# 2018-2019 Funded Projects

This table summarizes approved 2018-2019 funding allocations for technical committee projects.

**Supporting Committee: Rivers**

# of Projects: 16

<table>
<thead>
<tr>
<th>Status</th>
<th>Project Number</th>
<th>Project Title</th>
<th>Delivery Region</th>
<th>Allocated $</th>
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<tr>
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<td>R1702</td>
<td>Steelhead Index Stream Monitoring - Vancouver Island</td>
<td>1 - West Coast</td>
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<td>Completed</td>
<td>R1705</td>
<td>Seymour River Rockslide Mitigation Project</td>
<td>2 - South Coast</td>
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<td>Stellako Spring Fishing Closure Evaluation</td>
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Total Allocated: 408,462
Delivery Region Locations

1. Region 1 West Coast
2. Region 2 South Coast
3. Region 3 Thompson
4. Region 4 Kootenay Boundary
5. Region 5 Cariboo
6. Region 6 Skeena
7. Region 7a Omineca
8. Region 7b North East (Peace)
9. Region 8 Okanagan

<table>
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<tr>
<th>Project Categories</th>
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<tr>
<td>Aquatic Invasive Species</td>
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<tr>
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<td>Guardian Programs</td>
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<td>Habitat Maintenance, Restoration &amp; Enhancement</td>
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<td>Research &amp; Development</td>
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<td>Stock Assessment</td>
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<td>$408,462</td>
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This project continues long-term steelhead stock assessment data collection on key Vancouver Island streams. A combination of methods including direct underwater observation (snorkel survey) and electrofishing assessment were used to determine relative abundance, habitat saturation and an estimate of absolute steelhead abundance in the Englishman River.

Winter steelhead snorkel surveys were completed, and results were contrasted against historic indices of abundance on the Englishman (1998–2019) and Gold (1998–2019) rivers. Summer steelhead snorkel surveys are summarized for the Tshitka (1976–2018), Heber (1975–2018) and Gordon (1985–2018) rivers. This year’s results indicate relatively low steelhead abundance across their range for both summer and winter stocks.

Assessment activity on the Gold River in 2017 led to a successful application by the British Columbia Conservation Foundation (BCCF) for funding from the Habitat Conservation Trust Fund (HCTF) to continue stock assessment in relation to the decline of Gold River steelhead. This five-year project is moving into its second year.

The winter snorkel survey conducted in the Gold River during 2019 counted only four steelhead in 7.8 km of habitat, indicating a large decline over benchmark conditions.

Electrofishing data are summarised for the Cowichan (1999-2018), Englishman (1998-2018) and Gold (1990; 2017-2018) rivers. Gold River was added in 2018 in response to a large decline in adult and juvenile abundance noted in 2017. Future assessment activities will continue through 2022 under the BCCF’s Gold River steelhead assessment program.

Steelhead fry density on the Cowichan River continues to be below the 5-year average, but may be near the minimum abundance required to saturate available parr habitat (Ptolemy, pers comm). Steelhead density on the Englishman River is consistent with the small estimated adult population, and is likely below or near the minimum abundance required to saturate parr habitat.

Englishman River peak counts of 26 steelhead in the spring of 2018 yielded a population estimate of 72 steelhead and is below the lower quartile values within the intensively monitored years of 2002 – 2018. The spring 2019 peak count of 45 adult steelhead yields a population estimate of 135 and is near the average of the intensively monitored period. This level of abundance places the Englishman River in the Extreme Conservation Concern Zone based on both the absolute population size and our understanding of this stock.

These data are important for the management and maintenance of steelhead populations and angling opportunities on Vancouver Island. Additionally, this information builds upon available long-term trend monitoring inside and outside of the Georgia Basin.

Tracking No.  R1702  Year 3 of 3  Total Spent to Date $80,935
Seymour River Rockslide Mitigation Project

Status: Completed

A December 7, 2014, rockslide deposited over 50,000 m³ of rock into the Seymour River canyon approximately 3 kilometres upstream of the river mouth, blocking access of anadromous salmonids to most of the watershed’s productive fish habitats in the 15km of river and tributaries upstream of the slide site to the Seymour Falls Dam. Due to conservation concerns, the entire river was closed to angling soon after the slide, resulting in the loss of a quality river angling opportunity very close to a major urban centre.

