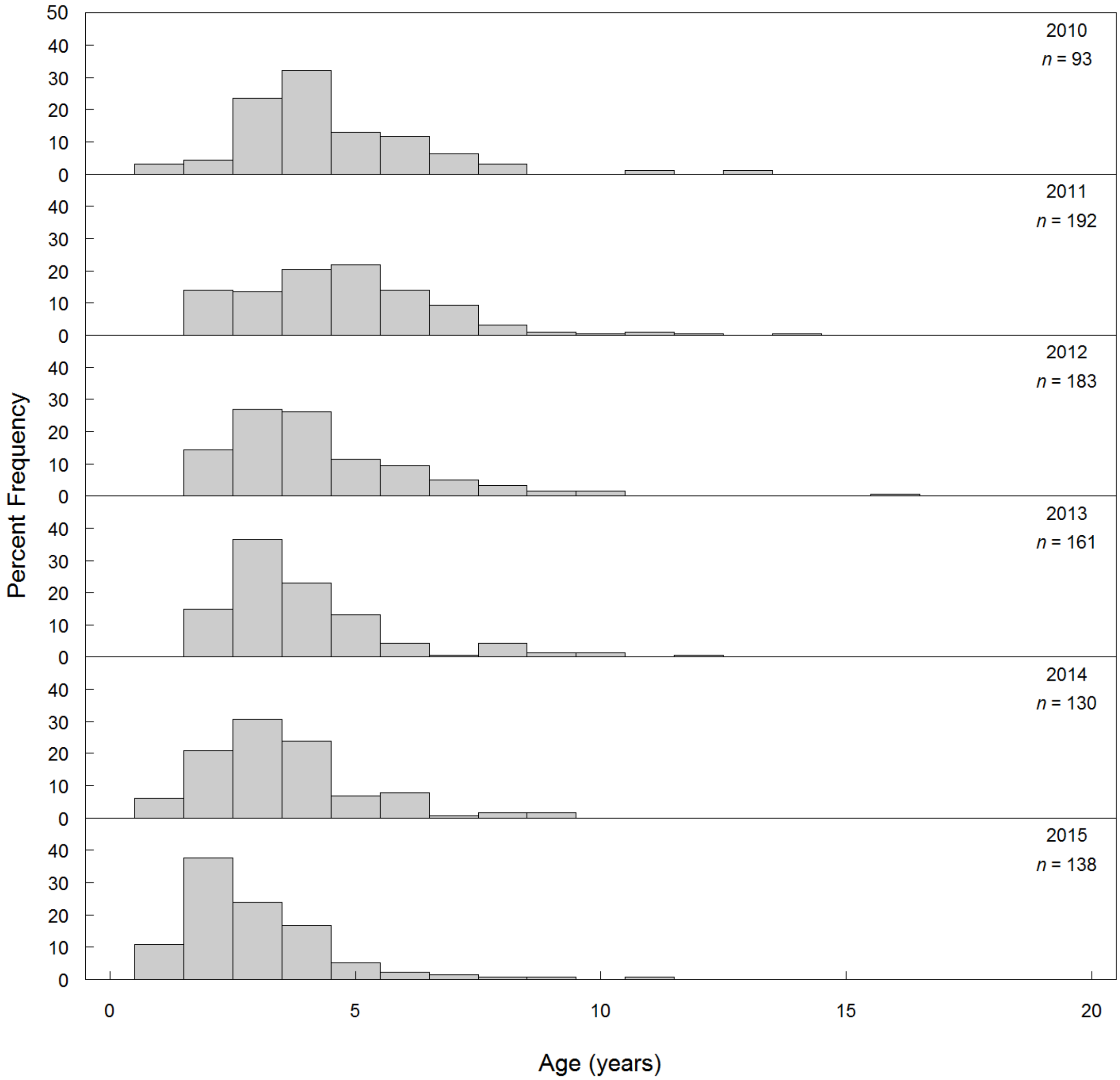


Figure F8 Age-frequency distributions by year for Bull Trout captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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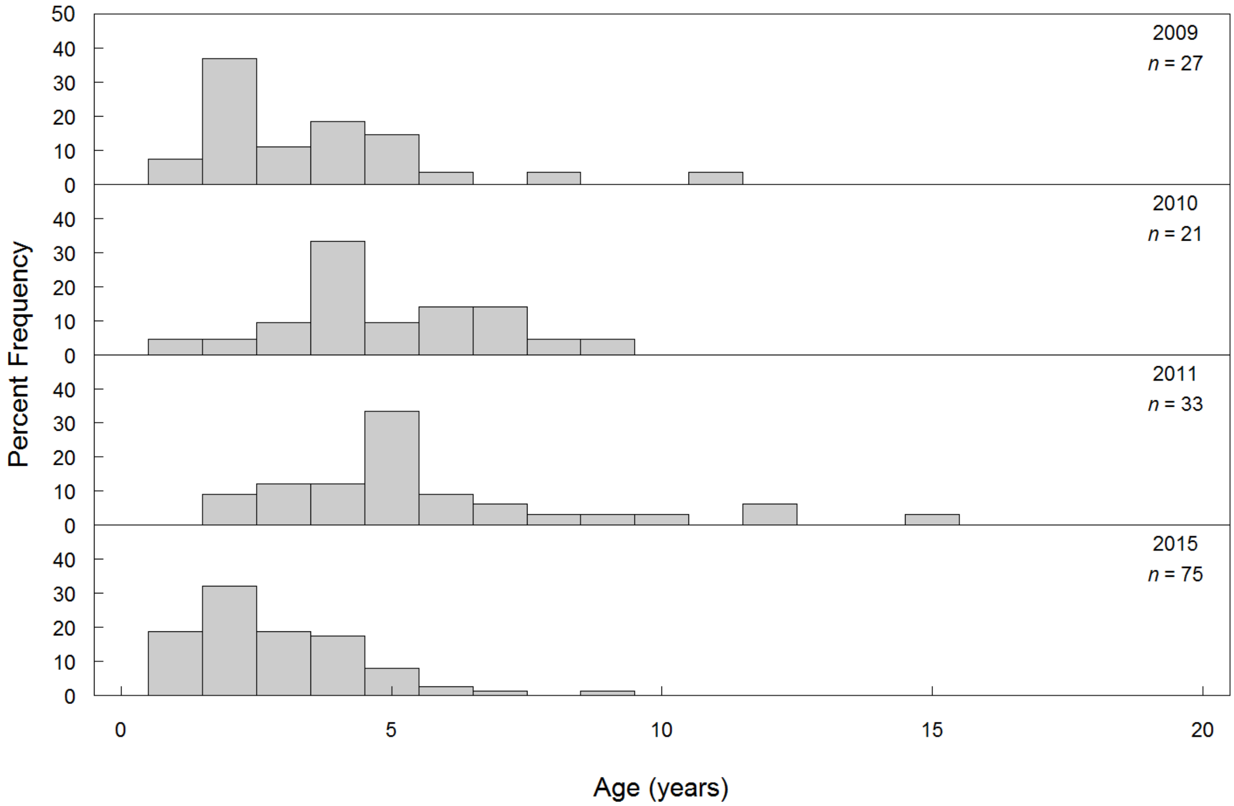

Figure F9 *Age-frequency distributions by year for Bull Trout captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2002 to 2015.* Data from 2009 to 2011 courtesy of *BC Hydro's Site C Peace River Fish Inventory* (Mainstream 2010, 2011, 2013a).

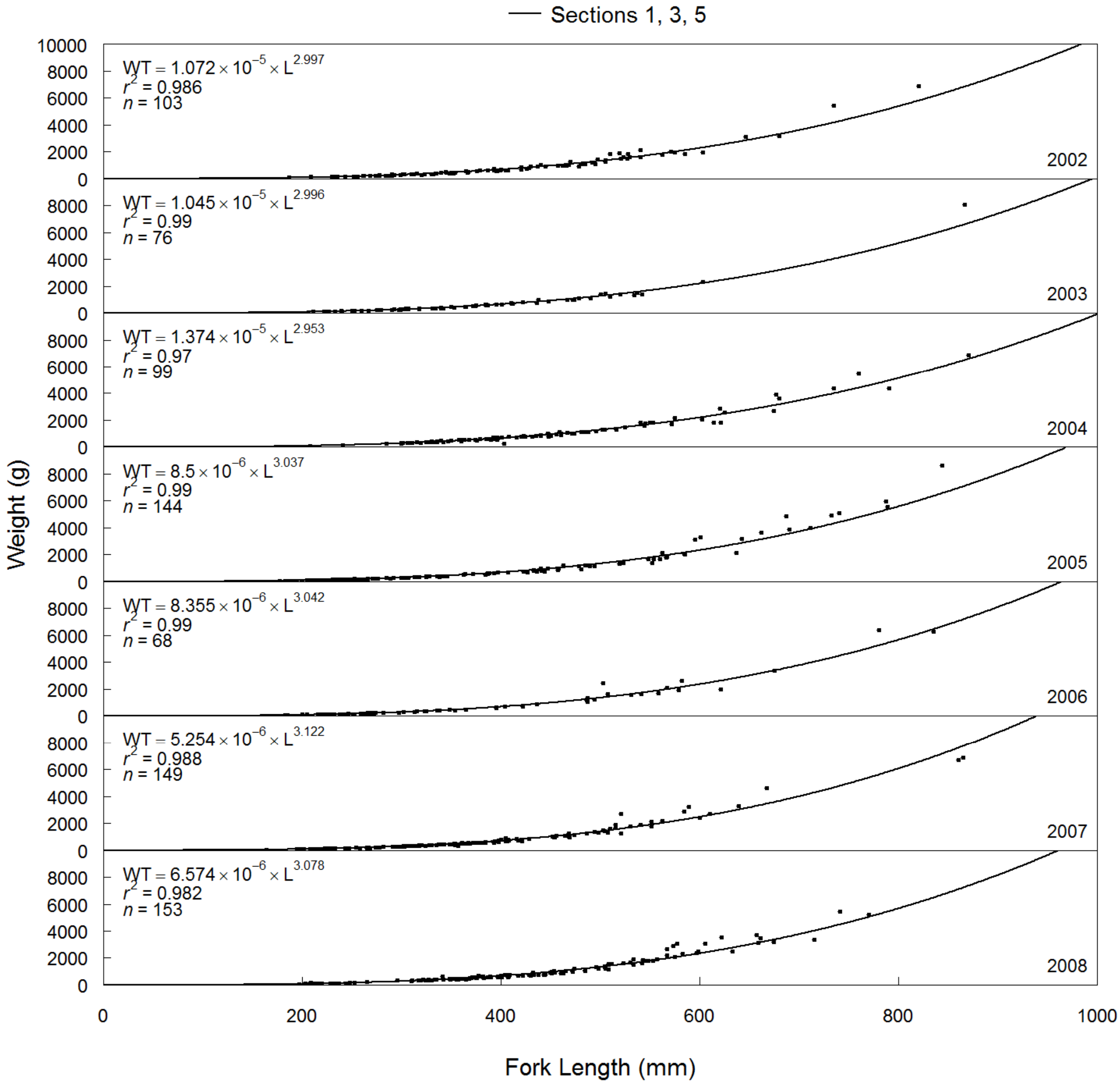

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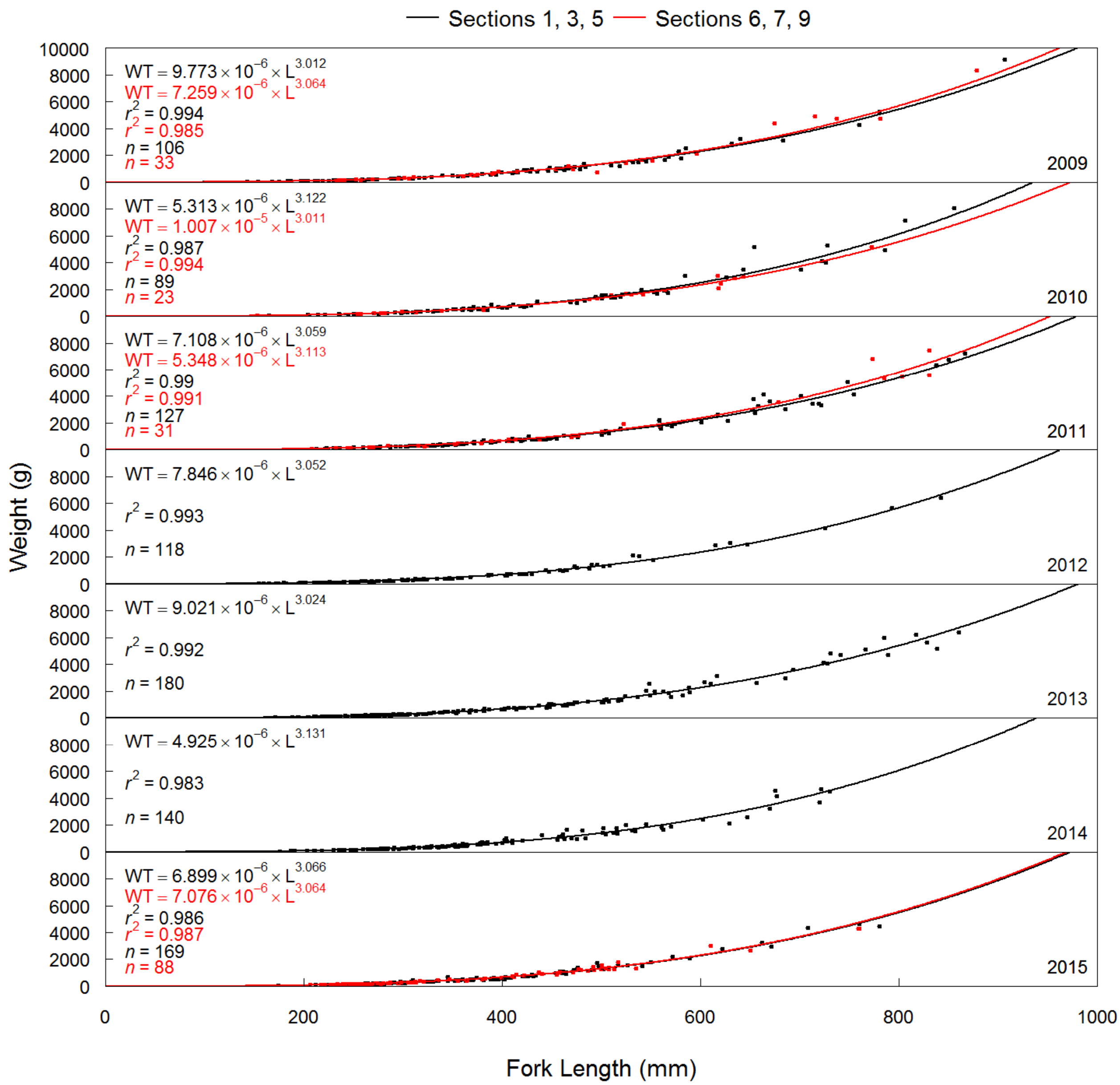
Figure F10 Length-weight regressions for Bull Trout captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).



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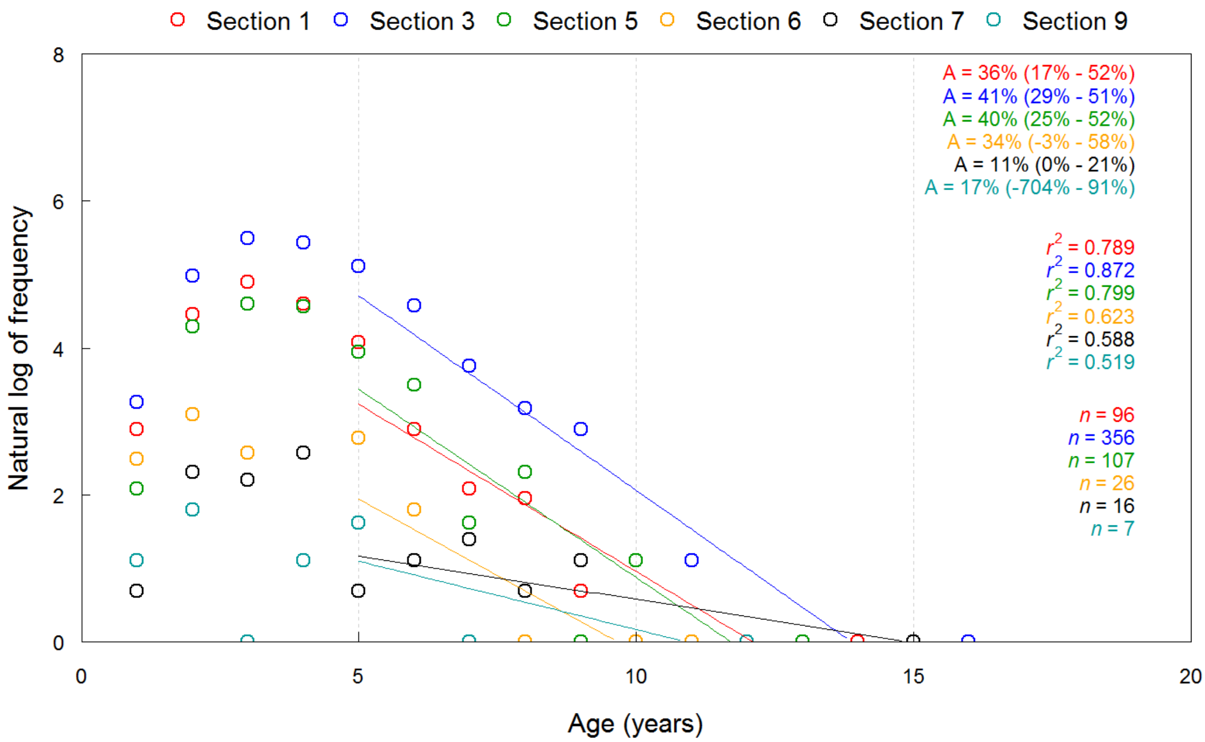


Figure F11 Catch curve and annual mortality estimates (A; mean and 95% confidence intervals) for Bull Trout, calculated for each sample section using data from 2003 to 2015 combined. Sample size, and r² of the catch curve regression are provided for each section.

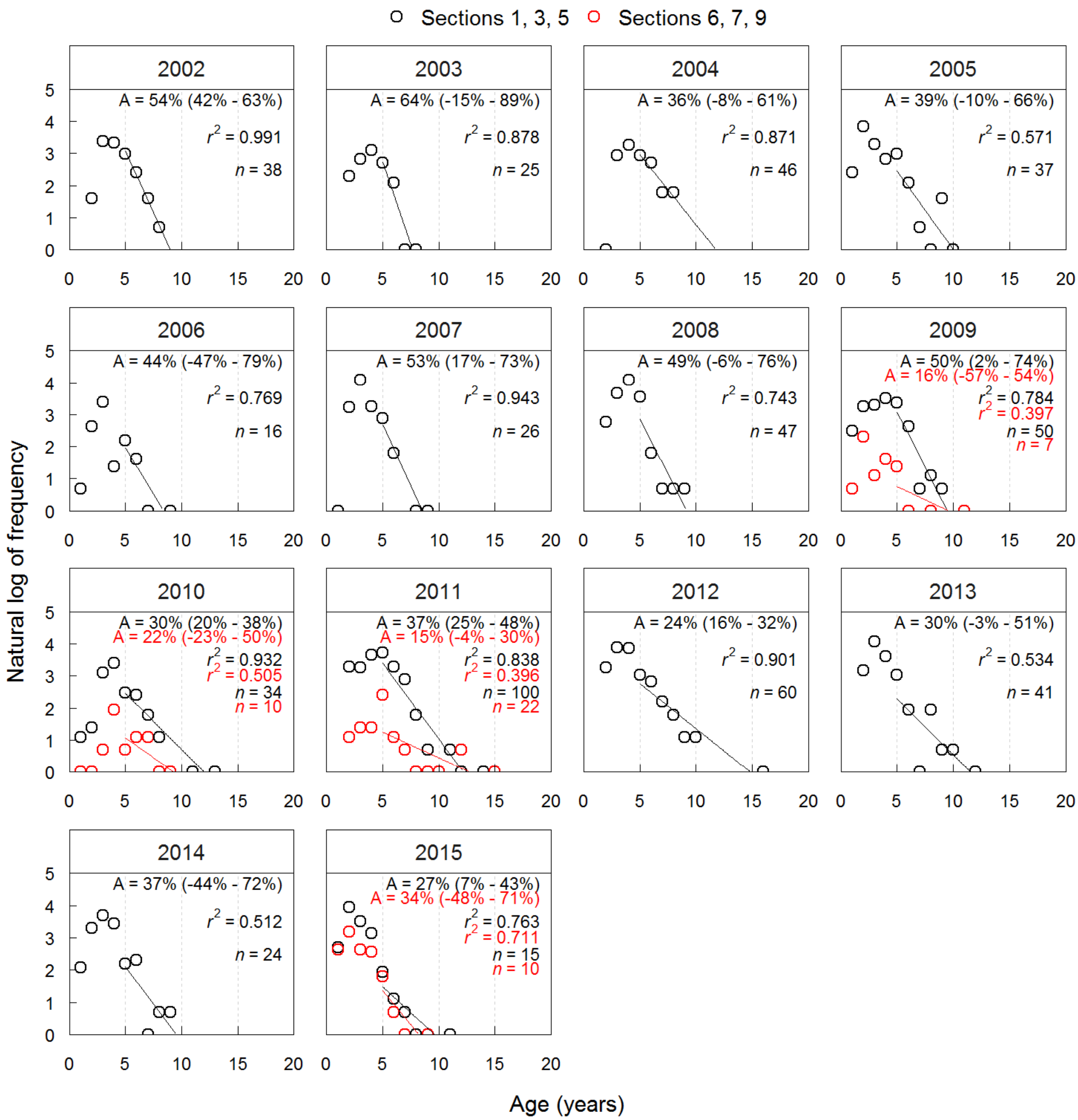


Figure F12 Catch curve and annual mortality estimates (A; mean and 95% confidence intervals) for Bull Trout, calculated for each sample year, by sample section. Sample size and r² of the catch curve regression are provided for each sample year.

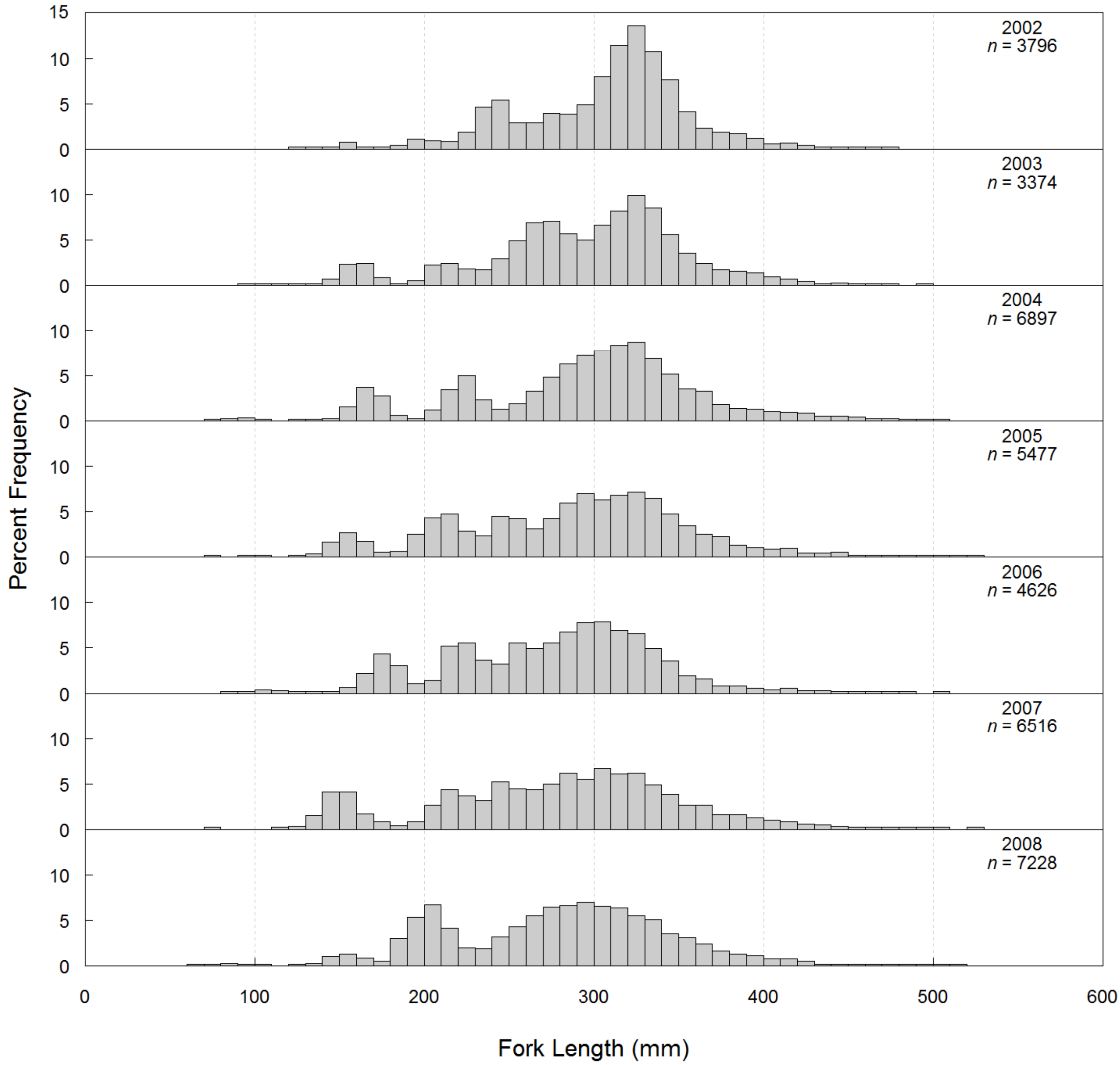
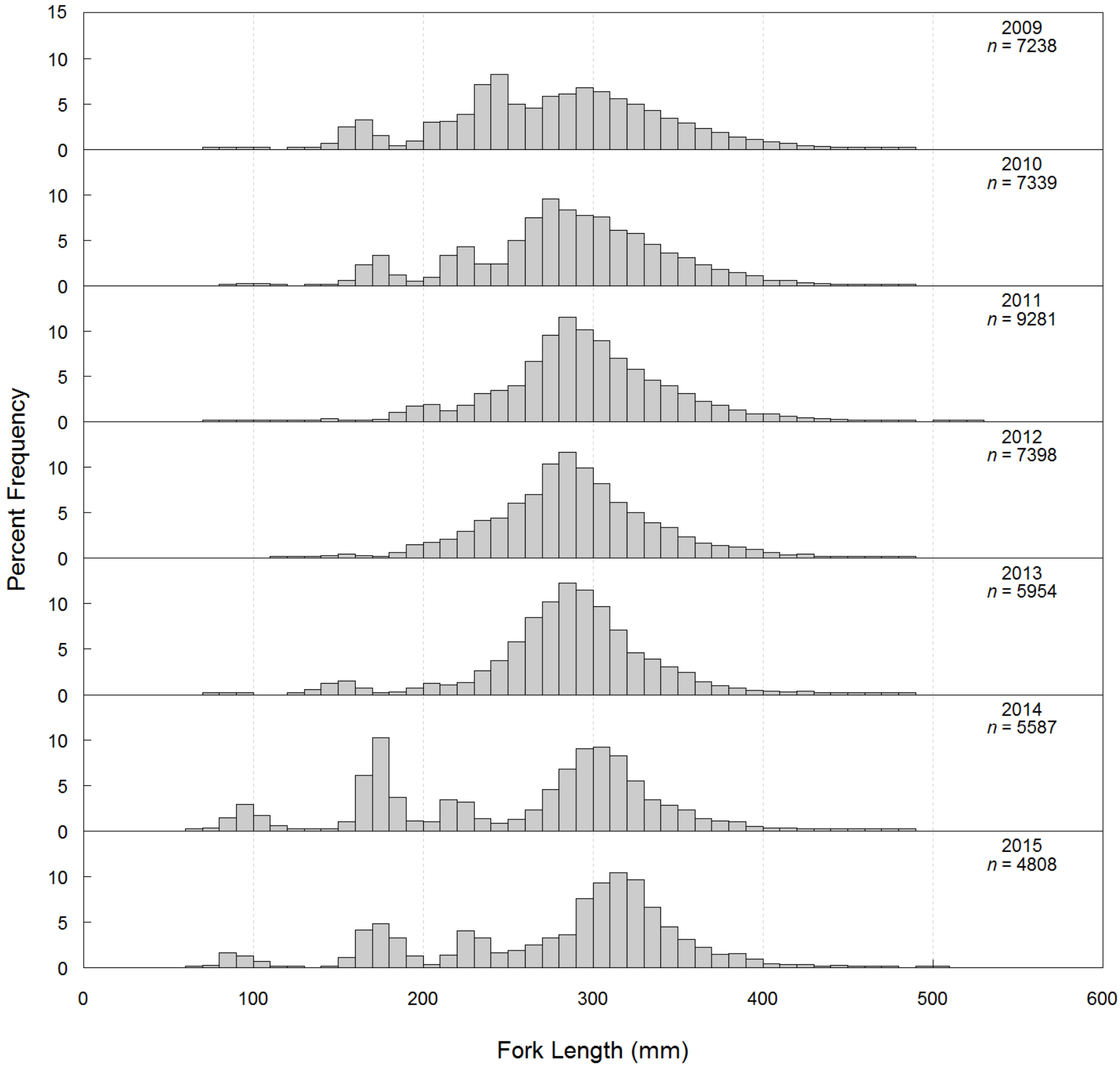


Figure F13 Length-frequency distributions by year for Mountain Whitefish captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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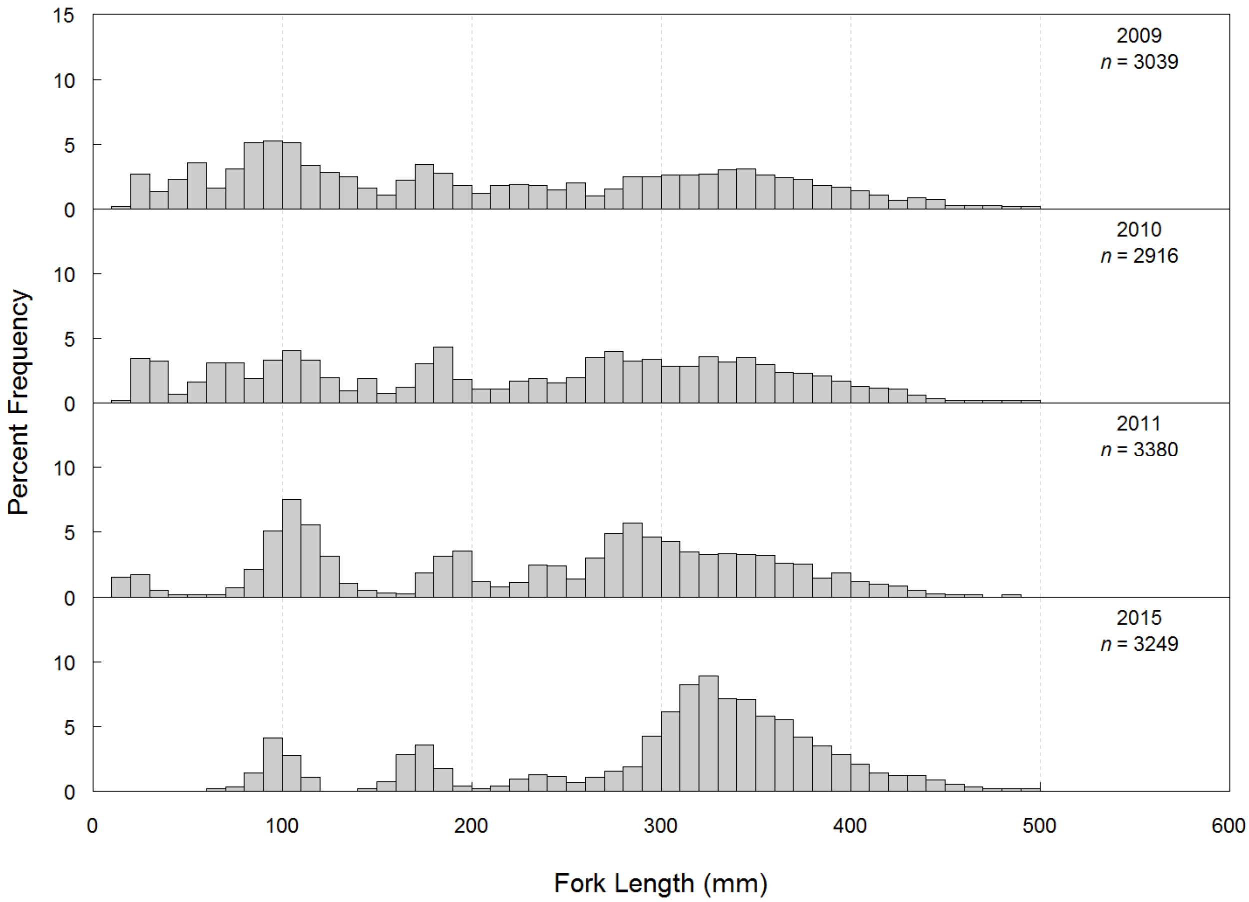


Figure F14 *Length-frequency distributions by year for Mountain Whitefish captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2009 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).*

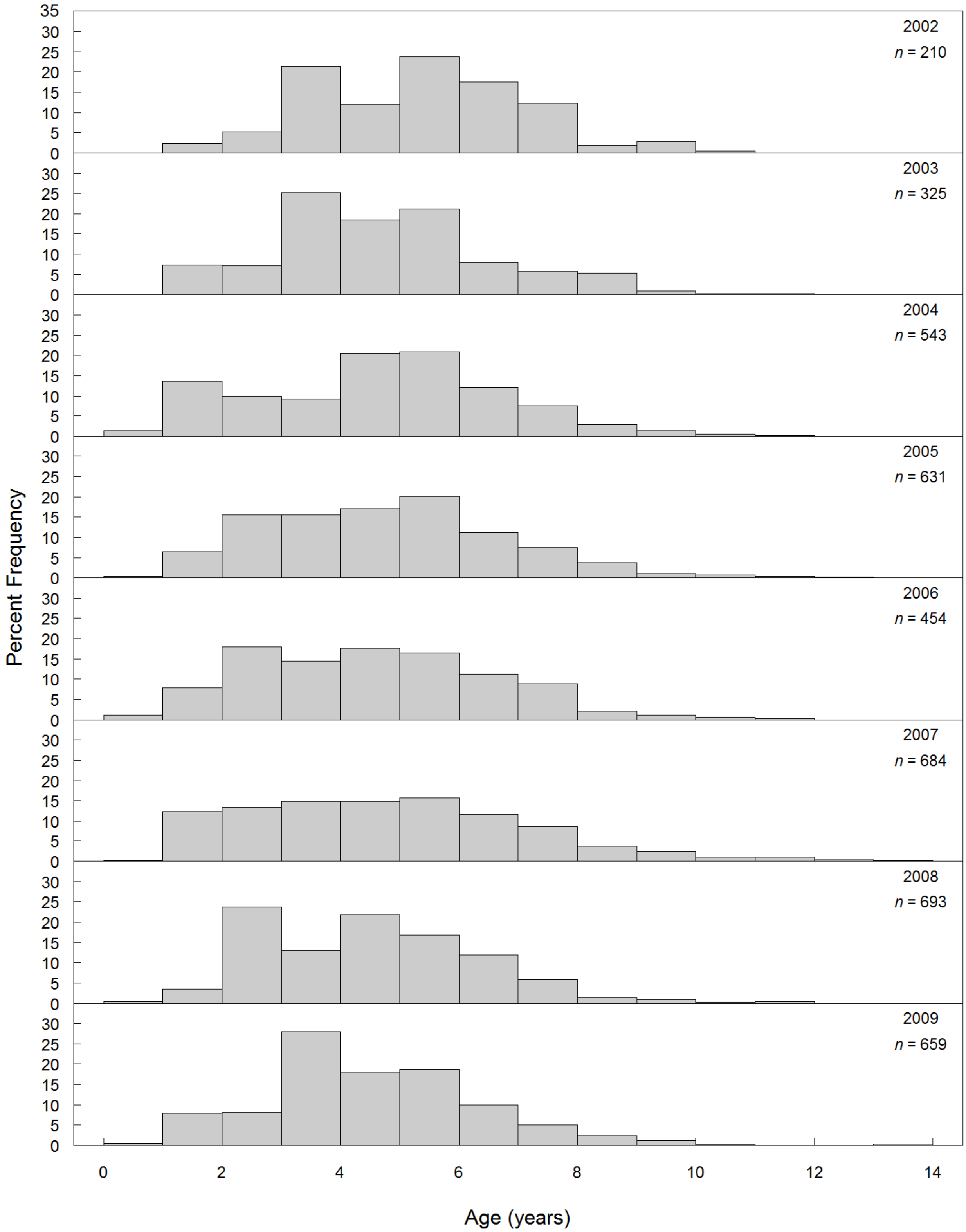
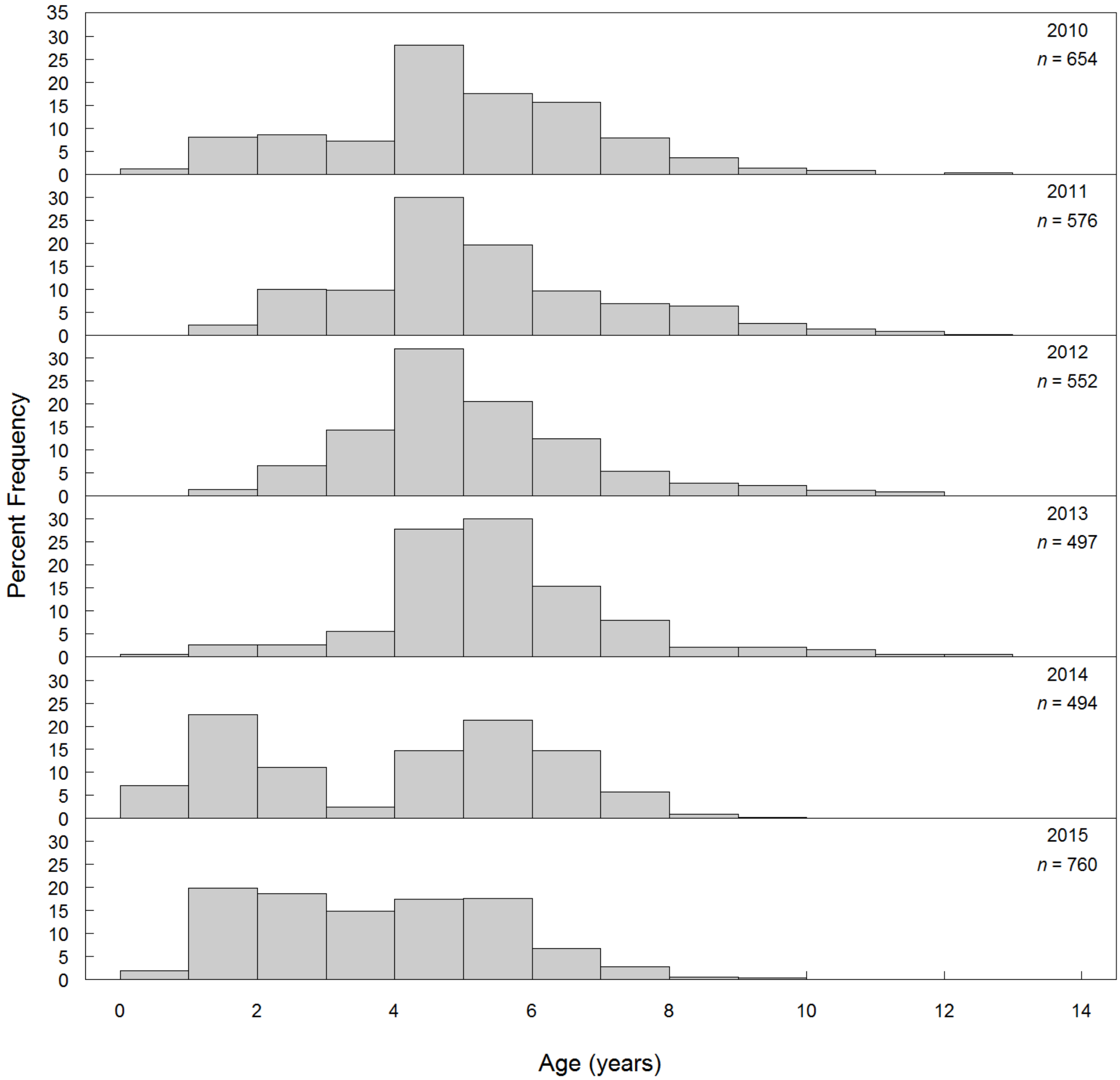


Figure F15 Age-frequency distributions by year for Mountain Whitefish captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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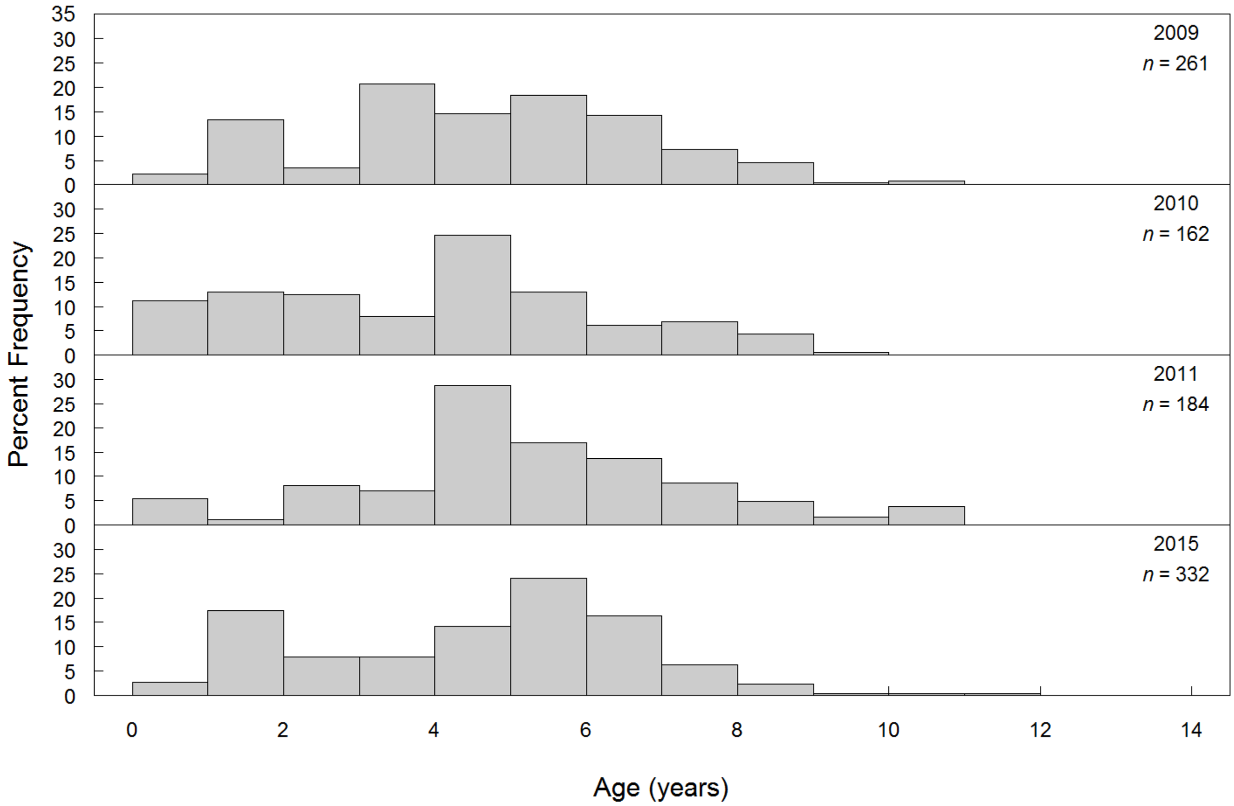

