FWCP
Fish & Wildlife
COMPENSATION PROGRAM

Annual Report

FWCP Peace Region
2018–2019

fwcp.ca

BC Hydro

BRITISH COLUMBIA

Fisheries and Oceans Canada | Pêches et Océans Canada

The FWCP is a partnership of BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations and Public Stakeholders, to conserve and enhance fish and wildlife in watersheds impacted by BC Hydro dams.

Message from the Board Co-Chairs

On behalf of the Fish & Wildlife Compensation Program's (FWCP) Peace Region Board, we invite you to read our annual report for fiscal year 2019 (F19), covering the period April 1, 2018 to March 31, 2019. Our work in the Peace Region is dedicated to advancing the objectives of the FWCP — conservation, sustainable use and community engagement — in watersheds impacted by existing BC Hydro dams.

In F19, we continued to successfully utilize and improve our online grant management system, which creates administration efficiencies, allows for robust data-collection and reporting, and helps automate some of the application review process.

In fall 2018, we also automated the Notice of Intent (NOI) process for the First Nations Working Group. The Notice of Intent process is unique to our Peace Region and allows for early engagement between First Nations and grant applicants prior to submission of grant applications. Incorporating the NOI process into the Grant Management System allowed for administrative efficiencies and saved time for our First Nations partners. We also continued to improve the FWCP website, providing up-to-date information on some of the many projects underway province-wide, including a results page that showcases FWCP projects across our three regions, and allows FWCP partners and stakeholders to easily access project information, including our list of project reports.

We received a good response to our call for grant applications in 2018–2019, with 55 Notice of Intent submissions for review to the First Nations Working Group and a total of 47 applications submitted for subsequent review by our Technical Committees and Board. Of these, the Board approved 25 grant applications, representing a broad spectrum of projects that will benefit a variety of species, including Bull Trout, Lake Trout, bats, caribou, and Fishers.

In addition to grant-based projects, the Board has continued to increase efforts on directed projects — those projects prioritized by the Board to address specific needs, as identified in our Peace Region Basin and Action Plans. We continued to support year four of the five-year Moose Limiting Factors directed project. This was the final year of the three-year Mercury in Fish Investigation directed project. The Board also saw a need to support grant applicants with fish passage improvement project applications, therefore guidance for fish passage improvement projects was made available through our grant information kit for applicants.

We also offer Community Engagement Grants, which provide an opportunity for our stakeholders (e.g. environmental groups, rod and gun clubs, non-profits, stewardship organizations, government) and First Nations to apply for funding up to a $1,000 maximum, to support their conservation and enhancement work. In F19, we were able to support six projects, for a total of $5,000.

Thank you to all members of the Board, the Fish and Wildlife Technical Committees, First Nations Working Group, and staff, for contributions to the FWCP Peace Region during this past year, and for helping to make FWCP a success. We would also like to give our condolences to the family of Wayne Sam, who passed away in 2018. Wayne was a long-time member of the First Nations Working Group, representing Nak'azdli Whu'ten. Wayne's dedication to the FWCP and his representation on the First Nations Working Group will be missed.

We now have a well-established program in place with a balanced focus on application-based and directed projects that will support our ongoing vision of Thriving fish and wildlife populations in watersheds that are functioning and sustainable.

Sincerely,

Trevor Oussoren
FWCP Peace Region, Board Co-Chair

Wayne Sawchuk
FWCP Peace Region, Board Co-Chair

Front Cover: The FWCP is funding the most comprehensive amphibian research project in Northern B.C., including collecting data on Long-toed Salamanders. PEA-F19-W-2608. Photo: M. Thompson

1. Organizational Overview

INTRODUCTION

The Fish & Wildlife Compensation Program (FWCP) was established to compensate for the applicable fish and wildlife impacts resulting from the construction of BC Hydro dams by conserving and enhancing fish and wildlife in the Coastal, Columbia, and Peace regions of British Columbia. The FWCP operates as a partnership between BC Hydro, the Province of B.C., Fisheries and Oceans Canada (DFO), First Nations, and Public Stakeholders.