A large group of stakeholders determined that a long-term (up to 5 years) rock breaking/removal project to restore fish access past the slide area was needed to sustain the river’s fish populations and allow re-opening of the recreational fishery.

The 2018 summer work season was the final year of a three-year project proposal submitted to FFSBC. Partial funding was requested from FFSCBC for each of the three seasons of rock work.

The third season of work continued the breakdown of large immovable rock using low impact explosives to achieve a continuous channel at a uniform 10% grade through the slide area to allow successful upstream migration of adult salmonids past the slide. At completion of the third season, a relatively uniform channel grade was attained in the downstream section of the slide area but a steep, 2 to 3 m (vertical), section remains in the upstream slide area thus, an additional one or two years of rock breaking are required to complete work on the upper section.

It is recommended that the FFSBC continue to support this project as much as possible until upstream access past the slide is achieved as this is critical to the sustainability of the river’s steelhead and salmon populations and critical to the restoration of a quality river fishing opportunity very close to a major urban centre.

Tracking No. R1705 Year 3 of 3 Total Spent to Date $210,000

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The Lower Fraser River supports a provincially significant catch and release fishery for White Sturgeon and is the main migration corridor for many lower mainland and interior Fraser Steelhead populations, including the Thompson/Chilcotin Interior Fraser stocks which are undergoing the emergency SARA listing process. White Sturgeon and Steelhead are also incidentally captured during commercial, and First Nation (FN) salmon net fisheries (i.e., FSC and EO), which can result in serious unintended consequences to these important provincially managed species. Although recreational, commercial and FN fisheries have monitoring programs in place (e.g., recreational catch and effort, DFO catch monitoring), reporting requirements, participation and enforcement differ among the various fisheries, areas and gear types, making it difficult to assess compliance, effort and bycatch (Cohen 2012). Many fishers are also unaware of some of the critical habitats or sensitive time periods for these species, or of best practices around angling and releasing fish safely. In addition, longstanding social, economic and cultural differences among the various fisheries can result in conflicts between fishers which can lead to further management challenges and difficulties in obtaining accurate data. Overcoming these obstacles through collaboration with all river users is critical to the conservation of these species and their habitats in the Lower Fraser River.

In 2017 the Province (Region 2) implemented a five-year lower Fraser River Guardian Program. The Objective of the program is to promote awareness and conservation of white sturgeon and steelhead through collaboration with FNs, recreational anglers and other Lower Fraser River users. As in 2017, in 2018, two RGs conducted 52 days of on-river surveys conducting 497 recreational angler interviews, 136 net fisher surveys, removed 13 abandoned gill nets and completed 2 sturgeon rescues. Interviews and surveys promoted education and awareness on proper angling practices and net fisheries and collected a range of data including but not limited to, angler compliance, catch and effort, licensing requirements, infractions and conservation.

Notable results of the 2018 program included:
• Angler compliance with voluntary angler closure areas and handling was high, but knowledge and awareness of best practices was mixed.
• Guided and non-guided angler composition contrasted that observed in the sturgeon catch and effort monitoring program.
• Observed concerns with inexperienced, non-guided anglers.
• Net fisheries are utilizing critical sturgeon habitat and intercepting critical steelhead stocks; however, the socio-economic complexities facing the net fisheries are challenging, requiring further dialogue and engagement with fishers.

Results observed and lessons learned in Year 2 of the 5 year program provided regional fisheries managers with information about current angling pressures and future angling regulation requirements, highlighted knowledge gaps and issues with existing monitoring programs and prompted potential changes to existing licensing requirements. In addition, the results revealed some of the complexities around existing net fisheries and how best to work with net fishers to reduce incidental mortalities of sturgeon and steelhead.
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<td>R1903</td>
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The Thompson Region Guardian project is a collaborative effort between the Conservation Officer Service (COS) and the Fish and Wildlife branch of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD). The project is designed to provide additional education/outreach, compliance and data collection capacity in some of the region’s more unique, wild-stock fisheries. During the 2018 – 2019 season, the project focused on several river fisheries and two large lake fisheries, including: the North Thompson, South Thompson, and Thompson Rivers, the Clearwater River, Kamloops Lake and Shuswap Lake.