Figure F16 Age-frequency distributions by year for Mountain Whitefish captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2002 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

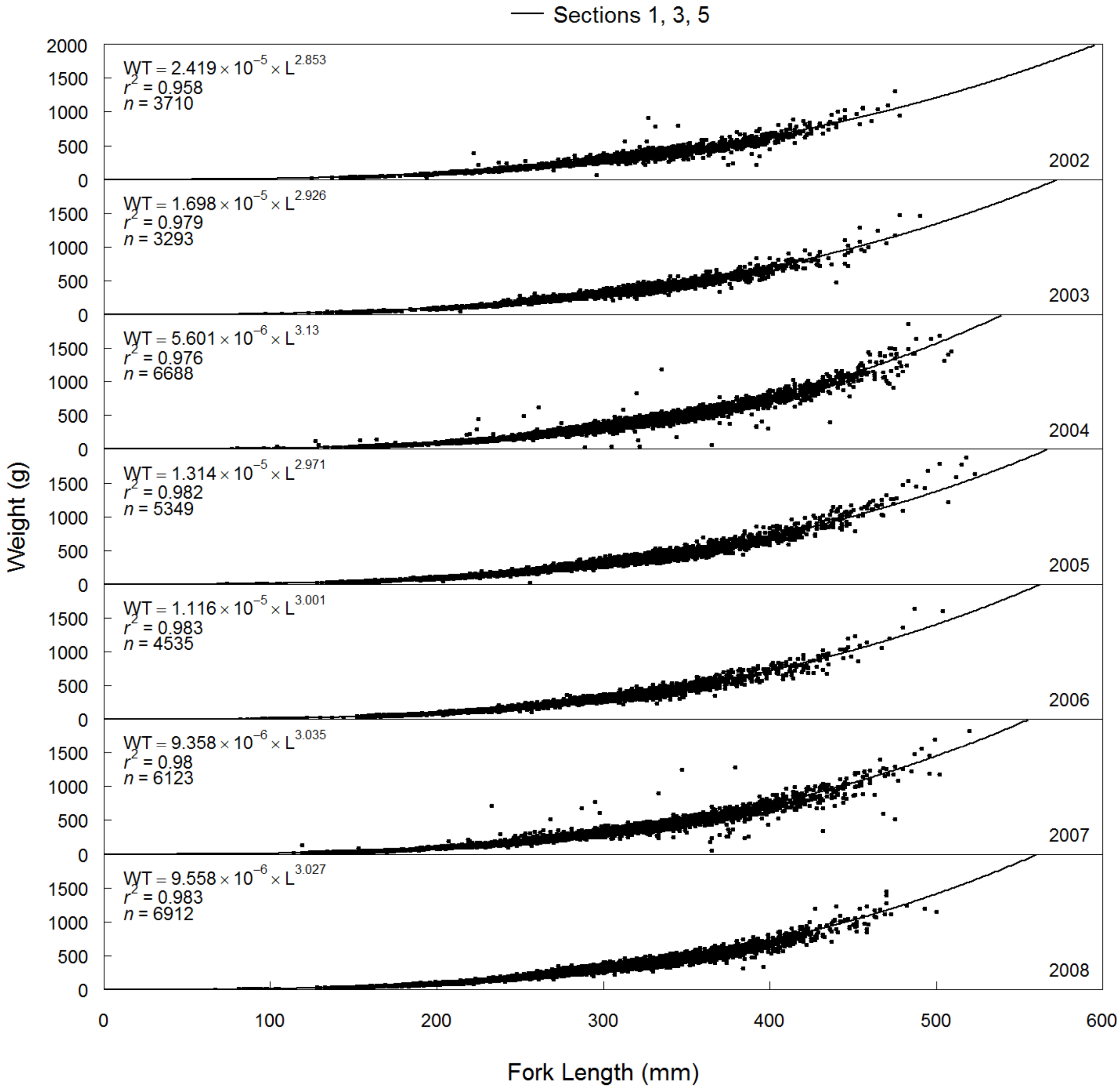

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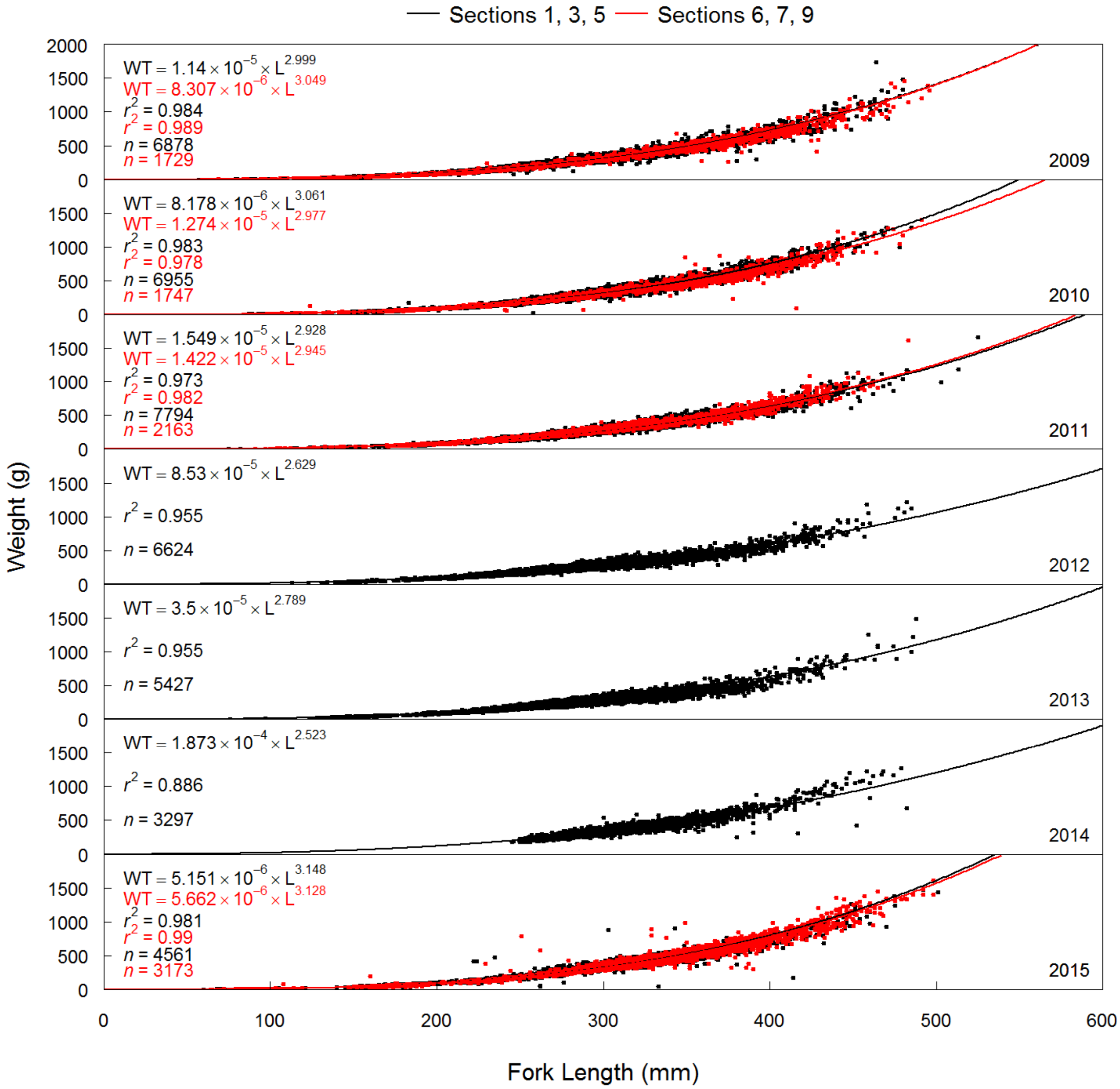
Figure F17 Length-weight regressions for Mountain Whitefish captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).



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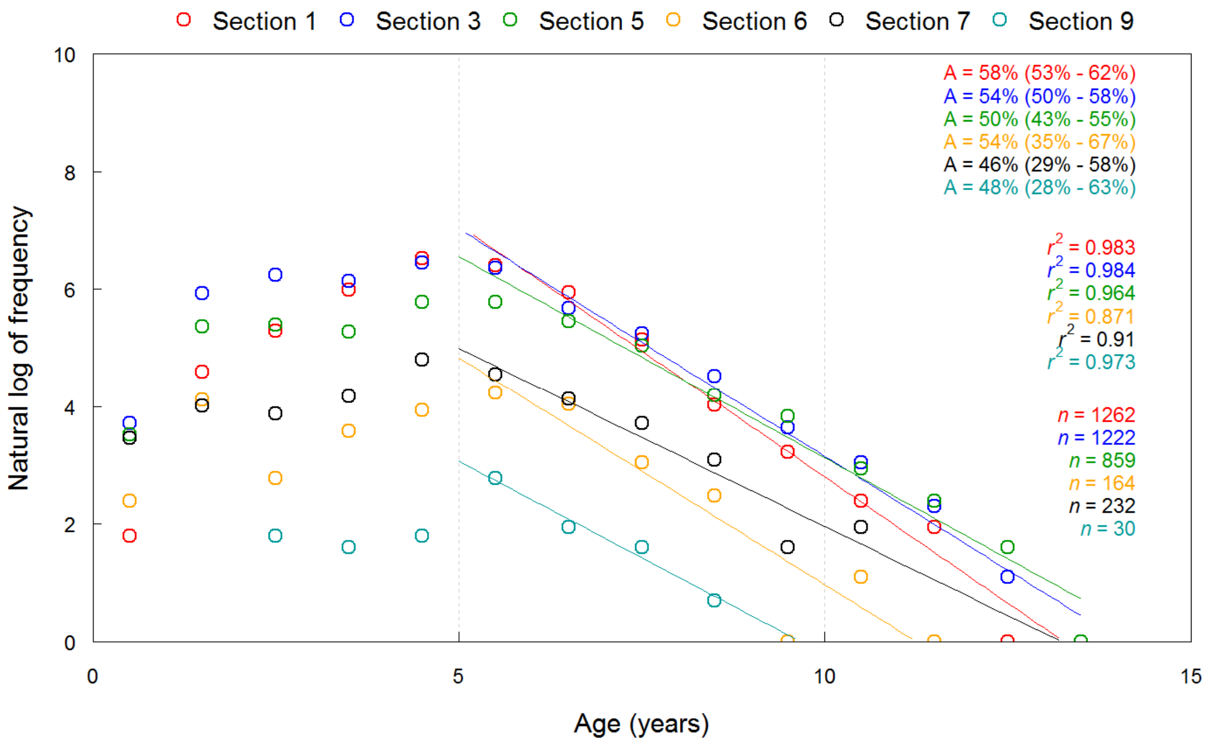


Figure F18 Catch curve and annual mortality estimates (A; mean and 95% confidence intervals) for Mountain Whitefish, calculated for each sample section using data from 2002 to 2015 combined. Sample size, and r² of the catch curve regression are provided for each section.

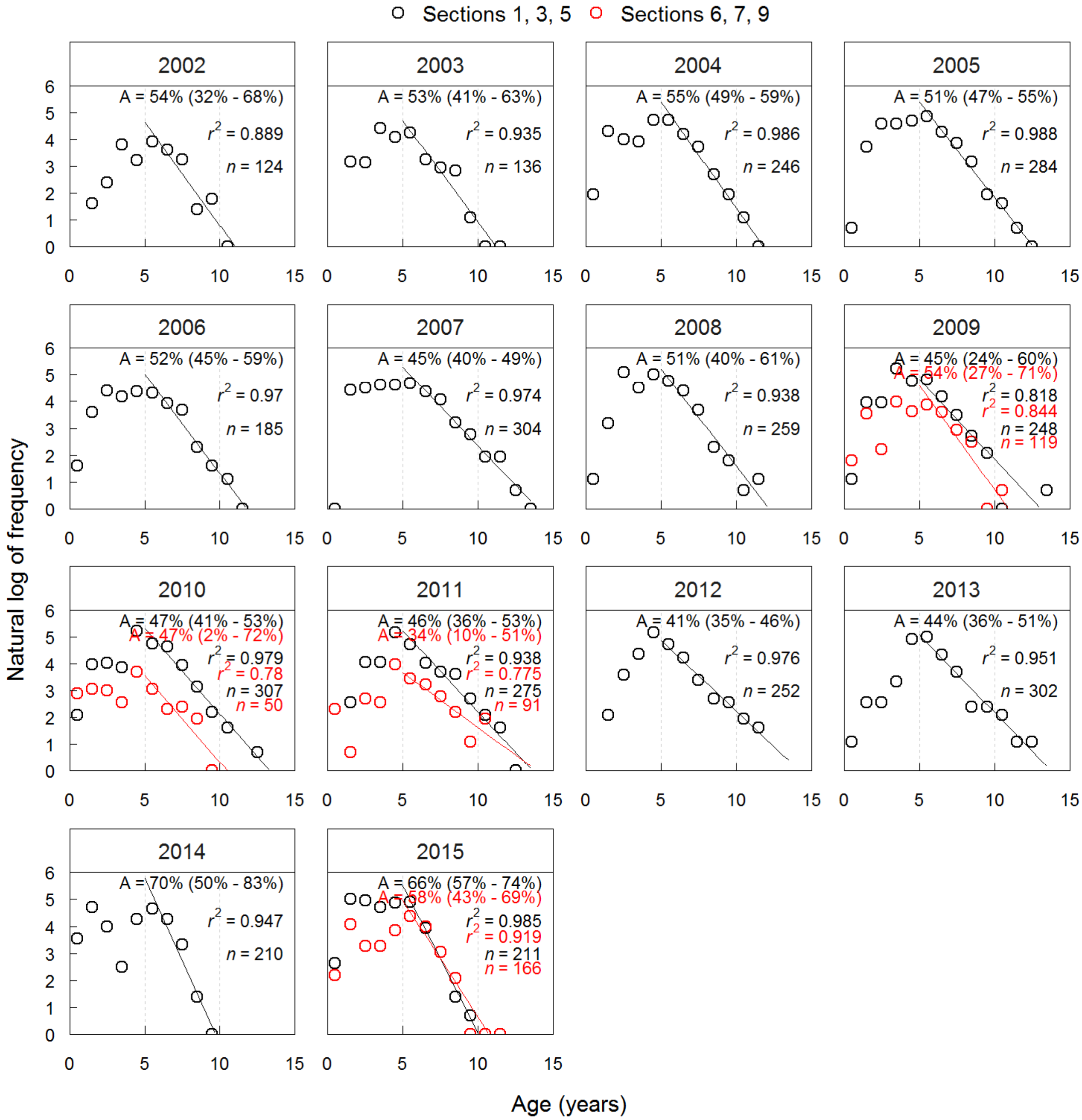


Figure F19 Catch curve and annual mortality estimates (A; mean and 95% confidence intervals) for Mountain Whitefish, calculated for each sample year. Sample size and r² of the catch curve regression are provided for each sample year.

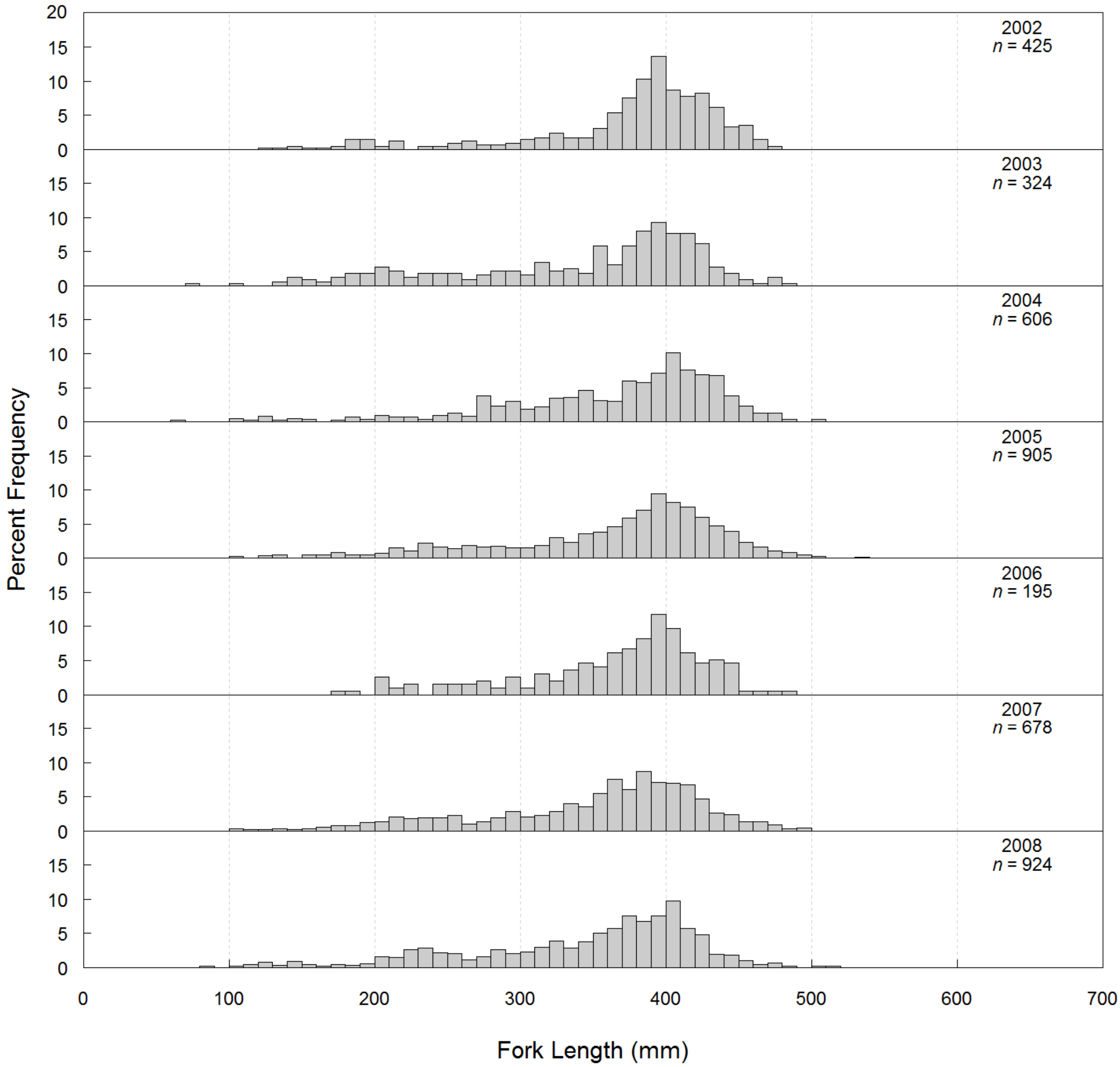
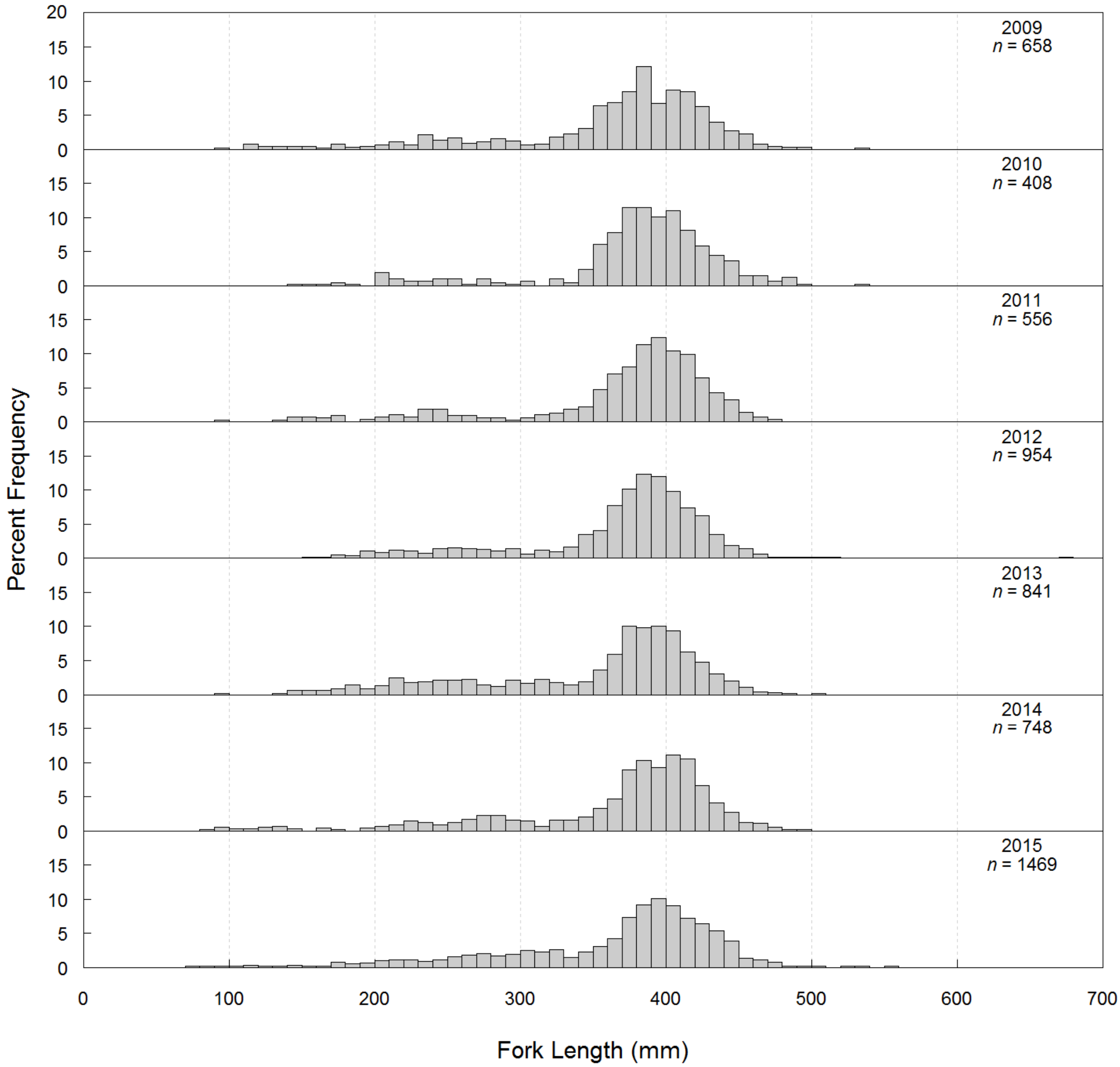


Figure F20 Length-frequency distributions by year for Longnose Sucker captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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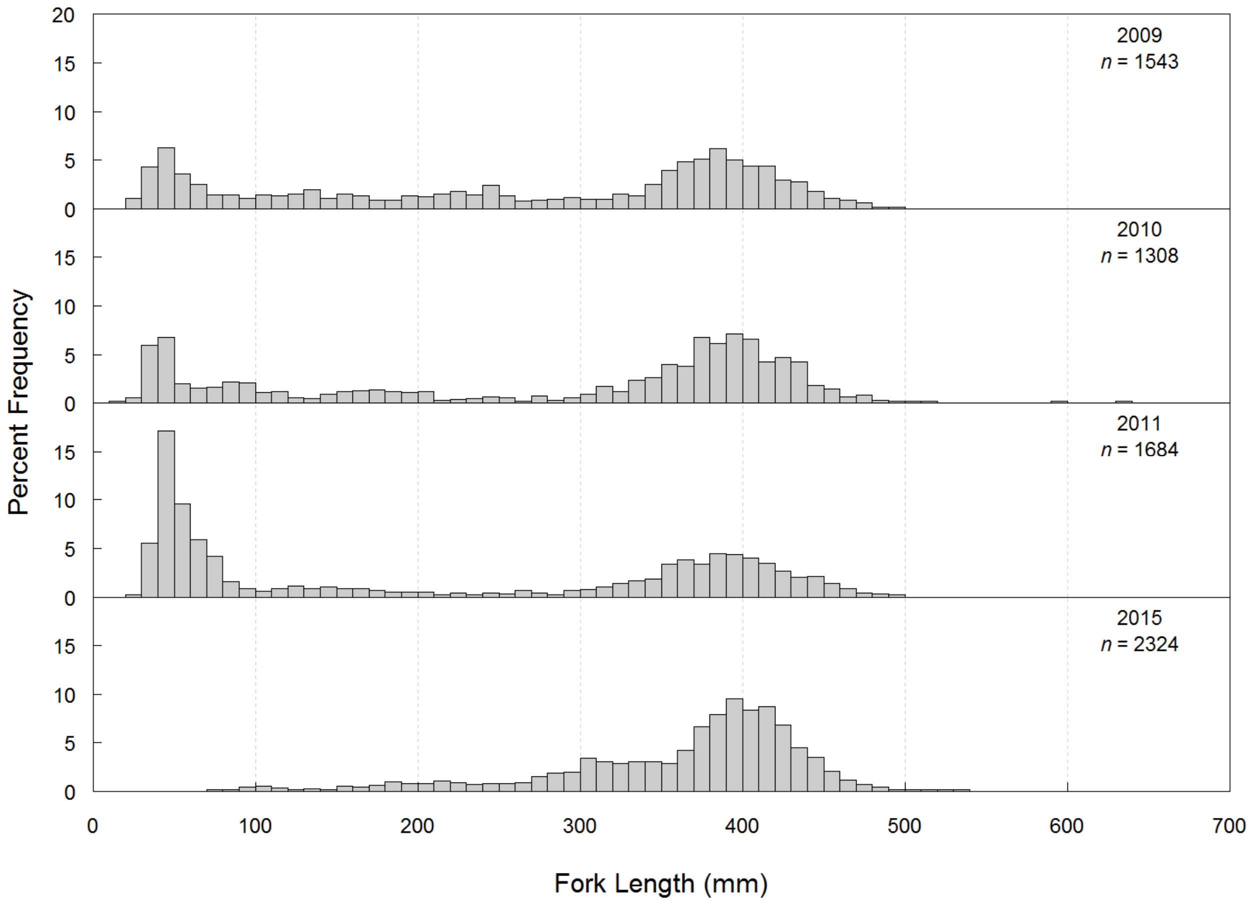

Figure F21 Length-frequency distributions by year for Mountain Whitefish captured by boat electroshocking in Sections 6, 7, and 9 of Peace River, 2002 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

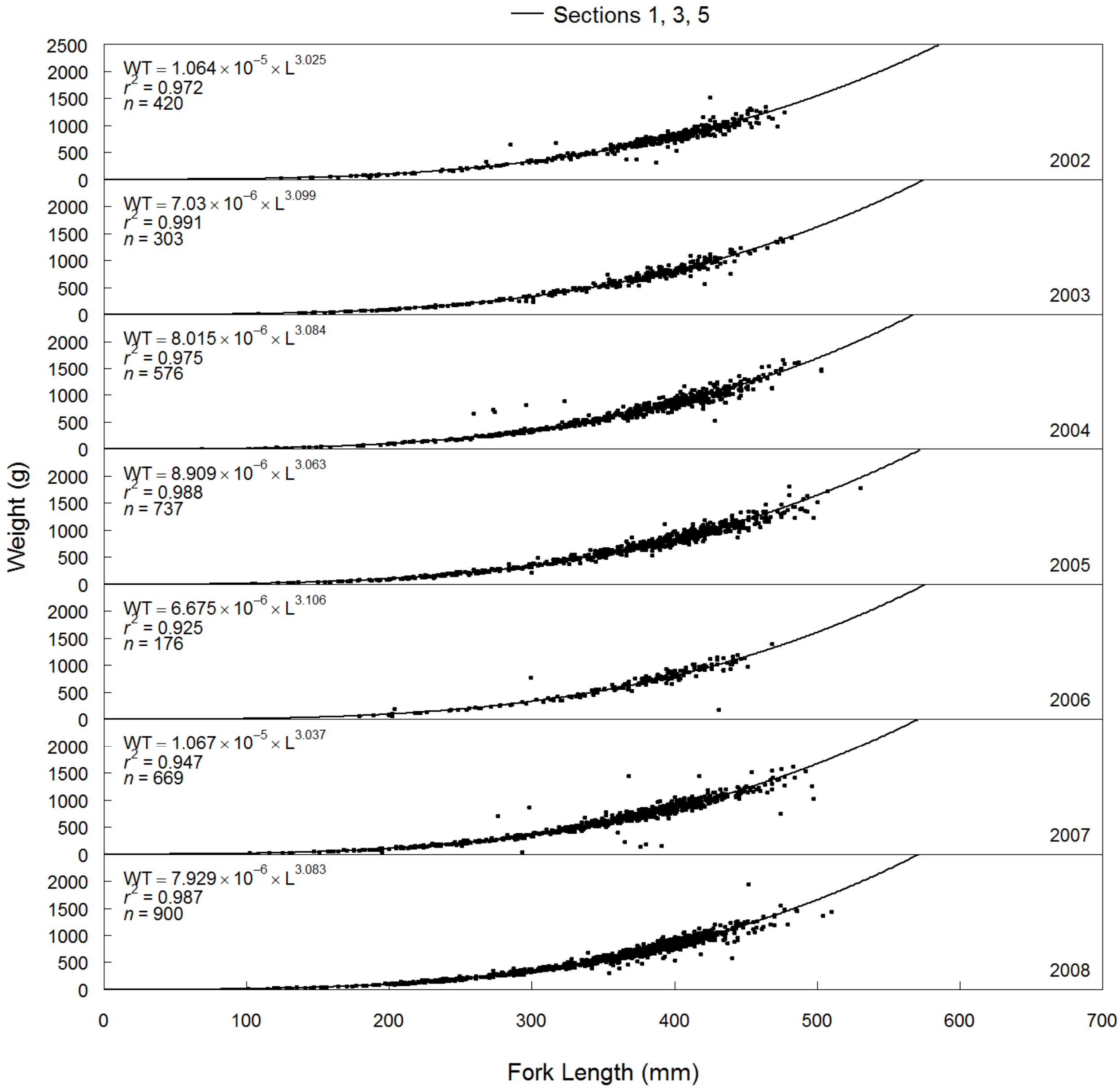

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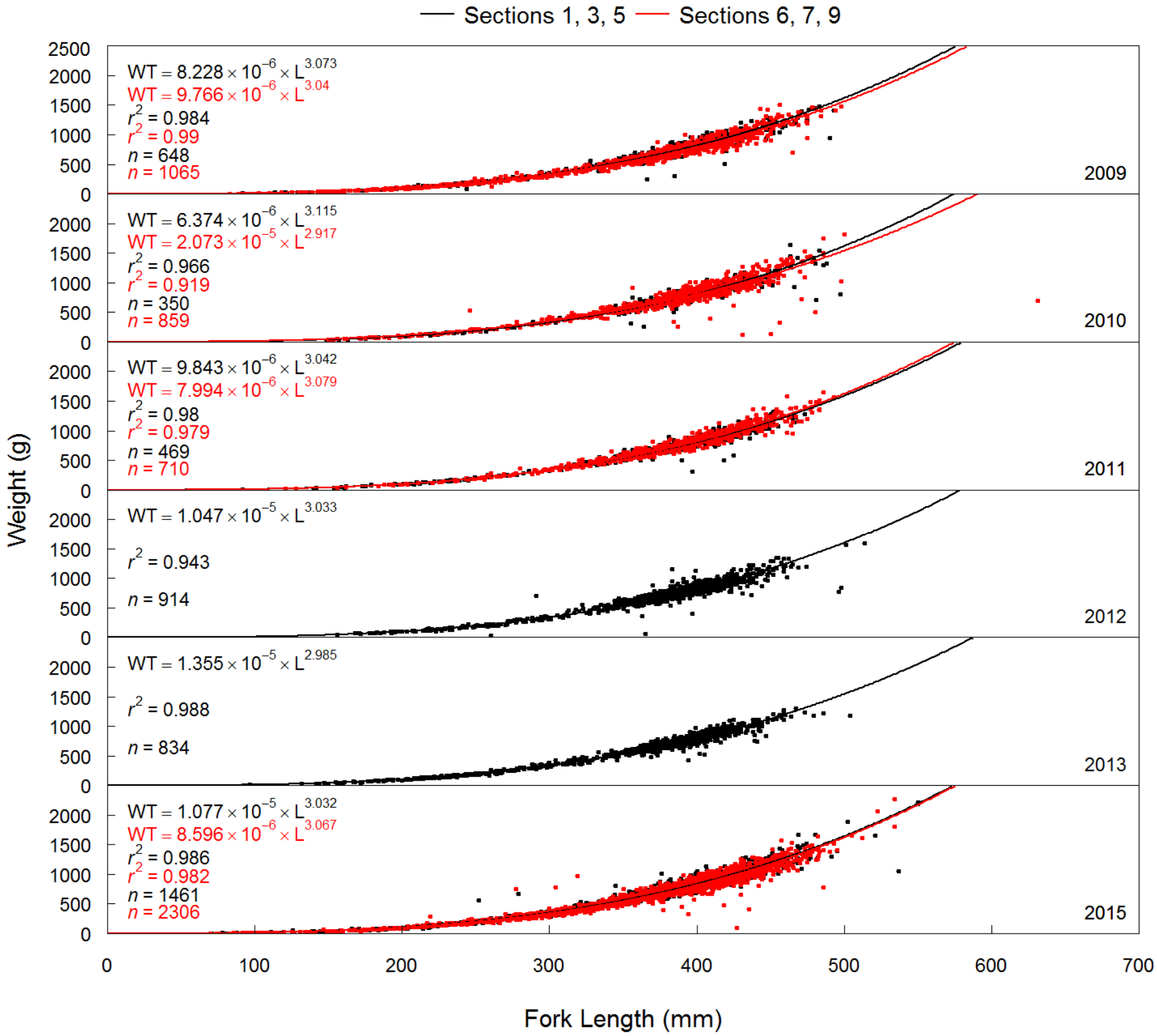
Figure F22 Length-weight regressions for Longnose Sucker captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).



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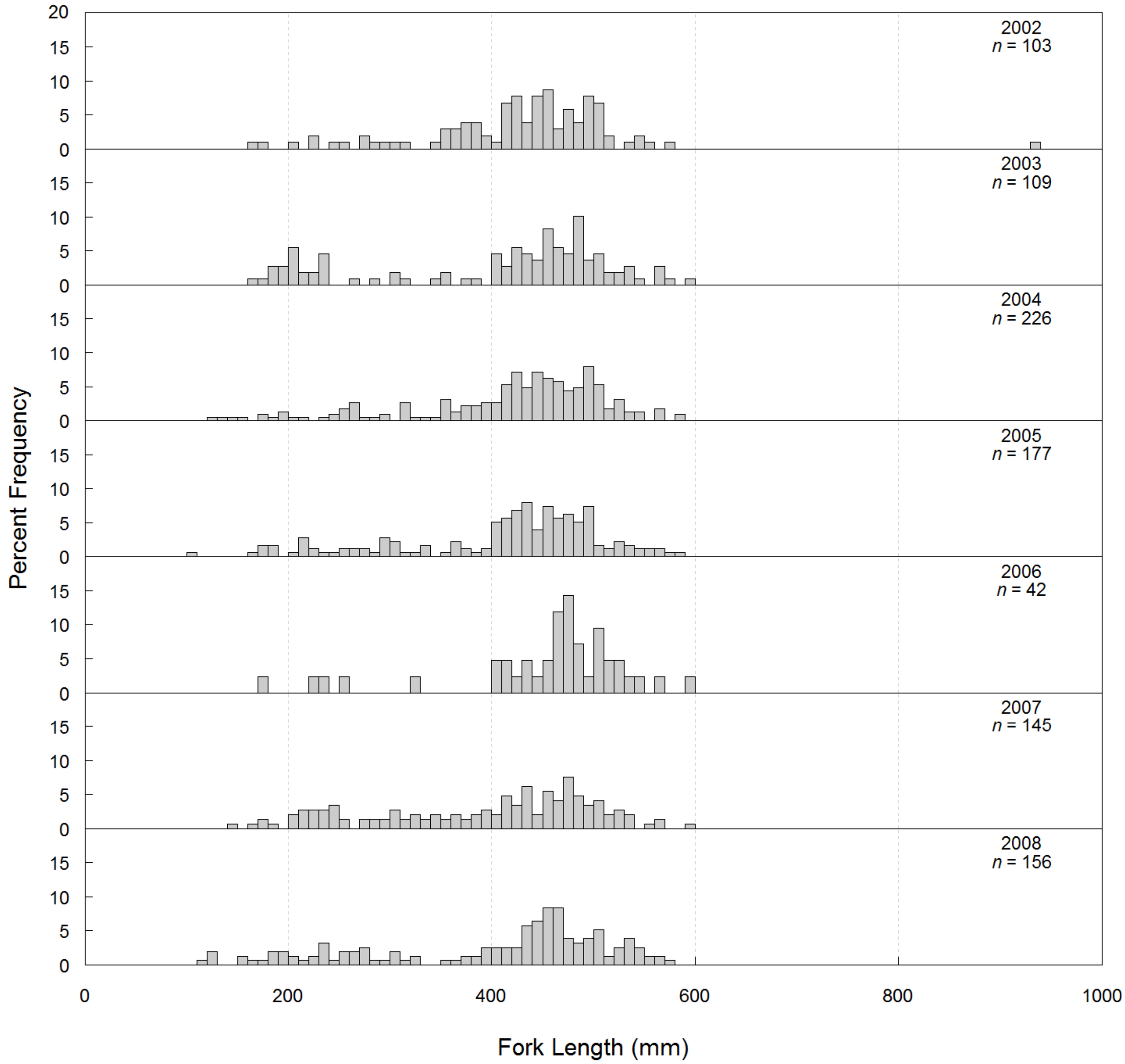
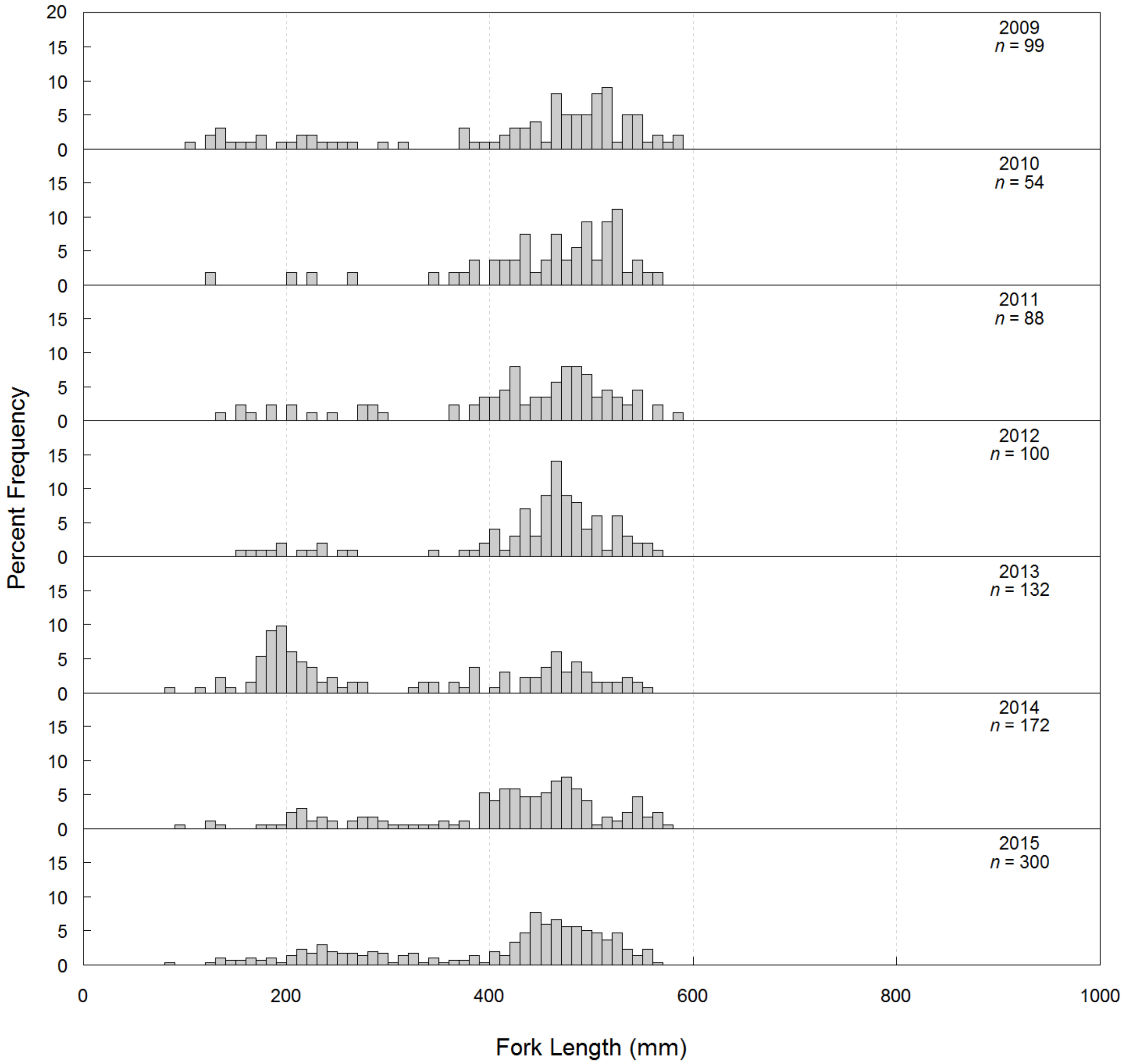


