



## Message from the board chair

Welcome to our annual report covering the key highlights, decisions, and expenditures in our Peace Region for the fiscal year 2019—2020 (F20), from April 1, 2019, to March 31, 2020.

In this reporting year, 26 fish and wildlife projects were approved by our Peace Region board. The 17 wildlife and nine fish projects represent a total project commitment of approximately \$1.5 million.

The FWCP study of mercury levels in fish from the Williston-Dinosaur Reservoir watersheds was completed this year. This was a multi-year, comprehensive study that measured current mercury levels in five fish species in the Williston and Dinosaur Reservoir watersheds and reference areas. We continue to work closely with Indigenous Nations to share the results. We will also continue to engage with the provincial health authorities responsible for fish consumption guidance about the results of our study. [Read](#) the final report and public summary.

Another important achievement this year was initiating updates to our Peace Region action plans. Action plans guide FWCP investments in fish and wildlife projects, and are referenced annually by our regional board to track progress toward implementation, set annual priorities, and guide decision-making. Our Peace Region's action plans were initialized in 2014, and have been used since to guide more than \$7.1 million in project funding toward more than 114 projects. The work in F20 included completing a strategic project review, early engagement in late 2019 and early 2020 with our FWCP partners and subject-matter experts across the region, and planning for broad public and stakeholder engagement in spring 2020.

In late 2019, an independent, third-party [evaluation and financial audit](#) as required by our governance manual was completed. The audit, which looked at each of our three regions, was conducted by Ference and Co. and resulted in nine recommendations to refine, support, and strengthen our approach to conserving and enhancing fish and wildlife in watersheds impacted by BC Hydro dams.

The summary and final reports, which include the auditor's recommendations, were posted to [fwcp.ca](http://fwcp.ca) in October 2019 and our regional boards began work to respond to the recommendations. Since receiving the final report in fall 2019, we have prioritized the recommendations and developed actions to address each one.

We recognize some recommendations will build on each other and a staged, strategic approach is required. As a result, several recommendations have been prioritized for immediate action and progress is underway. Others will be addressed in sequence, as we balance progress on the audit recommendations with the ongoing delivery of fish and wildlife projects in our three regions.

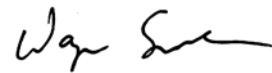
We are committed to reporting on our progress and will provide annual updates addressing all recommendations in our annual reports starting in 2021. Contact our program manager or regional manager anytime if you have questions.

Thank you to the many stewardship groups, consultants, First Nations, agencies and others who apply for a grant and do the projects to help us work toward our vision of thriving fish and wildlife populations in watersheds that are functioning and sustainable. We couldn't do it without you and the support of our board, First Nations Working Group, technical committees, and staff.

Sincerely,



Trevor Oussoren  
FWCP Peace Region,  
Board Co-Chair



Wayne Sawchuk  
FWCP Peace Region,  
Board Co-Chair

Front Cover: 13 caribou calves born inside the Klinse-Za maternity pen, a project led by the Nîkanêse Wah tzee Stewardship Society, were all safely released in July 2019—the most since the project started in 2014. (PEA-F20-W-2937). Photo: Wildlife Infometrics



Annual reports are also available for our Columbia and Coastal regions at [fwcp.ca](http://fwcp.ca).



# 1.0 Organizational overview

## 1.1 INTRODUCTION

The Fish & Wildlife Compensation Program (FWCP) was established to compensate for the impacts resulting from the construction of BC Hydro dams. The FWCP conserves and enhances fish and wildlife in 31 watersheds impacted by BC Hydro dams. The FWCP is funded annually by BC Hydro. The FWCP directs those funds toward priority actions across its three regions to fulfill its mission and work towards its vision of thriving fish and wildlife populations in watersheds that are functioning and sustainable.

BC Hydro has water licence obligations in the Columbia and Peace regions, and has made voluntary commitments to address the impacts of dams in the Coastal Region. BC Hydro fulfills the applicable obligations through the work of the FWCP. BC Hydro works in equal partnership with the Province of B.C., Fisheries and Oceans Canada (DFO), First Nations, and public stakeholders by participating on FWCP’s regional boards.

The FWCP is governed through a framework that recognizes the regulatory accountabilities of agency partners (BC Hydro, the Province of B.C., and DFO), and ensures active participation and input from First Nations and public stakeholders. Independent board members in each region review, evaluate, and approve funding for all projects. Our boards include representatives from each of our FWCP partners: BC Hydro, the Province of B.C., First Nations, and public stakeholders, and—in our Coastal Region—Fisheries and Oceans Canada. When it comes to decision-making, input from each board member is given equal consideration through collaborative discussion. Learn more at [fwcp.ca/our-story](http://fwcp.ca/our-story).

Combined, our three regional boards have the following number of representatives:

- First Nations—15
- Public stakeholders—9
- BC Hydro—5
- Provincial government—5
- Federal government—1

Board representation by region is shown in Figure 1.1 below. In F20, the boards approved approximately \$9.2 million for 97 fish and wildlife projects.

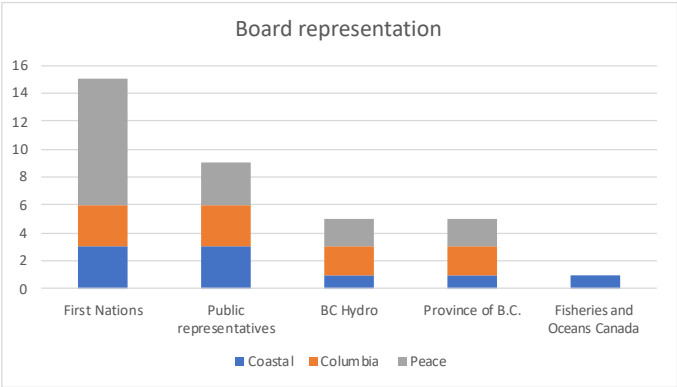


Figure 1.1: Board representation across all three FWCP regions

Since 1988, BC Hydro has provided approximately \$183 million to the FWCP to compensate for dam impacts, and the FWCP has funded more than 2,000 projects across its three regions.

The FWCP’s Peace Region was established in 1988 to support the conservation and enhancement of fish, wildlife, and habitats in watersheds impacted by the footprint created by the impoundment of the Peace River, and creation of the Williston and Dinosaur reservoirs (Figure 1.2).

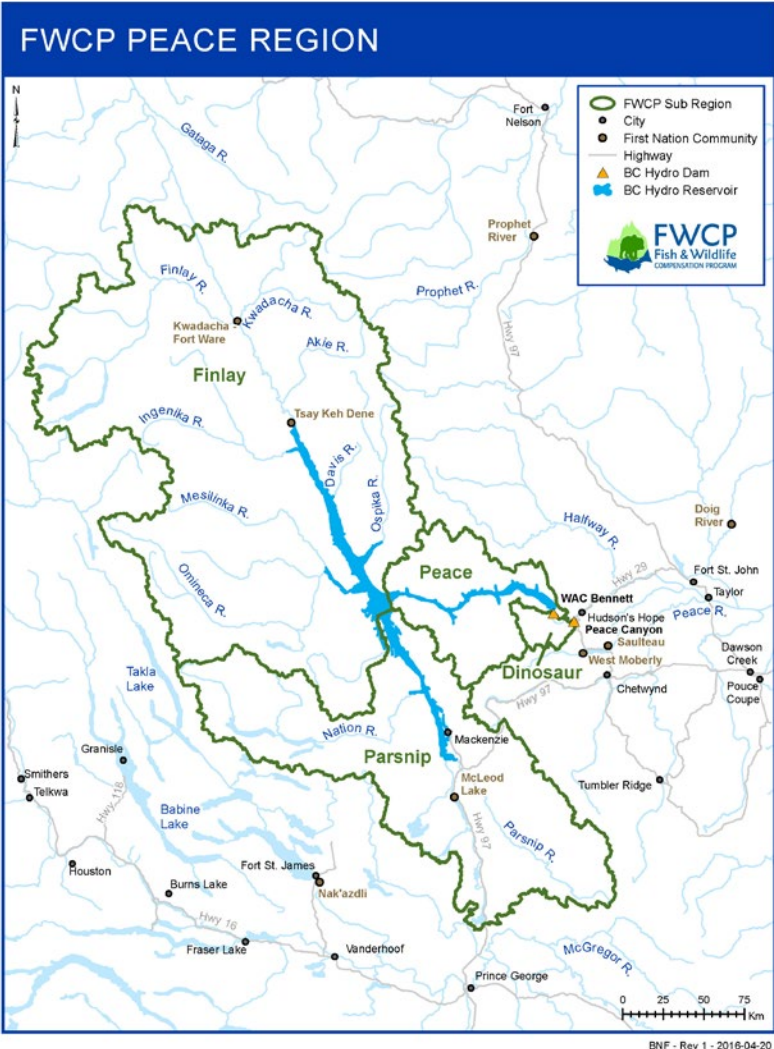


Figure 1.2: Map of the FWCP's Peace Region.