Project objectives include:
1. Assist with fishery implementation by way of improved compliance with angling regulations and guiding restrictions.
2. Promote angler knowledge and best handling practices for fish being caught and released.
3. Better understand the extent by which the fisheries are being used at the present time, the composition of those using the fishery, and the current quality of the fishing and the fishing experience.
4. Collect angler feedback regarding management of the fisheries.

Outcomes for the Guardian project include:
1. Expanded monitoring on Shuswap Lake Catch and Release fishery for additional two weeks of fishing opportunity beginning in mid-May.
2. Expanded monitoring on South Thompson and Kamloops Lake to help implement changes made to the sport fishery regulations in 2017.
3. Improved angler compliance.
4. Enhanced integration between fishery management and fishery enforcement personnel.
5. Diversified angling opportunity on the Clearwater River by way of new angling regulations in place for 2019 season.

| Tracking No. | R1611 | Year | 4 of 5 | Total Spent to Date | $151,940 |
Kootenay River Guardian Program (non-CW)

Status: Ongoing

Objectives
Compliance presence on priority non-classified stream systems in Kootenay Region through RG angler compliance checks/inspections
• River Guardian compliance presence
• Compliance trend data with goal of stable to decreasing non-compliance rates
• Compliance data obtained from 100% of angler interviews

Greater level of protection for vulnerable wild stock BT, WCT and other native fish populations through data collection and RG presence

Gauge, maintain and/or improve high quality angling opportunities and experience
• River Guardian angler survey data: effort, catch, CPUE, species composition, effort and catch distribution, targeted species, angler demographics, quality of angler experience and misc. human dimensions data for each system. Data critical for informing fisheries management decisions

Provide public and angler education/outreach; River Guardians develop and deliver education and public outreach messaging during angler interviews, stakeholder meetings, educational signage, etc.

Collection of baseline BT and WCT population data to estimate abundance and predict population trends/conservation concerns and inform regulations
➢ BT inventory & reconnaissance (including spawner index identification and redd counts) in the Lussier, Findlay and Wildhorse systems. Purpose is baseline population data to inform regulatory decisions and meet management objectives in balancing angler opportunity and species conservation
➢ WCT inventory (abundance/density estimates) where identified on nonclassified systems. Most likely locations are Lussier, Findlay and Wildhorse systems, where anecdotal and preliminary survey data indicate conservation concerns. Purpose is baseline population data to inform regulatory decisions and meet management objectives in balancing angler opportunity and species conservation

Outcomes:
• RG compliance presence on non-classified priority streams in Kootenay Region through active patrols on all identified systems (based on randomized priority schedules)
• Areas identified with specific non-compliance concerns and baseline compliance data established (short term). Long term goal of stable to decreasing non-compliance rates
• Identified quality fisheries and areas with concerns. Objective to ensure sustained or improved high quality angling opportunities and angler experience. Data will inform management strategies
• Active public outreach and education on all systems
• RG angler survey (creel) data on all systems
• Baseline population/inventory data for BT and WCT where needed in priority nonclassified waters

Activities achieved this fiscal:
• River Guardian angler surveys (catch, CPUE, method, demographics, quality of experience, etc.) and angler compliance/inspections on the Salmo, Lussier, Findlay, Wildhorse, Flathead and upper Kootenay River (non-classified)
• Outreach and angler education conducted on all identified systems
• Preliminary Bull Trout inventory baseline data on 2 non-classified waters; Wildhorse and Lussier (index ID and redds)
• WCT and BT habitat assessment/baseline population assessment on Findlay River
• RG angler survey, compliance/enforcement and outreach/education activities on the Kootenay River winter-spring fishery
• Data analysis and reporting

Tracking No. R1615 Year 4 of 5 Total Spent to Date $153,666

2018-2019 Rivers Projects
Dean River Steelhead - Juvenile Assessment

Status: Ongoing

The Dean River supports a high value summer run steelhead fishery. The fishery is monitored via an annual river guardian program. Through the guardian program, a long time series of catch and effort data has been recorded. Historically, catch data alone has been utilized to monitor stock status. While this was sufficient through the 80s and 90s when escapements were consistently high, returns have been increasingly variable over the last decade. Given the high value of the fishery and well documented issues with using catch data to monitor stock status, there is a need to collect fishery independent data to calibrate the annual creel.