Figure F23 Length-frequency distributions by year for Largescale Sucker captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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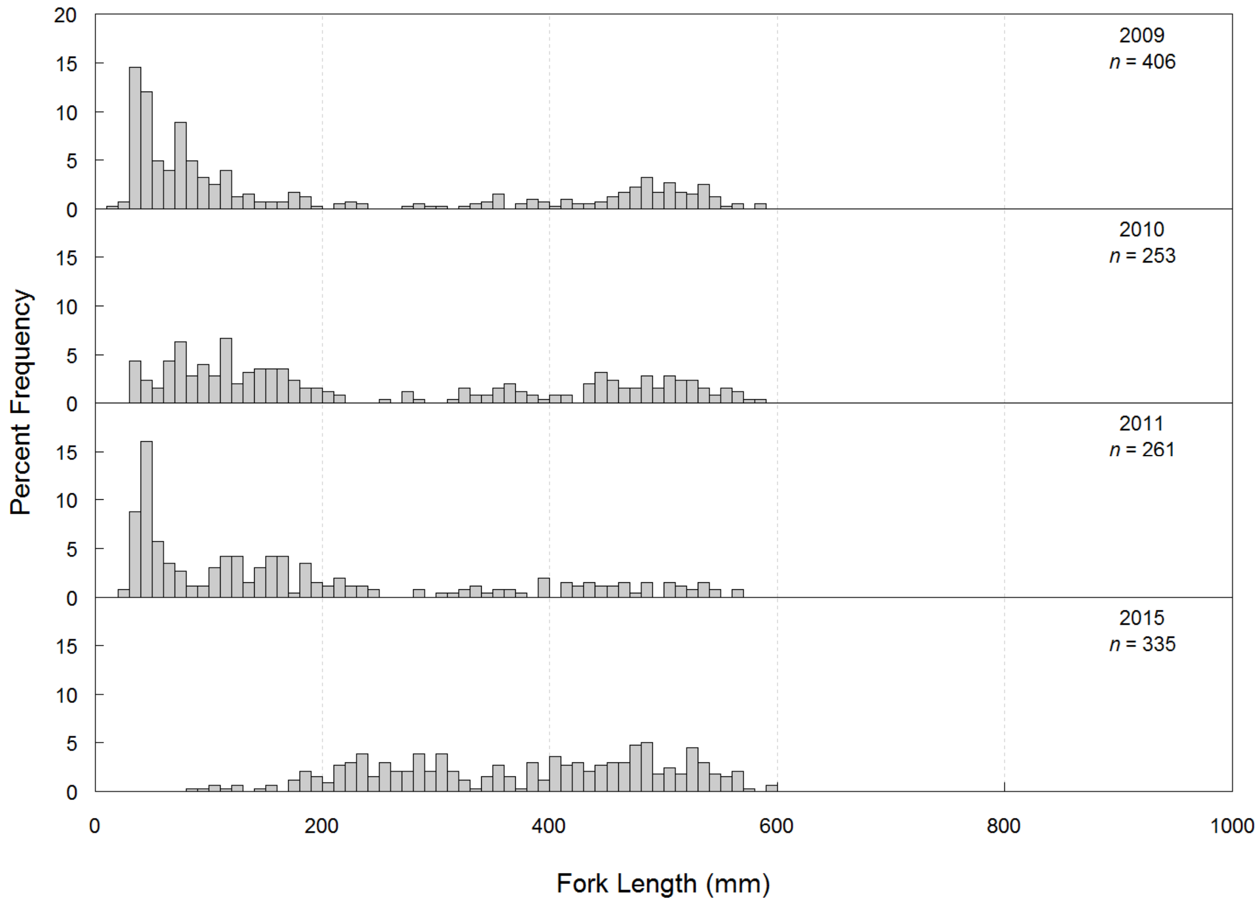

Figure F24 Length-frequency distributions by year for Largescale Sucker captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2009 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

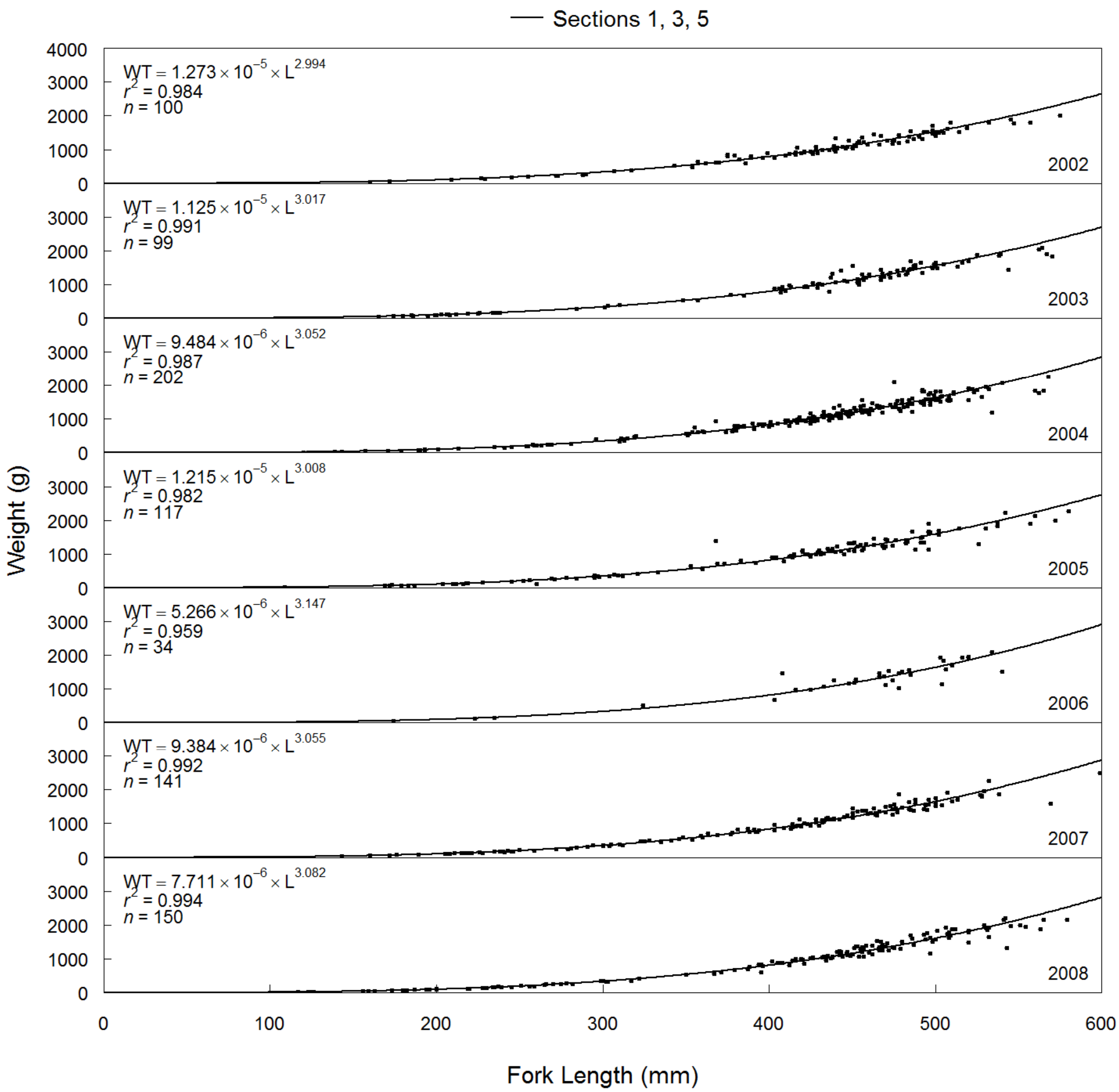

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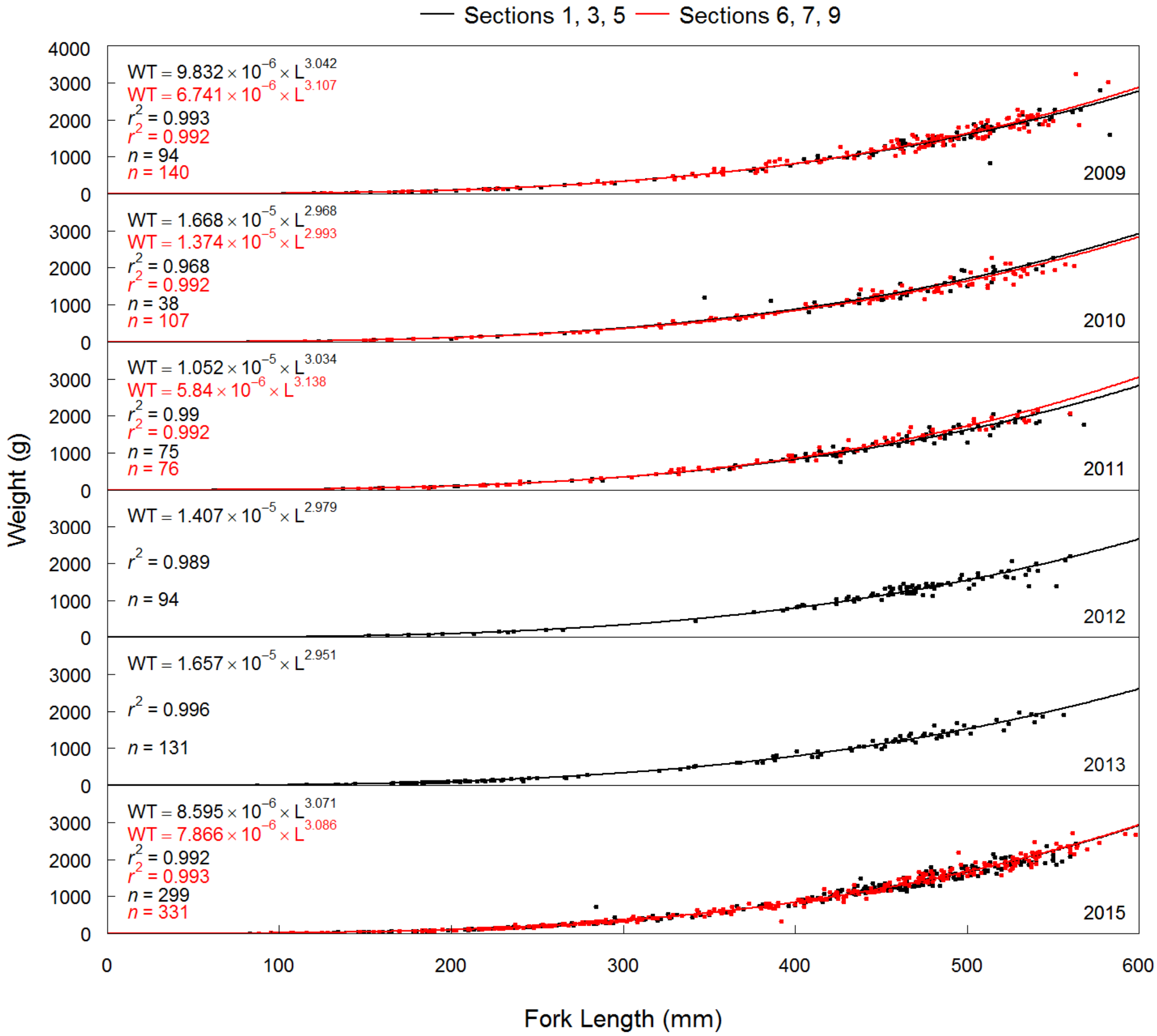
Figure F25 Length-weight regressions for Largescale Sucker captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).



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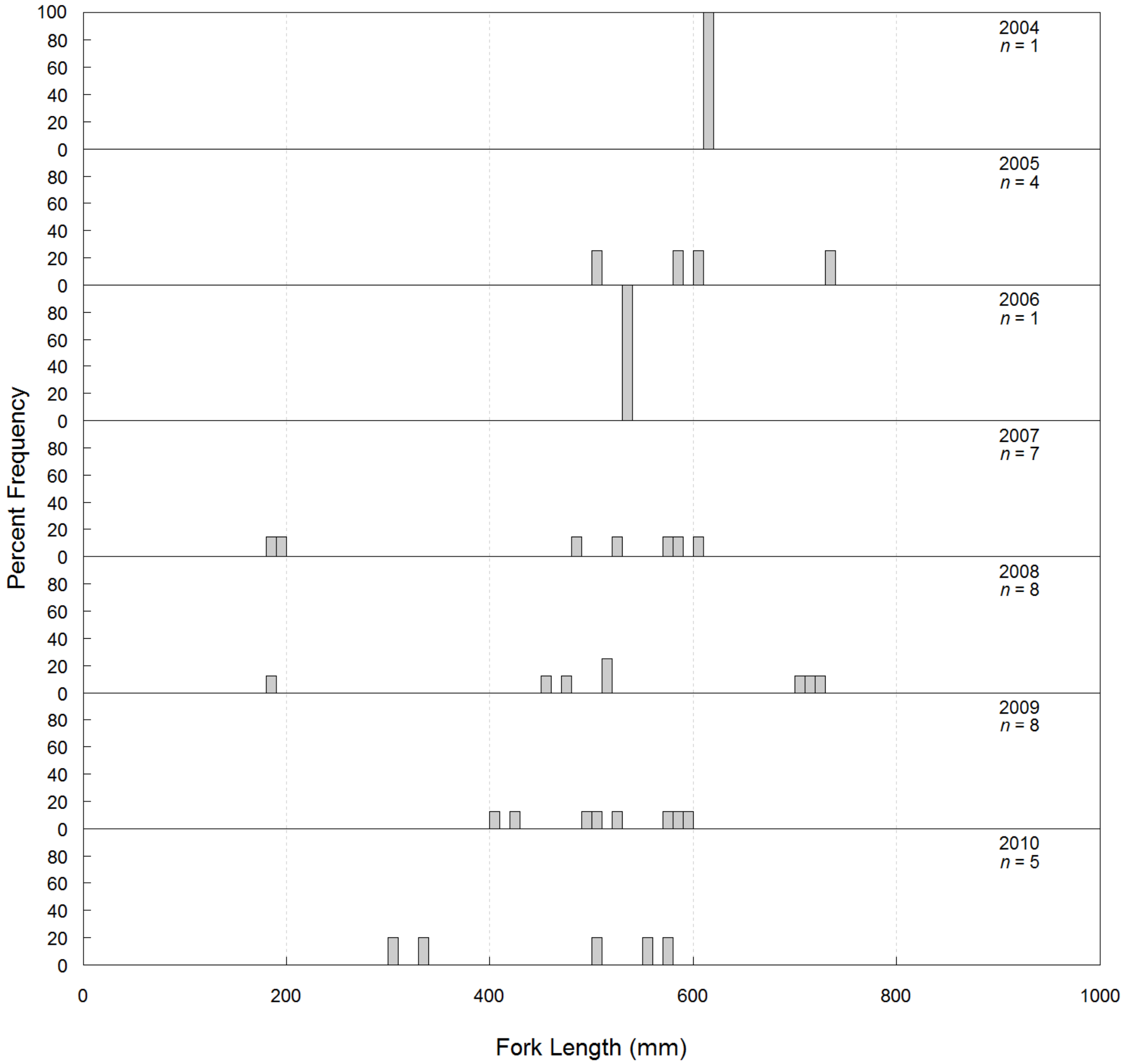
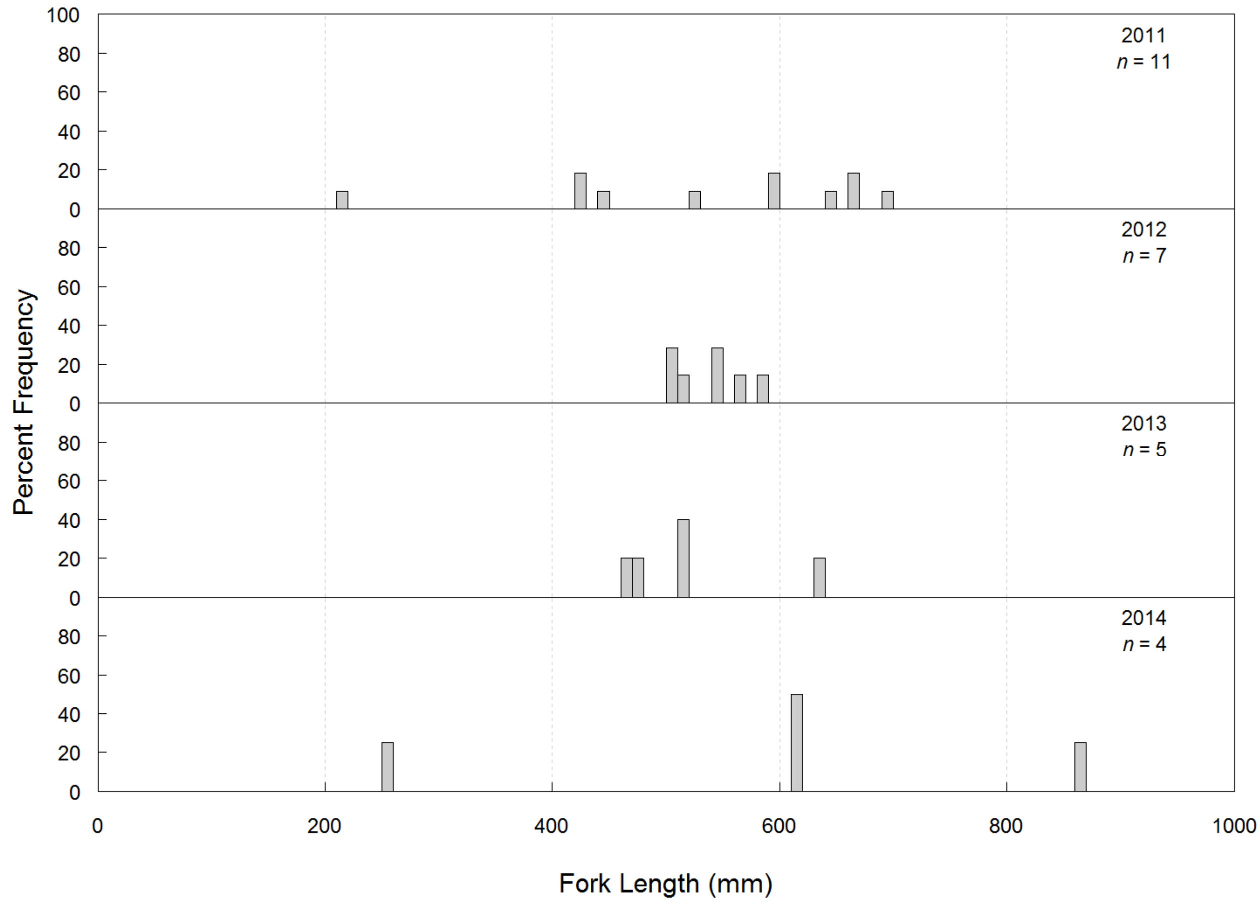


Figure F26 Length-frequency distributions by year for Northern Pike captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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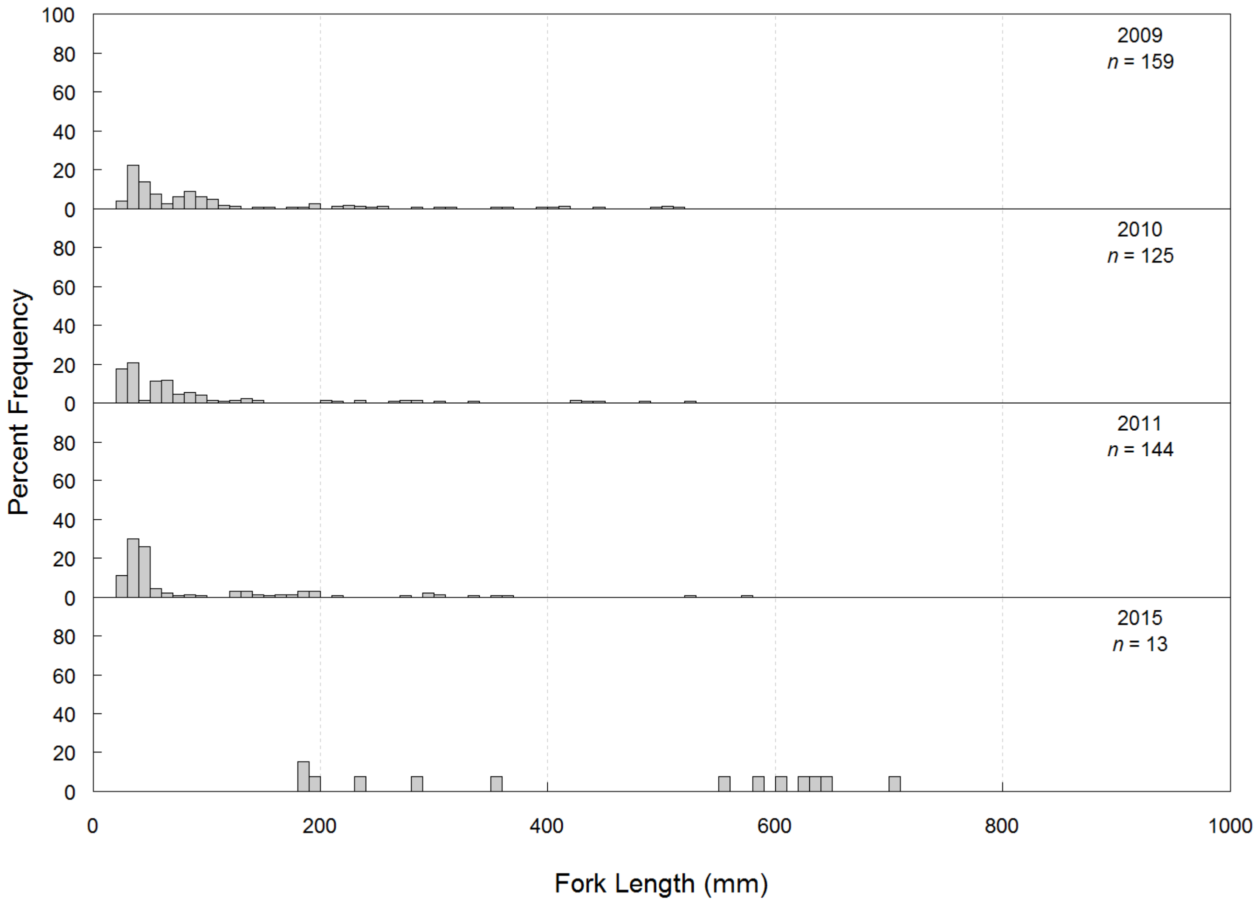

Figure F27 Length-frequency distributions by year for Northern Pike captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2009 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

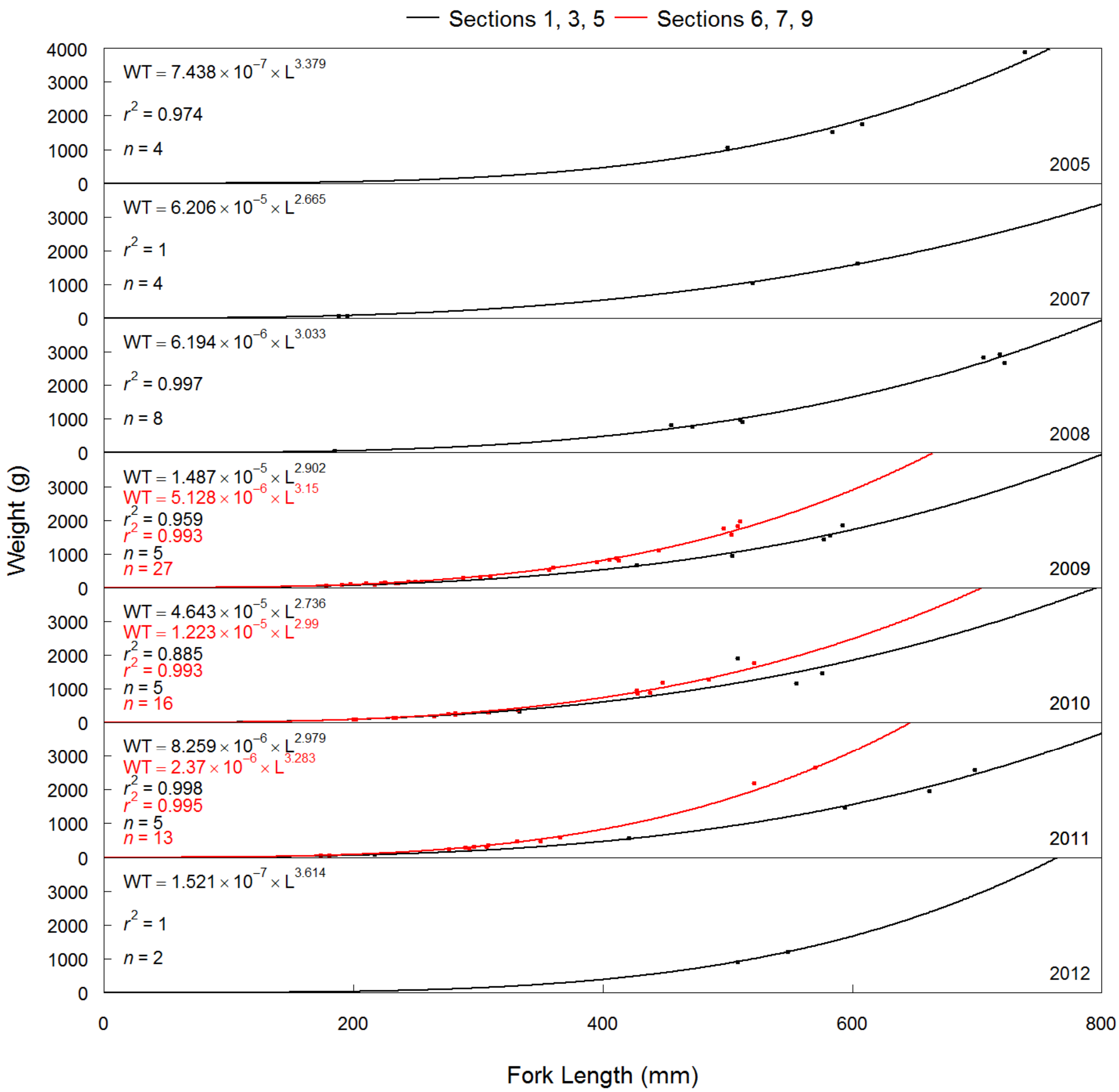

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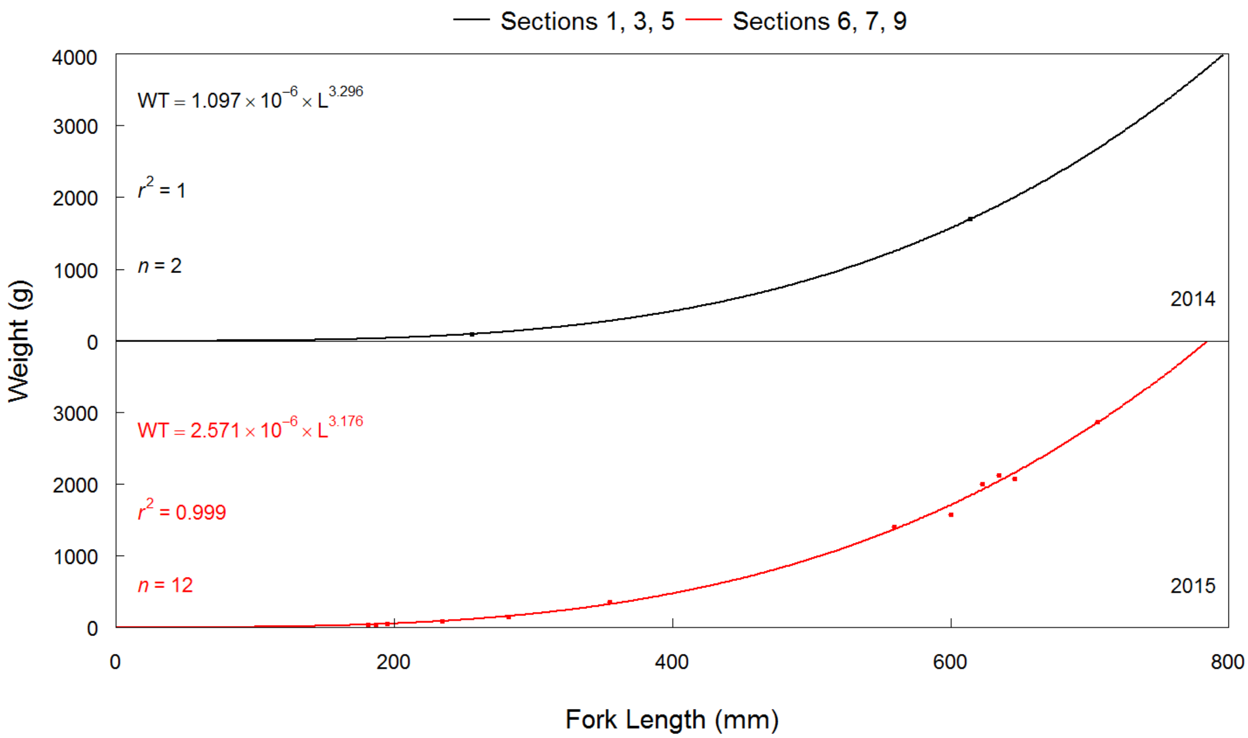
Figure F28 Length-weight regressions for Northern Pike captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).



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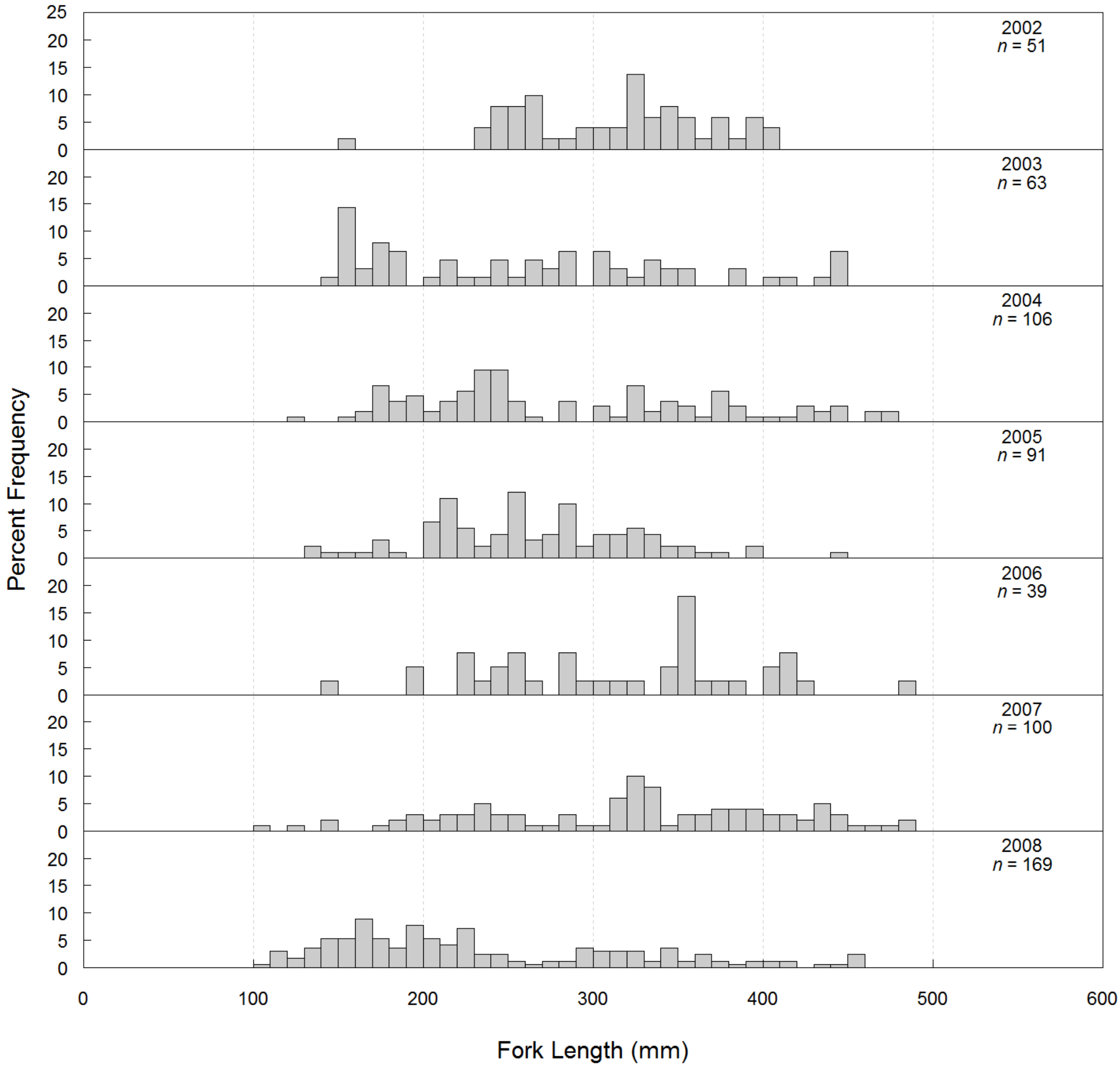
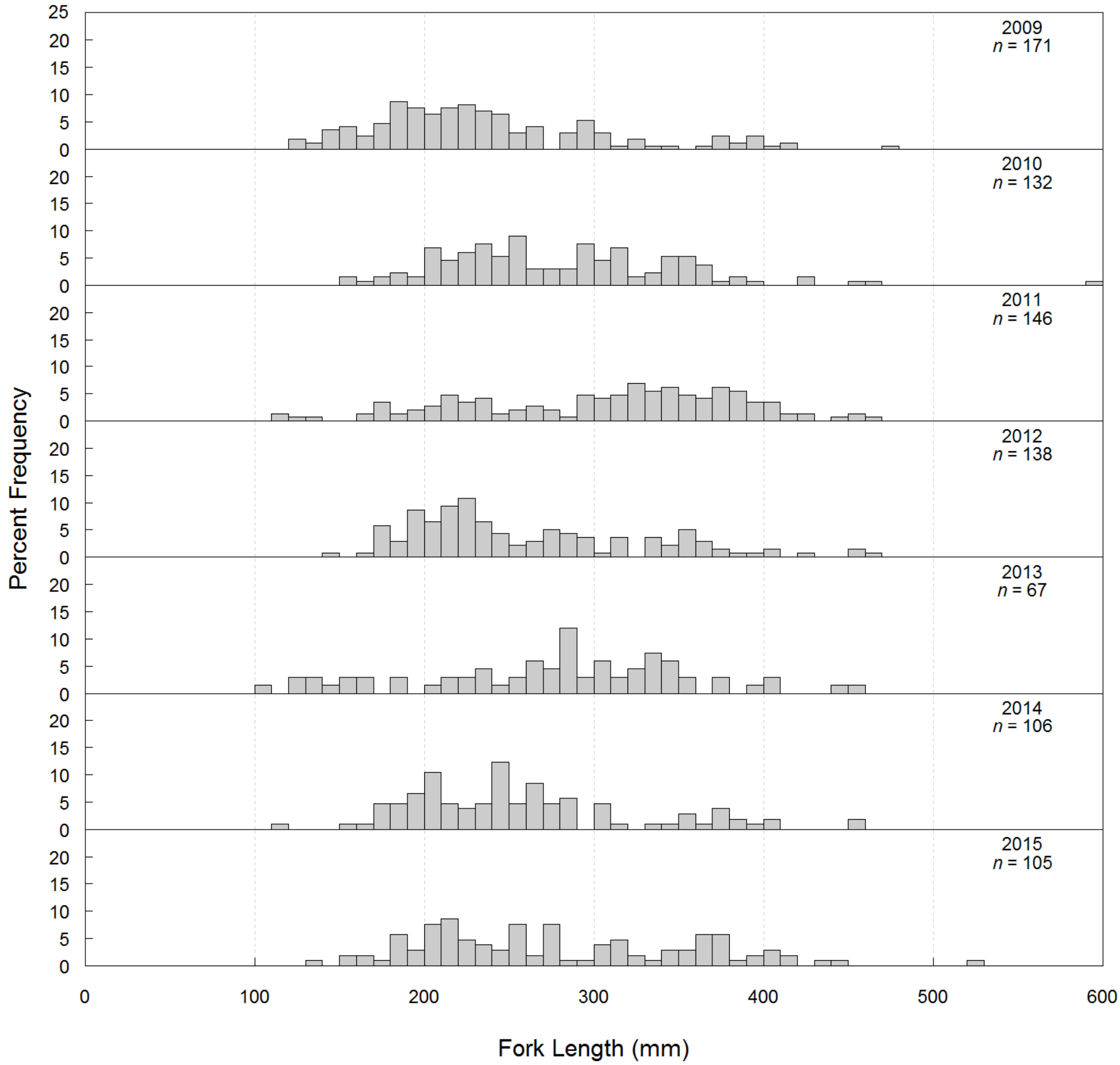


Figure F29 Length-frequency distributions by year for Rainbow Trout captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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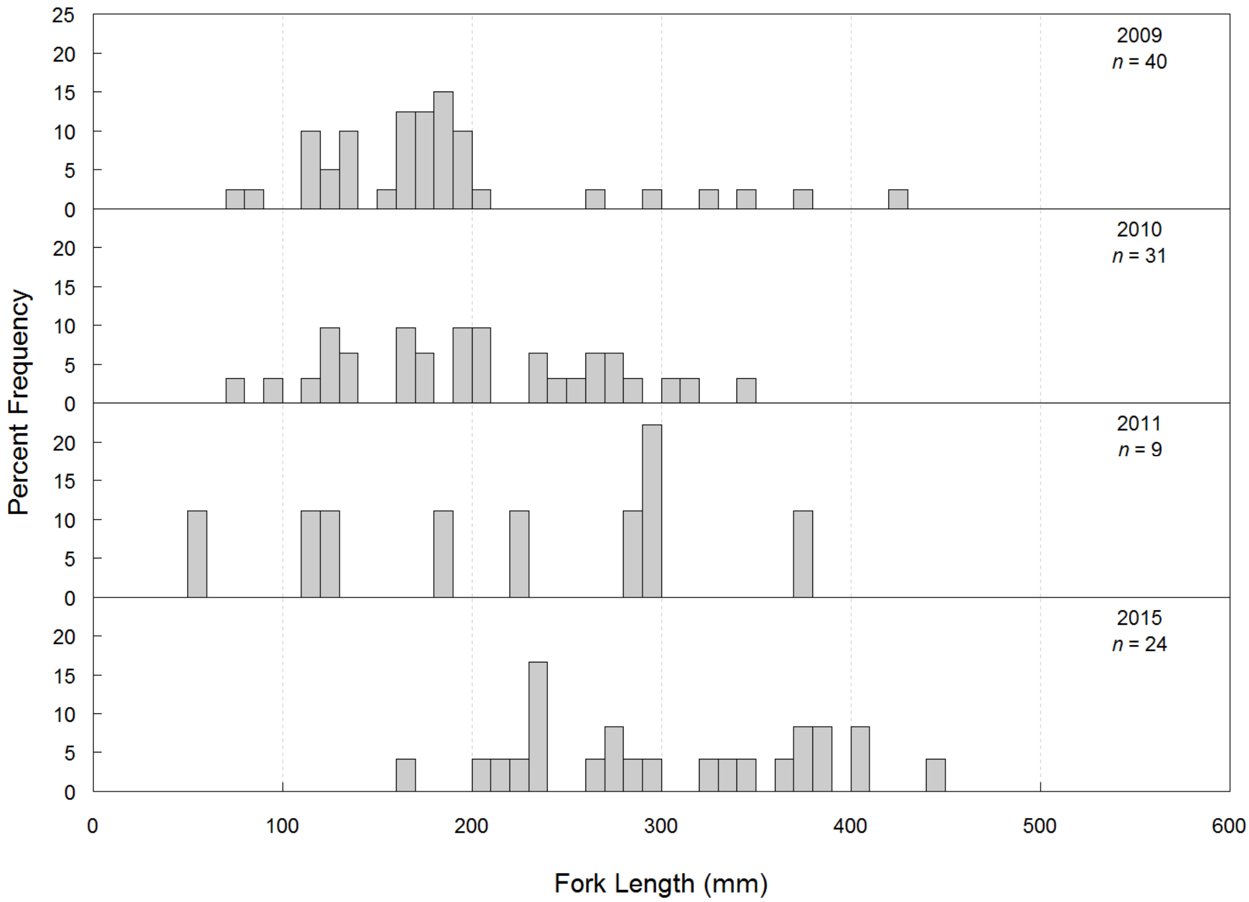

Figure F30 Length-frequency distributions by year for Rainbow Trout captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2002 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

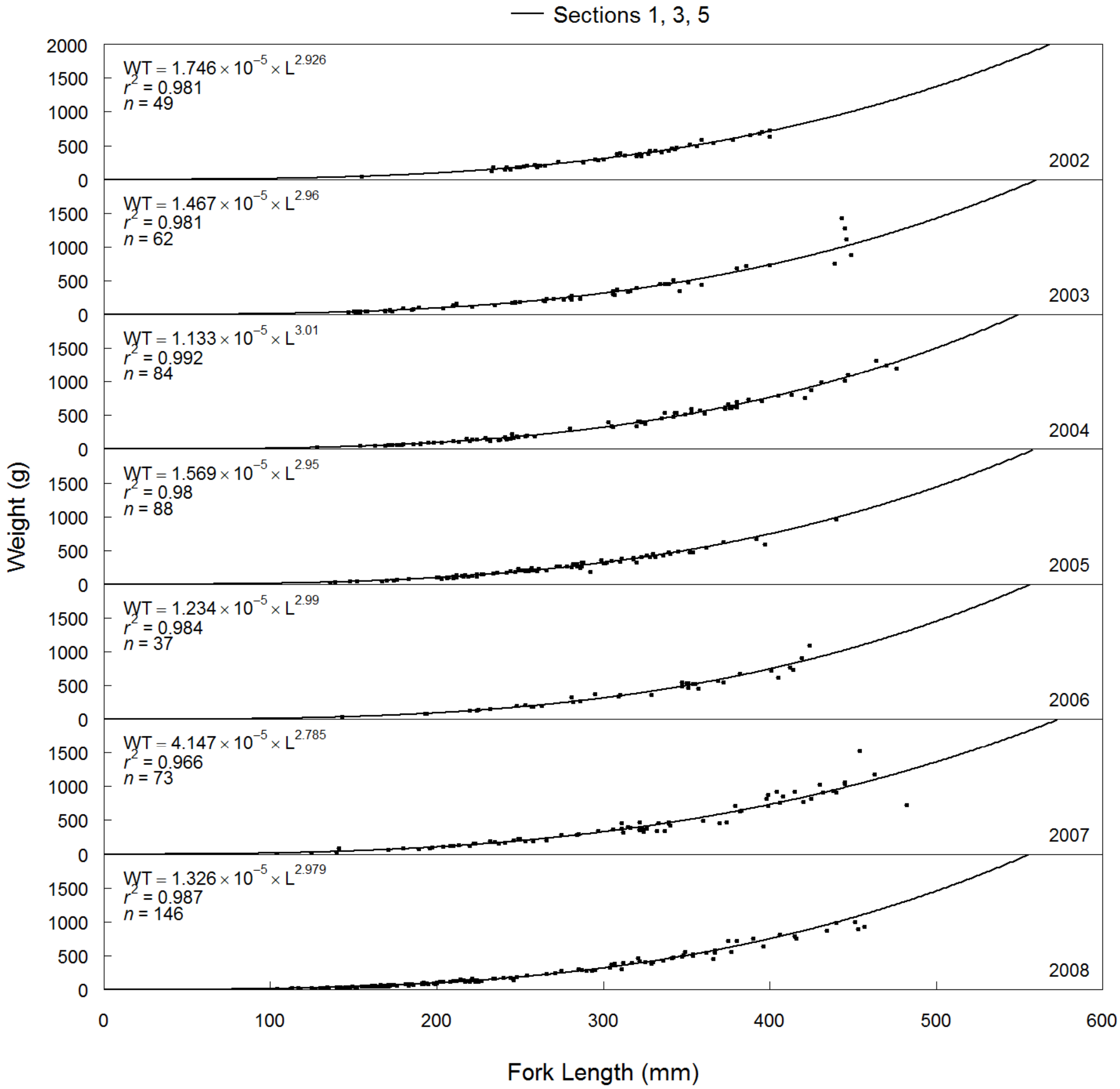

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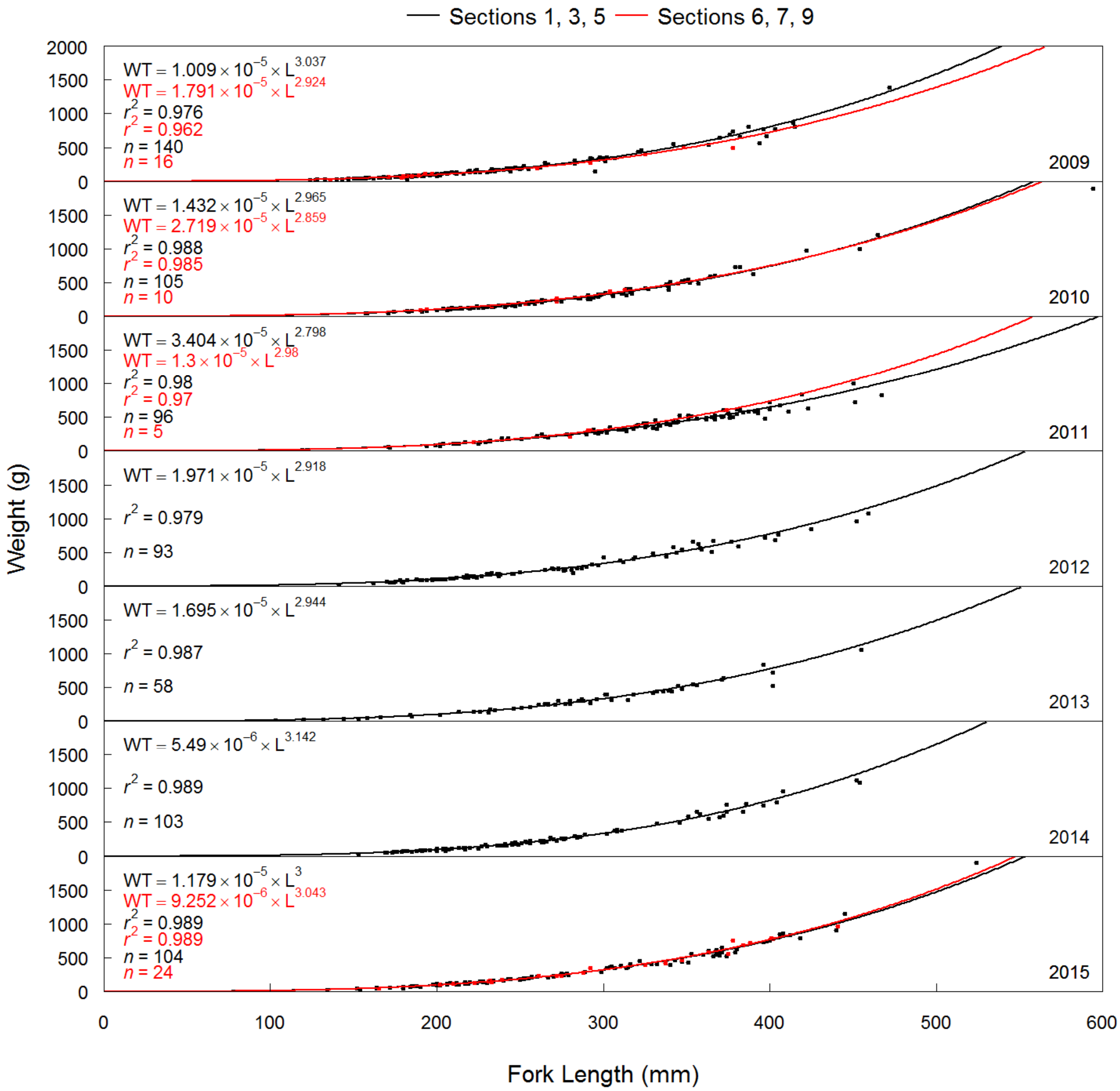
Figure F31 Length-weight regressions for Rainbow Trout captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).