## 2.0 Our strategic approach

### 2.1 VISION AND MISSION

Our vision is for thriving fish and wildlife populations in watersheds that are functioning and sustainable, and our mission is to compensate for fish, wildlife, and their supporting habitats in watersheds impacted by BC Hydro owned and operated generation facilities.

We take a forward-looking, ecosystem-based approach that defines the desired outcomes and takes actions to restore, enhance, and conserve priority species and their habitats.

Our strategic objectives are:

#### Conservation

Maintain or improve the status of species or ecosystems of concern.

Maintain or improve the integrity and productivity of ecosystems and habitats.

#### Sustainable use

Maintain or improve opportunities for sustainable use, including harvesting and other uses. Harvesting includes First Nations, recreational, sport, and commercial harvests. Other uses may include cultural, medicinal, or non-consumptive uses.

### Community engagement

Build and maintain relationships with stakeholders and Indigenous communities. This objective stems from BC Hydro's social responsibility policy and the Province of B.C.'s shared stewardship objective.

More details can be found on these objectives in our [governance manual](#).

### 2.2 ACTION PLANS

Our action plans guide FWCP investments in fish and wildlife projects, and are referenced annually by our regional boards to track progress toward implementation, set annual priorities, and guide decision-making in setting out and approving the annual operating plan for each region. Actions in our action plans are eligible for FWCP funding and align with our vision, mission, and geographic scope.

Priority actions for fish and wildlife in our Peace Region are reflected in a Peace Basin Plan and six action plans that were drafted in 2014, developed with local input, and provided strategic guidance on grant applications and funding decisions. These action plans have now been archived for reference at: <http://fwcp.ca/archived-action-plans/>

All F20 projects approved for funding by our board align with the priority actions identified in these archived action plans, which will be replaced in F21 by new, updated [2020 action plans](#).



Close to one million location and depth data points for lake trout in the Williston Reservoir have been logged as part of a multi-year Peace Reach Lake Trout Movements Project. (PEA-F20-F-2948). Photo: Diversified Environmental Services



## 3.0 Board and committee members

### FWCP Peace Region board 2019–2020

<b>Ross Peck</b>	Public
<b>Wayne Sawchuk</b>	Public
<b>Brian Paterson</b>	Public
<b>Ray Pillipow</b>	B.C. Ministry of Forests, Lands and Natural Resource Operations (FLNR)
<b>Corey Erwin</b>	B.C. Ministry of Environment & Climate Change Strategy
<b>Trevor Oussoren</b>	BC Hydro
<b>Heather Middleton</b>	BC Hydro
<b>Luke Gleeson/</b>	
<b>Sina Abadzadesahraei</b>	Tsay Keh Dene Nation
<b>Michael Freer</b>	Treaty 8 Tribal Association
<b>Naomi Owens</b>	Saulteau First Nations
<b>T. Rosemarie Sam</b>	Nak'azdli Whut'en
<b>Jayde Duranleau</b>	McLeod Lake Indian Band
<b>Carolyn McCook</b>	Kwadacha Nation
<b>Tamara Dokkie</b>	West Moberly First Nations
<b>Melissa Knight</b>	Prophet River First Nation
<b>Gord Haines</b>	Doig River First Nations

The board guides our work and is responsible for approving our Peace Region projects and budget. In addition to funding projects through our annual grants, the board may choose to direct projects and approve funding to address regional priorities.

The board was supported by the First Nations Working Group (FNWG) and two technical committees.

### First Nations Working Group

<b>Sina Abadzadesahraei/</b>	
<b>Sean Rapa</b>	Tsay Keh Dene Nation
<b>Michael Freer</b>	Treaty 8 Tribal Association
<b>Josh Foerderer &amp; Lisa McArthur/</b>	
<b>Fernie Garbitt</b>	Saulteau First Nations
<b>George Desjarlais &amp; Walter Allison</b>	West Moberly First Nations
<b>Robin Tsakoza &amp; Maurice Wolf</b>	Prophet River First Nation
<b>Charmayne Brinkworth &amp;</b>	
<b>Madeline Oker</b>	Doig River First Nations
<b>Shawna Case</b>	Kwadacha Nation
<b>Arlene Solonas</b>	McLeod Lake Indian Band
<b>T. Rosemarie Sam</b>	Nak'azdli Whut'en

The primary roles of the FNWG are: to provide a First Nations advisory role, including early dialogue with proponents prior to project application submission; to review and score all fish and wildlife project applications received; to advise on cultural, heritage, and Indigenous knowledge aspects that are important to their respective communities; to support the development of strategic plans and provide advice on the effective implementation of action plans; and to contribute to building strong relationships with all FWCP partners.

### Fish technical committee

<b>Matthew Casselman, Chair</b>	BC Hydro
<b>Randy Zemlak</b>	BC Hydro
<b>Nikolaus Gantner</b>	FLNR
<b>Kristen Peck</b>	FLNR
<b>Carmen Richter</b>	Saulteau First Nations
<b>Mark Shrimpton</b>	Public

### Wildlife technical committee

<b>Carmen Richter</b>	Saulteau First Nations
<b>Kim Hawkins</b>	BC Hydro
<b>Michael Bridger</b>	FLNR
<b>Michael Klaczek, Chair</b>	FLNR
<b>Toby Jones</b>	BC Hydro

The primary roles of the technical committees are: to provide a technical advisory role, including fair and objective technical review, evaluation, and ranking of fish and wildlife project proposals; support the development of strategic plans; assist in the development and oversight of directed projects; and provide advice on the effective implementation of action plans.

### Policy committee

**Cheryl Webb/Brian Fanos**, Regional Director Pacific Region, Fisheries and Oceans Canada

**Jennifer McGuire**, Assistant Deputy Minister, B.C. Ministry of Environment & Climate Change Strategy

**Karen Popoff**, Director, Environment, BC Hydro

The policy committee provides oversight on a range of fish and wildlife-related issues.

In each region, program management and operations were implemented by a region manager, and supported by Trevor Oussoren, FWCP program manager; Crystal Klym, team lead; and Lorraine Ens, business coordinator. In our FWCP Peace Region during F20, Chelsea Coady was our dedicated region manager.



Members of the Peace Region board at Mount Bickford in May 2019. From left: Wayne Sawchuk, Jayde Duranleau, Trevor Oussoren, Heather Middleton, Corey Erwin, Luke Gleeson, Ray Pillipow, Melissa Knight, and Brian Paterson.

# 4.0 Project funding and grants

## 4.1 PROVINCIAL PROJECT FUNDING

In F20, 97 projects were approved for a total FWCP contribution of approximately \$9.2 million. The total value of these projects—including leveraged funding from other organizations and in-kind resources—was \$12.8 million.

Final reports for all FWCP-funded projects are loaded onto [Ecocat](#) or [SIWE](#) provincial data bases, and searchable spreadsheets of reports for each FWCP region are available at [fwcp.ca/results/](#). Due to the COVID-19 pandemic in early 2020, there were delays in completing some projects and final reports.

## 4.2 PEACE REGION PROJECT FUNDING

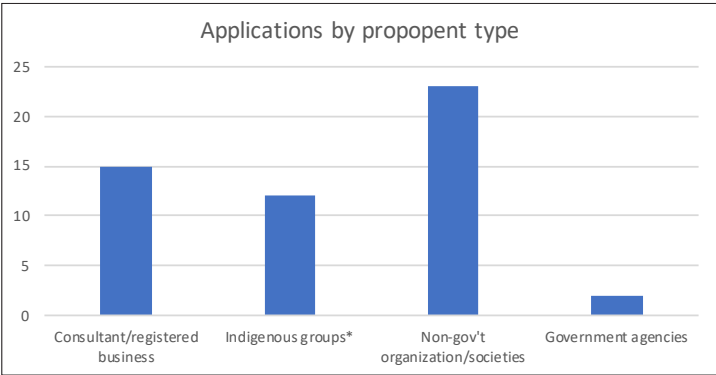
In our Peace Region, the FWCP supports the delivery of fish and wildlife projects in a variety of ways, including grant applications and directed projects.