Thus, a juvenile study was proposed in 2015 as a cost effective method to calibrate the annual creel and develop biologically based conservation reference points. Specifically, the relationship between catch recorded in the creel and subsequent fry and parr densities is being evaluated. Multiple years of assessment over a range of catches will be required to quantify these relationships; therefore, this project was submitted as a 5 year project. The information gathered over the course of this study will be used in conjunction with existing juvenile and creel data from previous years to achieve the objective of calibrating the annual creel.

The same methods successfully utilized to develop conservation reference points for Bella Coola steelhead are being used on the Dean. Sixteen index sites have been identified to collect juvenile data. For each of the sixteen index sites, standard two pass removal electroshocking methodology was used to develop HSI adjusted fry and parr densities. All sixteen sites were successfully sampled in 2018. Additional, years of data will be required to provide a quantified calibration of the annual creel. This project remains on track.

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This project is capitalizing on investments currently being made through the ongoing HCTF/FLNRORD/MOE/FFSBC Quesnel Lake exploitation project. An acoustic array has been set up which includes a total of 34 receivers distributed throughout Quesnel Lake as well as the Mitchell and Horsefly rivers. The Quesnel and Cariboo rivers also have known bull trout populations, however, very little is known with regards to habitat use, distribution or migratory behaviour. In addition, despite the presence of recreational fisheries that support both guided and unguided effort, there is a general lack of information with regards to current exploitation.

Preliminary results from the Quesnel Lake exploitation project indicate bull trout stocks within the Quesnel River watershed are being exploited across a range of lake and stream fisheries, which includes the Quesnel and Cariboo rivers. In many instances, current angling regulations are not consistent across these fisheries. This project was initiated to provide the basic information required to sustainably manage blue listed bull trout across the watershed. Results of this project will be used directly to develop sustainable angling regulations; inform future habitat protection measures and develop an effective population monitoring plan.

As planned, year 4 of this project was focussed on downloading and maintenance of acoustic receivers deployed within streams across the Quesnel River watershed. Ten acoustic receivers have been successfully deployed in the Quesnel, Cariboo and Horsefly Rivers, which when added to the 24 receivers in the lake, provides excellent acoustic coverage for detecting movements throughout the system. During the first three years of the study, thirty bull trout were successfully tagged with five year acoustic tags. Tags were distributed across the Quesnel and Cariboo rivers. All acoustic tagged fish were also marked with high reward floy tags, consistent with methodology currently being utilized on Quesnel Lake. The high reward tags provide an incentive for anglers to report re-captured bull trout and ultimately improve our understanding of exploitation dynamics within the system.

FFSBC funding received in 2018/2019 was utilized to hire contractor support to deploy, download and maintain acoustic receivers. Funding to purchase receivers and tags for this project was secured through FLNRORD. This project remains on track and on budget.

| Tracking No. | R1618 | Year  | 4 of 5 | Total Spent to Date | $52,498 |
Our first objective is to identify and prioritize Bull Trout index streams for the Skeena Region. We have made good progress in this respect, confirming five index reaches in three index streams, representing two different ecotypes of Bull Trout.

Our second objective is to annually estimate an index of abundance for Bull Trout in these key monitoring streams. Our success at this objective is yet to be determined. In years where redd survey conditions have been good, abundance estimates appear feasible. However, uncertainty still exists about the number of fish per redd, the possible contamination of some survey reaches with Coho redds and sightability issues relating to crew experience, water level and turbidity.

Our third objective is to refine survey methods in order to determine the efficacy of these surveys with which to make management recommendations. We have been able to refine our survey reaches and methods but to date have not collected enough information to be able to determine if redd surveys will be sufficient information to base management recommendations on.