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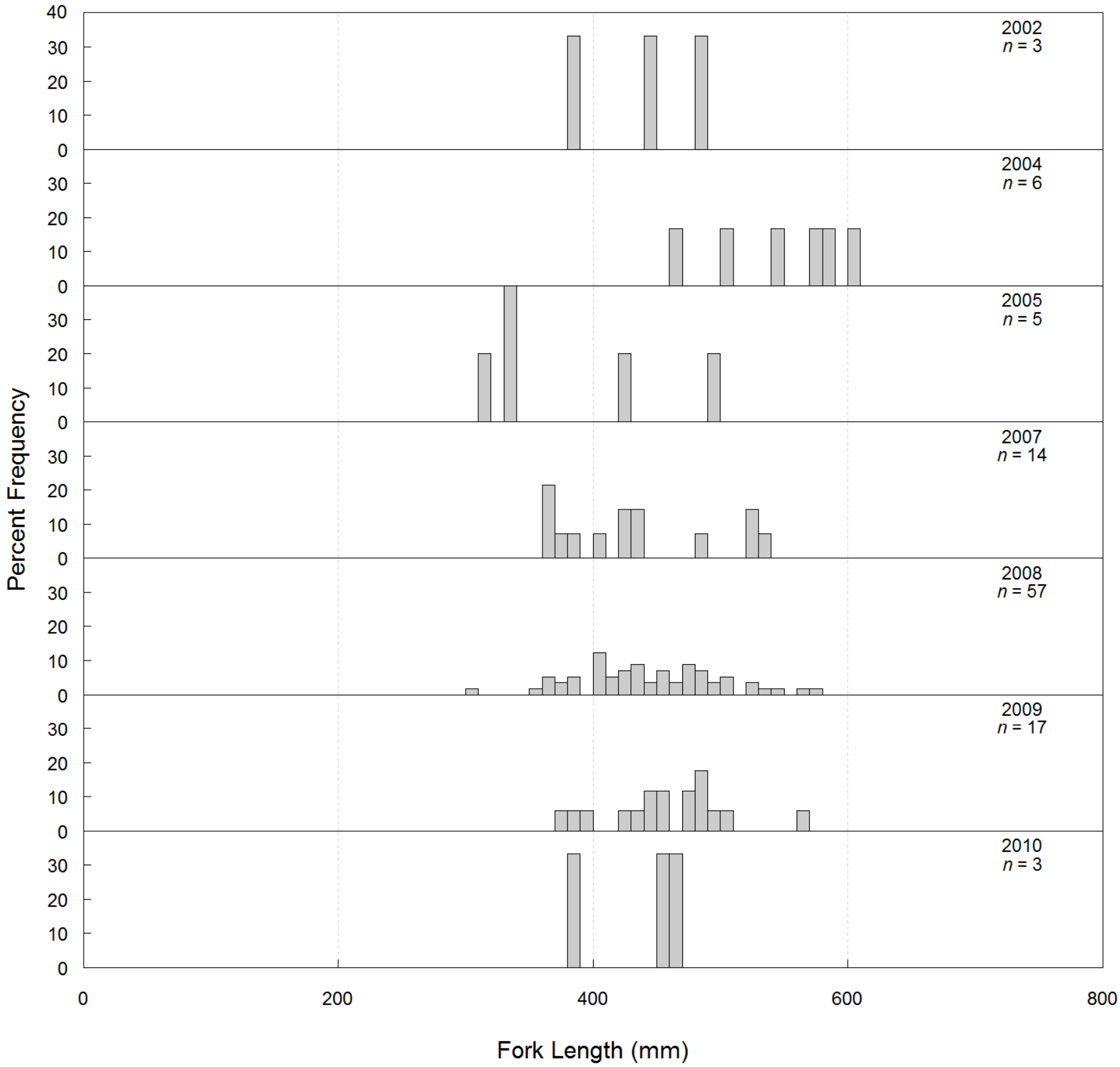
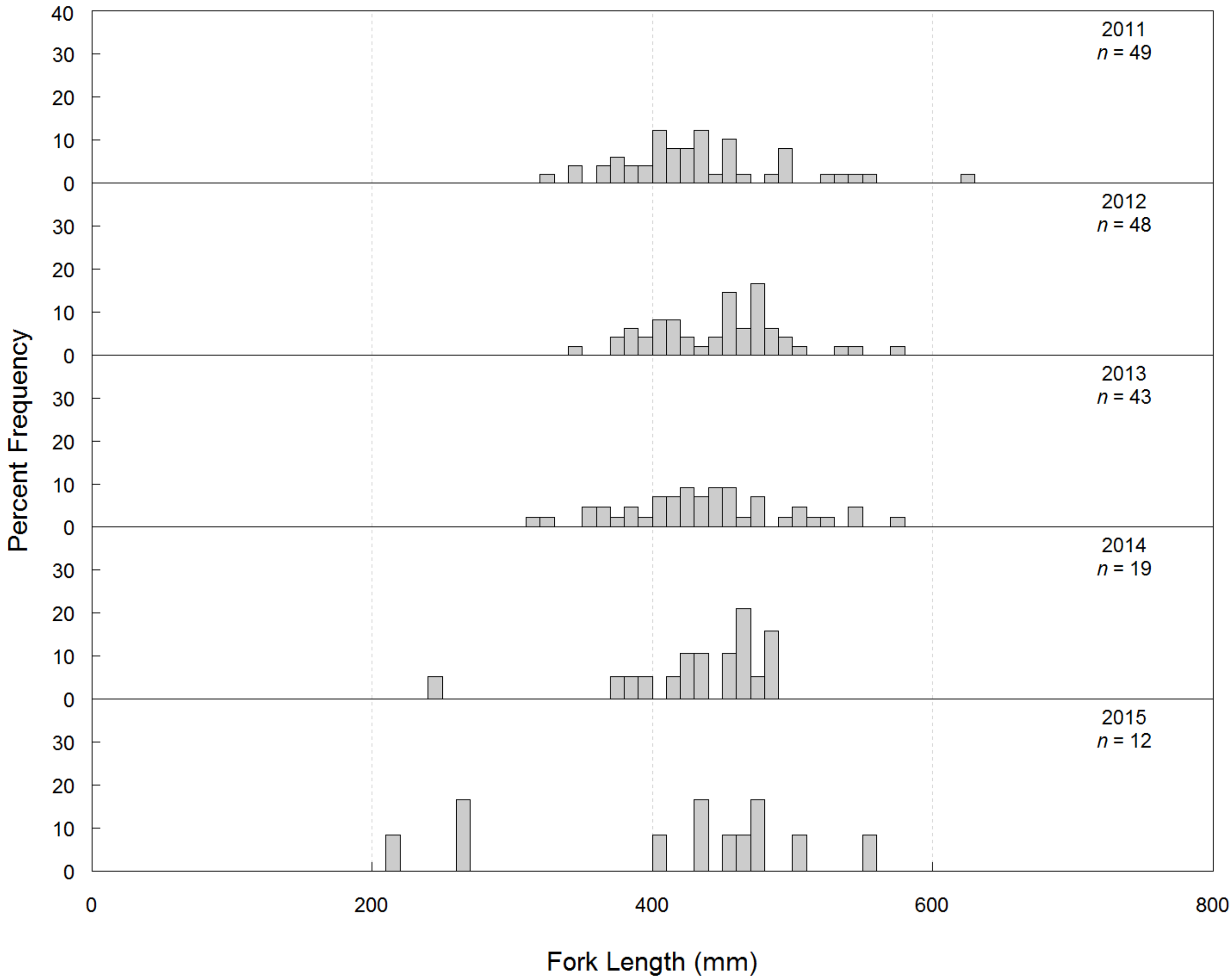


Figure F32 Length-frequency distributions by year for Walleye captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.



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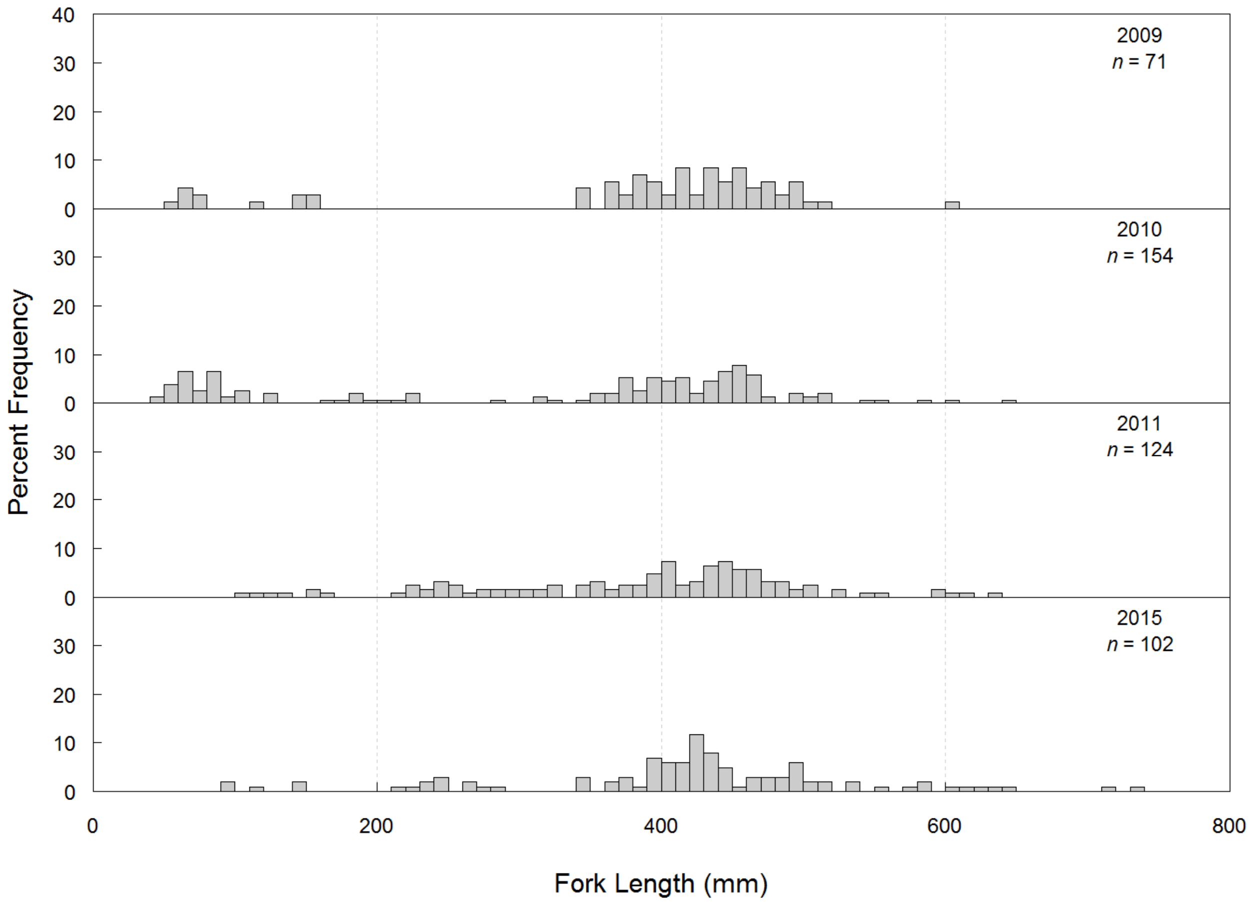


Figure F33 *Length-frequency distributions by year for Walleye captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2002 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).*

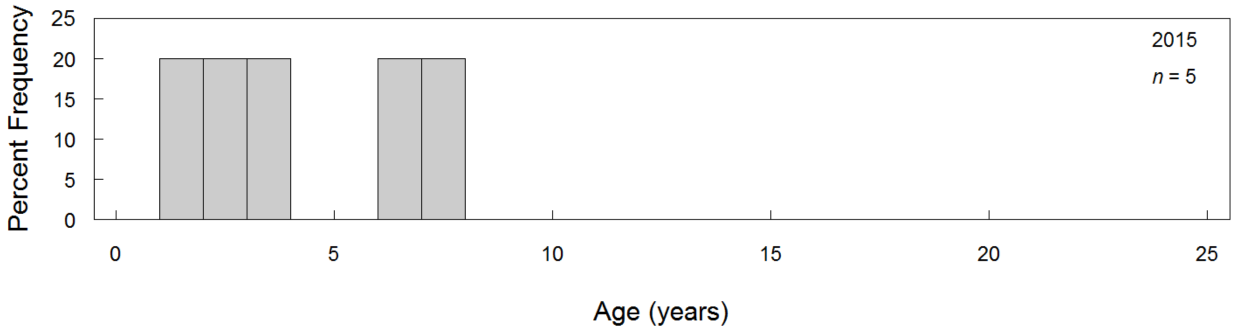


Figure F34 Age-frequency distributions by year for Walleye captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.

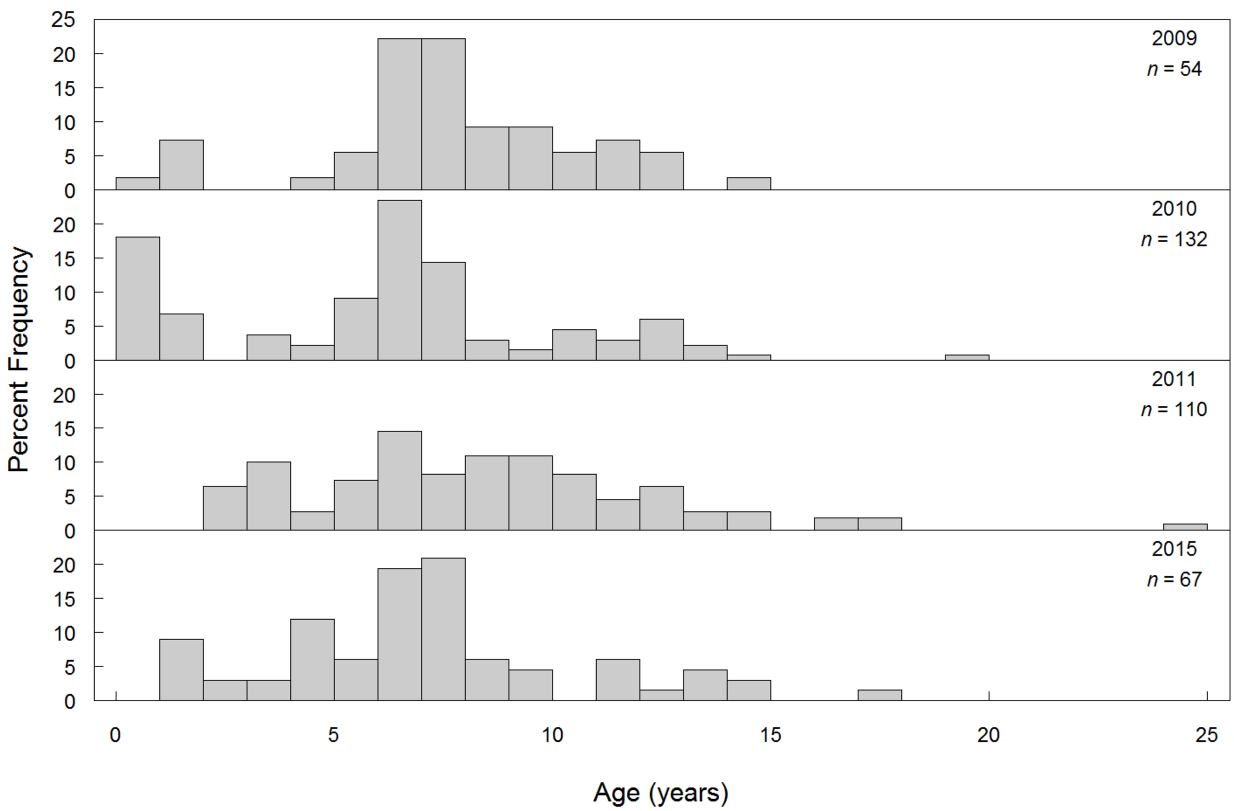
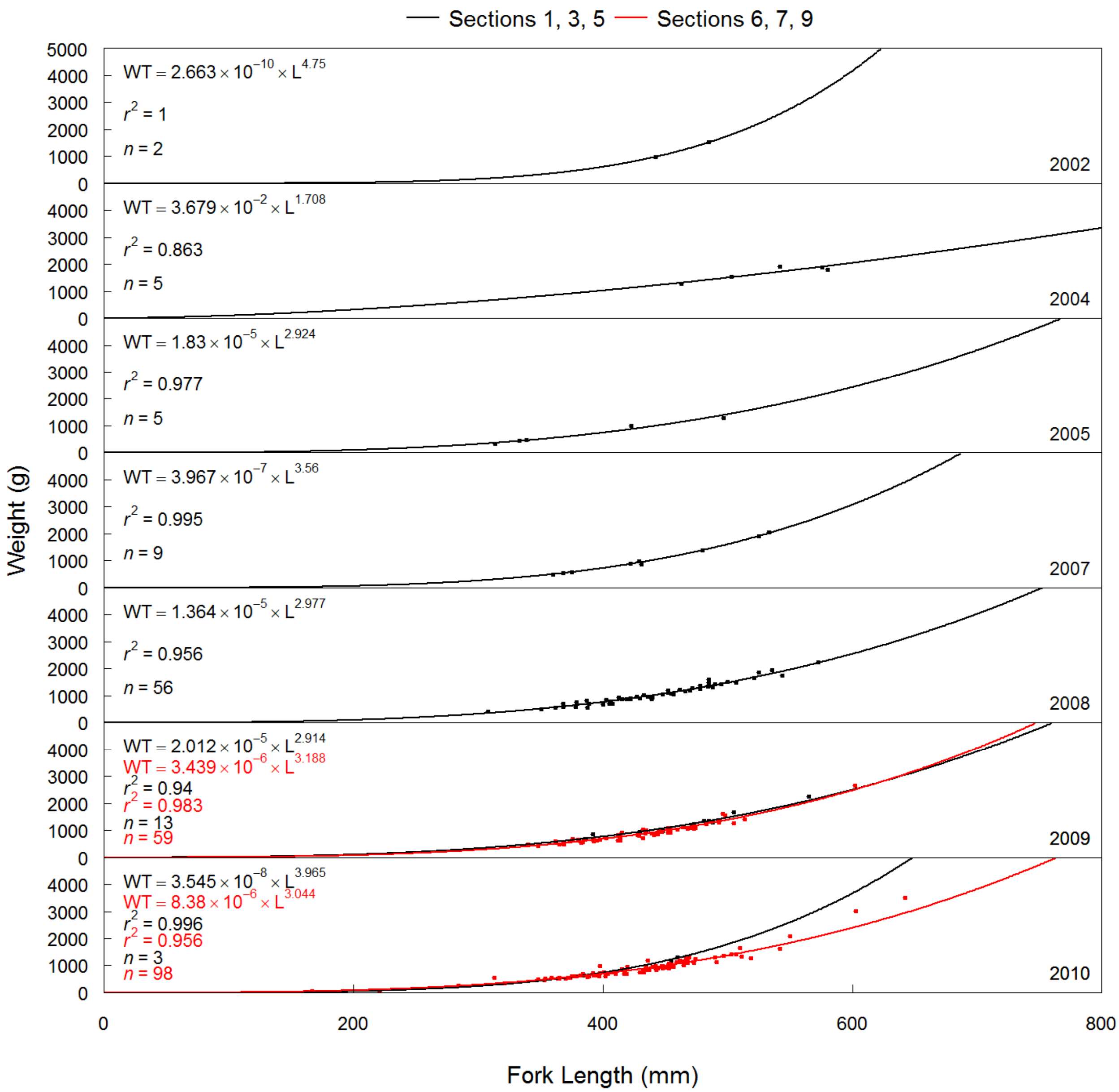


Figure F35 Age-frequency distributions by year for Walleye captured by boat electroshocking in Sections 6, 7, and 9 of the Peace River, 2002 to 2015. Data from 2009 to 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).



Continued...

Figure F36 Length-weight regressions for Walleye captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

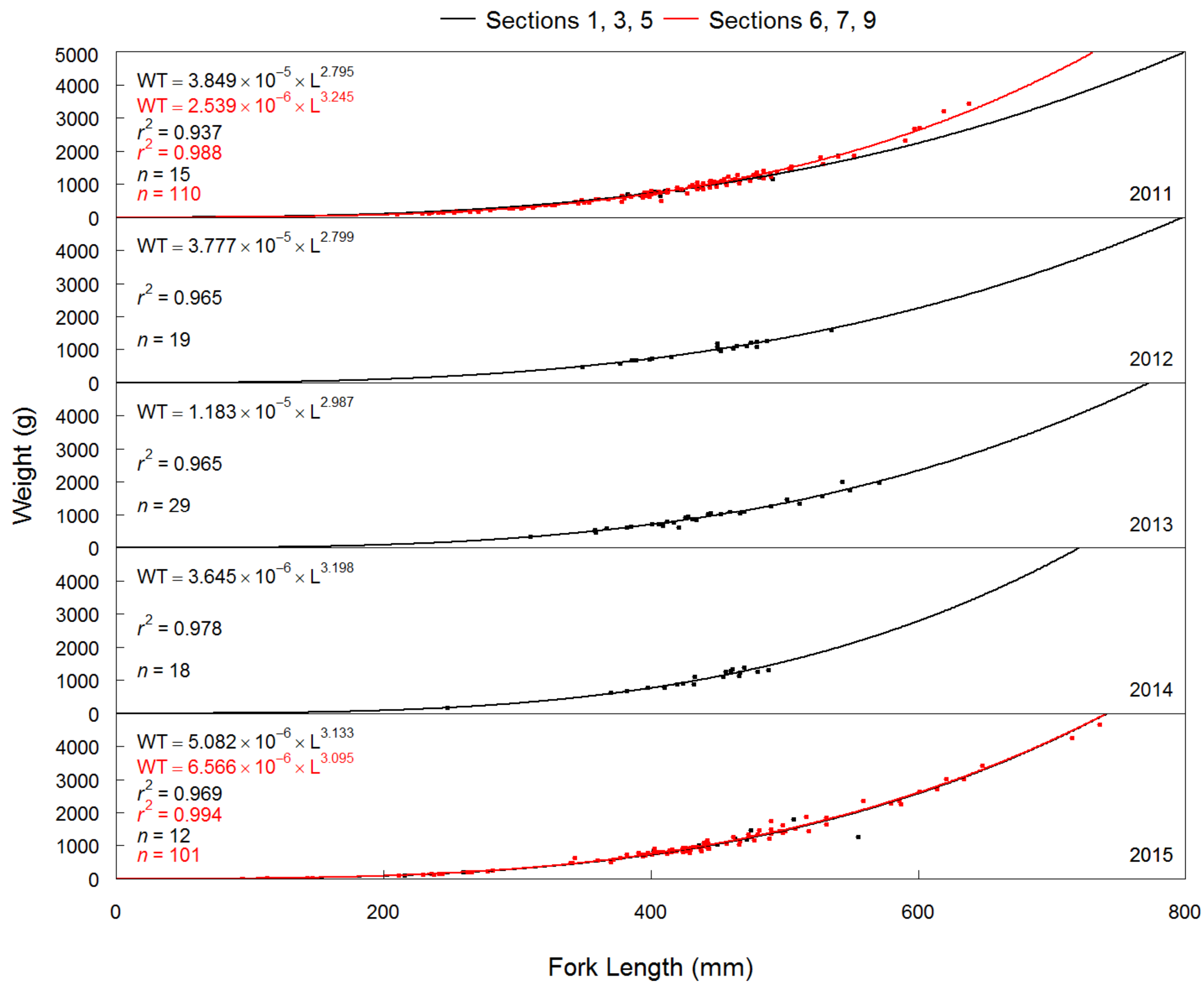


Figure F36 Concluded.

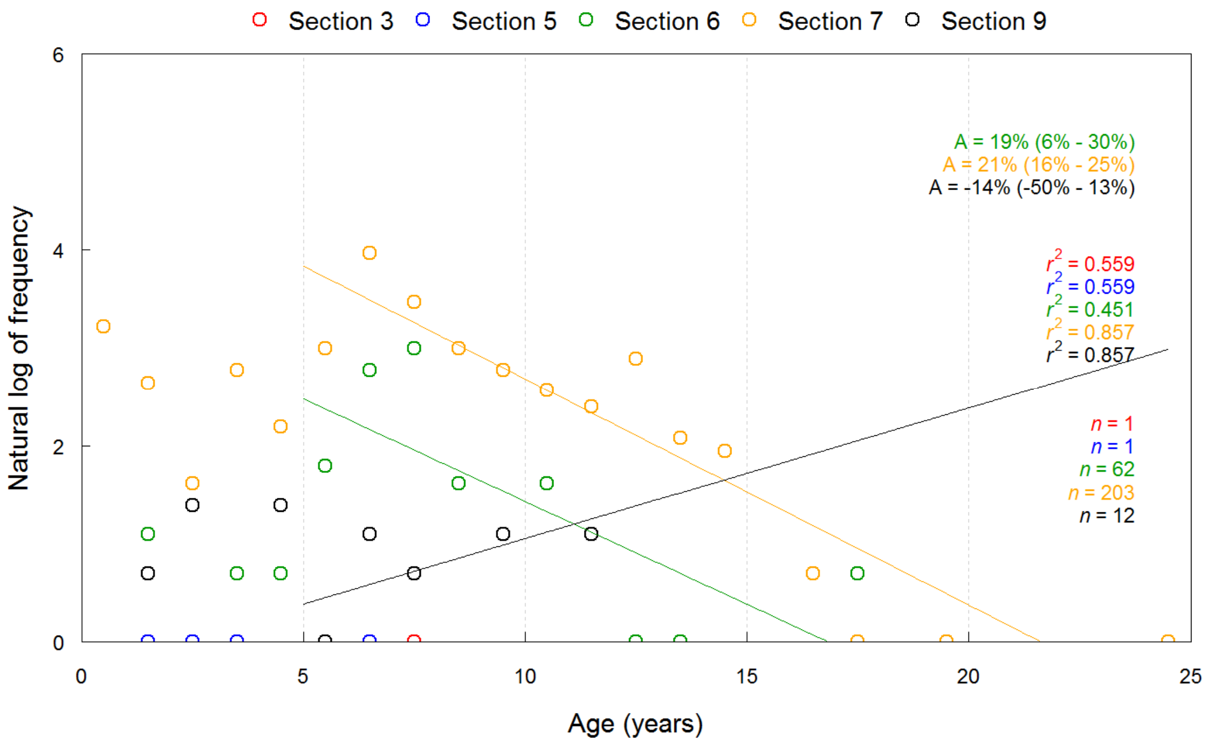


Figure F37 Catch curve and annual mortality estimates (A; mean and 95% confidence intervals) for Walleye, calculated for each sample section using data from 2002 to 2015 combined. Sample size, and r² of the catch curve regression are provided for each section.

Figure F38 *Catch curve and annual mortality estimates (A; mean and 95% confidence intervals) for Walleye, calculated for each sample year. Sample size and r^2 of the catch curve regression are provided for each sample year. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).*

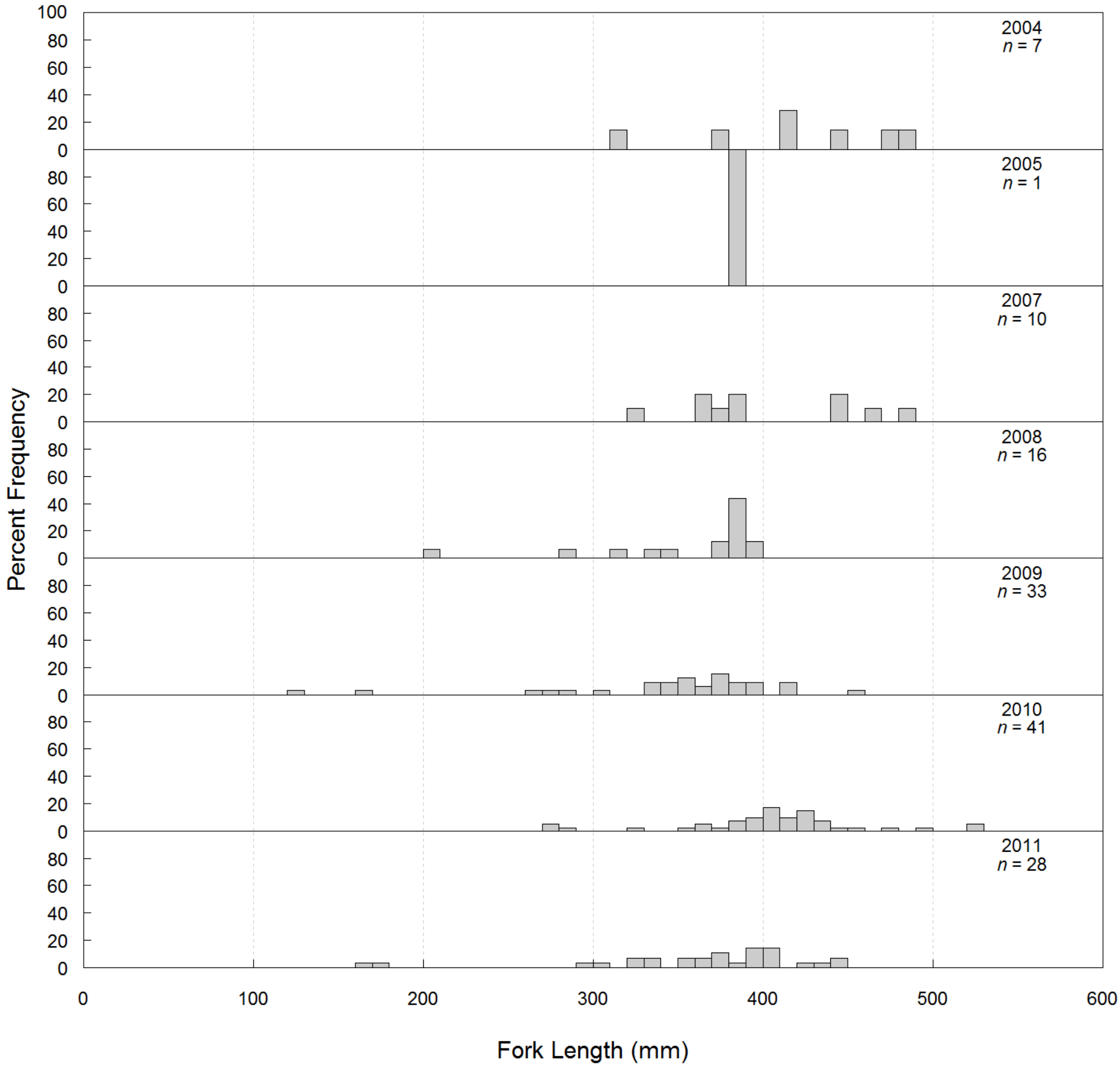


Figure F39 Length-frequency distributions by year for White Sucker captured by boat electroshocking in Sections 1, 3, and 5 of the Peace River, 2002 to 2015.

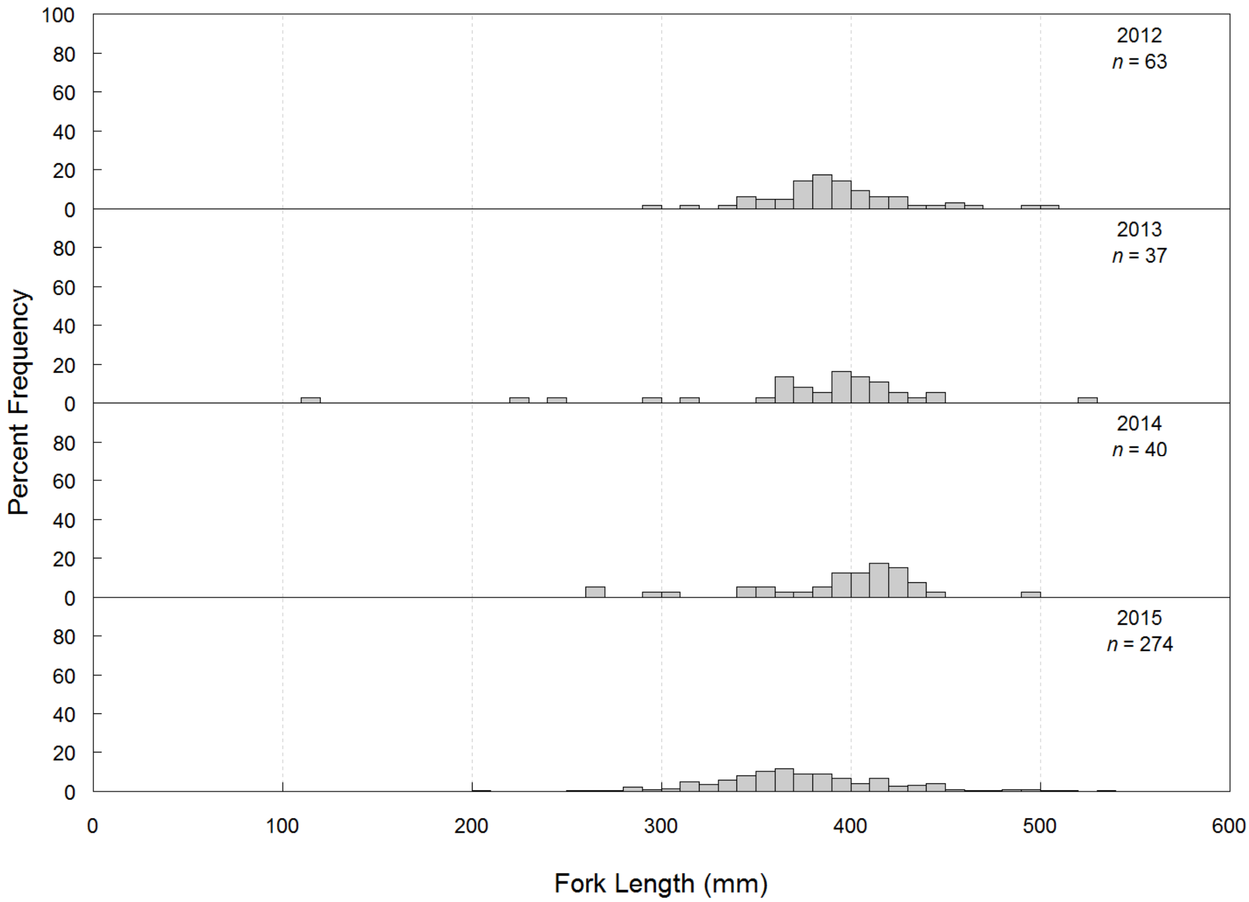


Figure F39 Concluded.