### Grant applications

FWCP’s annual grant intake opens each summer and closes in late fall. In the Peace Region, prior to applications being submitted, all grant applicants, including First Nations, must submit a notice of intent (NOI). The NOI is an important part of our commitment to First Nations. It helps inform First Nations about proposed projects and is the basis for identifying opportunities for First Nations perspectives on, and involvement in, the projects. The NOI helps our Peace Region manager, Chelsea Coady, provide additional guidance before completing grant applications.

All grant applications go through a three-stage review process—for more details visit our FAQs at [fwcp.ca/apply-for-funding/](#).

For the F20 grant intake, 42 NOI submissions were received and submitted to the First Nations Working Group. Subsequently, a total of 34 applications were received for review, requesting funding of



\*Includes Indigenous-owned businesses and Indigenous organizations

Figure 4.1: Applications received by proponent type for F20.

approximately \$1.7 million for a total project value of more that \$3.7 million. Applications by proponent type is shown in Figure 4.1 above.

Our Peace Region board approved \$1.225 million in funding for 22 projects through our annual intake of grant applications. Fifteen were wildlife projects (\$634,989) and seven were fish projects (\$589,942). First Nations were involved in 21 out of the 22 approved grant application projects.

### Directed projects

Our Peace Region board may also choose to direct projects and approve funding to address regional priorities. Priority actions in those plans that are identified as “Open” and “Directed / Open” are eligible for a grant. Actions identified as “Directed” are not eligible for a grant, and these are projects that our board directs through the appropriate procurement process (e.g. a request for proposal).

More than \$291,000 was approved for four directed projects. A kokanee assessment project received nearly \$107,000, and monitoring fish enhancement structures \$5,000. For wildlife, nearly \$20,000 was approved for supporting the Mugaha Marsh bird banding station, and nearly \$160,000 for investigating moose limiting factors.

## Community Engagement Grant

The goal of the Community Engagement Grant is to provide an opportunity for FWCP stakeholders and Indigenous Nations, bands or groups to apply for a small grant to support their conservation and enhancement work that aligns with our action plans.

Our Peace Region manager approved five Community Engagement Grant applications and fully allocated the \$5,000 available. Projects included supporting: an Indigenous community event that shared information about FWCP funded projects in the area; fundraising initiatives for non-profits to further on-the-ground fish and wildlife projects; and the BC Bat Action Plan team to prioritize actions mitigating the threat of white-nose syndrome. All the Community Engagement Grant projects funded in F20 are shown below in Table 4.1.

Table 4.1: Approved F20 Community Engagements Grants

Applicant	Project title	Approved funds
Tsay Keh Dene Nation	Tsay Keh Dene Science Week 2.0	\$1,000
Isaac Ecological	BC-Alberta bat conservation planning workshop	\$500
Ducks Unlimited	Ducks Unlimited Spring Banquet Fundraiser	\$1,000
North Peace Rod & Gun Club	North East BC wildlife management projects	\$1,500
Wild Sheep Society of BC	WSSBC Dinner and Discussion	\$1,000



### 4.3 PEACE REGION PROJECT HIGHLIGHTS



15 wetlands near the Williston Reservoir were assessed as part of a traditional ecological study conducted by members of the Tsay Keh Dene Nation and Chu Cho Environmental. (COA-PEA-F20-W-2966). Photo: Chu Cho Environmental



350 students participated in creating a new wetland at Morfee Elementary School in Mackenzie under the guidance of the BC Wildlife Federation. (PEA-F20-W-2962) Photo: BC Wildlife Federation

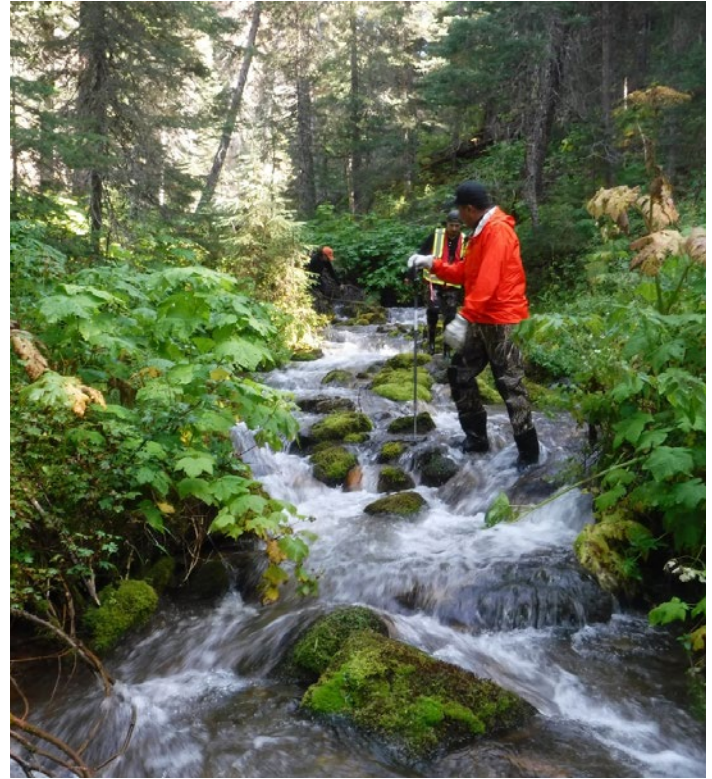


Aerial enumeration surveys for kokanee were conducted over 28 tributaries across the four main sub-watersheds and, to date, the Pacific Biological Station has provided genotypes analyzed from 865 samples collected. (PEA-F203143-DCA/PEA-F20-3359/PEA-F20-F-3143-DCA). Collecting kokanee in Aley Creek. Photo: DWB Consulting Services Ltd.





Monitoring of a restored 2.3-kilometre section of a forest service road on Mount Bickford has showed a significant reduction of vehicle traffic and wolf movement through it to sensitive caribou calving habitat. (PEA-F20-W-2943). Photo: Wildlife Infometrics



More than 14 linear kilometres of stream habitat were assessed in the Parsnip River Watershed to help prioritize culverts for restoration. (PEA-F20-F-2967). Photo: A. Irvine



Vi Lambie, who sadly passed away suddenly in the fall of 2019, was highly involved in the operations of the Mackenzie Nature Observatory, held a master bander permit, and participated in a multitude of bird monitoring surveys and volunteer programs through Birds Canada. (PEA-F20-W-3144-DCA). Photo: Mackenzie Nature Observatory



Twenty four tree roosts used by northern myotis, a federally Endangered and provincially Blue-listed bat species, have been identified in the Peace Region, and fifteen of which were used as maternal roosts. (PEA-F20-W-2947). Photo: B. Paterson



# 5.0 Financial report

Annual funding is allocated by our Peace Region board toward fish and wildlife projects, administration and communications (e.g., salaries, safety, board and technical committee expenses, communications support, and advertising). These allocations form the annual operating plan. Any unallocated funds are carried forward, i.e., “unspent surplus dollars”, and are available for future spending.