BC Hydro has invested over $168 million into the work of the FWCP, which has funded nearly 2,000 projects since 1988 that increase understanding, and conserve and enhance fish, wildlife and their supporting habitats impacted by existing BC Hydro dams. Our three regional Boards approved approximately $10 million for 118 fish and wildlife projects to be implemented in F19.

The Peace Region compensation program was established in 1988 to support the conservation and enhancement of fish, wildlife, and habitat in watersheds impacted by the footprint created by the impoundment of the Peace River, and creation of the Williston and Dinosaur reservoirs (Figure 1.1). In the Peace and Columbia regions, FWCP is in place as a mechanism to implement conditions in BC Hydro's water licenses, issued under the provincial *Water Act*; FWCP is voluntary by BC Hydro in the Coastal Region.

This annual report provides an overview of FWCP's activities in the Peace Region for fiscal year 2019 (F19), covering the period April 1, 2018 to March 31, 2019. It includes an overview of financial performance, budget allocation, and information about the projects funded in F19.

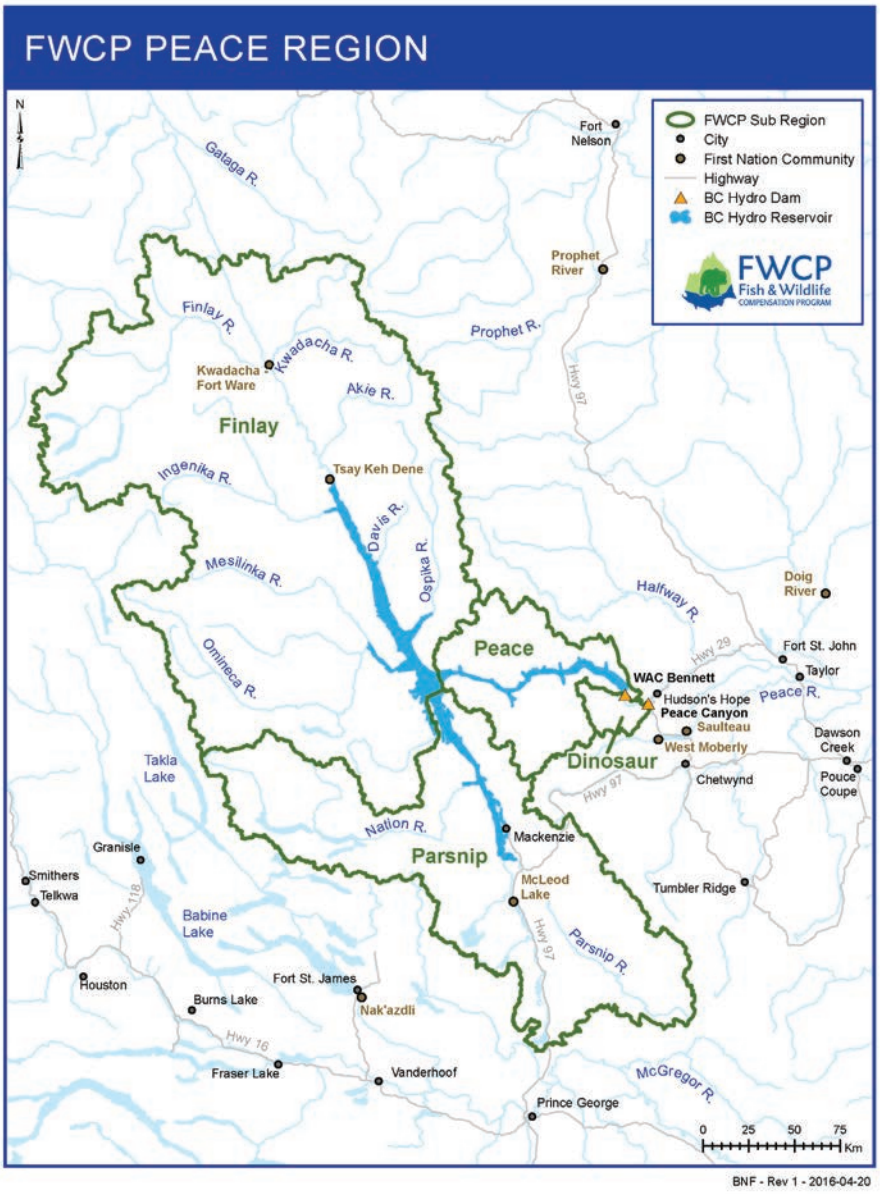

Figure 1.1: Map of the FWCP Peace Region.