Our fourth objective is to improve the delivery of Bull Trout angling management regulations. We have made significant improvements on this front by partnering with the Gitanyow Fisheries Authority to enumerate and identify char using the Kitwanga River watershed. Some uncertainty remains in this population with respect to species composition, age structure, age at maturity and number of subpopulations, however early results indicate that there may be enough information to base management actions on.

Our fifth objective is to share our experience to inform other jurisdictions and agencies with information on possible BT management strategies. We have taken advantage of limited opportunities to work with other regions and agencies to refine Bull Trout assessment methodologies, but as yet have not collected enough data to share concise recommendations with partners.

Activities completed this fiscal:
• Redd surveys in Magar East and West tributaries
• Redd surveys in Gosnell and Denys Creeks
• Exploratory surveys & BT tagging of the Dease, Cottonwood and Eagle rivers
• Expanded temperature monitoring
• Collection of genetic material for stock discrimination analysis
• Partnership with Gitanyow First Nation including abundance and biodata collection.

| Tracking No. | R1610 | Year 4 of 5 | Total Spent to Date | $58,752 |
### Stellako Spring Fishing Closure Evaluation

**Status:** Completed

In spring 2017, MFLNRORD with the financial support of HCTF and FFSBC initiated a two year study to evaluate risks and benefits related to a potential earlier start to spring angling on the Stellako River, which is home to one of BC’s best-known stream fisheries for Rainbow Trout, and which is currently closed seasonally between November 15 and June 1. The study was motivated by the desires to: 1) maintain or increase angler opportunity on the Stellako River while ensuring conservation, and 2) identify a potential offsetting measure for high water temperature-related closures in summer, should they be required in future depending on climate conditions. While year 1 was completed, in year two high water conditions compromised the Stellako River study. Evaluating the risks and benefits of extending the Stellako fishery into May, one of the key objectives of this project, will require further work in future.

A key outcome of the program, for the first time rainbow trout spawner use of habitats in Stellako River was confirmed through a combination of redd site confirmation and spawning behavior observations in 2017. Taken together, the spring surveys of potential fishery quality and spawner vulnerability, in combination with quantitative population monitoring during conditions of suitable detection probability in July (30 years of swim count data on record), provide a sound basis for science-based decisions about the potential expansion of the Stellako River angling period.

**SECTION**

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<td>R1802</td>
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<td>$28,148</td>
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### Upper Fraser Bull Trout Management Evaluation

**Status:** Ongoing

This project aims to provide management guidance for Omineca decision makers, who are being asked by anglers to open the Nechako River to bull trout harvest. In response to this request, biologists have radio tagged nearly 200 bull trout and monitored them using fixed and mobile tracking. Additional work has included stream surveys throughout the upper Fraser watershed, genetic samples and mark-recapture. We have a graduate student who is analyzing this data to provide science-based management advice for this meta-population. This fiscal, we have:

1) published one paper on the productive capacity of bull trout based on a meta-analysis
2) successfully applied for a 2-year MITACS grant to provide matching funds to the student

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Two high-priority knowledge gaps have been identified by the Peace Region Fish and Wildlife Compensation Program (FWCP) that limit the program’s ability to initiate conservation and enhancement actions for Arctic Grayling of the Parsnip River watershed. These are: 1) the lack of recent abundance monitoring indicating population trend and total adult population size, key indicators of conservation status, and 2) the lack of monitoring data delineating critical habitats, which is needed for planning conservation and enhancement actions. In this study we address these two information gaps using a snorkeling survey methodology in the Anzac and Table river watersheds, thereby aligning the study with FWCP Streams Action Plan (FWCP 2014a) priority action 1b-3.

The present Parsnip Arctic Grayling abundance monitoring study had three objectives for 2018 field studies:
1. To replicate snorkeling counts of Arctic Grayling within index reaches using three independent crews, to investigate the repeatability of counts across a realistic range of crew experience levels.
2. To acquire counts of Arctic Grayling and other species in 6 long-term index sites in the Anzac River and Table rivers, using a snorkeling survey methodology consistent with past surveys up to 2007, and to evaluate trend over time for Arctic Grayling in the Parsnip River watershed.
3. To acquire counts of Arctic Grayling and other species along the entire accessible length of the Anzac River using a single-pass snorkeling survey methodology, in order to estimate total population size and delineate critical summer rearing habitats for adult and subadult grayling.