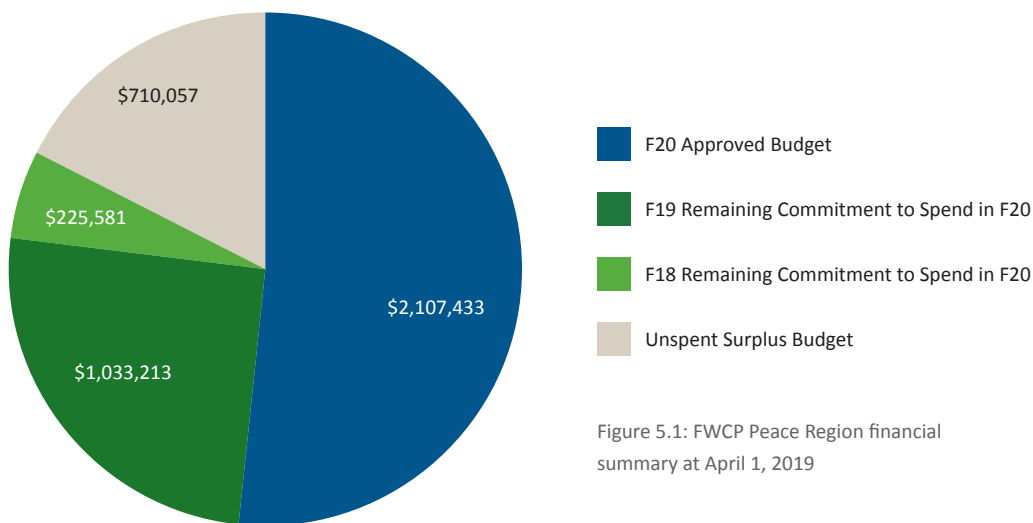


Figure 5.1: FWCP Peace Region financial summary at April 1, 2019

Our FWCP Peace Region board approved an F20 budget of \$2,107,433 and utilized 100% of its annual funding from BC Hydro—which for F20 was \$1,546,488. This, together with unspent funds from previous years, of \$2,529,795, resulted in available funds of just over \$4.076 million.

Figure 5.1 (above) shows this total of approximately \$4.076 million in the FWCP Peace Region account as of April 1, 2019. This comprises the approved budget of \$2.107 million, plus an unspent surplus of approximately \$710,000, and prior year funding commitments remaining of approximately \$226,000 and \$1.033 million for F18 and F19 respectively.

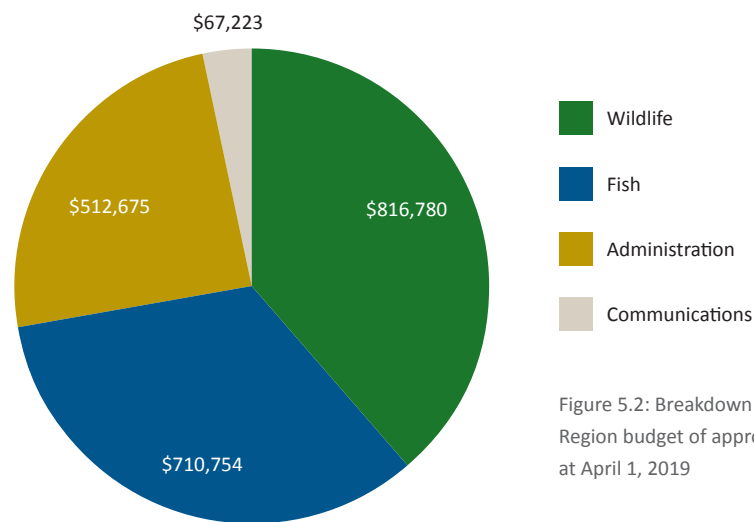


Figure 5.2: Breakdown of the approved Peace Region budget of approximately \$2.107 million as at April 1, 2019

Figure 5.2 (above) illustrates the approved F20 budget as of April 1, 2019. Funding for wildlife projects made up 39% of the budget, and fish projects 34%. Administrative costs made up approximately 24% of the total budget, including regional manager salary and expenses, costs to support the strategic planning for updating the Peace Region actions plans, office-related expenditures, support staff, board, First Nations Working Group, and technical committee costs, fees associated with uploading reports to the provincial data warehouses, and maintenance and refinements to our grant management system. The remaining allocation was for communications for approximately 3% of the annual budget.

The FWCP encourages grant applicants to seek additional funding sources (e.g., other funding agencies, in-kind contributions) to leverage FWCP funding contributions. In F20, the FWCP funding allocation for grant-based projects was approximately \$1.225 million. The total value of the projects was approximately \$3.167 million as a result of financial partnerships and in-kind contributions. In other words, for every \$1 dollar invested by FWCP, others contributed approximately \$1.60, greatly increasing the value of the FWCP's investment overall.

FWCP Peace Region expenditures up to March 31, 2020 are shown in Table 5.1. This reflects a “snapshot” in time of actual and planned payments made related to F20 projects. At the end of the fiscal year (Table 5.1), \$1,117,932 of the F20 budget had been spent, while \$876,439 remained as an F20 commitment to spend in F21 with unspent funds of just over \$113,000 which will go into the “unspent surplus funds.”

Table 5.1: Program expenditures to March 31, 2020

Fund Category	F20 Approved Budget	Paid up to Mar. 2020	Planned Payments <sup>1</sup>	Unspent funds <sup>2</sup>
Wildlife	\$816,780	\$406,609	\$385,074	\$25,098
Fish	\$710,754	\$313,384	\$334,491	\$62,880
Administration	\$512,675	\$338,733	\$148,335	\$25,608
Communications	\$67,223	\$59,207	\$8,539	-\$523
<b>TOTAL</b>	<b>\$2,107,433</b>	<b>\$1,117,932</b>	<b>\$876,439</b>	<b>\$113,062</b>

Note 1: Planned payments represents expected invoices for approved, ongoing projects that have not yet submitted final reports by March 31, 2020

Note 2: Unspent funds are carried forward and made available for future spending

In addition to the planned payments of \$876,439, the balance of prior year funding commitments anticipated to be spent in F21 was \$127,922 from F19, and \$210,587 from F18, resulting in an unspent surplus of nearly \$1.08 million (Figure 5.3, below).

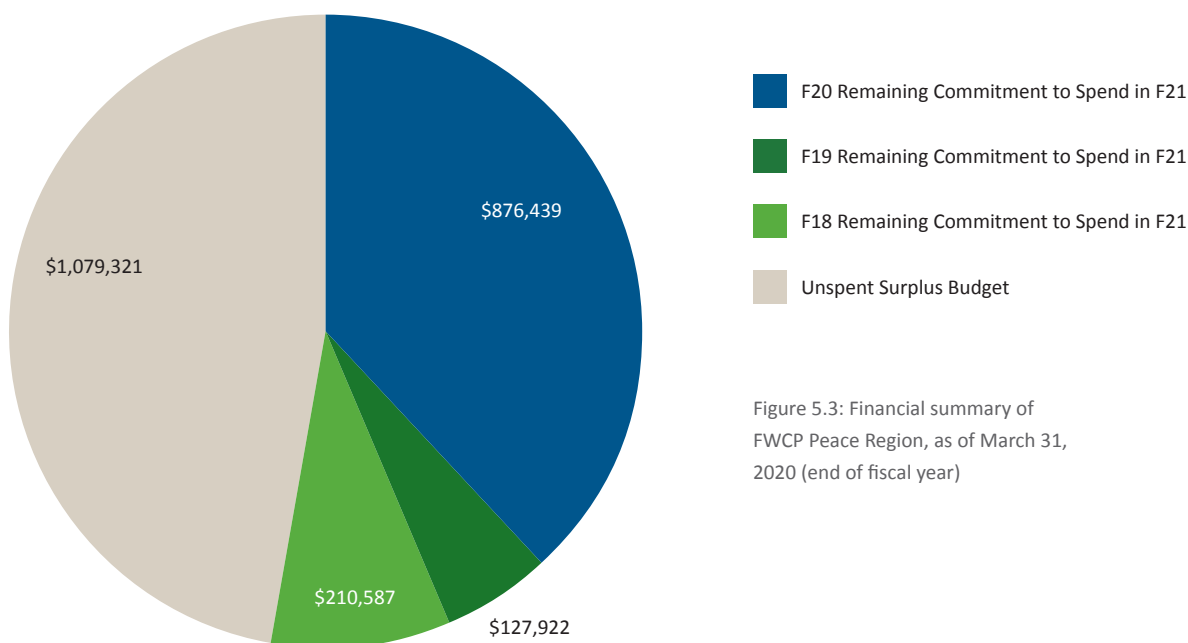


Figure 5.3: Financial summary of FWCP Peace Region, as of March 31, 2020 (end of fiscal year)



## 6.0 F20 projects

Table 6.1 provides a listing of 2019–20 fish and wildlife projects approved for funding, including alignment with action plan priorities. Funding identified in the following tables may vary from the approved budget, as of April 1, 2019, due to project budget increases or decreases as they progressed throughout the fiscal year. Final reports for all projects are posted to the appropriate provincial databases once available. Visit [fwcp.ca/results](http://fwcp.ca/results) for an updated list of all available final reports.