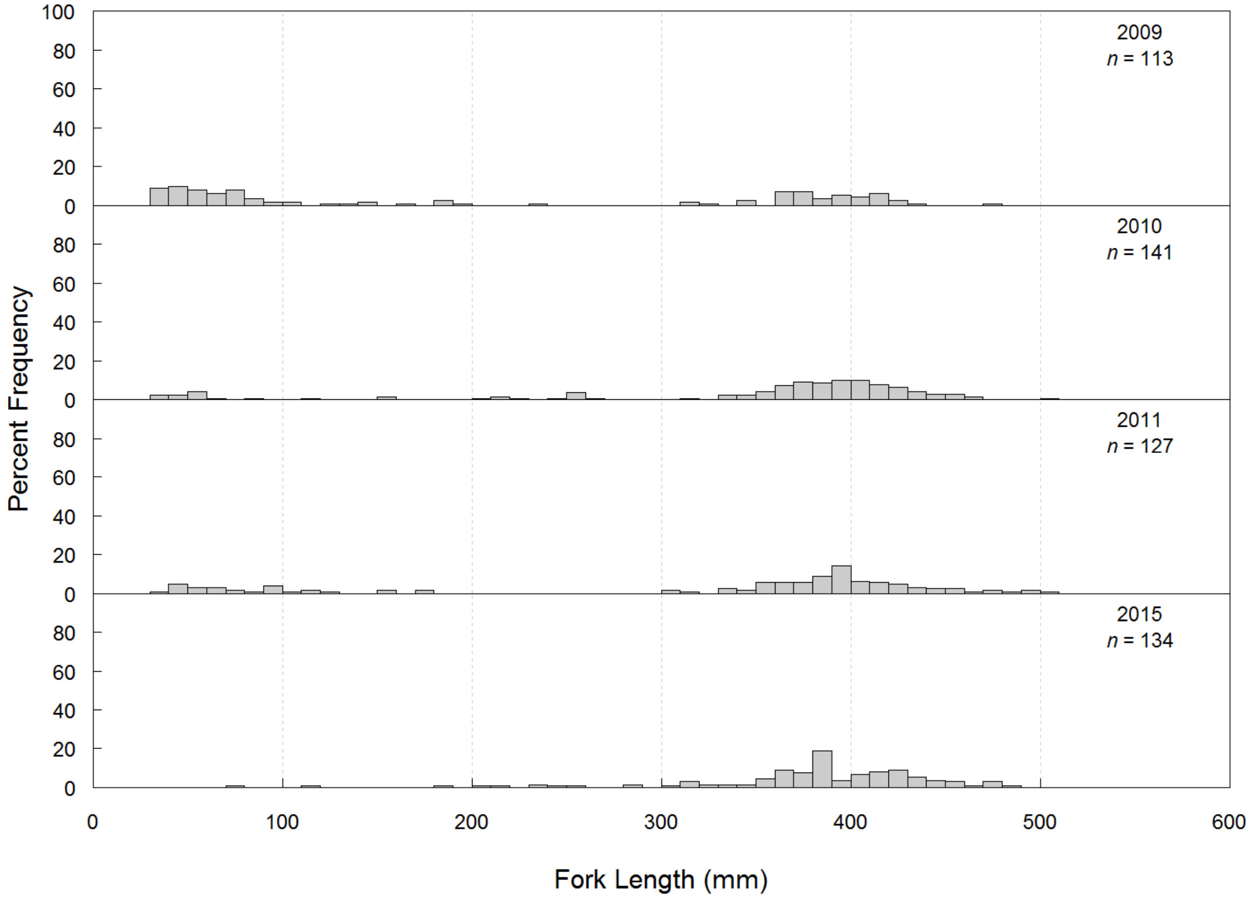


Figure F40 *Length-frequency distributions by year for White Sucker captured by boat electroshocking in Sections 6, 7, and 9 of Peace River, 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).*

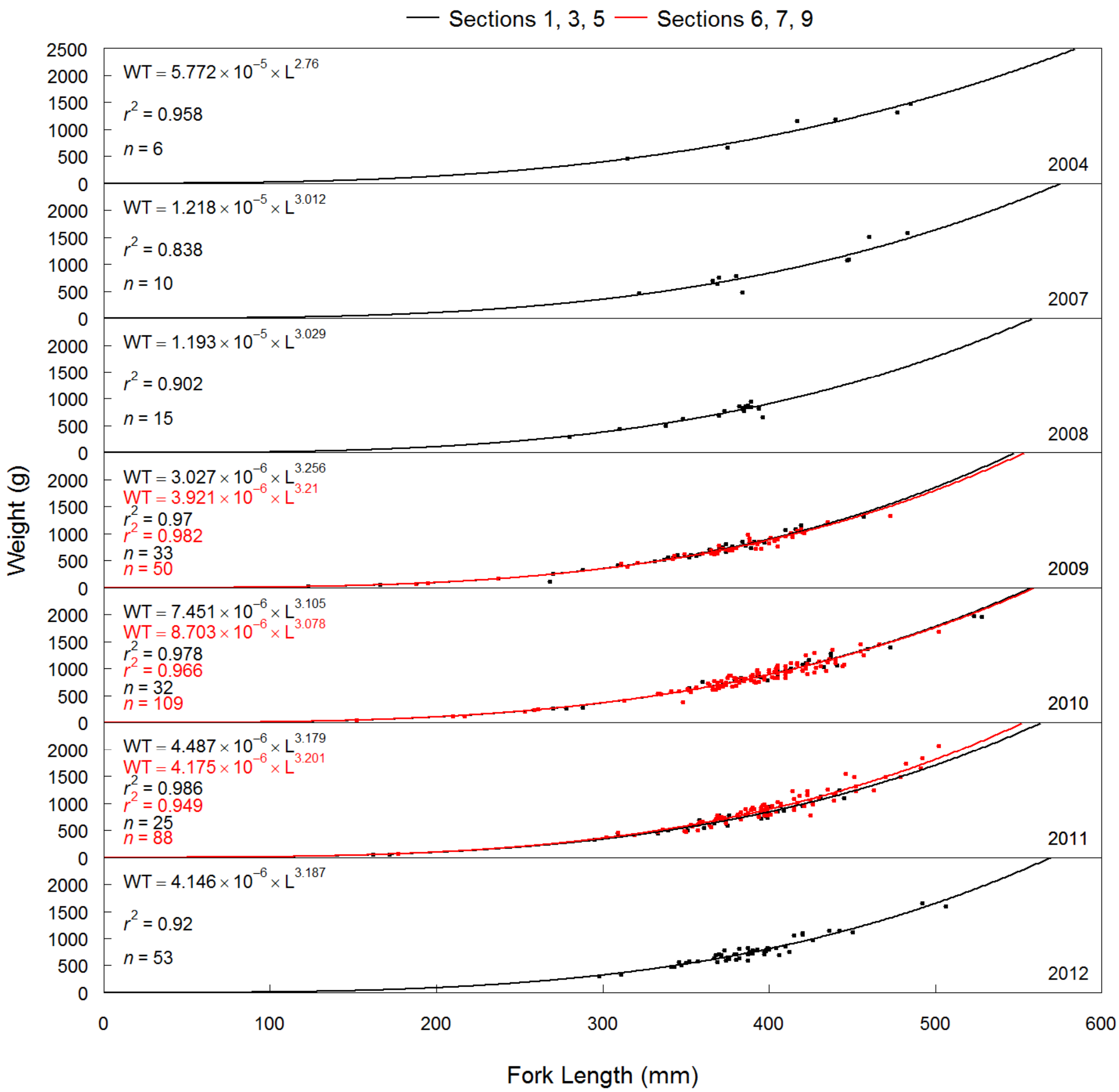


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Figure F41 Length-weight regressions for White Sucker captured by boat electroshocking in sampled sections of the Peace River, 2002 to 2015. Data from Sections 6, 7, and 9 in 2009, 2010, and 2011 courtesy of BC Hydro's Site C Peace River Fish Inventory (Mainstream 2010, 2011, 2013a).

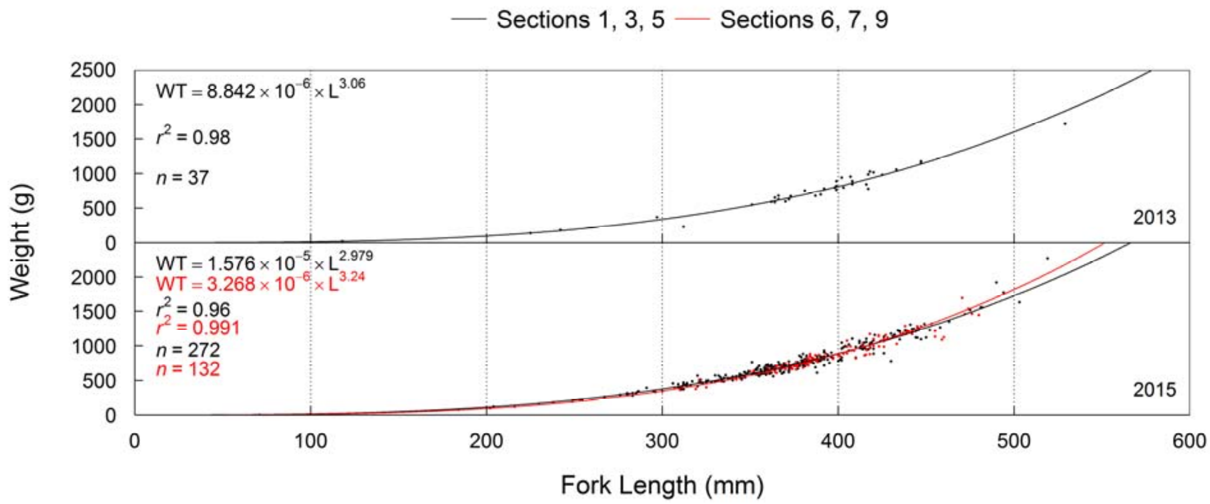

Figure F41 Concluded.

APPENDIX G

Population Analysis Output

MOUNTAIN WHITEFISH

Characteristics that Impact Population Estimates

Few Floy tagged fish (marked in or before 2004) were recovered in 2015. Population estimates were restricted to fish PIT tagged post 2003.

For the 2015 study, PIT tags were applied to lengths >= 200 mm; however, in past studies tag application was restricted to lengths ≥ 250 mm. Histograms of the Mountain Whitefish lengths at release and recapture are plotted in Figures G1 and G2, respectively. Inspection of the figures reveals that smaller fish (200-290 mm) were not recaptured with the same frequency. Comparison of the sample cumulative proportion of length at release and recapture illustrates (see Figure G3) that the distributions were very similar for lengths greater than 290 mm. A slight under representation of smaller fish (250-260 mm) in the recapture record has been noted in all previous studies. A comparison of lengths at release and recapture accumulated into 25 mm bins (not shown) was not significantly different ($P > 0.05$). Another restriction was that the number of unmarked Mountain Whitefish captured in the 200-250 length range was not recorded for sessions 5 and 6. In order to obtain population estimates consistent with past studies and to minimize bias from size selectivity to electrofishing, only Mountain Whitefish marked and sampled of length ≥ 250 mm were used to obtain population estimates. A comparison of lengths at release and recapture accumulated into 25 mm bins (not shown) was not significantly different ($P > 0.05$).

Time at large of recaptured Mountain Whitefish regressed on the growth increment (length at release minus length at recapture) is plotted in Figure G4. The positive growth trend was statistically significant ($P < 0.001$). The mean growth for a released and recaptured fish was approximately 1.5 mm and approximately 5 mm for over the greatest sampling period of the 2015 study (33 days for river Section 1). The border histogram of the growth increment provides an indication of measurement error (residual standard deviation of 3.8 mm for each measurement), which was higher than observed in past studies (historical range of 2.4 to 3.3 mm, approximately).

The movement of recaptured Mountain Whitefish between sections during 2015 is listed in Table G1 along with the estimates of the migration proportions adjusted for the number of fish examined (Equation 4). These proportions are plotted in Figure G5. Figure G6 provides a bar plot of the distance traveled within each section for marked fish released in 2015. Positive values indicate fish were recaptured upstream of the release site and vice-versa. Note that most fish were recaptured in the same site-of-release. Consistent with movement patterns in previous studies, Mountain Whitefish had remarkable fidelity to a site.

Empirical Model Selection

The number of captures by encounter history (six sessions) and section used for the CJS analysis are listed in Table G2. Capture probabilities were evaluated by session (time varying) and pooled over sessions 1 to 4 and 5 to 6 within each section. Survival was evaluated by session (time varying) and as constant within each section. The pooled capture probabilities provided the best fit to the data based on Akaike information criteria (AIC) in all river sections (see Table G3). With the exception of river Section 3, constant survival provided the best fit to the data (see Table G3) with survival estimated not significantly different than 1.0 (not shown, $P > 0.4$). For river Section 3, the best fitting model was for time varying survival. In three of the five possible time intervals, survival of 1.0 was not included in the 95% confidence intervals (see Table G4). However, the constant survival model in

Section 3 fit the data almost as well (relative likelihood = 0.571, see Table G3) and had a survival estimate of 1.0. Based on these results, we applied no apparent mortality for Mountain Whitefish within 2015.

A direct test of catchability is provided with population estimates using ADMB with Equations (1 to 8) in Table G5 (input data corrected for movement listed in Table G1 which was also used for the Bayesian model). There was not sufficient data to reliably estimate the time varying catchability model for sections 7 and 9. In sections 1, 5 and 6 the constant catchability model fit the data best. Whereas the model with time varying catchability fit the data best in Section 3; however, the population estimates were very similar (within 2%, see Table G5). The logarithmic population deviation estimates for the time varying catchability model (Equation 2) are plotted by section and date in Figure G7. Note that the deviations for Section 6 display an upward trend over time.

Bayes Sequential Model for a Closed Population

The mark-recapture data were extracted by section from the database using PIT tags applied during 2015 and PIT tags that were observed during 2015 that were originally applied in 2004 through 2014 and a minimum length of 250 mm. Table G6 lists mountain whitefish examined for marks and recaptures by date and section. The releases, adjusted for movement between sections (Equation 4) by section and date, are given in Table G7. The compilations of marks available (Equation 6), fish examined (Equation 7), and recaptures (Equation 8) assuming no instantaneous mortality rate or undetected mark rate are listed in Table G8. The subsequent population estimates using the Bayesian closed model are given in Table G9. The sequential posterior probability plots by section are provided in Figures G8 through G13. The final posterior distributions for the three sections are drawn in Figure G14.

The sequence of posterior probability plots can be used as an indicator of closure or change in the population size over the study period (Gazey and Staley 1986). Trends in the posterior plots can also be caused by trends in catchability (changes in population size and catchability are confounded). Inspection of the posterior probability plot sequences in sections 1 (Figure G8), 7 (Figure G12) and 9 (Figure G13) appear stable (no marked trend or sequence to larger or smaller population sizes) and were consistent with a convergence to a modal population size. Sections 3 (Figure G9) and 5 (Figure G10) appear to stabilize on the last four sampling days in which the majority of the recoveries were collected. Conversely, Section 6 (Figure G11) provides evidence that a trend in catchability and/or immigration of unmarked fish into the section were unaccounted in the population estimates. Note that this phenomenon is consistent with the increasing time varying catchability observed in Figure G7.

ARCTIC GRAYLING

The mark-recapture data were extracted by section from the database using all available marks (smallest length 200 mm). There was no movement between sections. Table G10 lists Arctic Grayling examined for marks and recaptures by date and section. The releases are given in Table G11. The compilations of marks available (Equation 6), fish examined (Equation 7), and recaptures (Equation 8) assuming no mortality and 0% undetected mark rate are listed in Table G12. Only Section 3 recorded recaptures (2). The sequential posterior probability plots for the population estimates are provided in Figure G15. Given the extremely sparse data only minimal population estimates could be calculated (see Figure G16). There was a 0.95 probability of at least 125 fish in Sections 3.

BULL TROUT

The mark-recapture data were extracted by section from the database with a minimum length of 250 mm. The movement of recaptured Bull Trout between sections during 2015 is listed in Table G13 along with the estimates of the migration proportions adjusted for the number of fish examined (Equation 4). Table G14 lists Bull Trout examined for marks and recaptures by date and section. The releases by section and date are given in Table G15. The compilations of marks available (Equation 6), fish examined (Equation 7), and recaptures (Equation 8) assuming no mortality and 0% undetected mark rate are listed in Table G16. The data were too sparse to generate diagnostic measures or a population estimate for Section 1. The population estimates using the Bayesian model are given in Table G17 and the associated sequential posterior probability plots are provided in Figures G17 through G21. None of the posterior probability plots display trends over time. The final posterior distributions are drawn in Figure G22.

LARGESCALE SUCKER

The mark-recapture data were extracted by section from the database with a minimum length of 250 mm. The movement of recaptured Largescale Sucker between sections during 2015 is listed in Table G18 along with the estimates of the migration proportions adjusted for the number of fish examined (Equation 4). Table G19 lists Largescale Sucker examined for marks and recaptures by date and section. The releases by section and date are given in Table G20. No tagged fish were recovered in Section 9. The compilations of marks available (Equation 6), fish examined (Equation 7), and recaptures (Equation 8) assuming no mortality and 0% undetected mark rate are listed in Table G21. The population estimates using the Bayesian model are given in Table G22 and the associated sequential posterior probability plots are provided in Figures G23 through G27. None of the posterior probability plots display trends over time. The final posterior distributions are drawn in Figure G28.

LONGNOSE SUCKER

The mark-recapture data were extracted by section from the database with a minimum length of 250 mm. The movement of recaptured Longnose Sucker between sections during 2015 is listed in Table G23 along with the estimates of the migration proportions adjusted for the number of fish examined (Equation 4). Table G24 lists Longnose Sucker examined for marks and recaptures by date and section. The releases by section and date are given in Table G25. The compilation of marks available (Equation 6), fish examined (Equation 7), and recaptures (Equation 8) assuming no mortality and 0% undetected mark rate are listed in Table G26. The population estimates using the Bayesian model are given in Table G27 and the associated sequential posterior probability plots are provided in Figures G29 through G34. With the exception of Section 5 (Figure G31), the posterior probability plots do not display trends over time. In section 9 the final sampling day (30-Sep-16) was anomalous (a recapture rate of <1% whereas the preceding days had a rate >8% with similar number of available marks). The final posterior distributions are drawn in Figure G35.

WHITE SUCKER

The mark-recapture data were extracted by section from the database with a minimum length of 250 mm. The movement of recaptured White Sucker between sections during 2015 is listed in Table G28 along with the estimates of the migration proportions adjusted for the number of fish examined (Equation 4). Table G29 lists white sucker examined for marks and recaptures by date and section. The releases by section and date are given in Table G30. Only a single tagged fish was recovered in Section 9; thus, a population was not generated for the section. The compilations of marks available (Equation 6), fish examined (Equation 7), and recaptures (Equation 8) assuming no mortality and 0% undetected mark rate are listed in Table G31. The population estimates using the Bayesian model are given in Table G32 and the associated sequential posterior probability plots are provided in Figures G36 through G40. None of the posterior probability plots display trends over time. The final posterior distributions are drawn in Figure G41.

Table G1: Mountain Whitefish recaptures and migration proportions adjusted (inverse weight) for fish examined by section during 2015.

Release	Recapture Section						
Section	**One**	**Three**	**Five**	**Six**	**Seven**	**Nine**	**Total**
Recaptures:							
One	76	0	4	2	0	0	82
Three	0	133	2	3	0	0	138
Five	0	1	45	2	1	0	49
Six	0	2	2	96	1	0	101
Seven	0	1	2	9	29	0	41
Nine	0	0	0	0	2	7	9
Sample:	1,685	2,263	1,106	1,840	600	208	7,702
Recap. %	4.51	6.05	4.97	6.09	5.50	3.37	5.45
Proportions:							
One	0.906	0.000	0.073	0.022	0.000	0.000	1.000
Three	0.000	0.945	0.029	0.026	0.000	0.000	1.000
Five	0.000	0.010	0.927	0.025	0.038	0.000	1.000
Six	0.000	0.016	0.032	0.923	0.029	0.000	1.000
Seven	0.000	0.008	0.033	0.088	0.871	0.000	1.000
Nine	0.000	0.000	0.000	0.000	0.090	0.910	1.000

Table G2: **Number of captures by encounter history and section used for the Cormack-Jolly-Seber analysis. A '1' indicates a capture and '0' no capture in the session.**

	Section					
History	**One**	**Three**	**Five**	**Six**	**Seven**	**Nine**
000011	4	6	1	9	5	0
000101	3	5	4	7	7	0
000110	4	11	3	11	2	1
000111	0	1	0	0	0	0
001001	2	6	0	1	3	0
001010	6	10	8	3	2	0
001100	6	16	2	7	3	0
001101	0	1	0	0	0	0
001110	0	1	0	0	0	0
010001	10	6	3	4	1	2
010010	8	10	2	9	1	1
010100	8	8	4	10	3	1
011000	6	8	6	7	0	2
011010	0	0	1	0	0	0
011100	1	3	0	0	0	0
100001	1	5	2	9	2	1
100010	8	3	1	5	1	0
100011	0	1	0	0	0	0
100100	3	10	2	0	3	0
100101	1	1	0	1	1	0
100110	0	1	0	0	0	0
101000	7	5	5	9	1	0
101010	0	1	1	0	0	0
110000	3	10	4	7	1	1
110010	0	1	0	0	0	0
110100	0	0	0	0	1	0
111000	0	1	0	0	0	0

Table G3: Evaluation of various survival Cormack-Jolly-Seber models using MARK based on delta Akaike information criteria (ΔAIC).

Model	ΔAIC	AIC Weights	Model Like.	Num. Par
River Section One:				
S(.)p(2 levels)	0.0	0.916	1.000	3
S(t)p(2 levels)	5.2	0.068	0.074	7
S(t)p(t)	8.1	0.016	0.018	9
River Section Three:				
S(t)p(2 levels)	0.0	0.512	1.000	7
S(.)p(2 levels)	1.1	0.292	0.571	3
S(t)p(t)	1.9	0.196	0.383	9
River Section Five:				
S(.)p(2 levels)	0.0	0.715	1.000	3
S(t)p(2 levels)	3.1	0.153	0.214	7
S(t)p(t)	3.4	0.132	0.184	9
River Section Six:				
S(.)p(2 levels)	0.0	0.959	1.000	3
S(t)p(2 levels)	6.7	0.034	0.036	7
S(t)p(t)	10.0	0.006	0.007	9
River Section Seven:				
S(.)p(2 levels)	0.0	0.669	1.000	3
S(t)p(2 levels)	1.5	0.311	0.465	9
S(t)p(t)	7.0	0.020	0.030	7
River Section Nine:				
S(.)p(2 levels)	0.0	0.971	1.000	3
S(t)p(2 levels)	7.4	0.024	0.025	7
S(t)p(t)	10.4	0.005	0.006	9

Models:
S(.)p(2 levels) - constant survival, capture probabilities pooled for sessions 1 to 4 and sessions 5 to 6.
S(.)p(2 levels) - survival by session, capture probabilities pooled for sessions 1 to 4 and sessions 5 to 6.
S(t)p(t) - survival by session, capture probalilities by session

Table G4: Daily survival estimates for river Section 3.

Session Interval	Daily Survival	SD	95% Confidence Interval	
			Low	High
1 to 2	0.9943	0.0343	0.9270	1.0000
2 to 3	0.9358	0.0186	0.8884	0.9639
3 to 4	1.0000	0.0000	1.0000	1.0000
4 to 5	0.8933	0.0447	0.7696	0.9545
5 to 6	0.8977	0.0539	0.7354	0.9651

Table G5: Population estimates using AD Model Builder, assuming constant population size (M0t) and time varying catchability (Mtt).

Model	N	SD	Function	Param.	AIC	ΔAIC	Weight	Model Like.
River Section One:								
M_{0t}	13,125	1,468	281.8	1	565.7	0.00	0.988	1.000
M_{tt}	15,657	3,276	279.2	8	574.5	8.79	0.012	0.012
River Section Three:								
M_{tt}	14,137	1,456	481.7	10	983.4	0.00	0.809	1.000
M_{0t}	13,873	1,135	492.1	1	986.3	2.89	0.191	0.236
River Section Five:								
M_{0t}	10,833	1,413	212.9	1	427.8	0.00	0.890	1.000
M_{tt}	12,475	3,784	208.0	8	432.0	4.19	0.110	0.123
River Section Six:								
M_{0t}	12,983	1,174	411.6	1	825.2	0.00	0.528	1.000
M_{tt}	11,468	1,204	402.7	10	825.4	0.23	0.472	0.892

Table G6: Sample size (N) and recaptures (N_R) of Mountain Whitefish by section and date.

	One		Three		Five		Six		Seven		Nine		Total	
Date	N	N_R	N	N_R	N	N_R	N	N_R	N	N_R	N	N_R	N	N_R
25-08-15	0	0	0	0	0	0	11	0	0	0	0	0	11	0
26-08-15	35	0	0	0	0	0	25	0	0	0	0	0	60	0
27-08-15	172	0	0	0	0	0	73	0	0	0	0	0	245	0
28-08-15	0	0	53	0	0	0	12	0	0	0	0	0	65	0
29-08-15	0	0	94	0	0	0	33	0	3	0	0	0	130	0
30-08-15	0	0	69	0	0	0	0	0	27	0	0	0	96	0
31-08-15	0	0	41	0	61	0	0	0	0	0	0	0	102	0

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
01-09-15	0	0	0	0	21	0	0	0	37	0	0	0	58	0
02-09-15	121	1	0	0	0	0	53	0	0	0	0	0	174	1
03-09-15	199	2	0	0	0	0	132	4	0	0	0	0	331	6
04-09-15	0	0	442	12	0	0	0	0	0	0	0	0	442	12
05-09-15	0	0	0	0	0	0	82	3	12	1	0	0	94	4
06-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-09-15	0	0	0	0	0	0	0	0	25	0	0	0	25	0
08-09-15	0	0	0	0	0	0	86	6	0	0	0	0	86	6
09-09-15	0	0	0	0	0	0	115	10	40	1	0	0	155	11
10-09-15	145	3	0	0	73	3	0	0	0	0	0	0	218	6
11-09-15	155	9	0	0	123	1	0	0	0	0	0	0	278	10
12-09-15	0	0	207	8	0	0	0	0	0	0	0	0	207	8
13-09-15	0	0	71	7	0	0	0	0	33	0	0	0	104	7
14-09-15	0	0	0	0	0	0	0	0	59	2	0	0	59	2
15-09-15	91	5	0	0	117	9	0	0	0	0	0	0	208	14
16-09-15	120	10	0	0	118	4	0	0	0	0	0	0	238	14
17-09-15	0	0	202	20	0	0	162	13	0	0	46	0	410	33
18-09-15	0	0	109	14	0	0	179	8	0	0	0	0	288	22
19-09-15	0	0	89	5	0	0	0	0	66	4	0	0	155	9
20-09-15	0	0	0	0	88	4	0	0	69	6	0	0	157	10
21-09-15	0	0	0	0	135	7	0	0	0	0	0	0	135	7
22-09-15	0	0	0	0	0	0	268	16	0	0	38	1	306	17
23-09-15	0	0	0	0	0	0	173	14	8	0	15	0	196	14
24-09-15	391	26	0	0	0	0	0	0	122	5	0	0	513	31
25-09-15	0	0	328	19	205	15	0	0	0	0	0	0	533	34
26-09-15	0	0	160	21	0	0	315	27	0	0	0	0	475	48
27-09-15	0	0	0	0	0	0	0	0	0	0	37	2	37	2
28-09-15	116	7	0	0	0	0	121	11	46	2	0	0	283	20
29-09-15	140	13	232	19	0	0	0	0	53	12	0	0	425	44
30-09-15	0	0	166	12	165	12	0	0	0	0	0	0	331	24
01-10-15	0	0	0	0	0	0	0	0	0	0	25	1	25	1
02-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
04-10-15	0	0	0	0	0	0	0	0	0	0	19	2	19	2
05-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-10-15	0	0	0	0	0	0	0	0	0	0	28	1	28	1
Total	**1,685**	**76**	**2,263**	**137**	**1,106**	**55**	**1,840**	**112**	**600**	**33**	**208**	**7**	**7,702**	**420**

Table G7: Mountain Whitefish marks applied by river section and date adjusted for migration.

Date	One	Three	Five	Six	Seven	Nine	Total
25-08-15	0.0	0.2	0.3	9.2	0.3	0.0	10
26-08-15	31.7	0.3	3.1	17.4	0.5	0.0	53
27-08-15	155.8	1.1	14.8	71.1	2.2	0.0	245
28-08-15	0.0	50.3	1.9	12.5	0.4	0.0	65
29-08-15	0.0	89.3	3.8	29.5	3.5	0.0	126
30-08-15	0.0	64.5	2.9	4.2	23.5	0.0	95
31-08-15	0.0	39.3	55.9	2.5	2.2	0.0	100
01-09-15	0.0	0.5	20.7	3.8	33.0	0.0	58
02-09-15	105.0	0.8	10.1	51.4	1.6	0.0	169
03-09-15	174.8	2.0	18.0	119.6	3.7	0.0	318
04-09-15	0.0	401.5	12.4	11.1	0.0	0.0	425
05-09-15	0.0	1.3	2.8	72.0	11.9	0.0	88
06-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-09-15	0.0	0.2	0.8	2.2	21.8	0.0	25
08-09-15	0.0	1.2	2.5	72.9	2.3	0.0	79
09-09-15	0.0	2.0	4.6	100.3	37.1	0.0	144
10-09-15	128.6	0.7	73.4	4.8	2.6	0.0	210
11-09-15	130.4	1.2	120.8	6.1	4.5	0.0	263
12-09-15	0.0	187.1	5.8	5.2	0.0	0.0	198
13-09-15	0.0	59.8	2.9	4.6	28.8	0.0	96
14-09-15	0.0	0.5	1.9	5.0	49.7	0.0	57
15-09-15	75.2	1.1	106.2	4.5	4.1	0.0	191
16-09-15	99.6	1.1	112.8	5.2	4.3	0.0	223
17-09-15	0.0	174.3	10.1	142.3	8.4	40.9	376
18-09-15	0.0	92.4	8.2	159.4	5.0	0.0	265

Date	One	Three	Five	Six	Seven	Nine	Total
19-09-15	0.0	79.9	4.5	7.7	54.0	0.0	146
20-09-15	0.0	1.3	78.9	7.4	56.3	0.0	144
21-09-15	0.0	1.3	116.8	3.1	4.8	0.0	126
22-09-15	0.0	3.9	7.9	228.0	10.6	33.7	284
23-09-15	0.0	2.5	5.3	146.5	13.0	13.6	181
24-09-15	79.7	0.9	10.2	12.2	101.9	0.0	205
25-09-15	0.0	72.2	37.4	2.9	1.4	0.0	114
26-09-15	0.0	47.9	10.5	266.1	8.5	0.0	333
27-09-15	0.0	0.0	0.0	0.0	3.1	30.9	34
28-09-15	16.3	2.1	6.2	105.6	39.8	0.0	170
29-09-15	13.6	20.2	3.0	4.4	34.9	0.0	76
30-09-15	0.0	37.0	16.0	1.4	0.6	0.0	55
01-10-15	0.0	0.0	0.0	0.0	2.2	21.8	24
02-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
03-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
04-10-15	0.0	0.0	0.0	0.0	1.5	15.5	17
05-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
06-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-10-15	0.0	0.0	0.0	0.0	2.4	24.6	27
Total	**1,011**	**1,442**	**893**	**1,702**	**586**	**181**	**5,815**

Table G8: Mountain Whitefish sample, cumulative marks available for recapture and recaptures by river section and date.

Date	Sample	Marks	Recap.
Section One:			
27-08-15	172	32	
02-09-15	121	187	1
03-09-15	199	292	2
10-09-15	145	467	3
11-09-15	155	596	9
15-09-15	91	726	5
16-09-15	120	801	10
24-09-15	391	901	26
28-09-15	116	981	7

Date	Sample	Marks	Recap.
29-09-15	140	997	13
Section Three:			
28-08-15	53	2	
29-08-15	94	52	
30-08-15	69	141	
31-08-15	41	206	
04-09-15	442	248	12
12-09-15	207	656	8
13-09-15	71	843	7
17-09-15	202	906	20
18-09-15	109	1080	14
19-09-15	89	1172	5
25-09-15	328	1262	19
26-09-15	160	1334	21
29-09-15	232	1384	19
30-09-15	166	1405	12
Section Five:			
31-08-15	61	27	
01-09-15	21	83	
10-09-15	73	155	3
11-09-15	123	228	1
15-09-15	117	359	9
16-09-15	118	465	4
20-09-15	88	601	4
21-09-15	135	680	7
25-09-15	205	820	15
30-09-15	165	877	12
Section Six:			
26-08-15	25	9	
27-08-15	73	27	
28-08-15	12	98	
29-08-15	33	110	
02-09-15	53	150	
03-09-15	132	202	4
05-09-15	82	332	3

Date	Sample	Marks	Recap.
08-09-15	86	407	6
09-09-15	115	479	10
17-09-15	162	615	13
18-09-15	179	757	8
22-09-15	268	935	16
23-09-15	173	1163	14
26-09-15	315	1325	27
28-09-15	121	1591	11
Section Seven:			
29-08-15	3	3	
30-08-15	27	7	
01-09-15	37	33	
05-09-15	12	71	1
07-09-15	25	83	
09-09-15	40	107	1
13-09-15	33	151	
14-09-15	59	180	2
19-09-15	66	251	4
20-09-15	69	305	6
23-09-15	8	377	
24-09-15	122	390	5
28-09-15	46	505	2
29-09-15	53	545	12
Section Nine:			
22-09-15	38	41	1
23-09-15	15	75	
27-09-15	37	88	2
01-10-15	25	119	1
04-10-15	19	141	2
07-10-15	28	156	1

Table G9: Population estimates by section for Mountain Whitefish.

			95% HPD		Standard Deviation	CV (%)
Section	**Bayes Mean**	**MLE**	**Low**	**High**		
One	13,664	13,310	10,760	16,770	1,551	11.4
Three	14,231	14,030	11,990	16,590	1,179	8.3
Five	11,291	10,890	8,490	14,340	1,517	13.4
Six	13,335	13,110	11,020	15,790	1,224	9.2
Seven	5,273	4,960	3,610	7,150	928	17.6
Nine	3,137	2,290	1,120	6,020	1,402	44.7
Total	**60,931**		**54,603**	**67,259**	**3,229**	**5.3**

Table G10: Sample size (N) and recaptures (N_R) of Arctic Grayling by section and date.

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
25-08-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-08-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-08-15	0	0	0	0	0	0	1	0	0	0	0	0	1	0
28-08-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-08-15	0	0	2	0	0	0	0	0	0	0	0	0	2	0
30-08-15	0	0	2	0	0	0	0	0	0	0	0	0	2	0
31-08-15	0	0	7	0	1	0	0	0	0	0	0	0	8	0
01-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02-09-15	0	0	0	0	0	0	1	0	0	0	0	0	1	0
03-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-09-15	0	0	1	0	0	0	0	0	0	0	0	0	1	0
05-09-15	0	0	0	0	0	0	2	0	0	0	0	0	2	0
06-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-09-15	0	0	0	0	1	0	0	0	0	0	0	0	1	0
11-09-15	0	0	0	0	2	0	0	0	0	0	0	0	2	0
12-09-15	0	0	3	0	0	0	0	0	0	0	0	0	3	0
13-09-15	0	0	4	1	0	0	0	0	0	0	0	0	4	1
14-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
15-09-15	0	0	0	0	1	0	0	0	0	0	0	0	1	0
16-09-15	0	0	0	0	1	0	0	0	0	0	0	0	1	0
17-09-15	0	0	3	0	0	0	0	0	0	0	0	0	3	0
18-09-15	0	0	0	0	0	0	1	0	0	0	0	0	1	0
19-09-15	0	0	2	0	0	0	0	0	0	0	0	0	2	0
20-09-15	0	0	0	0	4	0	0	0	0	0	0	0	4	0
21-09-15	0	0	0	0	1	0	0	0	0	0	0	0	1	0
22-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23-09-15	0	0	0	0	0	0	1	0	0	0	0	0	1	0
24-09-15	0	0	0	0	0	0	0	0	1	0	0	0	1	0
25-09-15	0	0	5	0	3	0	0	0	0	0	0	0	8	0
26-09-15	0	0	1	0	0	0	0	0	0	0	0	0	1	0
27-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-09-15	0	0	3	1	3	0	0	0	0	0	0	0	6	1
01-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**33**	**2**	**17**	**0**	**6**	**0**	**1**	**0**	**0**	**0**	**57**	**2**

Table G11: Arctic Grayling marks applied by river section and date adjusted for migration.

Date	One	Three	Five	Six	Seven	Nine	Total
25-08-15	0.0	0.0	0.0	0.0	0.0	0.0	0
26-08-15	0.0	0.0	0.0	0.0	0.0	0.0	0
27-08-15	0.0	0.0	0.0	1.0	0.0	0.0	1
28-08-15	0.0	0.0	0.0	0.0	0.0	0.0	0
29-08-15	0.0	1.0	0.0	0.0	0.0	0.0	1
30-08-15	0.0	1.0	0.0	0.0	0.0	0.0	1

Date	One	Three	Five	Six	Seven	Nine	Total
31-08-15	0.0	6.0	0.0	0.0	0.0	0.0	6
01-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
02-09-15	0.0	0.0	0.0	1.0	0.0	0.0	1
03-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
04-09-15	0.0	1.0	0.0	0.0	0.0	0.0	1
05-09-15	0.0	0.0	0.0	2.0	0.0	0.0	2
06-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
08-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
09-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
10-09-15	0.0	0.0	1.0	0.0	0.0	0.0	1
11-09-15	0.0	0.0	2.0	0.0	0.0	0.0	2
12-09-15	0.0	3.0	0.0	0.0	0.0	0.0	3
13-09-15	0.0	3.0	0.0	0.0	0.0	0.0	3
14-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
15-09-15	0.0	0.0	1.0	0.0	0.0	0.0	1
16-09-15	0.0	0.0	1.0	0.0	0.0	0.0	1
17-09-15	0.0	3.0	0.0	0.0	0.0	0.0	3
18-09-15	0.0	0.0	0.0	1.0	0.0	0.0	1
19-09-15	0.0	2.0	0.0	0.0	0.0	0.0	2
20-09-15	0.0	0.0	1.0	0.0	0.0	0.0	1
21-09-15	0.0	0.0	1.0	0.0	0.0	0.0	1
22-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
23-09-15	0.0	0.0	0.0	1.0	0.0	0.0	1
24-09-15	0.0	0.0	0.0	0.0	1.0	0.0	1
25-09-15	0.0	4.0	3.0	0.0	0.0	0.0	7
26-09-15	0.0	1.0	0.0	0.0	0.0	0.0	1
27-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
28-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
29-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
30-09-15	0.0	2.0	2.0	0.0	0.0	0.0	4
01-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
02-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
03-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0

Date	One	Three	Five	Six	Seven	Nine	Total
04-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
05-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
06-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
Total	**0**	**27**	**12**	**6**	**1**	**0**	**46**

Table G12: Arctic Grayling sample, cumulative marks available for capture and recaptures for river Section 3.

Date	Sample	Marks	Recap.
Section Three:			
30-08-15	2	1	
31-08-15	7	2	
04-09-15	1	8	
12-09-15	3	9	
13-09-15	4	12	1
17-09-15	3	15	
19-09-15	2	18	
25-09-15	5	20	
26-09-15	1	24	
30-09-15	3	25	1

Table G13: Bull Trout recaptures and migration proportions adjusted (inverse weight) for fish examined by river section during 2015.

Release	Recapture Section						
Section	**One**	**Three**	**Five**	**Six**	**Seven**	**Nine**	**Total**
Recaptures:							
One	1	0	0	1	0	0	2
Three	0	7	0	0	0	0	7
Five	0	0	5	0	0	0	5
Six	0	0	0	1	1	1	3
Seven	0	0	0	0	2	0	2
Nine	0	0	0	0	0	2	2
Sample:	**42**	**78**	**40**	**44**	**17**	**17**	**238**
Recap. %	**2.38**	**8.97**	**12.50**	**4.55**	**17.65**	**17.65**	**8.82**

Proportions:							
One	0.512	0.000	0.000	0.488	0.000	0.000	1.000
Three	0.000	1.000	0.000	0.000	0.000	0.000	1.000
Five	0.000	0.000	1.000	0.000	0.000	0.000	1.000
Six	0.000	0.000	0.000	0.162	0.419	0.419	1.000
Seven	0.000	0.000	0.000	0.000	1.000	0.000	1.000
Nine	0.000	0.000	0.000	0.000	0.000	1.000	1.000

Table G14: Sample size (N) and recaptures (N_R) of Bull Trout by section and date.

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
25-08-15	0	0	0	0	0	0	1	0	0	0	0	0	1	0
26-08-15	1	0	0	0	0	0	1	0	0	0	0	0	2	0
27-08-15	5	0	0	0	0	0	0	0	0	0	0	0	5	0
28-08-15	0	0	8	0	0	0	0	0	0	0	0	0	8	0
29-08-15	0	0	4	0	0	0	1	0	0	0	0	0	5	0
30-08-15	0	0	3	0	0	0	0	0	0	0	0	0	3	0
31-08-15	0	0	5	0	1	0	0	0	0	0	0	0	6	0
01-09-15	0	0	0	0	1	0	0	0	2	0	0	0	3	0
02-09-15	1	0	0	0	0	0	3	0	0	0	0	0	4	0
03-09-15	5	0	0	0	0	0	2	0	0	0	0	0	7	0
04-09-15	0	0	14	1	0	0	0	0	0	0	0	0	14	1
05-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-09-15	0	0	0	0	0	0	0	0	1	1	0	0	1	1
08-09-15	0	0	0	0	0	0	1	0	0	0	0	0	1	0
09-09-15	0	0	0	0	0	0	3	0	2	0	0	0	5	0
10-09-15	5	0	0	0	4	0	0	0	0	0	0	0	9	0
11-09-15	7	1	0	0	4	1	0	0	0	0	0	0	11	2
12-09-15	0	0	5	1	0	0	0	0	0	0	0	0	5	1
13-09-15	0	0	6	1	0	0	0	0	1	0	0	0	7	1
14-09-15	0	0	0	0	0	0	0	0	1	0	0	0	1	0
15-09-15	1	0	0	0	2	0	0	0	0	0	0	0	3	0
16-09-15	8	0	0	0	5	0	0	0	0	0	0	0	13	0
17-09-15	0	0	7	1	0	0	1	0	0	0	4	0	12	1

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
18-09-15	0	0	2	0	0	0	4	0	0	0	0	0	6	0
19-09-15	0	0	1	0	0	0	0	0	0	0	0	0	1	0
20-09-15	0	0	0	0	5	0	0	0	1	0	0	0	6	0
21-09-15	0	0	0	0	5	1	0	0	0	0	0	0	5	1
22-09-15	0	0	0	0	0	0	6	1	0	0	0	0	6	1
23-09-15	0	0	0	0	0	0	5	0	0	0	1	0	6	0
24-09-15	6	0	0	0	0	0	0	0	3	1	0	0	9	1
25-09-15	0	0	8	0	6	1	0	0	0	0	0	0	14	1
26-09-15	0	0	3	1	0	0	10	1	0	0	0	0	13	2
27-09-15	0	0	0	0	0	0	0	0	0	0	2	2	2	2
28-09-15	1	0	0	0	0	0	6	0	3	0	0	0	10	0
29-09-15	2	0	4	1	0	0	0	0	3	1	0	0	9	2
30-09-15	0	0	8	1	7	2	0	0	0	0	0	0	15	3
01-10-15	0	0	0	0	0	0	0	0	0	0	5	1	5	1
02-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-10-15	0	0	0	0	0	0	0	0	0	0	5	0	5	0
05-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**42**	**1**	**78**	**7**	**40**	**5**	**44**	**2**	**17**	**3**	**17**	**3**	**238**	**21**

Table G15: Bull Trout marks applied by river section and date adjusted for migration.