In three reaches surveyed by three independent crews, repeatability of snorkeling counts of Arctic Grayling >20cm was relatively high across a broad range of mean snorkeler experience among crews ranging from >20 years to <5 years. The coefficient of variation (CV) ranged from 4.1% to 19.9% among the three locations averaging 11.1 (±4.6)%, close to our target level of 10%. However, size estimation varied widely among crews in replicated reaches. Positive size estimation bias was evident and related to crew experience, indicating the need for improved size calibration using more realistic fish-size models in future swims.

In August 2018, Snorkeling counts of Arctic Grayling in long-term index sections of the Parsnip River watershed were the highest on record for 5 of the 6 sites surveyed (all but the lowest Anzac River site between 16km-12km; measured along the stream from the mouth). Analysis of population trend with a linear mixed-effects model, with Year as the fixed effect and Stream and Site as nested random effects in the model, indicated a significant increase in the abundance of Arctic Grayling >20cm in index sites over the 1995-2018 period (P = 0.014). However, at this point in time we consider this appearance of a positive trend to be provisional and requiring corroboration in 2019 and beyond, for two important reasons. First, with a hiatus of more than 10 years in the snorkeling count program, the abundance data are not balanced across time. Secondly, we have uncertainty about whether the extreme low water conditions observed in August 2018 may have affected counts of Arctic Grayling, for example because of higher detection probability or increased concentration of individuals in index sites related to low water conditions.

In addition, we conducted single-pass snorkeling surveys along a continuous section of the Anzac River extending nearly 50km from 56km to 5.8km. These surveys included 8.6km of stream habitat in which Arctic Grayling were discovered upstream of a chute obstruction at 47km that was previously thought to a migration barrier. The core of the Arctic Grayling distribution in 2018, as indicated by consistently high counts in surveyed reaches, extended from the 47km chute downstream for more than 30km to 16.6km, across several distinct zones of channel confinement, stream gradient, and land use. Counts of Arctic Grayling were consistently low in the lower 16.6km of the Anzac River mainstem, which is characterized by several major braids limiting pool frequency and depth, and a low gradient, meandering channel.

With the resumption of Arctic Grayling population monitoring in the Anzac River and Table River watersheds, we have an improved basis for assessing conservation status. After updating categorical estimates of Trend,
Adult abundance, Distribution, and Threats, parameters in the Core Area Conservation Status and Risk Assessment Methodology (USFWS 2005) used to evaluate status of British Columbia Arctic Grayling populations, we computed a ranking of ‘C3-Potential Risk’ for the Parsnip core area. This ranking is provisional and depends upon future corroboration of the abundance trend estimate, given that this is the first year of abundance monitoring data following an 11-year hiatus since 2007.

Importantly, the core of the Arctic Grayling summer rearing habitat lies adjacent to the existing road network, where intensive forestry and road building activity is now underway. Spruce beetle salvage harvesting is a threat to Arctic Grayling populations and has the potential to affect peak flows, sediment delivery, and water temperature in critical habitats. Therefore, the urgency for habitat conservation and restoration actions is high in critical Arctic Grayling rearing habitat of Parsnip River watershed.

In August of 2017, fisheries managers received a number of reports of bass being caught in the Kettle River. Bass are considered an invasive species and are non-native to the Kettle River watershed. The key fisheries management concern was that bass can proliferate quickly, take over the habitat, and consume juvenile fish stocks and their food sources; thereby negatively impacting the resident rainbow populations and recreational fishery. In addition, bass could have a devastating effect on the native speckled dace population which are listed as an Endangered Species.

The intent of this project was to confirm the presence, species composition, extent of distribution, and scale of impact of bass in the Kettle River watershed. If warranted, a management strategy would be developed to mitigate impacts on resident stocks and maintain a quality fishery.