Table 6.1: 2019–2020 projects

Project ID, project lead, FWCP \$s, and sub-region	Project title and description	Outcome
PEA-F20-F-2948, Diversified Environmental Services, \$82,437, Basin-wide	<b>Peace Reach Lake Trout Movements.</b> This project is year four of a multi-year project to study lake trout movements in the Peace Reach. In 2019, data from year three will be analyzed and survey work will occur near the Wicked River to identify potential lake trout spawning sites at this location. Movements of adult lake trout in Williston Reservoir were monitored in the past by using acoustic transmitters and data-logging receivers, stationed in the Peace, Finlay, and Parsnip reaches. Data suggest Williston Reservoir lake trout are a single, wideranging population that moves extensively within and beyond the Peace Reach, and concentrate in the vicinity of the Wicked River during the October spawning period.	<b>917,000 lake trout detections recorded in Williston Reservoir</b> In the final year of this four-year project, seasonal movement patterns of lake trout in Williston Reservoir were documented, reproductive strategies identified, and spawning zones delineated. Over the life of the project, 917,090 lake trout detections were recorded in all three reaches of the reservoir. A Carleton University research team conducted a preliminary analysis of potential competitive interactions between lake trout and bull trout in the Peace Reach, using bull trout transmitter-detection data that was recorded concurrently with lake trout monitoring. Initial results suggest that bull trout generally occupy shallower depths than lake trout on the seasonal and diel scales, and that a degree of separation also occurs at the reach scale.
PEA-F20-F-2956, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Omineca Region, \$67,756, Basin-wide	<b>Bull Trout Spawner Abundance and Critical Habitats 2019-2020.</b> This multi-year project will estimate bull trout spawner abundance to identify important populations and critical habitats. The results will inform conservation and enhancement actions. This project will include: 1) counts of bull trout spawning sites (redds) within index sites in four streams monitored annually; 2) redd counts in new index sections, located in other watersheds, to provide baseline data for future comparisons; and 3) rapid, aerial redd counts from a helicopter, where bull trout abundance and habitat use are unknown. Aerial redd counts, calibrated using on-the-ground foot surveys in the usual manner, allow whole watersheds to be surveyed in as little as a single day.	<b>16 new critical bull trout habitats identified in Williston Reservoir Watershed</b> In 2019, critical habitats for bull trout were identified in the Williston Reservoir, and surveys were conducted to record spawner abundance. A calibrated aerial redd count methodology was applied to the lower and middle Ospika River Watershed and to the Chowika Creek Watershed. A survey of the eastern shore of Parsnip Reach confirmed the presence of large-bodied migratory bull trout in Scott Creek and Weston Creek. Minor populations were identified in Patsuk Creek and Cut Thumb Creek. Extensive critical habitats and large populations were discovered in the Ospika River and Chowika Creek watersheds. Aerial redd count data were combined with juvenile bull trout sampling records to delineate 16 new critical habitat segments for large-bodied migratory bull trout in the Williston Reservoir Watershed. Additionally, the boundaries of four previously assessed critical habitat segments were refined, and two new ground survey index sections were surveyed: Gauvreau Creek, where 62 redds were recorded, and Chowika Creek, where 60 redds were recorded.
PEA-F20-F-2959, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, \$68,829, Parsnip	<b>Parsonip Watershed Arctic Grayling Monitoring.</b> This multi-year project will continue Arctic grayling abundance monitoring in the Anzac and Table rivers, which were surveyed over the 1995-2007 period and again in 2018, using snorkeling surveys. In 2019, the team will repeat 2018 surveys and describe the distribution of critical Arctic grayling habitats in the Missinka River for the first time. The monitoring data will address two major information gaps identified within the FWCP Arctic Grayling Synthesis and Monitoring Framework documents: 1) the lack of Arctic grayling abundance monitoring since 2007; and 2) poor understanding of abundance and critical habitats upstream of the Table River. These data are required to assess conservation status, and identify locations for conservation/ enhancement actions, limiting factors, and opportunities for human use.	<b>Arctic grayling abundance has increased significantly in long-term index sites</b> For the second consecutive year, the repeatability of snorkeling counts of Arctic grayling greater than 20 cm was relatively high in sites that received three replicate surveys. The introduction of new analysis methods enabled the estimation of detection probability and abundance at long-term index sites based on replicated count data that was recorded from 1995–2019. Incorporating these estimates into the trend analysis has increased confidence that the observed trend reflects real population changes. The analysis has indicated that Arctic grayling abundance has increased significantly in long-term index sites. Critical habitats for a small population of Arctic grayling in the Missinka River were found to be much more limited than in the Table and Anzac sub-basins. Consequently, it's recommended that the Table and Anzac systems be higher priorities for future conservation and enhancement actions.