GOVERNANCE

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. Specifically, each region has a Board to provide local oversight to the planning and implementation of the FWCP at the regional level, and to make local decisions on strategic priorities and on FWCP annual expenditures and investments. The FWCP Governance Manual can be found on our website at **fwcp.ca**.

In the past year, our work in the Peace Region operated with a Board of 16 members representing First Nations, Public Stakeholders, the Province of B.C., and BC Hydro.

We welcomed Heather Middleton as the new BC Hydro Representative, Albert Isadore as the new McLeod Lake Indian Band Representative and Corey Erwin as the new Ministry of Environment & Climate Change Strategy (MOECCS) representative. Thank you to departing representatives Rob Chaisson (BC Hydro) and Alec Chingee (McLeod Lake Indian Band) for all your dedication to the Board.

The F19 Board Members, as of March 31, 2019, were:

First Nation Representatives:

Albert Isadore, McLeod Lake Indian Band
Bruce Muir, Prophet River First Nation
Carolyn McCook, Kwadacha Nation
Gord Haines, Doig River First Nations
Luke Gleeson, Tsay Keh Dene Nation
Michael Freer, Treaty 8 Tribal Association
Naomi Owens-Beek, Saulteau First Nations
T. Rosemarie Sam, Nak'azdli Whut'en
Tamara Dokkie, West Moberly First Nations

Public Representatives:

Brian Paterson
Ross Peck
Wayne Sawchuk (Board Co-Chair)

Agency Representatives:

Corey Erwin, MOECCS
Heather Middleton, BC Hydro
Ray Pillipow, Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNR)
Trevor Oussoren, BC Hydro (Board Co-Chair)

The Board reports to the Policy Committee, representing the federal and provincial government regulators (DFO and the Province of B.C.), as well as BC Hydro, which exists to allow the agencies to provide oversight on a range of fish- and wildlife-related issues relevant to BC Hydro including, but not limited to, the FWCP.

The F19 Policy Committee Members were:

Cheryl Webb, 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

This year, the Board has been supported by the First Nations Working Group (FNWG) and by two Technical Committees, one for wildlife projects, and one for fish projects.

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 traditional ecological 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.

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 to provide advice on the effective implementation of Action Plans.

The FNWG and Technical Committee Members, as of March 31, 2019, were:

The First Nations Working Group Members:

Arlene Solonas, McLeod Lake Indian Band
Charmayne Brinkworth and Madeline Oker, Doig River First Nations
George Desjarlais (Co-Chair) and Walter Allison, West Moberly First Nations
Josh Foerderer and Lisa McArthur, Saulteau First Nations
Michael Freer, Treaty 8 Tribal Association
Robin Tsakoza and Maurice Wolf, Prophet River First Nation
Shawna Case, Kwadacha Nation
Sina Abadzadesahraei (Co-Chair) and Luke Gleeson, Tsay Keh Dene Nation
Vacant due to passing of Wayne Sam, Nak'azdli Whu'ten

The Fish Technical Committee Members:

Carmen Richter, Saulteau First Nations
Matt Casselman, (Chair) BC Hydro
Mark Shrimpton, Public
Nikolaus Gantner, FLNR
Randy Zemlak, BC Hydro

The Wildlife Technical Committee Members:

Carmen Richter, Saulteau First Nations
Kim Hawkins, BC Hydro
Michael Bridger, FLNR (Peace Region)
Michael Klaczek (Chair), FLNR (Omineca Region)
Toby Jones, BC Hydro

In each region, program management and operations are implemented by a full-time Region Manager who administers all aspects of program delivery. FWCP's Peace Region Manager was Chelsea Coady for F19. For all three FWCP regions, the Business Coordinator was Lorraine Ens and the overall Program Manager was Trevor Oussoren.