Date	One	Three	Five	Six	Seven	Nine	Total
25-08-15	0.0	0.0	0.0	0.2	0.4	0.4	1
26-08-15	0.5	0.0	0.0	0.7	0.4	0.4	2
27-08-15	2.6	0.0	0.0	2.4	0.0	0.0	5
28-08-15	0.0	8.0	0.0	0.0	0.0	0.0	8
29-08-15	0.0	4.0	0.0	0.2	0.4	0.4	5
30-08-15	0.0	3.0	0.0	0.0	0.0	0.0	3
31-08-15	0.0	5.0	1.0	0.0	0.0	0.0	6
01-09-15	0.0	0.0	1.0	0.0	2.0	0.0	3
02-09-15	0.5	0.0	0.0	1.0	1.3	1.3	4

Date	One	Three	Five	Six	Seven	Nine	Total
03-09-15	2.6	0.0	0.0	2.8	0.8	0.8	7
04-09-15	0.0	13.0	0.0	0.0	0.0	0.0	13
05-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
06-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
08-09-15	0.0	0.0	0.0	0.2	0.4	0.4	1
09-09-15	0.0	0.0	0.0	0.5	3.3	1.3	5
10-09-15	2.6	0.0	4.0	2.4	0.0	0.0	9
11-09-15	3.1	0.0	3.0	2.9	0.0	0.0	9
12-09-15	0.0	4.0	0.0	0.0	0.0	0.0	4
13-09-15	0.0	5.0	0.0	0.0	1.0	0.0	6
14-09-15	0.0	0.0	0.0	0.0	1.0	0.0	1
15-09-15	0.5	0.0	2.0	0.5	0.0	0.0	3
16-09-15	4.1	0.0	5.0	3.9	0.0	0.0	13
17-09-15	0.0	6.0	0.0	0.2	0.4	4.4	11
18-09-15	0.0	2.0	0.0	0.6	1.7	1.7	6
19-09-15	0.0	1.0	0.0	0.0	0.0	0.0	1
20-09-15	0.0	0.0	5.0	0.0	1.0	0.0	6
21-09-15	0.0	0.0	4.0	0.0	0.0	0.0	4
22-09-15	0.0	0.0	0.0	0.8	2.1	2.1	5
23-09-15	0.0	0.0	0.0	0.8	2.1	3.1	6
24-09-15	3.1	0.0	0.0	2.9	2.0	0.0	8
25-09-15	0.0	8.0	5.0	0.0	0.0	0.0	13
26-09-15	0.0	2.0	0.0	1.5	3.8	3.8	11
27-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
28-09-15	0.5	0.0	0.0	1.5	4.5	2.5	9
29-09-15	1.0	2.0	0.0	1.0	2.0	0.0	6
30-09-15	0.0	7.0	5.0	0.0	0.0	0.0	12
01-10-15	0.0	0.0	0.0	0.0	0.0	4.0	4
02-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
03-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
04-10-15	0.0	0.0	0.0	0.0	0.0	5.0	5
05-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
06-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0

Date	One	Three	Five	Six	Seven	Nine	Total
07-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
Total	**21**	**70**	**35**	**27**	**31**	**32**	**215**

Table G16: Bull Trout sample, cumulative marks available for recapture and recaptures by river section and date.

Date	Sample	Marks	Recap.
Section Three:			
29-08-15	4	8	
30-08-15	3	12	
31-08-15	5	15	
04-09-15	14	20	1
12-09-15	5	33	1
13-09-15	6	37	1
17-09-15	7	42	1
18-09-15	2	48	
19-09-15	1	50	
25-09-15	8	51	
26-09-15	3	59	1
29-09-15	4	61	1
30-09-15	8	63	1
Section Five:			
01-09-15	1	1	
10-09-15	4	2	
11-09-15	4	6	1
15-09-15	2	9	
16-09-15	5	11	
20-09-15	5	16	
21-09-15	5	21	1
25-09-15	6	25	1
30-09-15	7	30	2
Section Six:			
26-Aug-15	1		
29-Aug-15	1	3	
2-Sep-15	3	3	
3-Sep-15	2	4	

Date	Sample	Marks	Recap.
8-Sep-15	1	7	
9-Sep-15	3	7	
17-Sep-15	1	18	
18-Sep-15	4	18	
22-Sep-15	6	18	1
23-Sep-15	5	19	
26-Sep-15	10	23	1
28-Sep-15	6	24	
Section Seven:			
01-09-15	2	1	
07-09-15	1	5	1
09-09-15	2	6	
13-09-15	1	9	
14-09-15	1	10	
20-09-15	1	13	
24-09-15	3	18	1
28-09-15	3	24	
29-09-15	3	29	1
Section Nine:			
17-09-15	4	5	
23-09-15	1	13	
27-09-15	2	20	2
01-10-15	5	23	1
04-10-15	5	27	

Table G17: Population estimates by section for Bull Trout.

			95% HPD		Standard Deviation	CV (%)
Section	**Bayes Mean**	**MLE**	**Low**	**High**		
Three	506	370	188	964	230	45.4
Five	206	130	59	443	120	58.3
Six	1,243	360	100	3,710	1,073	86.3
Seven	229	92	36	658	228	99.4
Nine	238	109	43	631	177	74.3
Total	**2,422**		**186**	**4,658**	**1,141**	**47.1**

Table G18: Largescale Sucker recaptures and migration proportions adjusted (inverse weight) for fish examined by river section during 2015.

Release	Recapture Section						
Section	**One**	**Three**	**Five**	**Six**	**Seven**	**Nine**	**Total**
Recaptures:							
One	2	0	0	0	0	0	2
Three	0	5	0	0	0	0	5
Five	0	0	5	1	0	0	6
Six	0	1	1	3	0	0	5
Seven	0	0	0	2	6	0	8
Nine	0	0	0	0	0	0	0
Sample:	**145**	**132**	**130**	**170**	**212**	**19**	**808**
Recap. %	**1.38**	**4.55**	**4.62**	**3.53**	**2.83**	**0.00**	**3.22**
Proportions:							
One	1.000	0.000	0.000	0.000	0.000	0.000	1.000
Three	0.000	1.000	0.000	0.000	0.000	0.000	1.000
Five	0.000	0.000	0.867	0.133	0.000	0.000	1.000
Six	0.000	0.230	0.234	0.536	0.000	0.000	1.000
Seven	0.000	0.000	0.000	0.294	0.706	0.000	1.000
Nine	0.000	0.000	0.000	0.000	0.000	1.000	1.000

Table G19: Sample size (N) and recaptures (N_R) of Largescale Sucker by section and date.

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
25-08-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-08-15	0	0	0	0	0	0	10	0	0	0	0	0	10	0
27-08-15	3	0	0	0	0	0	3	0	0	0	0	0	6	0
28-08-15	0	0	2	0	0	0	2	0	0	0	0	0	4	0
29-08-15	0	0	19	0	0	0	10	0	3	0	0	0	32	0
30-08-15	0	0	0	0	0	0	0	0	10	0	0	0	10	0
31-08-15	0	0	2	0	2	0	0	0	0	0	0	0	4	0
01-09-15	0	0	0	0	2	0	3	0	5	0	0	0	10	0
02-09-15	1	0	0	0	0	0	5	0	0	0	0	0	6	0
03-09-15	14	0	0	0	0	0	16	0	0	0	0	0	30	0
04-09-15	0	0	27	0	0	0	0	0	0	0	0	0	27	0
05-09-15	0	0	0	0	0	0	5	0	7	0	0	0	12	0

Golder Associates

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
06-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-09-15	0	0	0	0	0	0	0	0	23	0	0	0	23	0
08-09-15	0	0	0	0	0	0	7	0	0	0	0	0	7	0
09-09-15	0	0	0	0	0	0	21	1	13	0	0	0	34	1
10-09-15	11	0	0	0	21	0	0	0	0	0	0	0	32	0
11-09-15	21	0	0	0	13	2	0	0	0	0	0	0	34	2
12-09-15	0	0	6	0	0	0	0	0	0	0	0	0	6	0
13-09-15	0	0	10	0	0	0	0	0	25	0	0	0	35	0
14-09-15	0	0	0	0	0	0	0	0	6	0	0	0	6	0
15-09-15	18	1	0	0	16	0	0	0	0	0	0	0	34	1
16-09-15	19	1	0	0	5	0	0	0	0	0	0	0	24	1
17-09-15	0	0	12	1	0	0	21	1	0	0	1	0	34	2
18-09-15	0	0	12	1	0	0	8	0	0	0	0	0	20	1
19-09-15	0	0	3	1	0	0	0	0	17	0	0	0	20	1
20-09-15	0	0	0	0	14	1	0	0	30	2	0	0	44	3
21-09-15	0	0	0	0	2	0	0	0	0	0	0	0	2	0
22-09-15	0	0	0	0	0	0	8	1	0	0	1	0	9	1
23-09-15	0	0	0	0	0	0	23	1	0	0	1	0	24	1
24-09-15	31	0	0	0	0	0	0	0	46	2	0	0	77	2
25-09-15	0	0	11	3	28	2	0	0	0	0	0	0	39	5
26-09-15	0	0	6	0	0	0	12	2	0	0	0	0	18	2
27-09-15	0	0	0	0	0	0	0	0	0	0	6	0	6	0
28-09-15	13	0	0	0	0	0	16	0	8	1	0	0	37	1
29-09-15	14	0	9	0	0	0	0	0	19	1	0	0	42	1
30-09-15	0	0	13	0	27	1	0	0	0	0	0	0	40	1
01-10-15	0	0	0	0	0	0	0	0	0	0	5	0	5	0
02-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-10-15	0	0	0	0	0	0	0	0	0	0	1	0	1	0
05-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-10-15	0	0	0	0	0	0	0	0	0	0	4	0	4	0
Total	**145**	**2**	**132**	**6**	**130**	**6**	**170**	**6**	**212**	**6**	**19**	**0**	**808**	**26**

Table G20: Largescale Sucker marks applied by river section and date adjusted for migration.

Date	One	Three	Five	Six	Seven	Nine	Total
25-08-15	0.0	0.0	0.0	0.0	0.0	0.0	0
26-08-15	0.0	2.3	2.3	5.4	0.0	0.0	10
27-08-15	3.0	0.7	0.7	1.6	0.0	0.0	6
28-08-15	0.0	2.5	0.5	1.1	0.0	0.0	4
29-08-15	0.0	21.3	2.3	5.9	1.4	0.0	31
30-08-15	0.0	0.0	0.0	2.9	7.1	0.0	10
31-08-15	0.0	2.0	1.7	0.3	0.0	0.0	4
01-09-15	0.0	0.7	2.4	3.3	3.5	0.0	10
02-09-15	1.0	0.9	0.9	2.1	0.0	0.0	5
03-09-15	14.0	3.5	3.5	8.0	0.0	0.0	29
04-09-15	0.0	27.0	0.0	0.0	0.0	0.0	27
05-09-15	0.0	1.2	1.2	4.7	4.9	0.0	12
06-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-09-15	0.0	0.0	0.0	6.8	16.2	0.0	23
08-09-15	0.0	1.6	1.6	3.8	0.0	0.0	7
09-09-15	0.0	4.6	4.7	14.2	8.5	0.0	32
10-09-15	11.0	0.0	18.2	2.8	0.0	0.0	32
11-09-15	20.0	0.0	8.7	1.3	0.0	0.0	30
12-09-15	0.0	6.0	0.0	0.0	0.0	0.0	6
13-09-15	0.0	10.0	0.0	7.0	17.0	0.0	34
14-09-15	0.0	0.0	0.0	1.8	4.2	0.0	6
15-09-15	17.0	0.0	13.9	2.1	0.0	0.0	33
16-09-15	18.0	0.0	4.3	0.7	0.0	0.0	23
17-09-15	0.0	14.6	4.7	10.7	0.0	1.0	31
18-09-15	0.0	11.8	1.9	4.3	0.0	0.0	18
19-09-15	0.0	2.0	0.0	5.0	12.0	0.0	19
20-09-15	0.0	0.0	11.3	9.9	19.8	0.0	41
21-09-15	0.0	0.0	1.7	0.3	0.0	0.0	2
22-09-15	0.0	0.0	0.0	0.0	0.0	1.0	1
23-09-15	0.0	0.5	0.5	1.1	0.0	1.0	3
24-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
25-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
26-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0

Date	One	Three	Five	Six	Seven	Nine	Total
27-09-15	0.0	0.0	0.0	0.0	0.0	6.0	6
28-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
29-09-15	1.0	0.0	0.0	0.0	0.0	0.0	1
30-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
01-10-15	0.0	0.0	0.0	0.0	0.0	5.0	5
02-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
03-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
04-10-15	0.0	0.0	0.0	0.0	0.0	1.0	1
05-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
06-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
Total	**85**	**113**	**87**	**107**	**95**	**15**	**502**

Table G21: Largescale Sucker sample, cumulative marks available for recapture and recaptures by river section and date.

Date	Sample	Marks	Recap.
Section One:			
02-09-15	1	3	
03-09-15	14	4	
10-09-15	11	18	
11-09-15	21	29	
15-09-15	18	49	1
16-09-15	19	66	1
24-09-15	31	84	
28-09-15	13	84	
29-09-15	14	84	
Section Three:			
28-08-15	2	3	
29-08-15	19	5	
31-08-15	2	27	
04-09-15	27	34	
12-09-15	6	68	
13-09-15	10	74	
17-09-15	12	84	1

Date	Sample	Marks	Recap.
18-09-15	12	99	1
19-09-15	3	111	1
25-09-15	11	113	3
26-09-15	6	113	
29-09-15	9	113	
30-09-15	13	113	
Section Five:			
31-08-15	2	6	
01-09-15	2	8	
10-09-15	21	22	
11-09-15	13	40	2
15-09-15	16	49	
16-09-15	5	63	
20-09-15	14	74	1
21-09-15	2	85	
25-09-15	28	87	2
30-09-15	27	87	1
Section Six:			
27-08-15	3	5	
28-08-15	2	7	
29-08-15	10	8	
01-09-15	3	17	
02-09-15	5	21	
03-09-15	16	23	
05-09-15	5	31	
08-09-15	7	42	
09-09-15	21	46	1
17-09-15	21	76	1
18-09-15	8	87	
22-09-15	8	106	1
23-09-15	23	106	1
26-09-15	12	107	2
28-09-15	16	107	

Date	Sample	Marks	Recap.
Section Seven:			
30-08-15	10	1	
01-09-15	5	8	
05-09-15	7	12	
07-09-15	23	17	
09-09-15	13	33	
13-09-15	25	42	
14-09-15	6	59	
19-09-15	17	63	
20-09-15	30	75	2
24-09-15	46	95	2
28-09-15	8	95	1
29-09-15	19	95	1

Table G22: Population estimates by section for Largescale Sucker.

			95% HPD		Standard Deviation	CV (%)
Section	**Bayes Mean**	**MLE**	**Low**	**High**		
One	11,858	3,940	1,140	31,980	9,028	76.1
Three	2,155	1,516	716	4,260	989	45.9
Five	1,949	1,352	632	3,912	931	47.8
Six	2,615	1,770	800	5,350	1,416	54.2
Seven	3,085	2,090	940	6,320	1,642	53.2
Total	**21,662**		**3,270**	**40,054**	**9,384**	**43.3**

Table G23: Longnose Sucker recaptures and migration proportions adjusted (inverse weight) for fish examined by river section during 2015.

Release	Recapture Section						
Section	**One**	**Three**	**Five**	**Six**	**Seven**	**Nine**	**Total**
Recaptures:							
One	4	1	0	0	0	0	5
Three	0	29	4	0	1	0	34
Five	0	0	16	7	3	0	26
Six	0	0	2	38	20	0	60
Seven	0	0	0	1	41	1	43

Nine	0	0	0	0	0	7	7
Sample:	**221**	**871**	**793**	**1,569**	**1,342**	**312**	**5,108**
Recap. %	**1.81**	**3.44**	**2.77**	**2.93**	**4.84**	**2.56**	**3.43**
Proportions:							
One	0.940	0.060	0.000	0.000	0.000	0.000	1.000
Three	0.000	0.852	0.129	0.000	0.019	0.000	1.000
Five	0.000	0.000	0.751	0.166	0.083	0.000	1.000
Six	0.000	0.000	0.061	0.582	0.358	0.000	1.000
Seven	0.000	0.000	0.000	0.019	0.888	0.093	1.000
Nine	0.000	0.000	0.000	0.000	0.000	1.000	1.000

Table G24: Sample size (N) and recaptures (N_R) of Longnose Sucker by section and date.

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
25-08-15	0	0	0	0	0	0	9	0	0	0	0	0	9	0
26-08-15	0	0	0	0	0	0	19	0	0	0	0	0	19	0
27-08-15	25	0	0	0	0	0	79	0	0	0	0	0	104	0
28-08-15	0	0	29	0	0	0	8	0	0	0	0	0	37	0
29-08-15	0	0	116	0	0	0	43	0	17	0	0	0	176	0
30-08-15	0	0	41	0	0	0	0	0	91	0	0	0	132	0
31-08-15	0	0	62	0	33	0	0	0	0	0	0	0	95	0
01-09-15	0	0	0	0	10	0	0	0	56	0	0	0	66	0
02-09-15	1	0	0	0	0	0	69	0	0	0	0	0	70	0
03-09-15	48	1	0	0	0	0	176	2	0	0	0	0	224	3
04-09-15	0	0	186	5	0	0	0	0	0	0	0	0	186	5
05-09-15	0	0	0	0	0	0	46	0	32	1	0	0	78	1
06-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-09-15	0	0	0	0	0	0	0	0	92	1	0	0	92	1
08-09-15	0	0	0	0	0	0	154	1	0	0	0	0	154	1
09-09-15	0	0	0	0	0	0	178	5	70	2	0	0	248	7
10-09-15	25	0	0	0	71	0	0	0	0	0	0	0	96	0
11-09-15	32	1	0	0	139	1	0	0	0	0	0	0	171	2
12-09-15	0	0	72	3	0	0	0	0	0	0	0	0	72	3
13-09-15	0	0	34	1	0	0	0	0	103	8	0	0	137	9
14-09-15	0	0	0	0	0	0	0	0	93	5	0	0	93	5

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
15-09-15	3	0	0	0	78	1	0	0	0	0	0	0	81	1
16-09-15	22	1	0	0	76	3	0	0	0	0	0	0	98	4
17-09-15	0	0	75	4	0	0	179	8	0	0	51	0	305	12
18-09-15	0	0	27	1	0	0	129	4	0	0	0	0	156	5
19-09-15	0	0	16	3	0	0	0	0	94	7	0	0	110	10
20-09-15	0	0	0	0	79	1	0	0	115	7	0	0	194	8
21-09-15	0	0	0	0	51	4	0	0	0	0	0	0	51	4
22-09-15	0	0	0	0	0	0	92	2	0	0	35	0	127	2
23-09-15	0	0	0	0	0	0	170	17	11	0	14	0	195	17
24-09-15	48	1	0	0	0	0	0	0	343	27	0	0	391	28
25-09-15	0	0	65	3	128	11	0	0	0	0	0	0	193	14
26-09-15	0	0	44	4	0	0	134	3	0	0	0	0	178	7
27-09-15	0	0	0	0	0	0	0	0	0	0	40	0	40	0
28-09-15	15	0	0	0	0	0	84	4	58	3	0	0	157	7
29-09-15	2	0	45	4	0	0	0	0	167	4	0	0	214	8
30-09-15	0	0	59	2	128	1	0	0	0	0	0	0	187	3
01-10-15	0	0	0	0	0	0	0	0	0	0	96	7	96	7
02-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-10-15	0	0	0	0	0	0	0	0	0	0	34	1	34	1
05-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-10-15	0	0	0	0	0	0	0	0	0	0	42	0	42	0
Total	**221**	**4**	**871**	**30**	**793**	**22**	**1,569**	**46**	**1,342**	**65**	**312**	**8**	**5,108**	**175**

Table G25: Longnose Sucker marks applied by river section and date adjusted for migration.

Date	One	Three	Five	Six	Seven	Nine	Total
25-08-15	0.0	0.0	0.5	5.2	3.2	0.0	9
26-08-15	0.0	0.0	1.2	11.0	6.8	0.0	19
27-08-15	23.5	1.5	4.6	44.2	27.2	0.0	101
28-08-15	0.0	24.7	4.2	4.7	3.4	0.0	37
29-08-15	0.0	98.0	17.4	24.7	31.4	1.5	173
30-08-15	0.0	34.9	5.3	1.6	79.8	8.3	130

Date	One	Three	Five	Six	Seven	Nine	Total
31-08-15	0.0	52.8	32.8	5.5	3.9	0.0	95
01-09-15	0.0	0.0	7.5	2.7	50.6	5.2	66
02-09-15	0.9	0.1	4.1	39.5	24.3	0.0	69
03-09-15	44.2	2.8	10.3	98.9	60.8	0.0	217
04-09-15	0.0	153.3	23.2	0.0	3.4	0.0	180
05-09-15	0.0	0.0	2.8	27.3	41.3	2.6	74
06-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-09-15	0.0	0.0	0.0	1.6	79.1	8.3	89
08-09-15	0.0	0.0	9.3	89.0	54.8	0.0	153
09-09-15	0.0	0.0	10.4	100.7	121.6	6.3	239
10-09-15	23.5	1.5	51.8	11.5	5.7	0.0	94
11-09-15	29.2	1.8	103.6	22.9	11.5	0.0	169
12-09-15	0.0	58.8	8.9	0.0	1.3	0.0	69
13-09-15	0.0	28.1	4.3	1.6	79.7	8.3	122
14-09-15	0.0	0.0	0.0	1.6	78.2	8.2	88
15-09-15	2.8	0.2	57.1	12.6	6.3	0.0	79
16-09-15	19.7	1.3	52.6	11.6	5.8	0.0	91
17-09-15	0.0	60.5	19.3	97.7	61.5	51.0	290
18-09-15	0.0	22.1	10.9	72.1	44.9	0.0	150
19-09-15	0.0	11.1	1.7	1.6	74.9	7.8	97
20-09-15	0.0	0.0	58.6	14.9	101.5	10.0	185
21-09-15	0.0	0.0	35.3	7.8	3.9	0.0	47
22-09-15	0.0	0.0	0.8	8.1	5.0	35.0	49
23-09-15	0.0	0.0	0.2	2.3	2.3	14.1	19
24-09-15	0.0	0.0	0.0	0.1	5.3	0.6	6
25-09-15	0.0	0.9	0.1	0.0	0.0	0.0	1
26-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
27-09-15	0.0	0.0	0.0	0.0	0.0	40.0	40
28-09-15	0.9	0.1	0.1	0.6	1.2	0.1	3
29-09-15	0.0	0.0	0.0	0.0	1.8	0.2	2
30-09-15	0.0	0.9	2.4	0.5	0.3	0.0	4
01-10-15	0.0	0.0	0.0	0.0	0.0	88.0	88
02-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
03-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0

Date	One	Three	Five	Six	Seven	Nine	Total
04-10-15	0.0	0.0	0.0	0.0	0.0	33.0	33
05-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
06-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
Total	**145**	**555**	**541**	**724**	**1,083**	**328**	**3,377**

Table G26: Longnose Sucker sample, cumulative marks available for recapture and recaptures by river section and date.

Date	Sample	Marks	Recap.
Section One:			
02-09-15	1	24	
03-09-15	48	24	1
10-09-15	25	69	
11-09-15	32	92	1
15-09-15	3	121	
16-09-15	22	124	1
24-09-15	48	144	1
28-09-15	15	144	
29-09-15	2	145	
Section Three:			
28-08-15	29	1	
29-08-15	116	26	
30-08-15	41	124	
31-08-15	62	159	
04-09-15	186	215	5
12-09-15	72	371	3
13-09-15	34	430	1
17-09-15	75	460	4
18-09-15	27	520	1
19-09-15	16	542	3
25-09-15	65	553	3
26-09-15	44	554	4
29-09-15	45	554	4
30-09-15	59	554	2

Date	Sample	Marks	Recap.
Section Five:			
31-08-15	33	33	
01-09-15	10	66	
10-09-15	71	134	
11-09-15	139	185	1
15-09-15	78	302	1
16-09-15	76	359	3
20-09-15	79	444	1
21-09-15	51	502	4
25-09-15	128	539	11
30-09-15	128	539	1
Section Six:			
26-08-15	19	5	
27-08-15	79	16	
28-08-15	8	60	
29-08-15	43	65	
02-09-15	69	100	
03-09-15	176	139	2
05-09-15	46	238	
08-09-15	154	267	1
09-09-15	178	356	5
17-09-15	179	519	8
18-09-15	129	616	4
22-09-15	92	713	2
23-09-15	170	721	17
26-09-15	134	723	3
28-09-15	84	723	4
Section Seven:			
29-08-15	17	41	
30-08-15	91	72	
01-09-15	56	156	
05-09-15	32	295	1
07-09-15	92	336	1
09-09-15	70	470	2

Date	Sample	Marks	Recap.
13-09-15	103	610	8
14-09-15	93	690	5
19-09-15	94	887	7
20-09-15	115	962	7
23-09-15	11	1072	
24-09-15	343	1074	27
28-09-15	58	1080	3
29-09-15	167	1081	4
Section Nine:			
17-09-15	51	49	
22-09-15	35	118	
23-09-15	14	153	
27-09-15	40	167	
01-10-15	96	207	7
04-10-15	34	295	1
07-10-15	42	328	

Table G27: Population estimates by section for Longnose Sucker.

			95% HPD		Standard Deviation	CV (%)
Section	Bayes Mean	MLE	Low	High		
One	8,560	4,600	1,680	20,840	5,890	68.8
Three	9,766	9,140	6,500	13,480	1,834	18.8
Five	14,137	12,980	8,820	20,340	2,991	21.2
Six	15,165	14,540	11,040	19,720	2,239	14.8
Seven	16,401	15,920	12,660	20,460	2,000	12.2
Total	**73,685**		**57,225**	**90,145**	**8,398**	**11.4**

Table G28: White Sucker recaptures and migration proportions adjusted (inverse weight) for fish examined by river section during 2015.

Release	Recapture Section						
Section	**One**	**Three**	**Five**	**Six**	**Seven**	**Nine**	**Total**
Recaptures:							
One	2	0	0	0	0	0	2
Three	0	5	0	0	0	0	5
Five	0	0	2	1	0	0	3
Six	0	0	0	2	0	0	2
Seven	0	0	0	0	2	0	2
Nine	0	0	0	0	0	1	1
Sample:	**117**	**97**	**120**	**59**	**52**	**50**	**495**
Recap. %	**1.71**	**5.15**	**1.67**	**5.08**	**3.85**	**2.00**	**3.03**
Proportions:							
One	1.000	0.000	0.000	0.000	0.000	0.000	1.000
Three	0.000	1.000	0.000	0.000	0.000	0.000	1.000
Five	0.000	0.000	0.496	0.504	0.000	0.000	1.000
Six	0.000	0.000	0.000	1.000	0.000	0.000	1.000
Seven	0.000	0.000	0.000	0.000	1.000	0.000	1.000
Nine	0.000	0.000	0.000	0.000	0.000	1.000	1.000

Table G29: Sample size (N) and recaptures (N_R) of White Sucker by section and date.

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
25-08-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-08-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27-08-15	11	0	0	0	0	0	2	0	0	0	0	0	13	0
28-08-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-08-15	0	0	18	0	0	0	7	0	1	0	0	0	26	0
30-08-15	0	0	3	0	0	0	0	0	4	0	0	0	7	0
31-08-15	0	0	9	0	4	0	0	0	0	0	0	0	13	0
01-09-15	0	0	0	0	3	0	0	0	6	0	0	0	9	0
02-09-15	3	0	0	0	0	0	5	0	0	0	0	0	8	0
03-09-15	24	0	0	0	0	0	0	0	0	0	0	0	24	0
04-09-15	0	0	30	1	0	0	0	0	0	0	0	0	30	1
05-09-15	0	0	0	0	0	0	2	0	3	0	0	0	5	0

	One		Three		Five		Six		Seven		Nine		Total	
Date	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**	**N**	**N_R**
06-09-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-09-15	0	0	0	0	0	0	0	0	1	0	0	0	1	0
08-09-15	0	0	0	0	0	0	4	2	0	0	0	0	4	2
09-09-15	0	0	0	0	0	0	9	0	3	0	0	0	12	0
10-09-15	11	0	0	0	29	0	0	0	0	0	0	0	40	0
11-09-15	18	1	0	0	10	0	0	0	0	0	0	0	28	1
12-09-15	0	0	5	2	0	0	0	0	0	0	0	0	5	2
13-09-15	0	0	4	0	0	0	0	0	8	0	0	0	12	0
14-09-15	0	0	0	0	0	0	0	0	5	0	0	0	5	0
15-09-15	19	1	0	0	20	0	0	0	0	0	0	0	39	1
16-09-15	13	0	0	0	9	0	0	0	0	0	0	0	22	0
17-09-15	0	0	2	0	0	0	12	0	0	0	12	0	26	0
18-09-15	0	0	6	0	0	0	3	1	0	0	0	0	9	1
19-09-15	0	0	4	1	0	0	0	0	5	0	0	0	9	1
20-09-15	0	0	0	0	12	1	0	0	0	0	0	0	12	1
21-09-15	0	0	0	0	10	0	0	0	0	0	0	0	10	0
22-09-15	0	0	0	0	0	0	4	0	0	0	4	0	8	0
23-09-15	0	0	0	0	0	0	7	0	0	0	4	0	11	0
24-09-15	13	0	0	0	0	0	0	0	7	1	0	0	20	1
25-09-15	0	0	7	0	14	1	0	0	0	0	0	0	21	1
26-09-15	0	0	3	0	0	0	2	0	0	0	0	0	5	0
27-09-15	0	0	0	0	0	0	0	0	0	0	4	0	4	0
28-09-15	5	0	0	0	0	0	2	0	2	0	0	0	9	0
29-09-15	0	0	1	1	0	0	0	0	7	1	0	0	8	2
30-09-15	0	0	5	0	9	0	0	0	0	0	0	0	14	0
01-10-15	0	0	0	0	0	0	0	0	0	0	7	0	7	0
02-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-10-15	0	0	0	0	0	0	0	0	0	0	14	0	14	0
05-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06-10-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-10-15	0	0	0	0	0	0	0	0	0	0	5	1	5	1
Total	**117**	**2**	**97**	**5**	**120**	**2**	**59**	**3**	**52**	**2**	**50**	**1**	**495**	**15**

Table G30: White Sucker marks applied by river section and date adjusted for migration.

Date	One	Three	Five	Six	Seven	Nine	Total
25-08-15	0.0	0.0	0.0	0.0	0.0	0.0	0
26-08-15	0.0	0.0	0.0	0.0	0.0	0.0	0
27-08-15	11.0	0.0	0.0	2.0	0.0	0.0	13
28-08-15	0.0	0.0	0.0	0.0	0.0	0.0	0
29-08-15	0.0	18.0	0.0	7.0	1.0	0.0	26
30-08-15	0.0	3.0	0.0	0.0	3.0	0.0	6
31-08-15	0.0	9.0	2.0	2.0	0.0	0.0	13
01-09-15	0.0	0.0	1.5	1.5	6.0	0.0	9
02-09-15	3.0	0.0	0.0	5.0	0.0	0.0	8
03-09-15	24.0	0.0	0.0	0.0	0.0	0.0	24
04-09-15	0.0	29.0	0.0	0.0	0.0	0.0	29
05-09-15	0.0	0.0	0.0	1.0	3.0	0.0	4
06-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-09-15	0.0	0.0	0.0	0.0	1.0	0.0	1
08-09-15	0.0	0.0	0.0	2.0	0.0	0.0	2
09-09-15	0.0	0.0	0.0	9.0	3.0	0.0	12
10-09-15	11.0	0.0	14.4	14.6	0.0	0.0	40
11-09-15	17.0	0.0	4.5	4.5	0.0	0.0	26
12-09-15	0.0	3.0	0.0	0.0	0.0	0.0	3
13-09-15	0.0	4.0	0.0	0.0	6.0	0.0	10
14-09-15	0.0	0.0	0.0	0.0	5.0	0.0	5
15-09-15	18.0	0.0	9.9	10.1	0.0	0.0	38
16-09-15	13.0	0.0	4.5	4.5	0.0	0.0	22
17-09-15	0.0	2.0	0.0	12.0	0.0	11.0	25
18-09-15	0.0	6.0	0.0	2.0	0.0	0.0	8
19-09-15	0.0	3.0	0.0	0.0	5.0	0.0	8
20-09-15	0.0	0.0	5.5	5.5	0.0	0.0	11
21-09-15	0.0	0.0	5.0	5.0	0.0	0.0	10
22-09-15	0.0	0.0	0.0	1.0	0.0	4.0	5
23-09-15	0.0	0.0	0.0	0.0	0.0	4.0	4
24-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
25-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
26-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0

Date	One	Three	Five	Six	Seven	Nine	Total
27-09-15	0.0	0.0	0.0	0.0	0.0	4.0	4
28-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
29-09-15	0.0	0.0	0.0	0.0	2.0	0.0	2
30-09-15	0.0	0.0	0.0	0.0	0.0	0.0	0
01-10-15	0.0	0.0	0.0	0.0	0.0	7.0	7
02-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
03-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
04-10-15	0.0	0.0	0.0	0.0	0.0	14.0	14
05-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
06-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
07-10-15	0.0	0.0	0.0	0.0	0.0	0.0	0
Total	**97**	**77**	**47**	**89**	**35**	**44**	**389**

Table G31: White Sucker sample, cumulative marks available for recapture and recaptures by river section and date.

Date	Sample	Marks	Recap.
Section One:			
02-09-15	3	11	
03-09-15	24	14	
10-09-15	11	38	
11-09-15	18	49	1
15-09-15	19	66	1
16-09-15	13	84	
24-09-15	13	97	
28-09-15	5	97	
Section Three:			
30-08-15	3	18	
31-08-15	9	21	
04-09-15	30	30	1
12-09-15	5	59	2
13-09-15	4	62	
17-09-15	2	66	
18-09-15	6	68	
19-09-15	4	74	1

Date	Sample	Marks	Recap.
25-09-15	7	77	
26-09-15	3	77	
29-09-15	1	77	1
30-09-15	5	77	
Section Five:			
01-09-15	3	2	
10-09-15	29	3	
11-09-15	10	18	
15-09-15	20	22	
16-09-15	9	32	
20-09-15	12	37	1
21-09-15	10	42	
25-09-15	14	47	1
30-09-15	9	47	
Section Six:			
29-08-15	7	2	
02-09-15	5	13	
05-09-15	2	18	
08-09-15	4	19	2
09-09-15	9	21	
17-09-15	12	63	
18-09-15	3	75	1
22-09-15	4	88	
23-09-15	7	89	
26-09-15	2	89	
28-09-15	2	89	
Section Seven:			
30-08-15	4	1	
01-09-15	6	4	
05-09-15	3	10	
07-09-15	1	13	
09-09-15	3	14	
13-09-15	8	17	
14-09-15	5	23	

Date	Sample	Marks	Recap.
19-09-15	5	28	
24-09-15	7	33	1
28-09-15	2	33	
29-09-15	7	33	1

Table G32: Population estimates by section for Longnose Sucker.

			95% HPD		Standard Deviation	CV (%)
Section	**Bayes Mean**	**MLE**	**Low**	**High**		
One	9,979	2,900	780	29,660	8,571	85.9
Three	1,194	750	320	2,600	686	57.4
Five	6,656	1,460	340	23,620	7,322	110.0
Six	1,789	930	360	4,105	1,059	59.2
Seven	2,599	500	120	9,900	3,270	125.8
Total	**22,217**		**1,920**	**45,354**	**11,805**	**53.1**

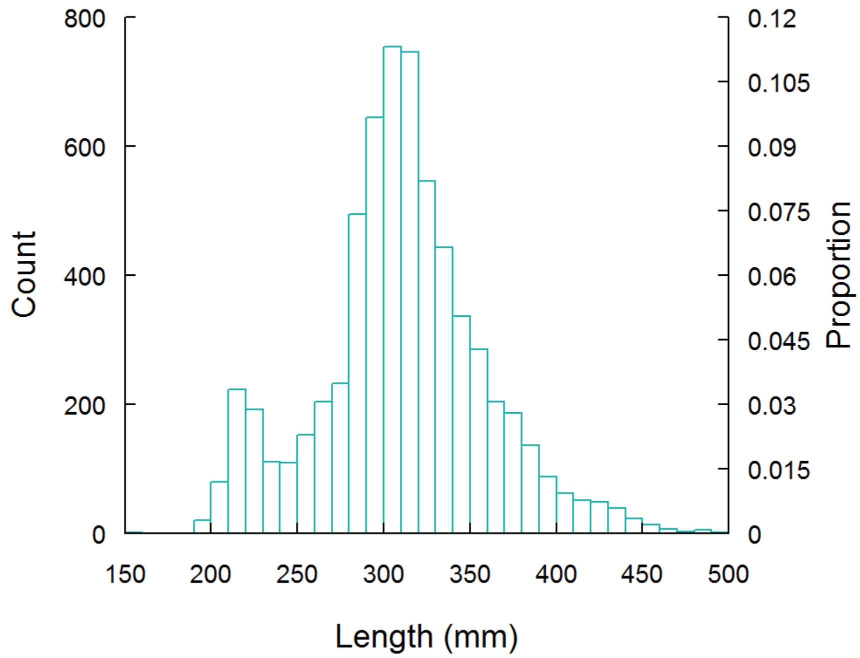

Figure G1: Histogram of Mountain Whitefish lengths at release.

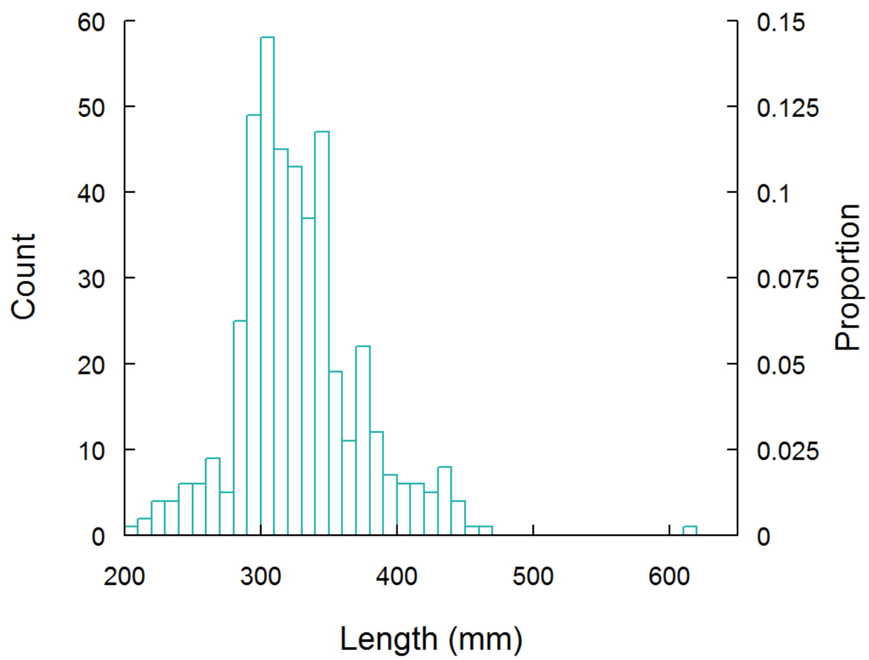

Figure G2: Histogram of Mountain Whitefish lengths at recapture.

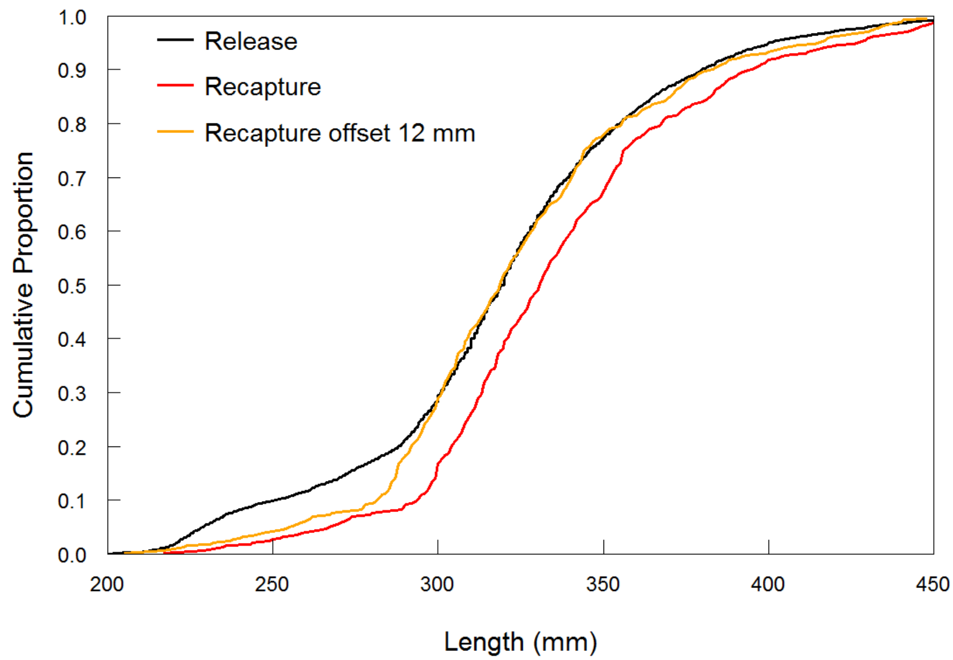

Figure G3: Cumulative proportion of length at release and recapture. The length at recapture is also offset 12 mm to illustrate similarity in release and recapture distributions for length > 290 mm.