Project ID, project lead, FWCP \$s, and sub-region	Project title and description	Outcome
PEA-F20-F-2961, UNBC, \$184,609, Parsnip	<b>Spatial Ecology of Arctic Grayling in the Parsnip Core Area.</b> Year two of this multi-year project will investigate the spatial ecology of juvenile and adult Arctic grayling, and their interactions with bull trout in the Parsnip River and its tributaries. Objectives will be addressed using a combination of approaches, including acoustic telemetry, capture-recapture, temperature data-logging, stable isotope analysis, and spatial modelling. The findings of the project will address a number of data gaps related to: 1) the spatial ecology (migration, distribution, and habitat use) of Arctic grayling that were identified for the Parsnip River core area; and 2) potential interactions with bull trout, which may be limiting the growth of Arctic grayling populations throughout the Williston Reservoir Watershed.	<b>Eighty-seven fish tagged in the Parsnip River Watershed</b> This multi-year project is monitoring Arctic grayling abundance. In 2019, a total of 87 fish—62 Arctic grayling and 25 bull trout—were tagged. Twenty-six additional acoustic receivers were deployed in the Parsnip River Watershed and two additional receivers in the lower Pack River. Thirty-nine new water temperature loggers were deployed in the Parsnip River Watershed, and the sample size for stable isotope analysis was expanded to 183. Further, six outreach activities were held.
PEA-F20-F-2963, Chu Cho Environmental LLP, \$62,183, Finlay	<b>Ingenika Watershed Arctic Grayling Monitoring 2019-2020.</b> This project will continue successful 2018 Arctic grayling snorkeling surveys in the Ingenika River. This work supports a proposed framework of long-term population monitoring in three rivers (Ingenika, Finlay, Mesilinka) within the Tsay Keh Dene traditional territory. Snorkeling surveys provide key information indicating abundance, trend, critical habitats, potential threats, and limiting factors for Arctic grayling. The population is of importance within FWCP's Arctic Grayling Monitoring Framework because of: 1) high cultural importance to the Tsay Key Dene people; 2) high feasibility of the methodology due to exceptional water clarity; and 3) the population is one of concern, due to isolation from the Finlay Arctic Grayling population and small population size.	<b>Seven sites in the Ingenika River monitored for Arctic grayling</b> Seven index sites were surveyed in the Ingenika River in 2019 to monitor for Arctic grayling. The patterns of density and abundance mirrored those of 2004 and 2018, with distinct zones evident in the river's upper and middle sections. The most important feature along the Ingenika River affecting the distribution of Arctic grayling continues to be the chute located approximately 95 km from the mouth. In 2019, a clear absence of smaller grayling was observed, with only one seen in the 20–30 cm size class and none less than 20 cm.
PEA-F20-F-2965, Chu Cho Environmental LLP, \$59,353, Finlay	<b>Williston grayling distribution: eDNA monitoring 2019-2020.</b> This project builds on work funded by FWCP in 2017 and 2018, and will include eDNA sampling in priority streams identified in earlier work. Surveys will be expanded to investigate the distribution and habitat use of Arctic grayling in small tributaries entering Finlay and Parsnip reaches. These Arctic grayling are of high cultural importance to the Tsay Key Dene people and McLeod Lake Indian Band. Surveys will be expanded southward, to include tributaries entering the Parsnip Arm and River.	<b>eDNA successfully expanded the known range of summer habitat use for Arctic grayling</b> The project successfully collected eDNA from 47 sites in Williston Core Area, and data from 20 sites to describe the distribution of Arctic grayling in east Finlay Reach and west Parsnip Reach streams. Thirteen sample sites were used to evaluate tributary use by Arctic grayling in Ingenika, Finlay, Ospika, and Manson rivers. The detection probability and false negative rate for the Arctic grayling assay was evaluated by collecting eDNA from Ingenika River during snorkel surveys. Laboratory components were initiated, including a digital droplet PCR platform, the ePLANT and Lambda DNA, which improved evaluation of the eDNA quality in samples and the potential for false negatives.
PEA-F20-F-2967, Society For Ecosystem Restoration in Northern BC, \$64,775, Finlay	<b>Fish Passage Assessments and Habitat Confirmations.</b> The goal of this project is to create a shortlist of culverts candidates for restoration of fish passage in the Parsnip River Watershed based on watershed-wide ecological and cultural values, while building capacity, awareness, and momentum for fish passage restoration in the Peace Region. This will be achieved through a data analysis exercise, First Nations input, First Nations training, fish passage assessments, and habitat confirmation assessments. Assessments will follow standardized protocols developed by the Province of B.C., and the Fish Passage Technical Working Group. Data from this project will be entered into the Provincial Stream Crossing Inventory System database (PSCIS).	<b>Nine “high priority” sites identified for fish passage restoration in Parsnip River Watershed</b> A review of the Provincial Stream Crossing Inventory System database shows that 574 assessments for fish passage were conducted at crossing structures within the Parsnip River Watershed since 2001. Ninety-nine of these crossing structure assessments were selected for a detailed office review and ranked for follow-up based on the quantity and quality of upstream wetland, lake, and instream habitat; the presence, or suspected presence, of fish species near the crossing; stream order; previously recorded channel size; and recommendations of past fish passage assessments. Habitat confirmation assessments were conducted between August 30 and September 8, 2019, at 17 crossings ranked as high or moderate priority for follow-up. During the habitat confirmations, approximately 15 km of stream was assessed, with nine crossings rated as high priority for rehabilitation, four as moderate, and four as low.
PEA-F20-F-3143-DCA, UNBC, \$18,113, Basin-wide	<b>F20 Kokanee Genetics and Demographics.</b> This project aims to address a priority action in our WCP Peace Region Reservoirs Action Plan (Action 2a-1) to “Undertake a kokanee assessment study to summarize status, trends, and aquatic and terrestrial ecosystem impacts and potential risks of kokanee introductions. Develop appropriate recommendations for actions, as needed”. Year two of this project will provide a second year of kokanee spawning surveys, to assess the abundance and distribution of kokanee within tributaries of Williston Reservoir. Kokanee will be collected from key locations, to assess reproductive potential, age at maturity, and whether there is potential genetic introgression of Columbia-origin stocked kokanee with native kokanee populations, in the region.	<b>Close to 2,000 kokanee samples collected for genotyping or aging analyses</b> The purpose of this project is to undertake a kokanee assessment study and explore genetic introgression of Columbia-origin kokanee with native kokanee populations in the region. To date, 900 kokanee have been genotyped at the University of Northern British Columbia (UNBC) and the Pacific Biological Station has provided genotypes from 865 kokanee analyzed in 2006. An additional 123 kokanee samples collected from the G.M. Shrum Generating Station intake towers in 2016 have been submitted for genotyping. Otoliths have been extracted from kokanee donated to UNBC, including approximately 350 collected in 2006 and donated by FLNRD, 310 collected by DWB Consulting for FLNRD in 2018, 90 collected by FLNRD in 2018 from the Columbia River, and 160 collected in 2019 by DWB Consulting for FLNRD. One hundred otoliths were submitted to North South Consultants and are being analyzed for age validation. All kokanee collected by DWB for FLNRD and given to UNBC have been processed for morphometrics and reproductive traits.



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PEA-F20-F-3359-DC-106374, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, \$88,700, Peace	<b>Kokanee Spawning Survey and Fish Collection Project Yr 2/3.</b> This project aims to address a priority action in the FWCP Peace Region Reservoirs Action Plan (Action 2a-1) to “Undertake a kokanee assessment study to summarize status, trends, and aquatic and terrestrial ecosystem impacts and potential risks of kokanee introductions. Develop appropriate recommendations for actions, as needed”. Year two of this project will provide a second year of kokanee spawning surveys, to assess the abundance and distribution of kokanee within tributaries of Williston Reservoir. Kokanee will be collected from key locations, to assess reproductive potential, age at maturity, and whether there is potential genetic introgression of Columbia-origin stocked kokanee with native kokanee populations, in the region.	<b>Aerial surveys count spawning kokanee in 28 Williston Reservoir tributaries</b> In September 2019, aerial enumeration surveys were conducted over 28 tributaries across the four main sub-watersheds of the Williston Reservoir: Finlay, Omineca, Peace, and Parsnip. The results were compared to spawner surveys conducted in 2002, 2003, 2006, 2007, 2010, and 2018. Comparing the 2019 count to the same cohort counts in 2003 shows an apparent reservoir-wide decline in kokanee spawner abundance, with counts 4.2 times lower in 2019 than 2003. These declines are reflected in three of the reservoir’s main sub-watersheds: 2019 counts in the Finlay, Omineca, and Parsnip reaches were five, 27, and 66 times lower than 2003 counts. The Peace Reach is the only sub-watershed where an increase in cohort spawner abundance occurred: 2019 counts were 74 times higher than 2003 counts.
PEA-F20-W-2931, Wildlife Infometrics Inc., \$22,836, Parsnip	<b>Williston School Ecology Project.</b> The purpose of this project, now in its fifth year, is to improve connection with, and understanding of, local ecology for Peace Region elementary and high school students. Students will gain hands-on experience with species and habitats of interest in their own communities through field trips, interaction with local First Nations elders, and natural resource experts, in addition to classroom activities integrated with the provincial curriculum. Grade-specific modules are tailored to complement standard curricula. This project will emphasize the importance of natural resources to human livelihoods and wellbeing, and foster an appreciation of native local flora and fauna.	<b>School ecology presentations reach over 450 people</b> The Williston school ecology project aims to build ecological awareness among elementary and high school students. Twelve ecology learning modules were delivered to 22 classes ranging from kindergarten to Grade 10—reaching approximately 400 students, 25 staff, and 25 parents across two communities—and at a community presentation. The modules addressed birds, ponds, fish, plants, furbearers, bears, forestry, insects, and caribou, and were made possible with 33 volunteers, who collectively contributed almost 300 hours. A new module was piloted this year: a timber cruise field trip targeted at secondary-school math classes. Some new elementary content was developed around bear hibernation ecology, focusing on fall feeding and physiological adaptations to hibernation. The program continues to be popular and appreciated by the community, with many teachers, school staff, and parents emphasizing how happy they are to see students receiving hands-on environmental education.
PEA-F20-W-2933, Wild Sheep Society of British Columbia, \$4,990, Peace	<b>Williston Lake Stone’s Sheep Health Assessment.</b> This seed grant project is designed to develop a study plan for an aerial baseline population inventory of Stone’s sheep along Williston Reservoir. This population is the region’s southernmost and is considered to be high risk due to its proximity to domestic sheep farms. This baseline study will aid in developing a health assessment plan, which would include a radio-collaring and health-testing program for at-risk Stone’s sheep herds in the Peace Region.	<b>Six Stone’s sheep outfitted with GPS collars</b> This project is designed to develop a study plan for a baseline inventory of Stone’s sheep along Williston Reservoir. The seed grant funding enabled many supportive conversations with First Nations, stakeholders, and local community members, and leveraged additional funding used to purchase Twenty GPS collars were purchased for health sampling. Eight Stone’s sheep have been sampled, with GPS collars placed on six of them.
PEA-F20-W-2934, Nikanese Wah tzee Stewardship Society, \$19,936, Basin-wide	<b>Bickford Habitat Restoration Pilot.</b> Due to rapid population declines of the Klinse-Za caribou herd, emergency recovery actions, such as predator removal and maternal penning have occurred since 2014. To support longterm sustainability of the herd, habitat restoration and access management are needed to reduce the negative impacts of disturbance. To-date, the Bickford Habitat Restoration Pilot project has resulted in the restoration of 2.3 kms of the Fisher Creek forest service road. In this final project year, post-treatment monitoring to determine the effectiveness of the restoration treatments will continue. Results will inform future habitat restoration projects for the Klinse-Za/ Scott East herd and others.	<b>Over 12,000 seedlings planted in restoration of Mount Bickford forest service road</b> The purpose of this project is to reduce negative impacts of disturbance to the at-risk Klinse-Za caribou herd. During this three-year restoration project, 2.3 km (6.9 ha) of a legacy oil and gas road was deactivated and reforested. Camera traps and vegetation plots have been used to monitor the effectiveness of the restoration. Since treatment occurred, motorized access during snow-free periods has been virtually eliminated and only five snow machines have accessed the corridor. Reforestation included the planting of 1,900 hybrid spruce, 7,790 sub-alpine fir, and 2,500 alder seedlings along the corridor in 2018. Educational signage was installed along the restoration site and camera traps have shown people viewing the sign. Tours of the site with First Nations and funding partners have occurred throughout the project, and additional activities, such as presentations at trade shows and workshops, have facilitated information sharing.