FWCP Peace Region Board, October 2018. (L-R) Ray Pillipow, Arlene Solonas, Michael Freer, Ross Peck, Wayne Sawchuk, Carolyn McCook, Naomi Owens-Beek, Trevor Oussoren, Luke Gleeson, and Brian Paterson. Missing: Albert Isadore, Tamara Dokkie, Bruce Muir, Corey Erwin, Heather Middleton and Gord Haines.

2.0 FWCP's Strategic Framework

We use a strategic framework to guide overall planning for our investments. The framework (Figure 2.1) has guided the development of strategic plans (Section 3.0) for each basin or watershed within the FWCP program area, which in turn inform Action Plans that focus on specific priorities within each watershed.

VISION

Thriving fish and wildlife populations in watersheds that are functioning and sustainable.

An effective program will support the maintenance of healthy fish and wildlife populations in basins significantly altered by hydroelectric development. Actions taken should satisfy both the conservation and sustainable-use objectives and, where possible, restore ecosystem function, making species more resilient to emerging pressures, such as climate change.

MISSION

The FWCP compensates for the impacts to fish, wildlife and their supporting habitats affected by BC Hydro-owned and operated generation facilities.

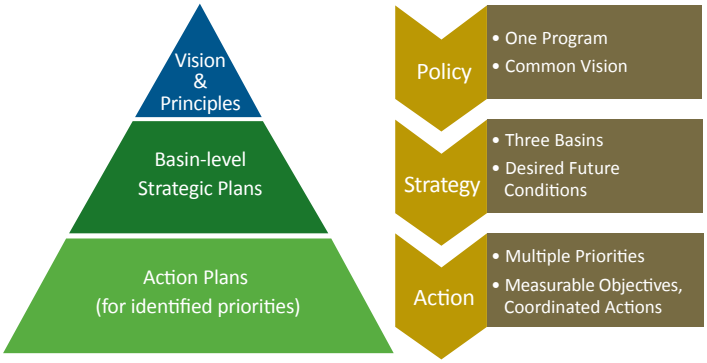

Figure 2.1
Relationship between FWCP's Strategic Framework, Basin Strategic Plans and Action Plans.

The FWCP funded multiple wetland workshops, led by Neil Fletcher (bottom left) in F19. PEA-F19-W-2651. Photo: BC Wildlife Federation

3.0 FWCP Strategic Objectives and Strategic Plans

3.1 STRATEGIC OBJECTIVES

The strategic objectives for the Fish & Wildlife Compensation Program reflect a synthesis of the core objectives and mandates of partner agencies as they relate to mitigating impacts associated with hydro-power generation in British Columbia:

Conservation

- Maintain or improve the status of species or ecosystems of concern.
- Maintain or improve the integrity and productivity of ecosystems and habitats. This addresses the concept of ecosystem integrity, resiliency, and the functional elements of ecosystems, including efforts to optimize productive capacity.

Sustainable Use

Maintain or improve opportunities for sustainable use, including harvesting and other uses. This objective focuses on our role in restoring or enhancing the abundance of priority species, and in providing information to resource management decision-makers related to providing opportunities for harvesting and other uses. Harvesting includes First Nations, recreational, and commercial harvests. Other uses may include cultural, medicinal, or non-consumptive uses, such as wildlife-viewing.

Community Engagement

Build and maintain relationships with stakeholders and Indigenous communities. This objective stems from BC Hydro's social responsibility policy, the provincial Ministry of Environment & Climate Change Strategy's shared stewardship goal, and the approach of Fisheries and Oceans Canada's Stewardship and Community Involvement Program. This recognizes the importance of engaging with Indigenous communities, local stakeholders, and other interest groups to contribute toward making good decisions and delivering effective projects.

3.2 STRATEGIC PLANS

Fish and wildlife investments in each FWCP region are guided by Action Plans that were developed with local input and provide strategic guidance. Our Peace Basin Plan and six Action Plans were approved by the Policy Committee in June 2014. These plans recommend specific projects and priorities, and are used to guide our grant decisions. We fund projects that align with these Action Plans. The plans are considered living documents that will be reviewed and refined as required, on an ongoing basis, as determined by the Board. The plans can be found on our website at **fwcp.ca/region/peace-region/**.