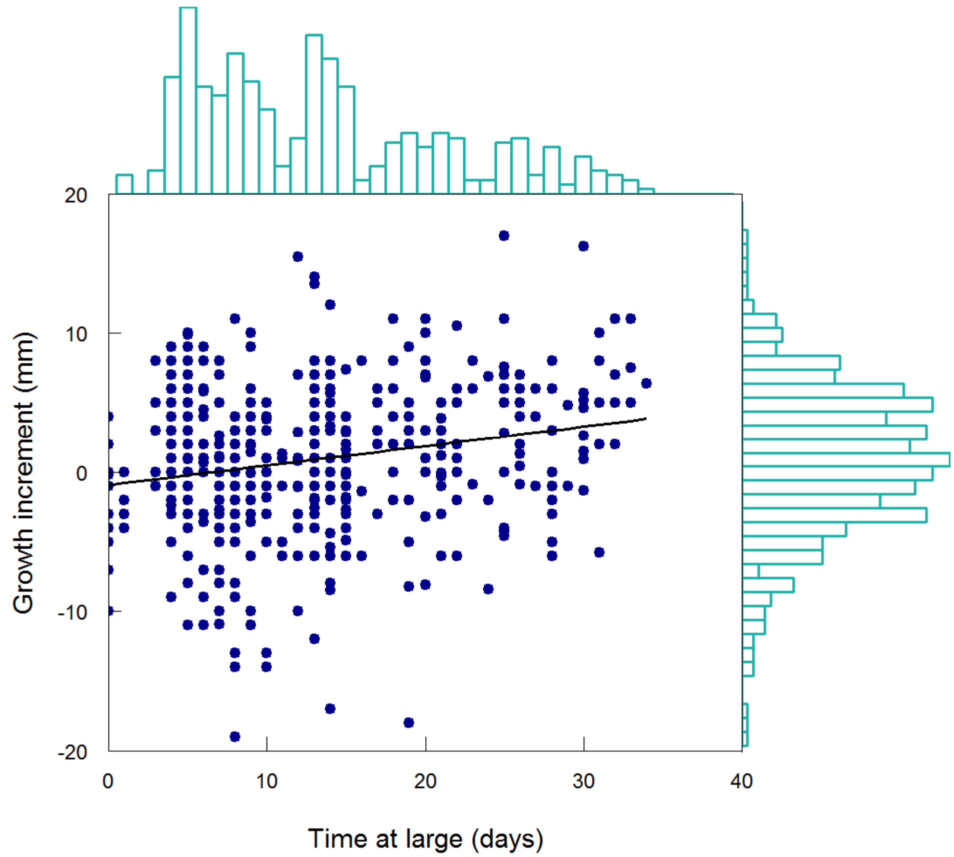

Figure G4: Growth over the study period of mountain whitefish with border histograms of time at large and growth increment.

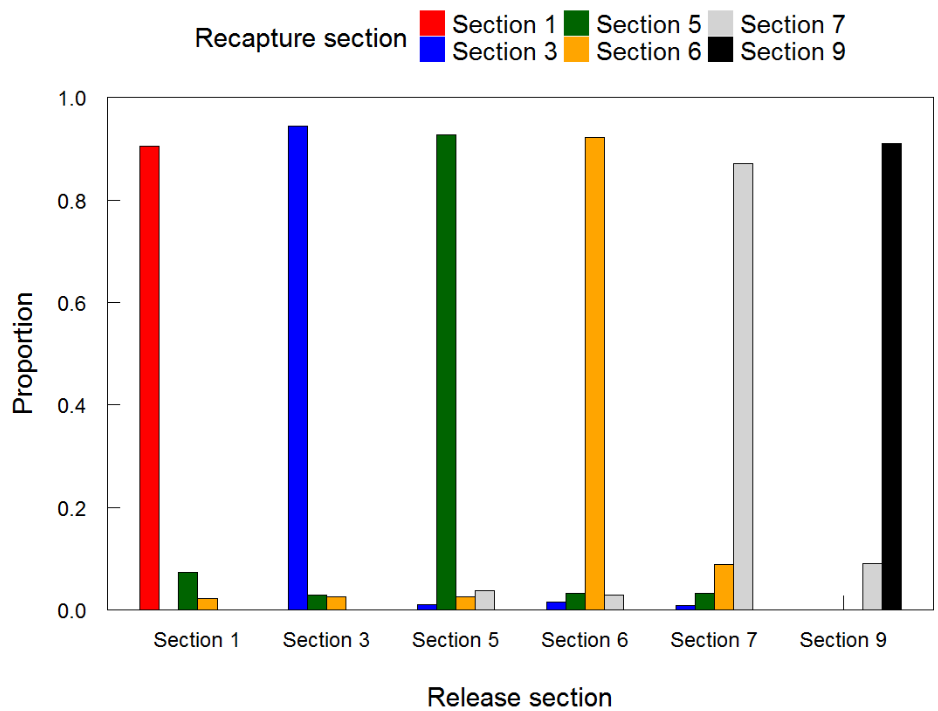

Figure G5: Distribution of recaptured marks in 2015 standardized for sampling effort by river section of Mountain Whitefish released in 2014.

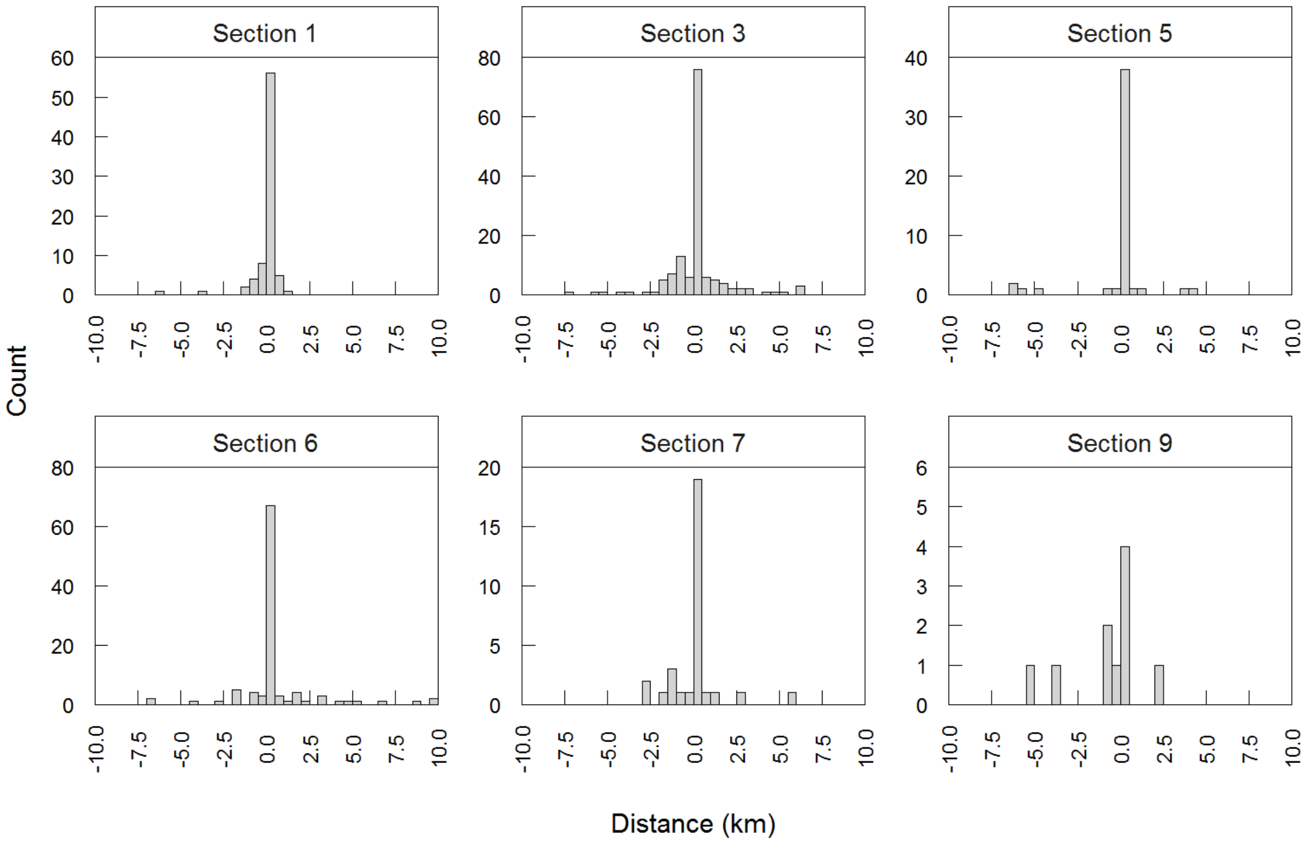

Figure G6: Bar plot of the travel distance of recaptured Mountain Whitefish released in 2015 within each of the sections sampled (positive values indicate upstream movement and negative values downstream movement).

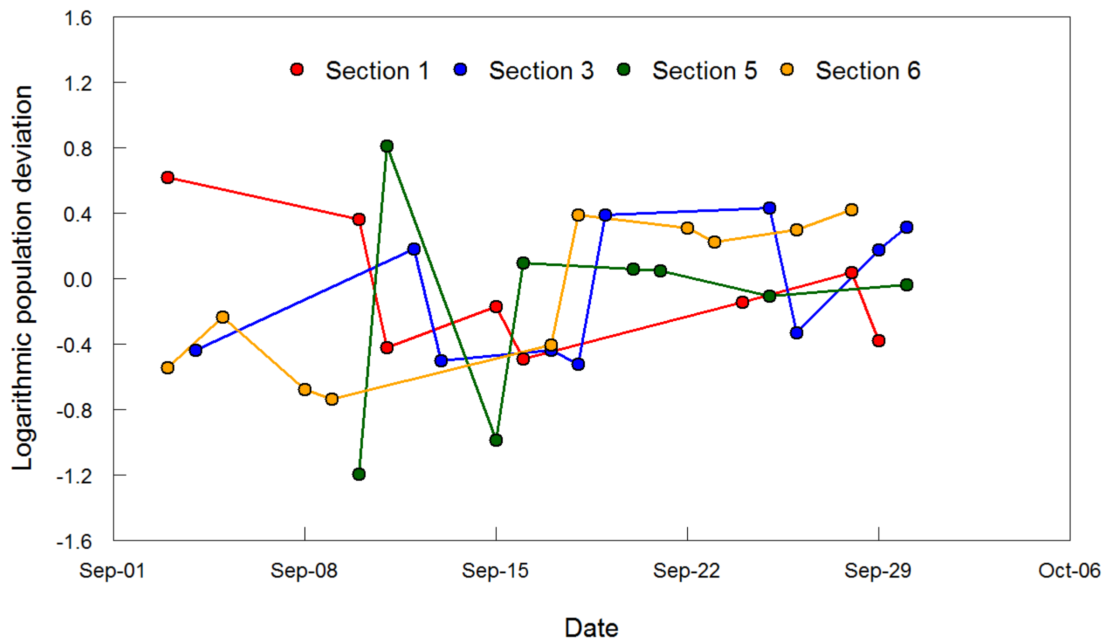

Figure G7: Logarithmic population deviation from the mean by river section and date for Mountain Whitefish.

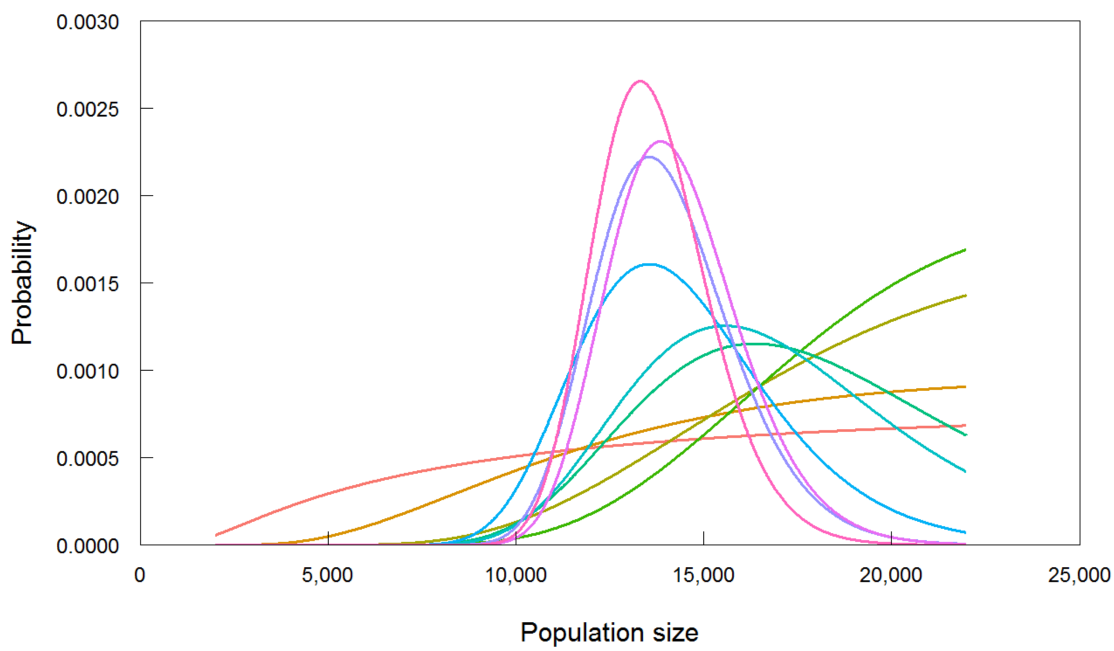

Figure G8: Sequential posterior probability plots of population size for river Section 1 Mountain Whitefish in 2015. Each line is the posterior probability updated by a sample day.

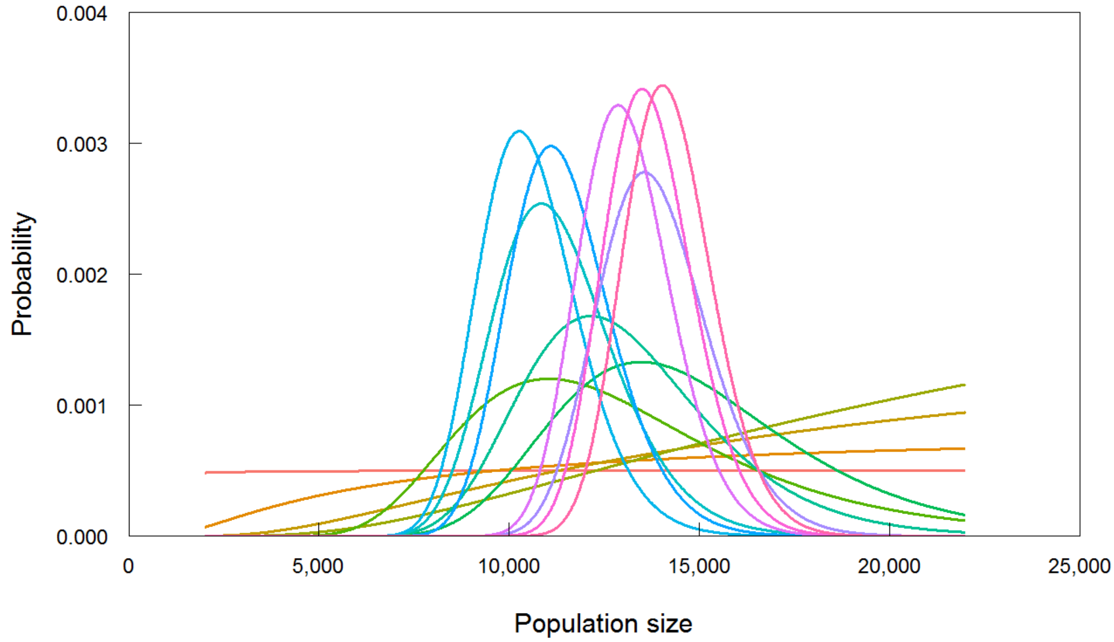

Figure G9: Sequential posterior probability plots of population size for river Section 3 Mountain Whitefish in 2015. Each line is the posterior probability updated by a sample day.

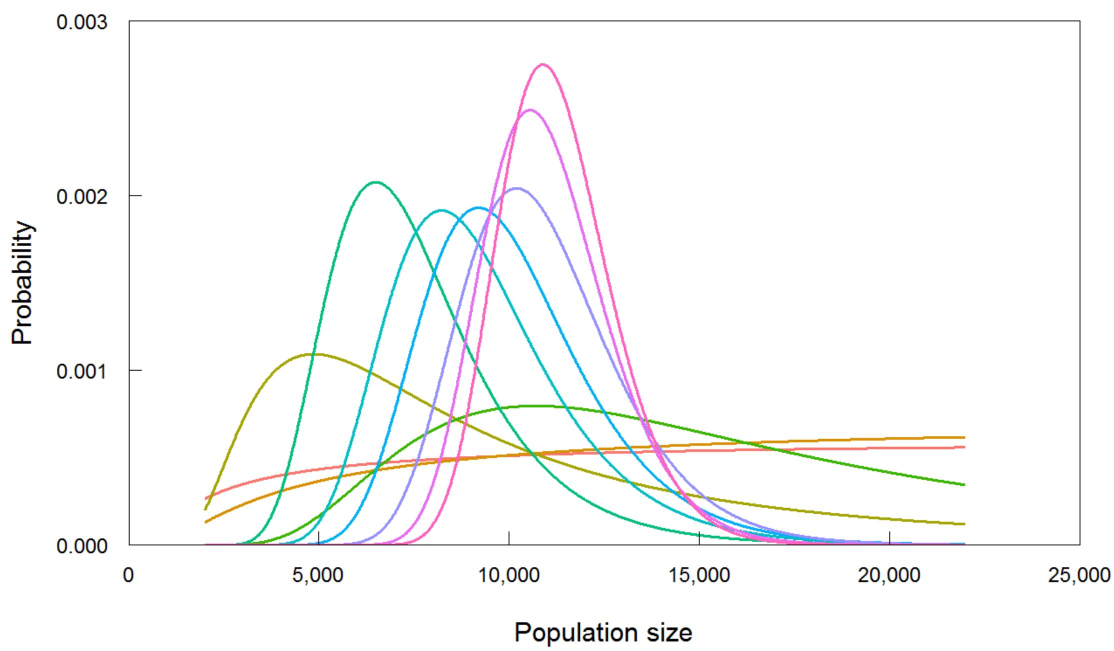

Figure G10: Sequential posterior probability plots of population size for river Section 5 Mountain Whitefish in 2015. Each line is the posterior probability updated by a sample day.

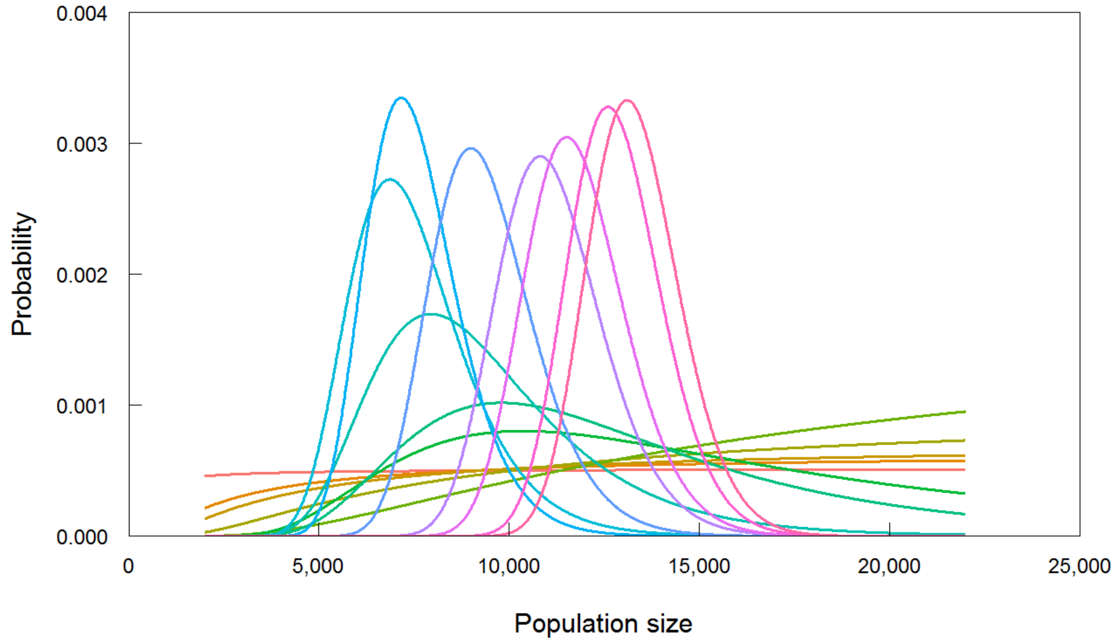

Figure G11: Sequential posterior probability plots of population size for river Section 6 Mountain Whitefish in 2015. Each line is the posterior probability updated by a sample day.

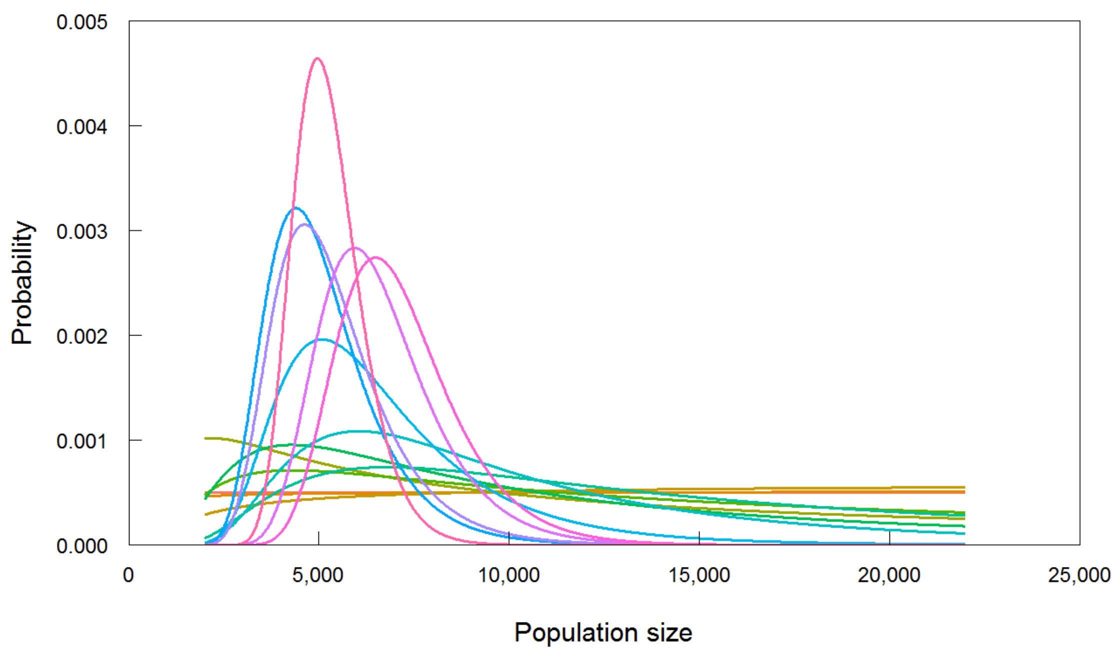

Figure G12: Sequential posterior probability plots of population size for river Section 7 Mountain Whitefish in 2015. Each line is the posterior probability updated by a sample day.

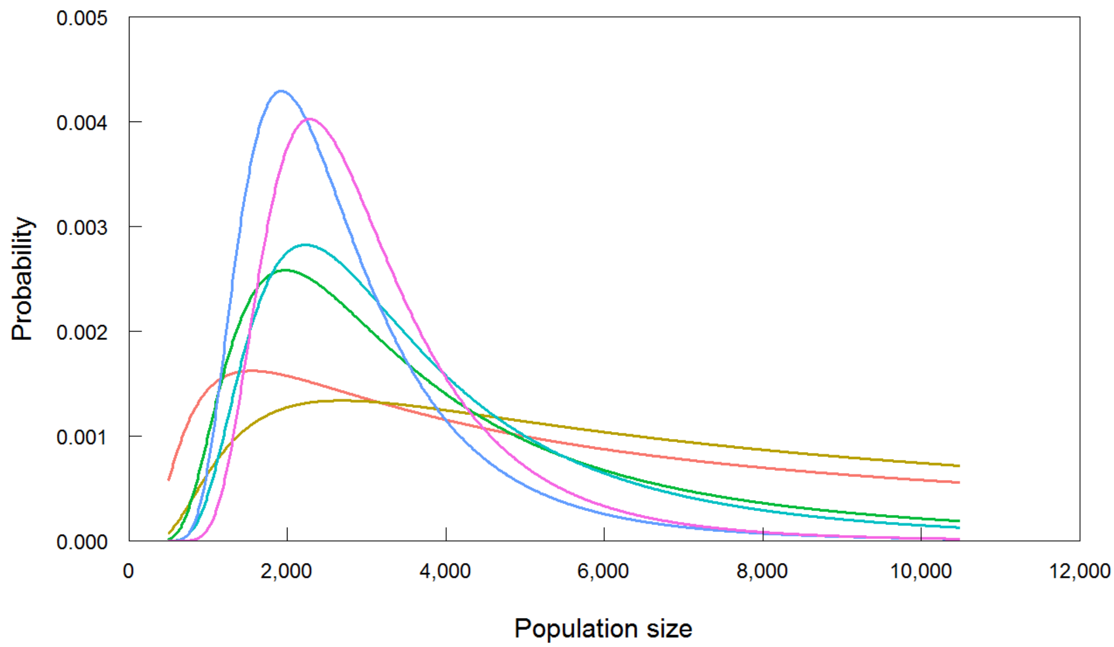

Figure G13: Sequential posterior probability plots of population size for river Section 7 Mountain Whitefish in 2015. Each line is the posterior probability updated by a sample day.

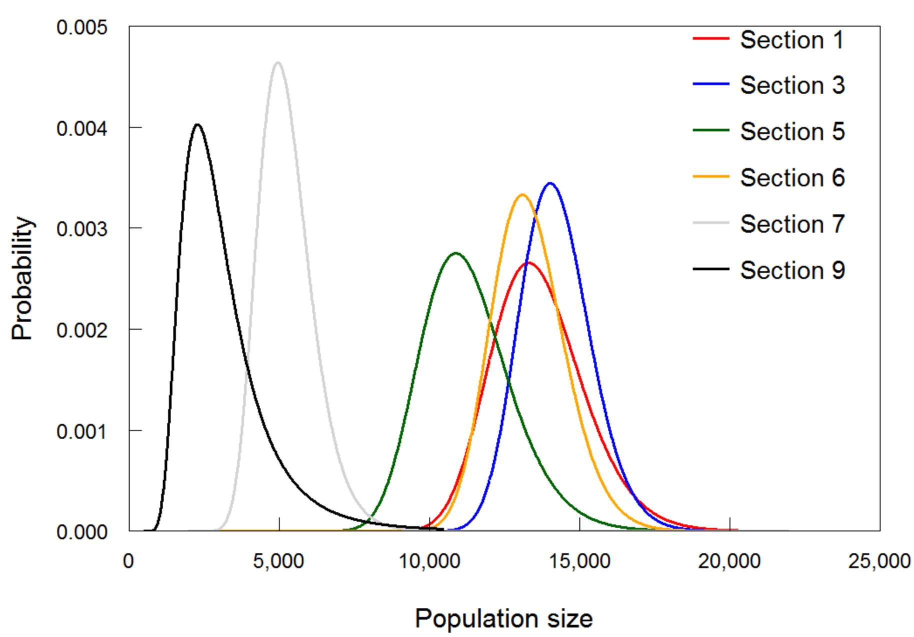

Figure G14: Final posterior distributions by river section for Mountain Whitefish.

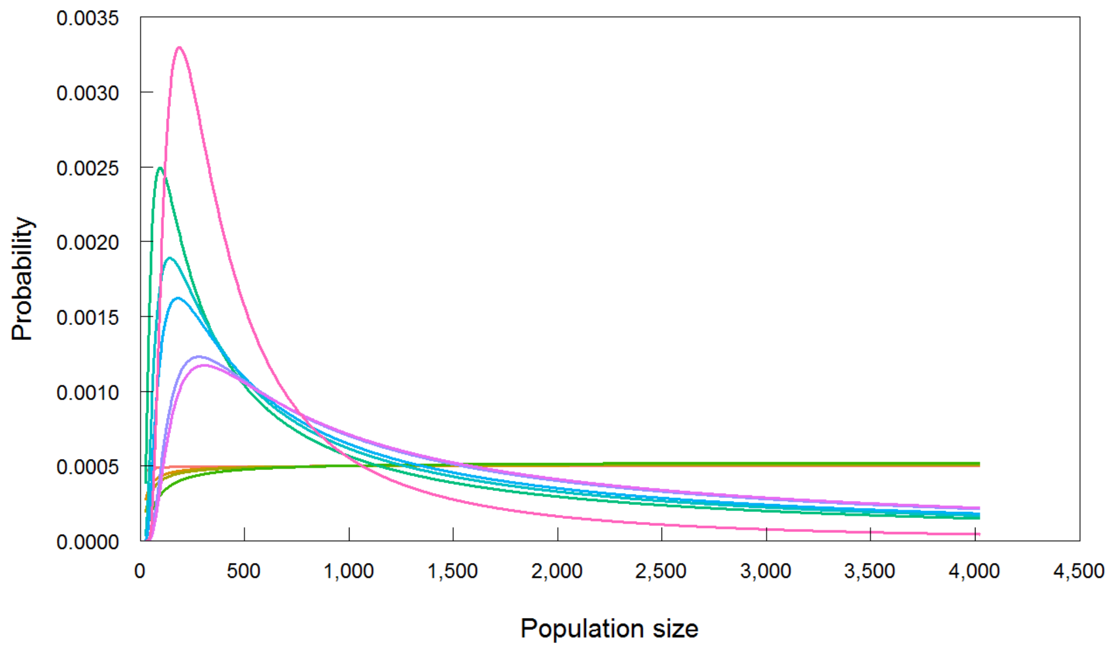

Figure G15: Sequential posterior probability plots of population size for river Section 3 Arctic Grayling in 2015. Each line is the posterior probability updated by a sample day.

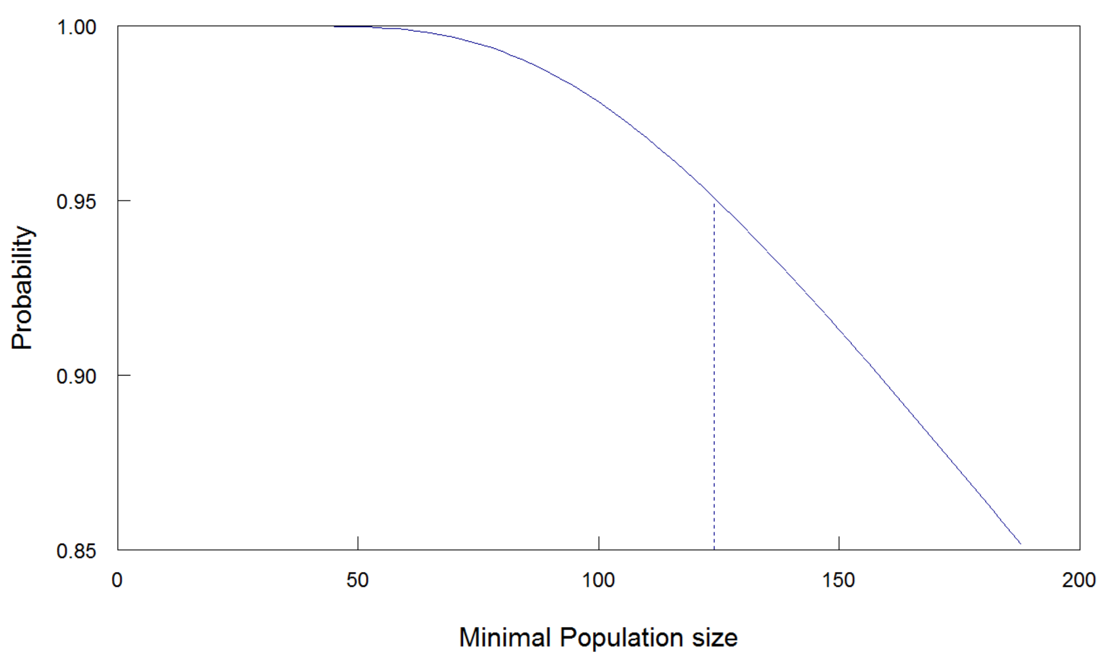

Figure G16: Minimal population estimates for river Section 3 Arctic Grayling in 2015. The dashed vertical lines indicate the 0.95 probability that the population size was at least 125 in river Section 3.

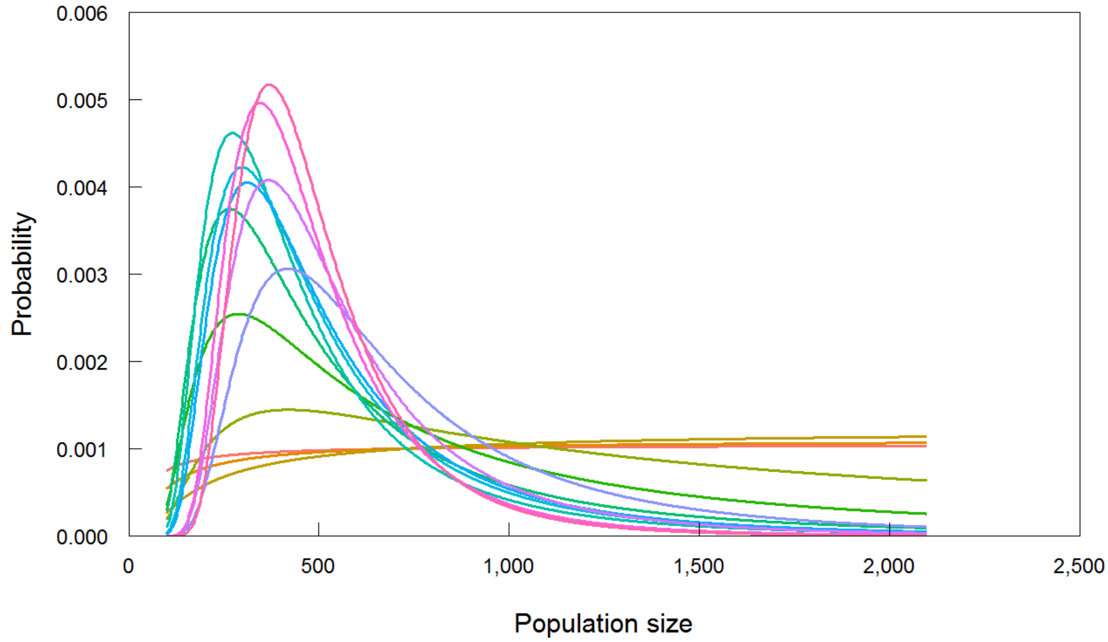

Figure G17: Sequential posterior probability plots of population size for river Section 3 Bull Trout in 2015. Each line is the posterior probability updated by a sample day.

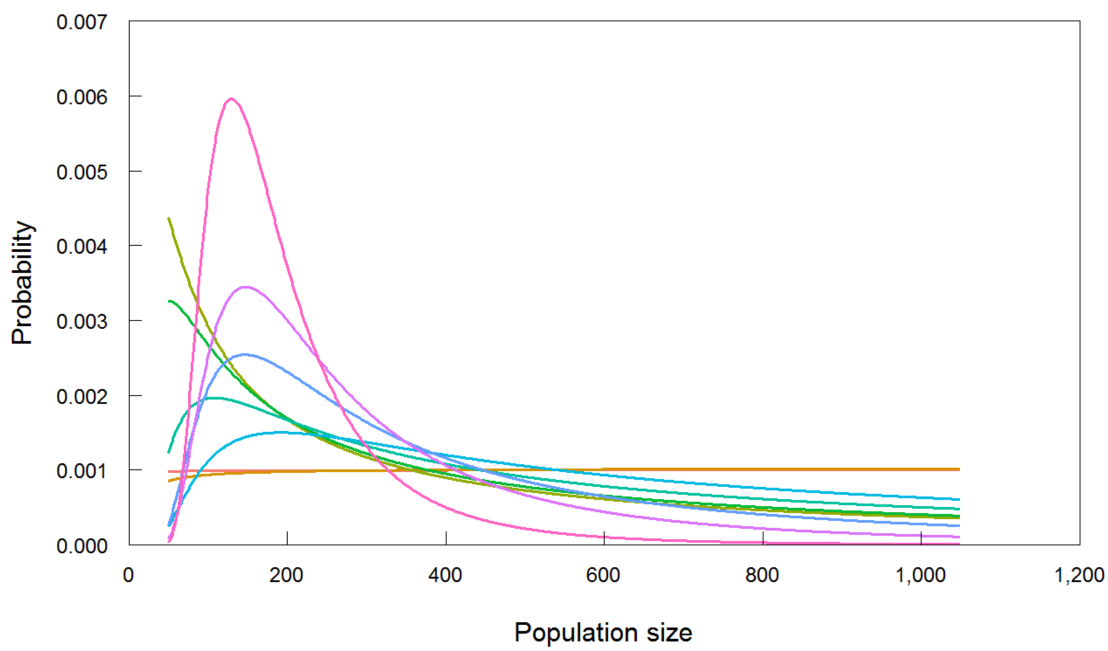

Figure G18: Sequential posterior probability plots of population size for river Section 5 Bull Trout in 2015. Each line is the posterior probability updated by a sample day.

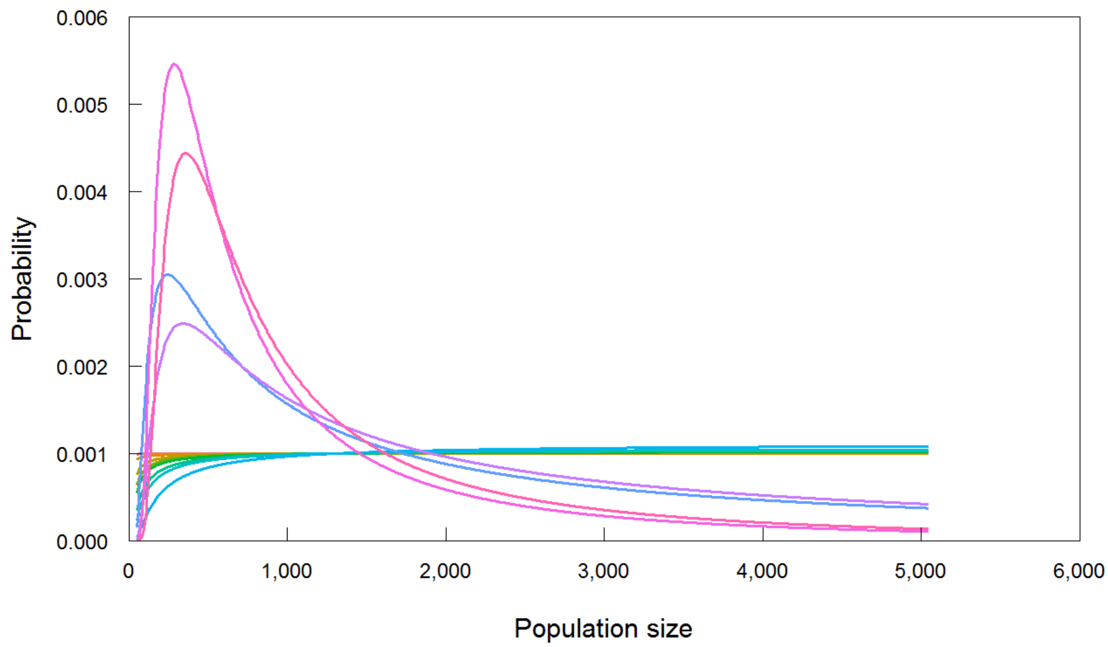

Figure G19: Sequential posterior probability plots of population size for river Section 6 Bull Trout in 2015. Each line is the posterior probability updated by a sample day.

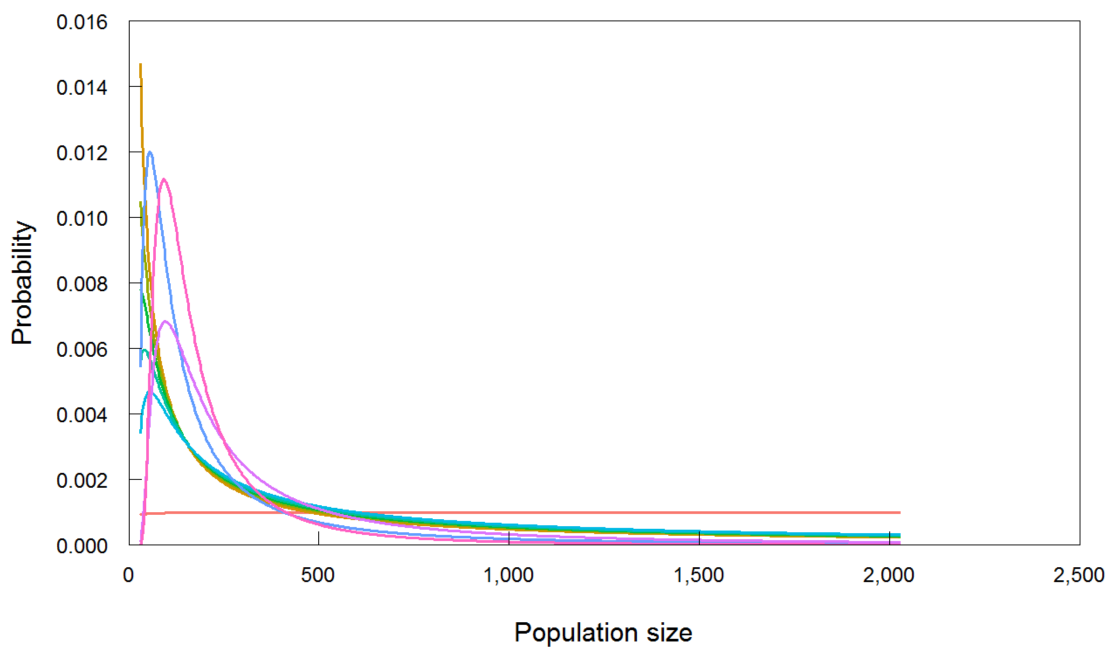

Figure G20: Sequential posterior probability plots of population size for river Section 7 Bull Trout in 2015. Each line is the posterior probability updated by a sample day.