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PEA-F20-W-2937, Nikanese Wah tzee Stewardship Society, \$72,257, Basin-wide	<b>Enhancing Caribou Survival in the Klinse-Za/Scott East Herd Area.</b> The goal of this project is to enhance the survival rate of caribou cows and calves in the Klinse-Za and Scott East herd areas, to allow for a positive population trajectory. Pregnant cow caribou are captured in late winter and relocated to a protective pen in natural calving range. The cows are fed, protected, and monitored during the calving season and afterwards. Cows and calves are released when calves have grown to a point where they are less susceptible to predation by wolves and bears (late July). Surveys will be undertaken to assess effectiveness of maternal penning, relative to other management measures undertaken as part of the overall population recovery program.	<b>Caribou herd size and number of reproductive cows on the rise</b> In July 2019, 16 caribou cows, 13 calves, and one juvenile were released after a successful year of maternity penning. In March 2020, 85 caribou were observed in the Klinse-Za/Scott East herd area: 30 adult cows, 40 adult males, one unknown adult/juvenile, and 14 calves (11 pen calves and 3 free-ranging calves). There was a population increase of four animals, or about five percent. Without the additive effect of the pen, it is estimated there would have been an overall population decline of at least four caribou. It is estimated that the number of reproductive cows in the population has increased from 23 in 2014 to 30 in 2020.
PEA-F20-W-2941, Wildlife Infometrics Inc.\$99,040, Finlay	<b>Chase Caribou Herd Response to Habitat Alterations: Year 3.</b> Alteration of habitat within caribou range is associated with declining caribou populations; a result of an imbalance between rates of cow and calf survival. Prior to 2009, the Chase Caribou herd was stable at 475 caribou, but has since declined to 290. Caribou range in the Chase area has undergone, and continues to undergo, significant alteration from both wildfire and increased salvage of beetle-killed pine trees. During year three of this five-year project, 40 female caribou will be monitored for habitat use, adult mortality, and calf survival. The results will be contrasted to pre-disturbance parameters. The contrast will allow for inferences about: 1) potential impacts associated with recent disturbances; and 2) conservation measures necessary to ensure resiliency of the herd.	<b>Census counts 365 caribou in the Chase herd area in 2020, six caribou captured for sampling</b> This multi-year project is determining habitat use, adult mortality and calf survival of the Chase caribou herd. A total of six caribou were safely captured and sampled in March 2020 to increase the sample size to compensate for mortalities in Year 3 of the Chase Caribou Herd Response to Habitat Alterations project. To date, nine collared caribou have died, seven from definitive or probable predation, one due to an accident, and one of unknown causes. Calf-cow ratios across the population was 30:100. The population census in March 2020 counted 365 caribou across 32 groups throughout the herd's range. Currently, natural disturbances represent the largest footprint on the landscape, with mountain pine beetle having the largest impact, followed by wildfire. It was observed, however, that there was very little increase in the footprints of those disturbances this year (1,191 ha). Conversely, the number of cutblocks has notably increased to 66, with the spatial extent growing to 1,696 ha. The length of roads has grown by 62 km to an overall footprint of 90 ha. There have been no new fires in the herd range in 2019.
PEA-F20-W-2943, Nikanese Wah tzee Stewardship Society, \$83,900, Basin-wide	<b>Restoring Caribou Habitat in the Klinse-Za/Scott East Herd.</b> Due to rapid population declines of the Klinse-Za and Scott East caribou herds, emergency recovery actions, such as predator removal and maternal penning have occurred since 2014, to avert extirpation of the herds. To support long-term sustainability of the herd, habitat restoration and access management are needed to reduce the negative impacts of disturbance. Based on the results of the Bickford Habitat Restoration Pilot (PEA-F20-W-2934) and recommendations in the Klinse-Za/Scott East Habitat Restoration Strategic Plan, the goal of this multi-year project is to functionally and ecologically restore linear corridors identified as near-term, high-priority sites.	<b>Restoration begins on three priority sites in the Klinse-Za/Scott East caribou range area</b> This project aims to restore high-priority linear corridors. Pre-treatment effectiveness monitoring was conducted on six near-term restoration sites in the Klinse-Za/Scott East caribou range area, including the collection of data on anthropogenic and wildlife use through trail camera traps and the characterization of existing site conditions by measuring pre-treatment vegetation plots. Restoration permits for three near-term restoration sites were received and restoration activities on these sites began in summer 2020. This year (year 1 of the project), a total of 201 km of linear features and 22 ha of polygonal features were identified for restoration in 10 long-term priority restoration zones.
PEA-F20-W-2945, Ministry of Environment and Climate Change Strategy, \$61,530, Finlay	<b>Effects of Habitat Change on Fisher and Marten Populations.</b> This project will improve understanding of the abundance, distribution, and trend of furbearing species, including fisher and marten that have been impacted by significant habitat loss and change (e.g. reservoir creation, logging of beetle-infested forest). The results of this multi-year project will contribute towards functioning and sustainable fisher and marten populations in the Williston Basin by helping to inform decision-making for continuing conservation.	<b>207 hair samples collected from fishers and martens to study the effects of habitat change</b> This project will improve understanding of abundance, distribution and trend of fur-bearing species. In 2019–2020, spatial data with respect to habitat change in the Williston Basin was compiled, non-invasive genetic sampling of the current fisher and marten populations was conducted, and initial engagement of target audiences begun. Historical and current forest harvest and disturbance spatial data has been compiled for the 2,140 km² study area. Hair-snagging stations were set up at 184 sites among the fisher and marten survey cells. A total of 207 hair samples were collected in 69 of 106 survey cells. Based upon hair colouration and pattern, it is estimated that fisher samples were collected at 16 of those survey cells and marten samples collected at 62 of the survey cells. Analysis of the retrospective data from the year 2000 was started, and engagement of Tsay Keh Dene Nation and trapper communities was initiated.
PEA-F20-W-2947, Zonal Ecosystem and Wildlife Consultants Ltd., \$41,670, Basin-wide	<b>Northern Myotis Maternal Roost Study: Year 2</b>	Project activities delayed