Action Plans:

- Lakes;
- Reservoirs;
- Riparian and Wetlands;
- Species of Interest;
- Streams; and
- Uplands.

Caribou were collared as part of a 2018–19 project to assess the Chase Caribou herd's response to habitat alterations. PEA-F19-W-2617. Photo: Wildlife Infometrics.

4.0 Report on performance

4.1 PROVINCIAL ROUND-UP OF FWCP FUNDING

The FWCP operates in three regions across British Columbia, with annual funding provided by BC Hydro. In the Columbia and Peace Regions, the FWCP operates to meet applicable fish and wildlife conditions in BC Hydro's water licences. In the Coastal Region, the FWCP's work is a voluntary initiative.

For F19, the total number of grant applications received across all three regions was 169, with 118 approved, for a total FWCP contribution of approximately $10 million. The total project value of these projects (including other supporting funders), which will help fish and wildlife, was $17.1 million.

4.2 2018–19 PEACE PROJECT SUMMARY

FWCP's annual grant intake opens each summer and closes in late fall. The grant applications are submitted and managed online through our grant management system (GMS). The GMS has improved administrative efficiency, enhanced data-collection and reporting, and has helped streamline the application review process.

In the Peace Region, prior to applications being submitted, project proposal ideas must go through the mandatory Notice of Intent (NOI) process. This process allows regional First Nations to speak directly to grant applicants for geographically relevant projects, and ensure they are fully aware of the proposed project activities. This process allows for early dialogue with First Nations prior to the grant application deadline and may lead to opportunities for First Nations participation in the proposed project. In fall 2018, the NOI process was incorporated into the GMS and streamlined the process for the First Nations Working Group Representatives reviewing the NOIs.

All grant applications received go through a three-stage review process. This consists of a review by the:

- Regional Manager and Business Coordinator who conduct a Program Office review of each application, including alignment of program mandate, project location, and connection to previous projects and deliverables;
- Fish or Wildlife Technical Committee to determine technical merit and the First Nations Working Group to evaluate for inclusion of traditional ecological knowledge, First Nation cultural values, and involvement of First Nations in the proposed project, where appropriate; and
- FWCP Peace Board that considers the review results from both the Technical Committees and the First Nations Working Group, and evaluates how well the proposed projects align with the FWCP strategic objectives of conservation, sustainable use and community engagement.

In the Peace Region, 55 Notice of Intent submissions were received for review to the First Nations Working Group, and a total of 47 applications submitted for subsequent review by our Technical Committees, First Nations Working Group, and Board. Applications were primarily submitted by consultants/registered businesses (28 applications), followed by non-government organizations/societies (10), government agencies (8) and First Nations (one). Although First Nations appear to have only submitted one application, First Nations-owned businesses (6) and First Nations-led societies (5) submitted applications and are included within those applicant types. Furthermore, First Nations were identified as participating in 40 of the 47 submitted applications (e.g. First Nation technicians in the budget).

Of the 47 submitted applications, the Board approved 25 applications (i.e. an approximate 50% approval rate). The Board also approved five directed projects for just under $671,000. Three were fish for $387,000 and two were wildlife for $284,000. A summary of F19 Board-approved fish and wildlife projects, including FWCP funding amounts, is provided in Table 4.2.

In addition to the annual grant applications and directed projects, our Peace Region received and approved six Community Engagement Grant applications in 2018–19, for a total of $5,000, utilizing all of the funding available for the year. We were able to support the following six projects: Father's Day Fishing Derby (Hudson's Hope Ski Association); Speaker STEM "The Golden Corridor" in Dawson Creek and Tumbler Ridge (Timberline Trail and Nature Club); North Peace Rod and Gun Club's Annual Fundraising Banquet in Fort St. John; Ducks Unlimited Spring Fundraising Banquet in Prince George; Tsay Keh Dene Science Week; and the Wild Sheep Society of BC's Storytelling and Dinner event in Fort St. John. Projects ranged from supporting local stewardship groups in hosting fish- and wildlife-related presentations to supporting First Nations' community science events.