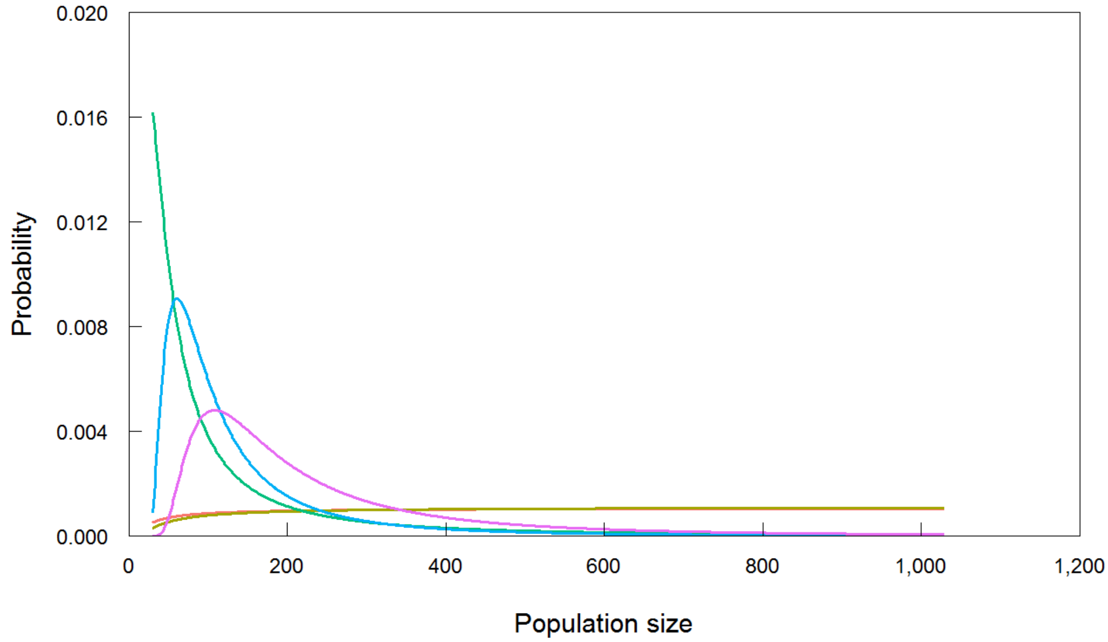

Figure G21: Sequential posterior probability plots of population size for river Section 9 Bull Trout in 2015. Each line is the posterior probability updated by a sample day.

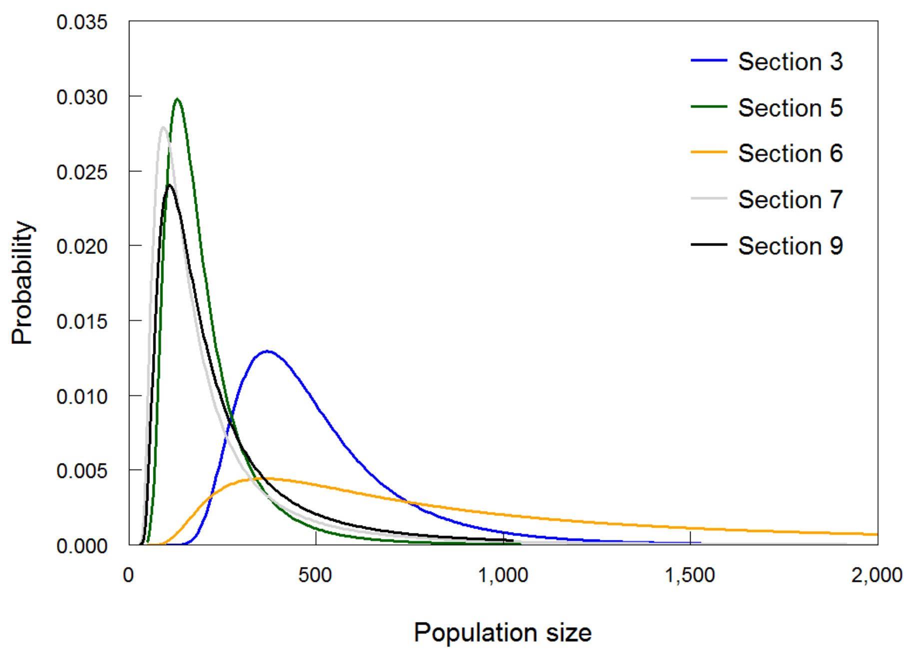

Figure G22: Final posterior distributions by river section for Bull Trout.

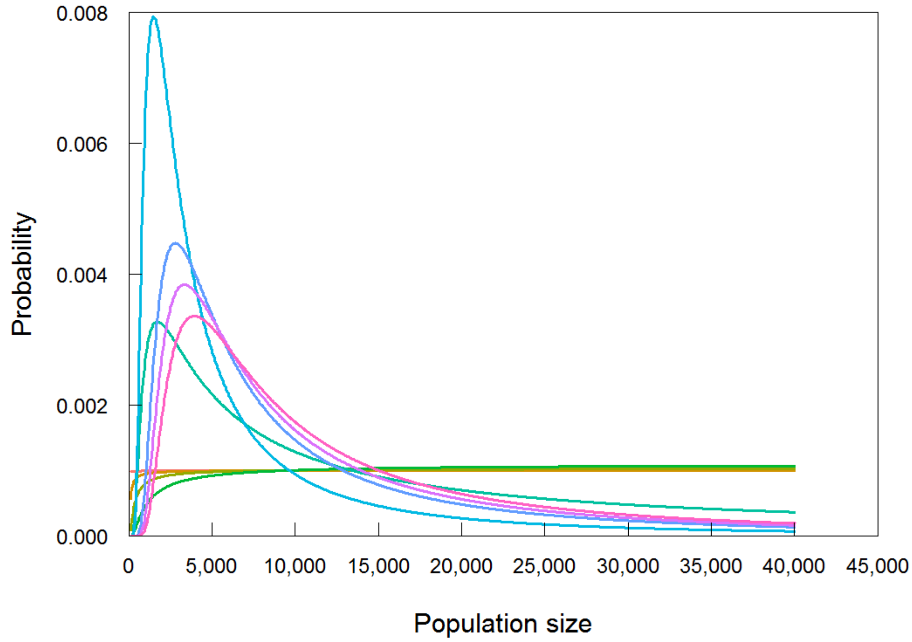

Figure G23: Sequential posterior probability plots of population size for river Section 1 Largescale Sucker in 2015. Each line is the posterior probability updated by a sample day.

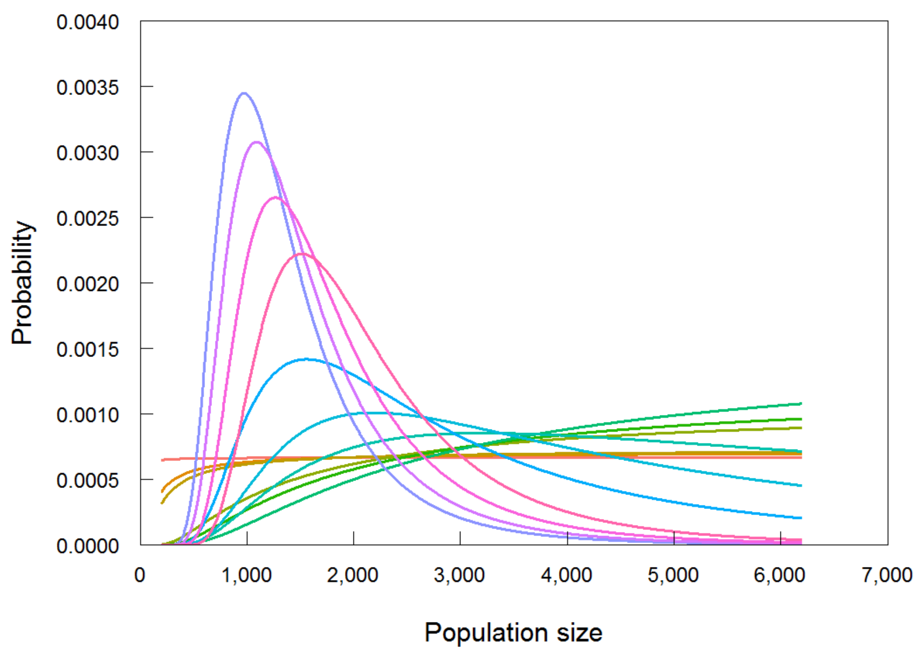

Figure G24: Sequential posterior probability plots of population size for river Section 3 Largescale Sucker in 2015. Each line is the posterior probability updated by a sample day.

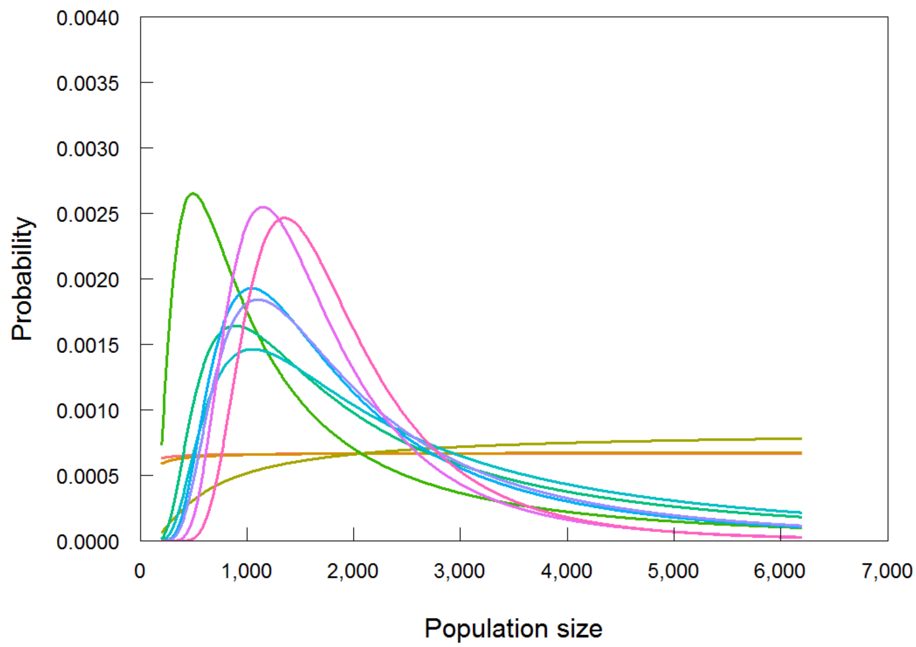

Figure G25: Sequential posterior probability plots of population size for river Section 5 Largescale Sucker in 2015. Each line is the posterior probability updated by a sample day.

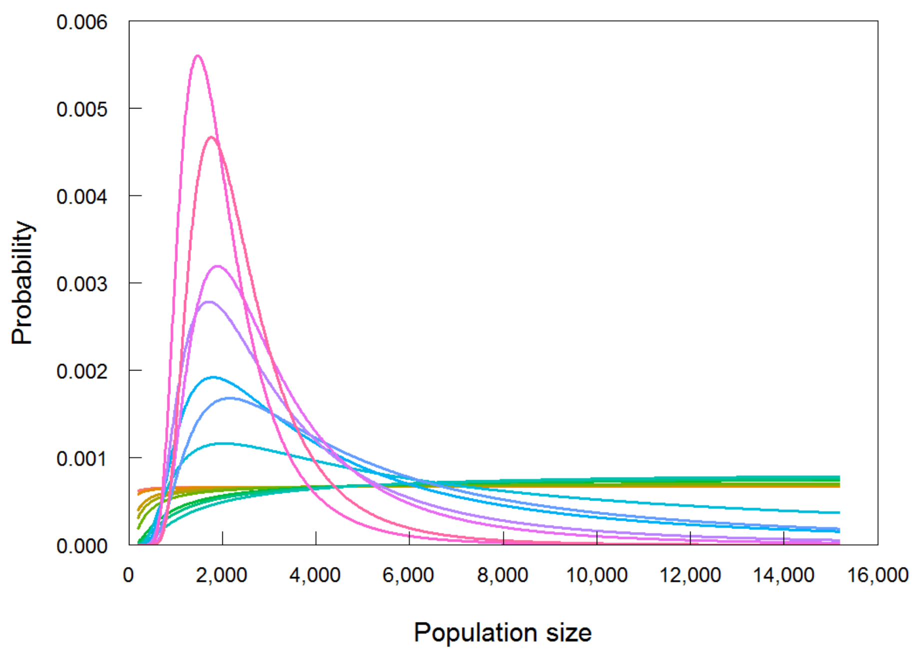

Figure G26: Sequential posterior probability plots of population size for river Section 6 Largescale Sucker in 2015. Each line is the posterior probability updated by a sample day.

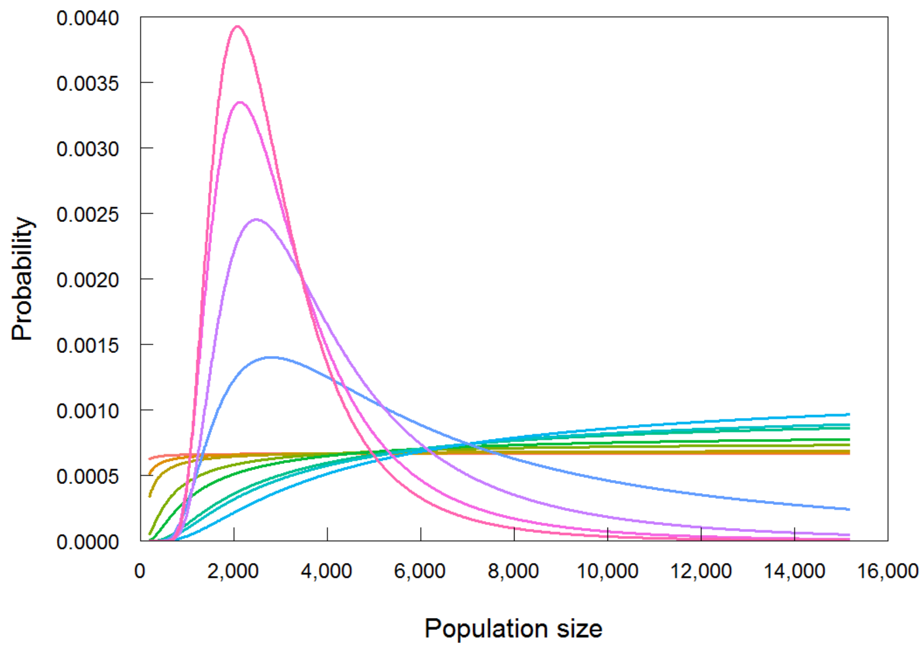

Figure G27: Sequential posterior probability plots of population size for river Section 7 Largescale Sucker in 2015. Each line is the posterior probability updated by a sample day.

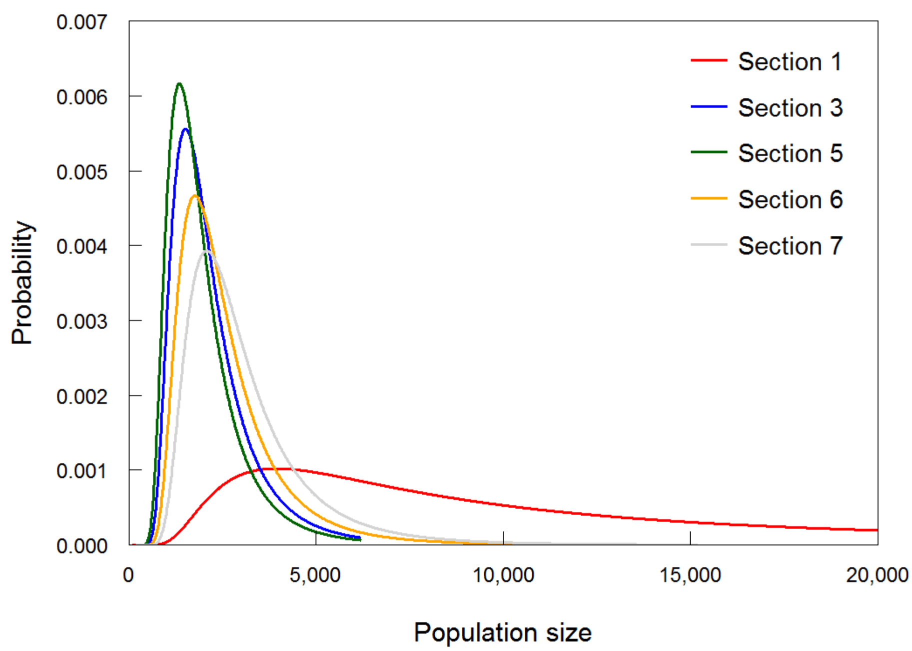

Figure G28: Final posterior distributions by river section for Largescale Sucker.

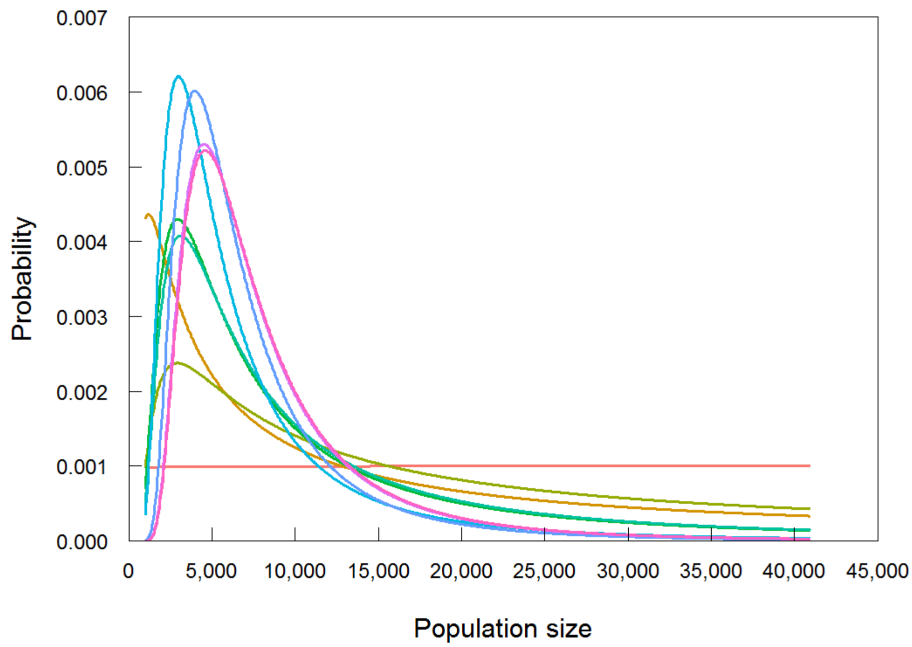

Figure G29: Sequential posterior probability plots of population size for river Section 1 Longnose Sucker in 2015. Each line is the posterior probability updated by a sample day.

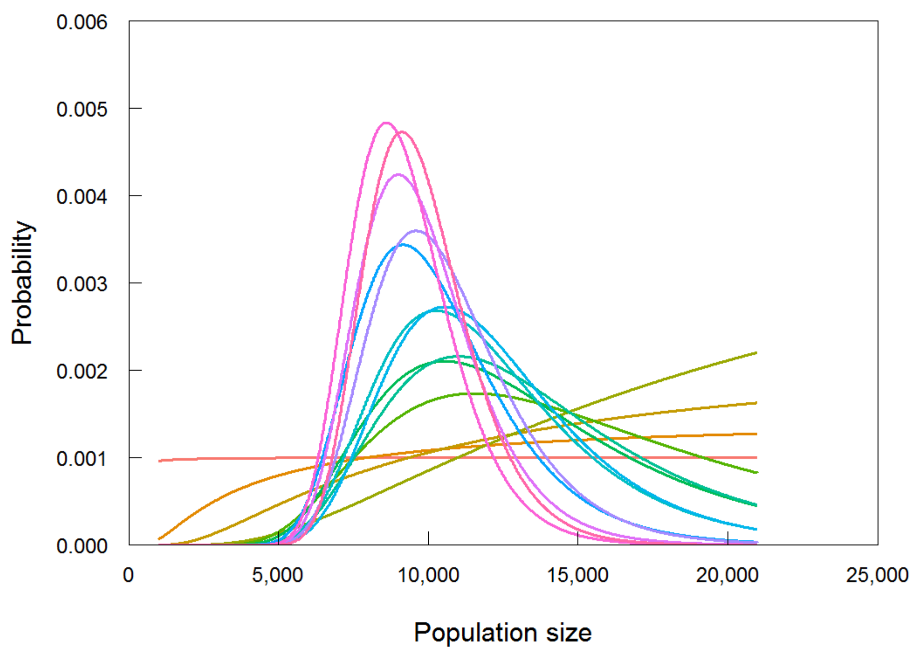

Figure G30: Sequential posterior probability plots of population size for river Section 3 Longnose Sucker in 2015. Each line is the posterior probability updated by a sample day.

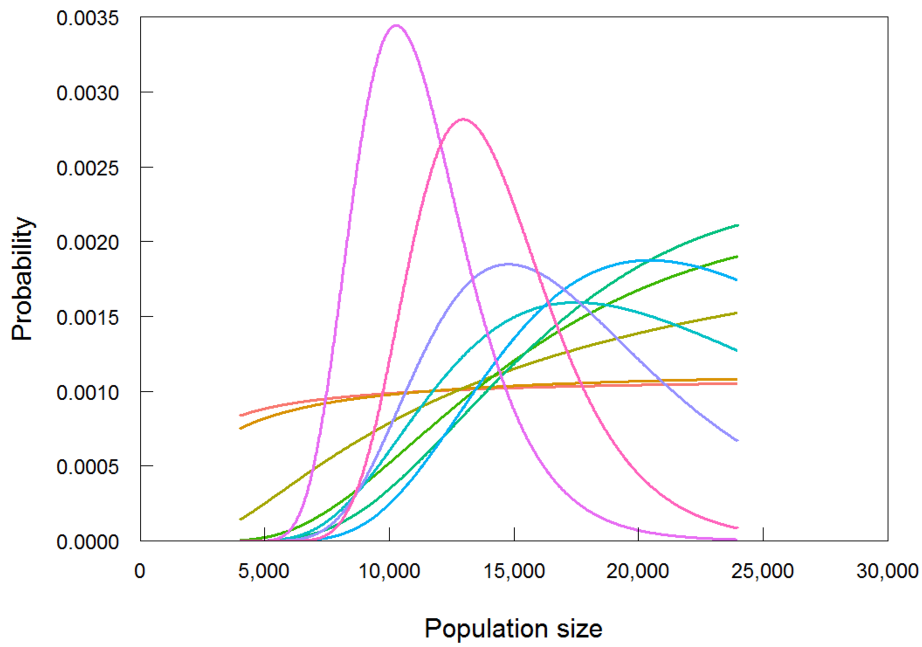

Figure G31: Sequential posterior probability plots of population size for river Section 5 Longnose Sucker in 2015. Each line is the posterior probability updated by a sample day.

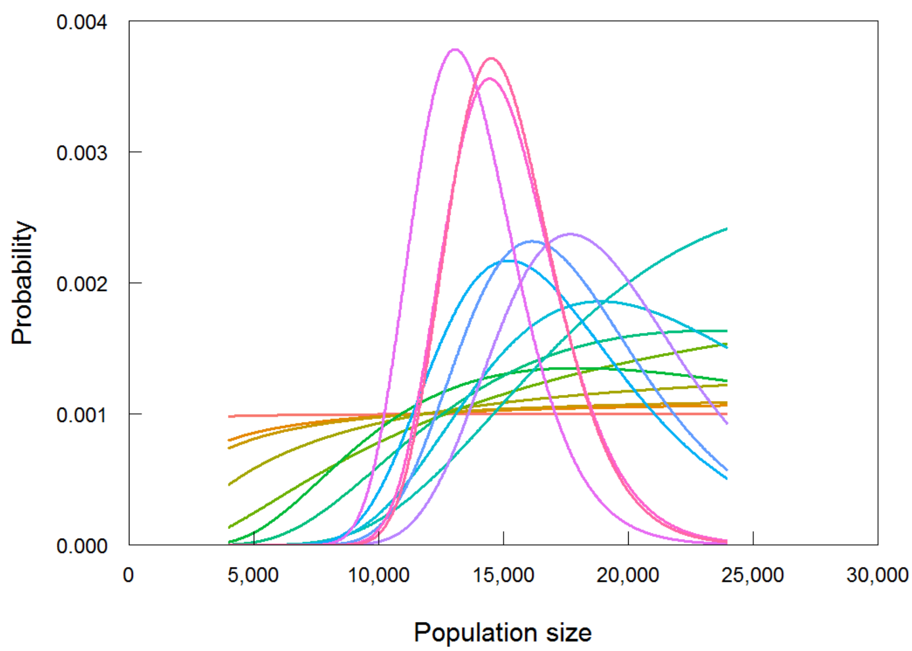

Figure G32: Sequential posterior probability plots of population size for river Section 6 Longnose Sucker in 2015. Each line is the posterior probability updated by a sample day.

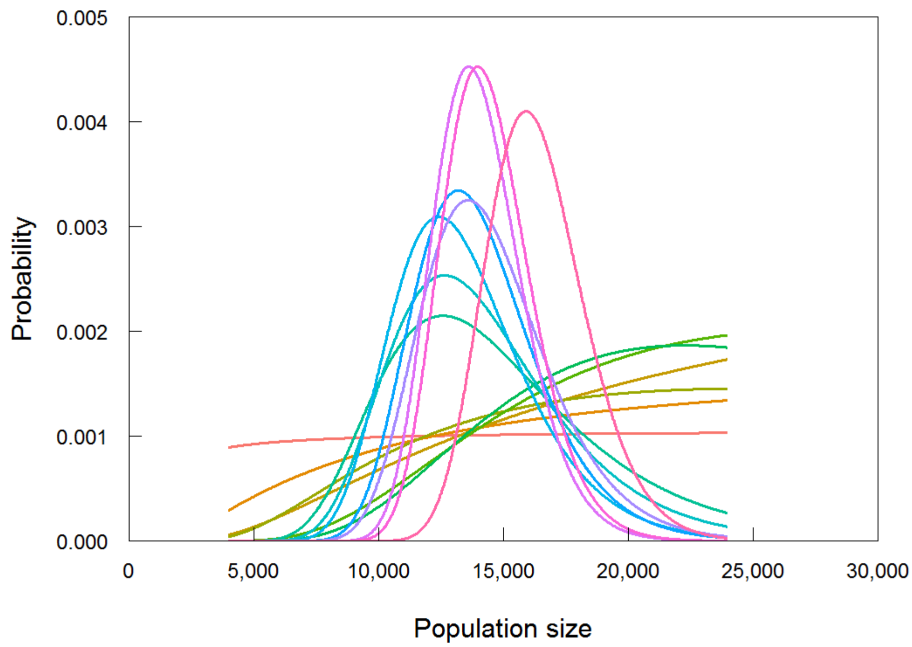

Figure G33: Sequential posterior probability plots of population size for river Section 7 Longnose Sucker in 2015. Each line is the posterior probability updated by a sample day.

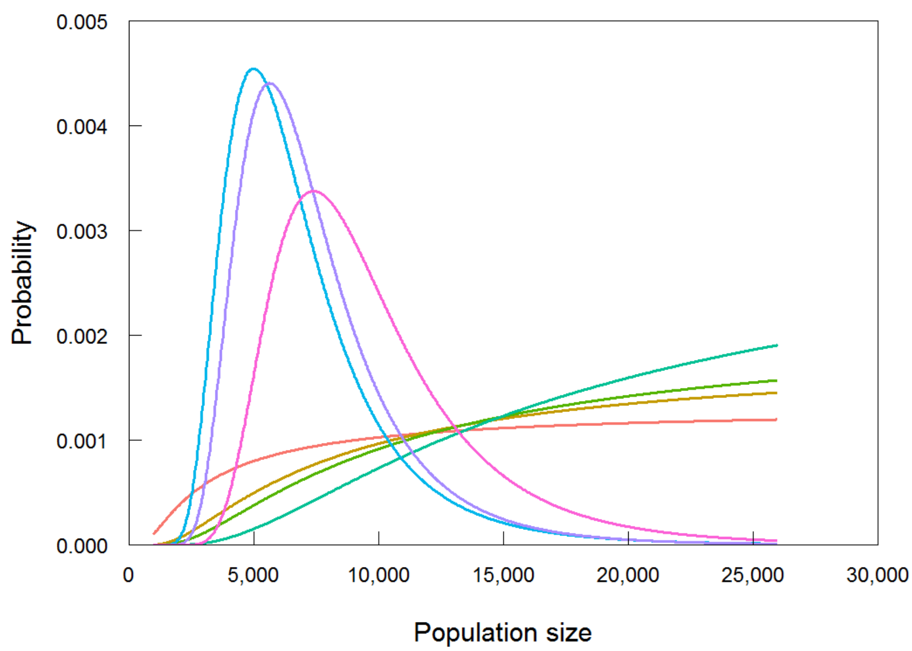

Figure G34: Sequential posterior probability plots of population size for river Section 9 Longnose Sucker in 2015. Each line is the posterior probability updated by a sample day.

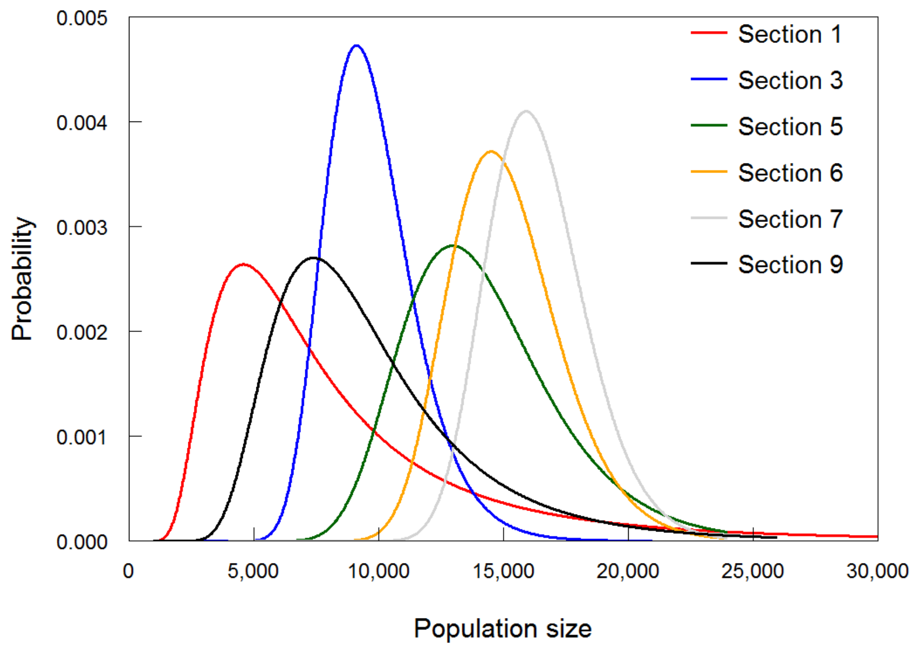

Figure G35: Final posterior distributions by river section for Longnose Sucker.

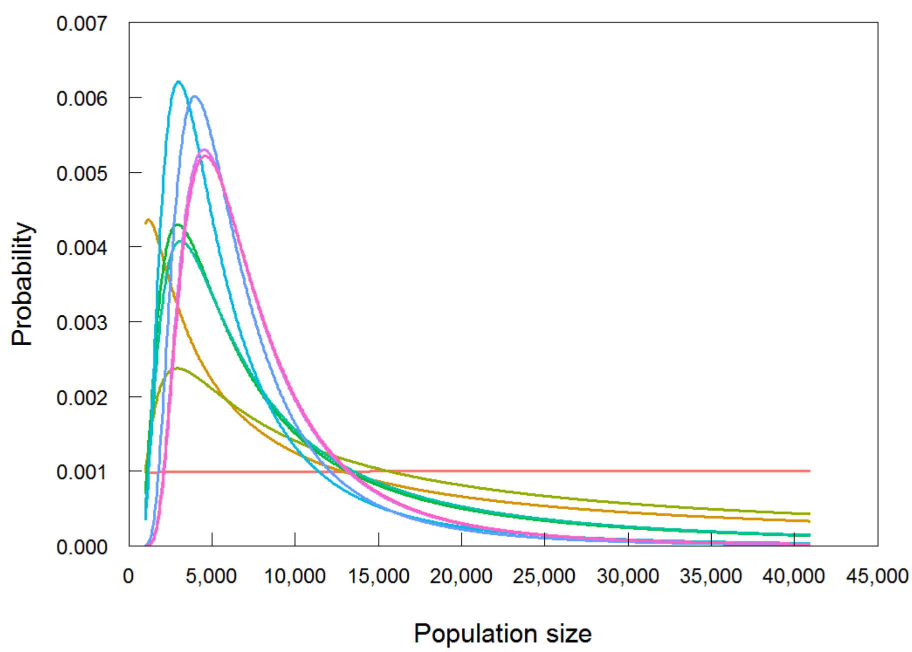

Figure G36: Sequential posterior probability plots of population size for river Section 1 White Sucker in 2015. Each line is the posterior probability updated by a sample day.

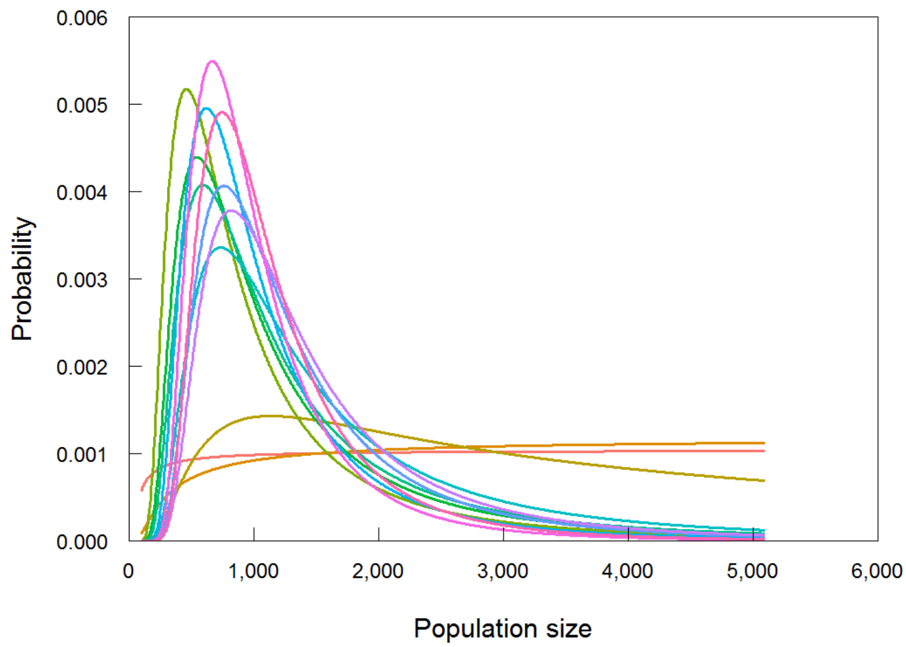

Figure G37: Sequential posterior probability plots of population size for river Section 3 White Sucker in 2015. Each line is the posterior probability updated by a sample day.

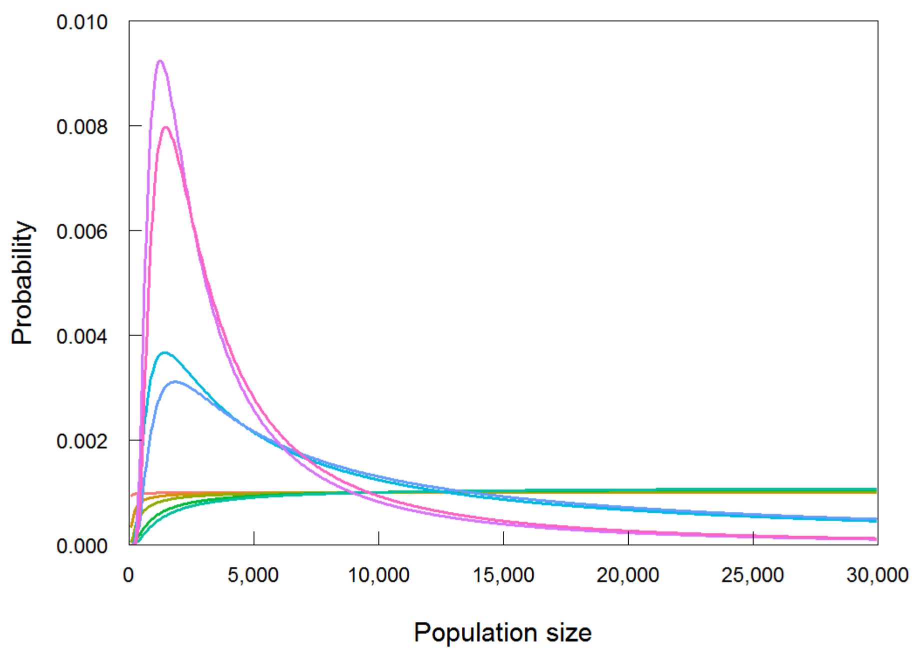

Figure G38: Sequential posterior probability plots of population size for river Section 5 White Sucker in 2015. Each line is the posterior probability updated by a sample day.

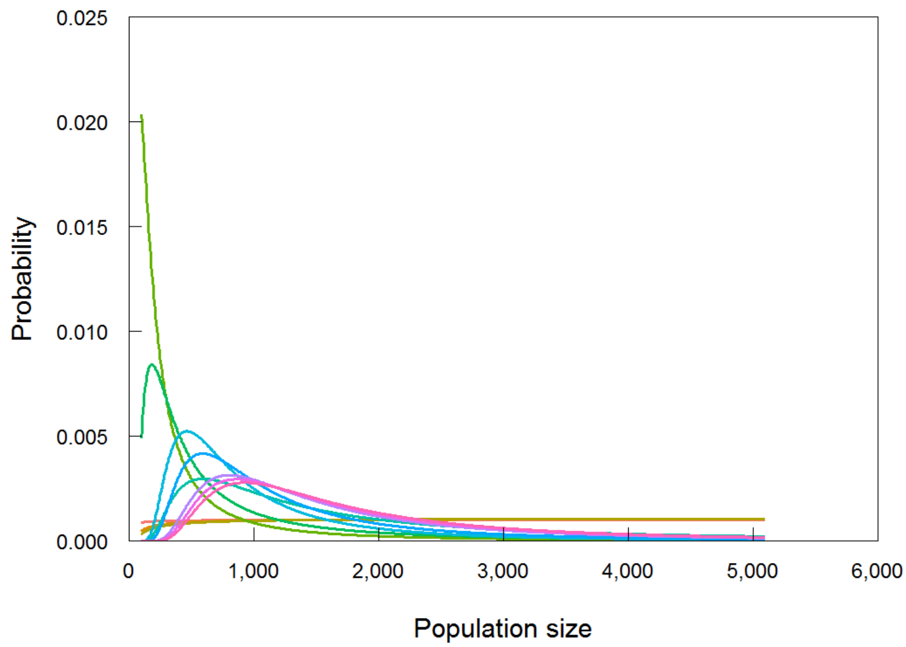

Figure G39: Sequential posterior probability plots of population size for river Section 6 White Sucker in 2015. Each line is the posterior probability updated by a sample day.

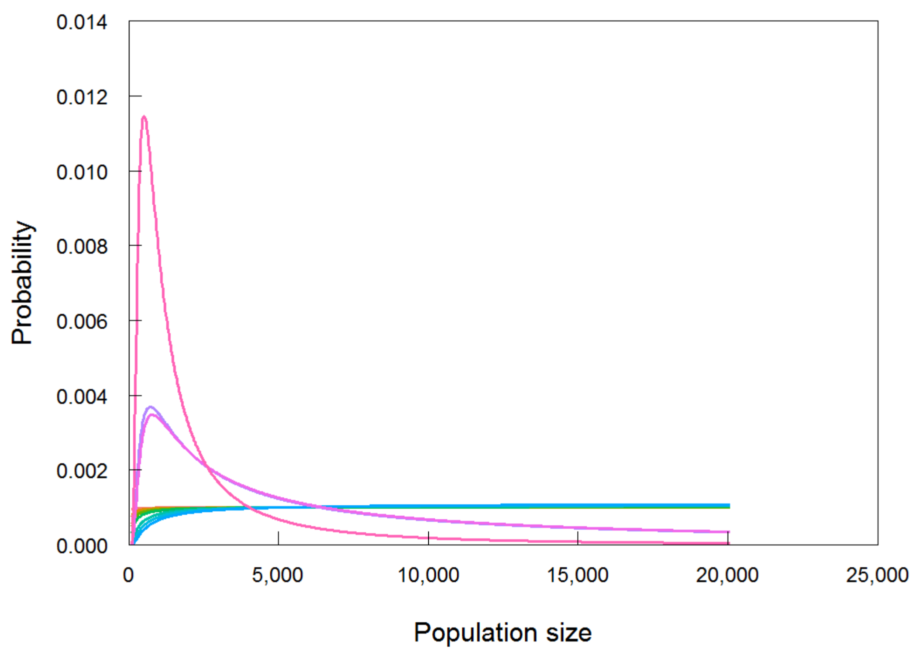

Figure G40: Sequential posterior probability plots of population size for river Section 7 White Sucker in 2015. Each line is the posterior probability updated by a sample day.

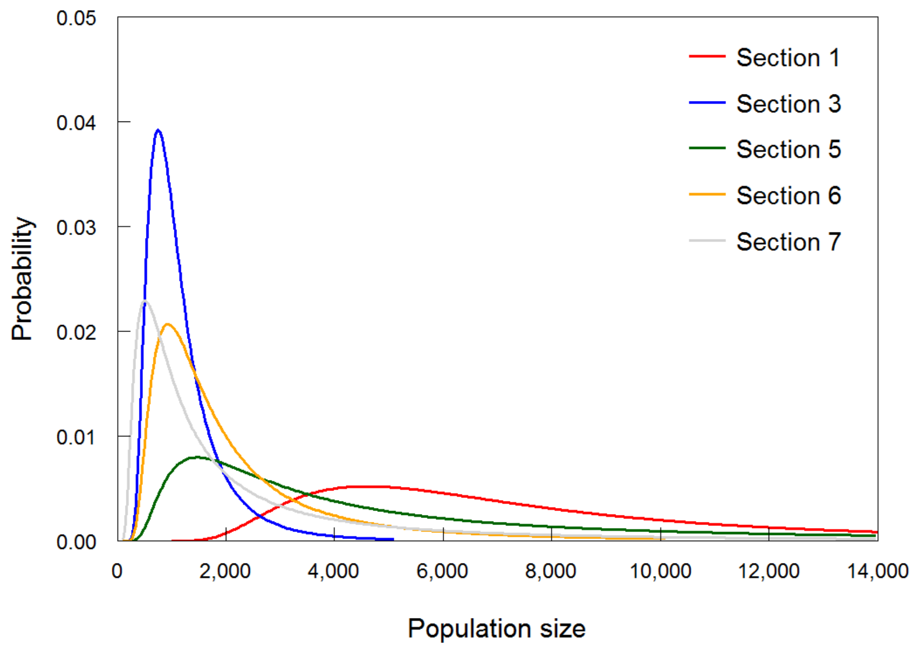

Figure G41: Final posterior distributions by river section for White Sucker.

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Australasia	+ 61 3 8862 3500
Europe	+ 44 1628 851851
North America	+ 1 800 275 3281
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solutions@golder.com
www.golder.com

Golder Associates Ltd.
201 Columbia Avenue
Castlegar, British Columbia, V1N 1A8
Canada
T: +1 (250) 365 0344