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PEA-F20-W-2949, Ministry of Environment and Climate Change Strategy, \$23,994, Basin-wide	<b>Fisher Habitat Conservation – Extension and Field trials</b>	Project activities delayed
PEA-F20-W-2952, UNBC, \$16,860, Basin-wide	<b>2019-20 Colloquium Presentation Series.</b> This project provides an education and outreach venue, builds connections and develops relationships through a series of free presentations focused on research that is underway or could be applied to, our Peace Region. The project will consist of a series of three invited speaker events in the fall, winter, and spring of 2019-2020. Two will feature researchers from British Columbia or Alberta, and the third will feature a national or international speaker, all of whom will present information or engage in discussion of topics related to fish and/or wildlife species in the Peace Region.	<b>Presentation on bat research generates discussion in Mackenzie</b> Brian Paterson of Zonal Ecosystem and Wildlife Consultants Ltd. gave a presentation, “A Summary of Bat Research in Northeastern British Columbia,” to an audience of 20 people in Mackenzie on December 3, 2019, and an additional 20 people attended online. The presentation was well received and generated good discussion and questions. Two other presentations planned for the spring of 2020 were cancelled due to the COVID-19 pandemic.
PEA-F20-W-2958, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, \$36,024,	<b>Distribution and Abundance of the Finlay Caribou Herd.</b> The goal of this multi-year project is to determine the population status of the Finlay Caribou herd, and provide current information on the distribution and seasonal movements, to delineate accurate range boundaries and core habitats within the range.	<b>Finlay caribou herd size numbers are increasing</b> This multi-year project is providing information on population status of the Finlay caribou herd. Two caribou population surveys were completed in the Finlay range in 2019 and 2020, and a total 84 and 96 caribou were estimated. These population estimates are over three times higher than the previous estimate of 26 caribou in 2002. A total of nine GPS collars were deployed and more than 18,000 telemetry locations collected during the study. The results suggest significant movement between Finlay and Pink Mountain ranges, making tracking population change a challenge. The East Williston area is currently designated as trace occurrence; however, results from this study suggest distribution patterns and numbers would meet the provincial definition of a separate sub-population.
PEA-F20-W-2962, British Columbia Wildlife Federation, \$48,615, Parsnip	<b>Advancing Wetland Stewardship and Engagement in the Peace</b>	Project activities delayed
PEA-F20-W-2966, Chu Cho Environmental LLP, \$56,324, Finlay	<b>Identifying Opportunities for Wetland Restoration 2019-2020.</b> This project will improve the understanding of historical distribution of wetlands in the Finlay Reach of Williston Reservoir, prior to inundation. This work will also document the cultural importance of wetlands to the Tsay Keh Dene (TKD) Nation, and quantitatively assess the current health of the wetlands. The results of this study will identify opportunities for wetland restoration. Debris scour and wave action is negatively impacting nearshore vegetation and wetlands within the Finlay Reach of Williston Reservoir. In addition, non-hydro-related, landscape-level disturbances have resulted in a loss of inland wetland habitat for fish and wildlife. This process is threatening the ecological benefits provided by wetlands and the ability of TKD Nation to harvest food and medicine from within wetlands.	<b>Tsay Key Dene lead wetland health assessments at 15 sites in the Finlay Reach</b> This project will increase awareness of the historical distribution of wetlands in the Finlay Reach. The BC Wildlife Federation held a wetland health assessment workshop on wetland classification and rapid wetland health assessments for participants from Chu Cho Environmental (CCE) staff, Tsay Keh Dene (TKD) Nation citizens, TKD Nation Lands Resources & Treaty Operations staff, and Chu Cho Industry staff. The workshop was followed by a traditional ecological knowledge (TEK) study. A TEK expert interviewed eight elders and knowledge holders from the TKD Nation. The intent was to foster discussion around the theme of wetland use and the impacts of loss and degradation. A map of the territory was available during the interviews for participants to easily identify areas being discussed. Next, CCE staff visited 15 sites in the Finlay Reach of the reservoir and conducted rapid health assessments. Based on the rapid wetland health assessments, two sites are considered to be non-functional (poor health), five sites are considered functionally at risk (healthy but with problems), and eight sites are considered functionally healthy. The sites were chosen based on information provided by TKD citizens during the wetland workshop, interviews, and by using the FWCP wetland prediction mapping layer.

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PEA-F20-W-2970, Wildlife Infometrics Inc., \$14,994, Basin-wide	<b>Effect of Mountain Pine Beetle and Forest Harvesting on Caribou Forage Lichen.</b> This project will conduct an analysis of the effects of Mountain Pine Beetle forest-harvesting and prescribed fire treatments on the abundance of terrestrial forage lichens on caribou winter ranges in central BC. As part of a long-term adaptive management trial, specific forest harvesting treatments were applied and permanent sampling plots were measured prior to, and following, treatment. All plots were re-measured again in 2016 and 2017, and initial analyses of effects were examined. This work will include a more inclusive (i.e. hierarchical) analysis to better expose effects across sites and factors. Results will lead to recommendations for sustaining forage supply for caribou. This project's purpose is to advance learnings from previous work and deliver a draft manuscript for publication.	<b>Six management recommendations developed for caribou terrestrial lichen retention</b> This project is studying the effect of forest harvesting and prescribed burns on the abundance of forage lichens in caribou winter range. Expanded analyses of data collected in 2016–2017 and 2017–2018 were conducted to assess the response of terrestrial lichens in caribou ranges in central British Columbia to three sources of unmanaged and managed disturbances: mountain pine beetle (MPB) outbreaks, forest harvesting, and prescribed burning. Six management recommendations have been developed based on analysis results from this study on short-term responses (12-14 years) of caribou terrestrial lichens to forest harvesting disturbance. These recommendations should be revisited after future sampling sessions are conducted. The results of this project could be considered in the development of forestry operational practices.
PEA-F20-W-2973, Chu Cho Environmental LLP, \$32,020, Finlay	<b>Identifying Olive-sided Flycatcher Breeding Populations 2019.</b> This project will continue population surveys for threatened olive-sided flycatchers. British Columbia supports a large proportion of the remaining olive-sided flycatcher breeding population. Although Northern BC hosts suitable habitat for this songbird, there is limited knowledge regarding abundance and breeding success. In Spring 2018, surveys for breeding olive-sided flycatchers were conducted within the Finlay Reach of Williston Reservoir, and successfully located three breeding pairs. Although apparently scarce, further surveys and data are necessary before any conclusions can be made regarding olive-sided flycatcher populations in this area.	<b>150 surveys identify breeding populations of olive-sided flycatchers</b> Two years of population surveys (2018–2019), confirm that the habitat surrounding the Finlay Reach of the Williston Reservoir supports a breeding population of olive-sided flycatchers. In June 2019, 150 surveys at 67 survey stations across three study areas were conducted, and 40 olive-sided flycatchers were detected (33 males and seven females). The timing of the arrival of the species in the study area was identified, with males beginning to arrive in late May and females in early June. It was estimated that 50% of the olive-sided flycatchers detected were resident breeders and not transient migrants, although this may be an underestimate. The focus of the surveys was on locating olive-sided flycatchers utilizing cutblock edge habitat, and coarse-scale habitat assessments were conducted at each survey station. None of the habitat characteristics measured predicted the detection probability of an olive-sided flycatcher; however finer-scale assessments may be necessary to reveal these associations.
PEA-F20-W-3142-DCA, Wildlife Infometrics Inc., \$159,310, Parsnip and Peace	<b>Moose Limiting Factors F20.</b> This project is year five of five, and is an investigation of limiting factors affecting moose survival in our Peace Region. This project is designed to improve understanding of the ecological factors that limit moose survival in representative areas of the FWCP's Peace Region, alongside the Provincial moose investigations, currently underway.	<b>Data gathered from collared moose to assess survival</b> This project is studying limiting factors for moose survival. One hundred GPS-collared moose were monitored for five-years in two study areas, West Parsnip and Moberly, to assess limiting factors. A total of 26 collared cow moose died, 16 in West Parsnip and 10 in Moberly. Predation accounted for 70% of the mortalities, with wolves causing 50% of those. In Moberly, predation accounted for 40% of mortalities, with wolves causing 10% of those. Annual survival rates varied by year, but were on average high (90% in West Parsnip and 94% in Moberly). Calf production and survival was highly variable by year and study area. Annual population growth rates were more likely positive than negative, which is consistent with a stable or increasing moose population. In general, moose in the both West Parsnip and Moberly were selecting for forage values, while maintaining a distance from roads.
PEA-F20-W-3144-DCA, Mackenzie Nature Observatory, \$19,885, Parsnip	<b>Mugaha Marsh Banding Station 2019-20.</b> Mackenzie Nature Observatory operates the Mugaha Marsh Sensitive Area bird banding station on the Parsnip Reach of Williston Reservoir. The 2019 season will add to the long-term monitoring data set and provide important information on breeding bird population trends, distribution, and health, which can guide species conservation and habitat enhancement initiatives in the region.	<b>Over 70,600 birds banded at the Mugaha Marsh Banding Station</b> In 2019, 3,047 individuals birds representing 62 species were banded at the Mugaha Marsh Banding Station, higher than the yearly average of 2,815 from 1995 to 2018. This brought the number of birds banded at the station to 70,629. Two milestones were achieved at the station in 2019: banding the 70,000th overall bird, including both non-standard banding and standard banding, and banding the 70,000th bird in standard banding. This long-term data set will help inform conservation and habitat enhancement actions.