Environmental DNA (eDNA) sampling was used to detect presence/absence of small and largemouth bass. Nine sites were selected for sampling between Midway, BC downstream to Cascade Falls. Sampling was conducted in the spring (during bass spawning), fall (during low flow) and again in the winter, as detection rates can vary with streamflow levels, water velocity and temperature. Water samples were filtered & preserved within 24 hrs of collection and samples sent to the U-Vic lab for analysis.

Results: Largemouth bass were detected in low concentrations in two locations on the Kettle River: 1). Johnsson Slough and 2). Gilpin Grasslands. Both of these sites are located near the City of Grand Forks. Fortunately, small mouth bass were not detected and no evidence was found that they are present in the lower portion of the Kettle River watershed.

Signage and coordinated messaging was developed, requesting anglers to notify provincial fisheries staff of any bass caught in the system. We were relieved to discover that small mouth bass were not present in the Kettle River. Although largemouth bass are present, they were detected in very low concentrations and the geographical area appears to be limited (15 km stretch of river between the city of Grand Forks and Christina Lake, BC). Largemouth bass tend not to overwinter well in river environments, therefore the risk to resident stocks is lower.

The primary operational outcome of this project was to sustain angler opportunity in the Kettle River, maintain the quality rainbow trout fishery and conserve resident stocks, including Canada’s only speckled dace population. Resident stocks appear stable. Drought, including low stream flows and high water temperatures, appears to be having more of a negative impact on resident fish stocks than the presence of largemouth bass. That said, stocks will continue to be monitored to ensure trends over time do not change.
The objective of this project is to collect information on angler effort, catch, harvest, compliance rates and stock status in order to make a scientifically-defensible management decisions for Onchorhynchus mykiss (rainbow/steelhead) sport fisheries, including the need for regulation changes and implementation of stock conservation or protection measures.

Accomplishments for 2018 include completion of 81 angler interviews on 3 river systems in the Okanagan Region including, the 1). the Okanagan River, 2). Similkameen River, and 3). Kettle River. Forty-eight percent of anglers interviewed on the Okanagan River and 33% of anglers interviewed on the Similkameen River in 2018 were found to be non-compliant (ie. prohibited gear, no license, fishing <23 m from a dam/drop structure). Only 8% of anglers on the Kettle River were found to be non-complaint. Continuation of the river guardian program in 2019 will help educate anglers, reduce the non-compliance rate by providing a continued enforcement presence, collect vital information on angler effort exploitation, and thereby help to maintain sustainable wild stock fisheries for steelhead and rainbow trout in the Okanagan Region.

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**Okanagan River Guardian Program**

**Status:** Ongoing

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**Tracking No.** R1907  **Year 1 of 3**  **Total Spent to Date** $17,760

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**Develop Quantitative Capacity, Tools and Project Alignment**

**Status:** Completed

**Introduction:**
- This project will cover travel, lodging and per diem for the Quantitative Assessment Team (QAT) and one interested non-QAT biologist from the region most affected by the project being considered.

**Project Objective(s):**
- Identify one critical quantitative analysis each year that the QAT will tackle;
- Facilitate learning within the QAT and use this to build regional quantitative capacity • Align quantitative stock assessment methods and priorities between regions

**Methods:**
This was a meeting with Hillary Ward, Brett Van Poorten and Trevor Davies at UBC in the summer of 2018. As time was limited (most of a single day) the day was restricted to a brain storming session regarding Provincial data needs and Trevor Davies ran a tutorial session about building Shiny Apps.

**Results:**
The results were the development of the Shiny tool for the invasive species model that Brett developed. Brett presented this at the FFSBC technical meeting in January 2019.

**Discussion:**
Accessible user interfaces are extremely beneficial in the roll out and use of assessment tools that biologists employ to support fisheries management. Although our group was small I was able to facilitate the development of an attractive and effective user interface for the rapid assessment tool for invasive species. Recreational benefits achieved as an outcome of this project:
Invasive species are an increasing threat to the Province’s recreational fisheries. The development of this tool will allow broader adoption by provincial biologists to make rapid and cost effective strategies for their control and potential eradication.

**Tracking No.** R1901  **Year 1 of 1**  **Total Spent to Date** $513