4.3 2018–19 FINANCIAL REPORT

The FWCP is funded annually by BC Hydro. These funds — indexed to the Consumer Price Index (CPI) — are directed by the FWCP towards its priority actions to help meet its vision of thriving fish and wildlife populations in watersheds that are functioning and sustainable. BC Hydro provided $1.516 million to the FWCP Peace Region for F19. Unspent funding from prior years totaled $2.308 million, which resulted in a total of up to $3.824 million available to be spent in the Peace Region in F19.

Each year, annual funding is allocated by our Peace Region Board toward fish and wildlife projects and other program costs. In F19, these other costs included administrative costs (e.g. salaries, travel and expenses, office expenses, maintenance costs, and committee costs) and communications costs (e.g. communications support and advertising). Any unallocated funds are carried forward ("unspent surplus dollars") and available for future spending.

Similarly, not all allocated "committed" funds are expended by the end of a given fiscal year, due to the seasonal nature of some field-based projects. The unspent committed funds (e.g. "F18 remaining commitment to spend in F19") are the difference between the committed funds and what has actually been spent. These committed funds are carried forward and remain available for spending on the respective committed projects. All committed funds are associated with the fiscal year in which the spending was approved, and tracked separately.

As of April 1, 2018, the FWCP Peace Board approved an F19 budget of $2.583 million. In addition, there were prior year funding commitments of $1.346 million from F18, $7,162 from F17 and $100,780 from F16 resulting in an expected unspent surplus of $1.241 million (Figure 4.1). The F19 budget was 170% ($2.583 million of $1.516 million) of the annual funding provided by BC Hydro, similar to F18 where 169% ($2.511 million of $1.488 million) of the annual BC Hydro funding was allocated. Meaning over $1 million of the unspent surplus budget was planned to be utilized in F19.

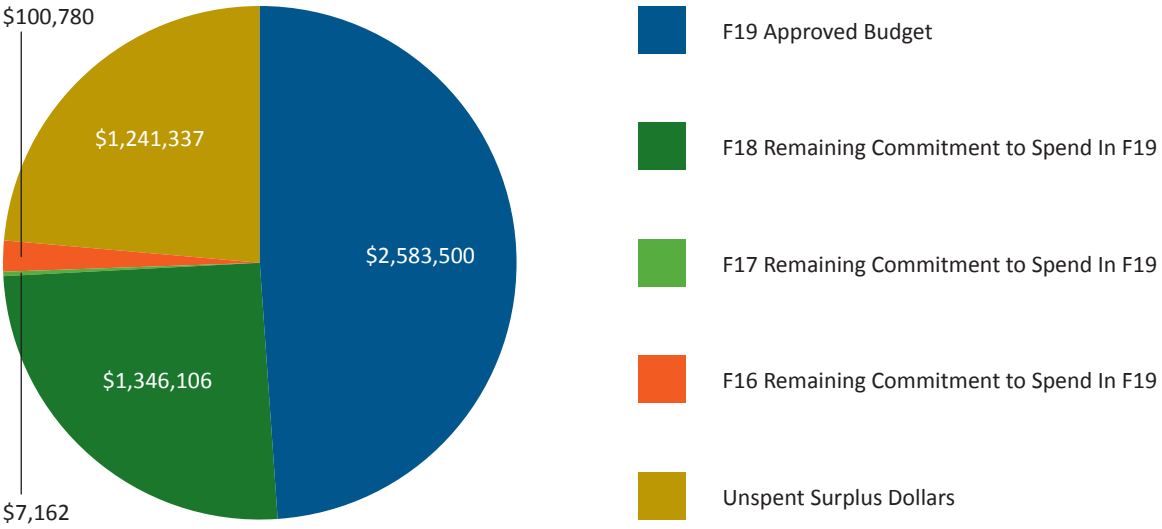

Figure 4.1: Financial Summary of FWCP Peace Region as of April 1, 2018 (start of fiscal year).

The approved F19 budget of $2.583 million directed funding toward administration (including committee meeting costs), communications, and fish and wildlife projects (grant-based projects and directed projects) is shown below in Figure 4.2.

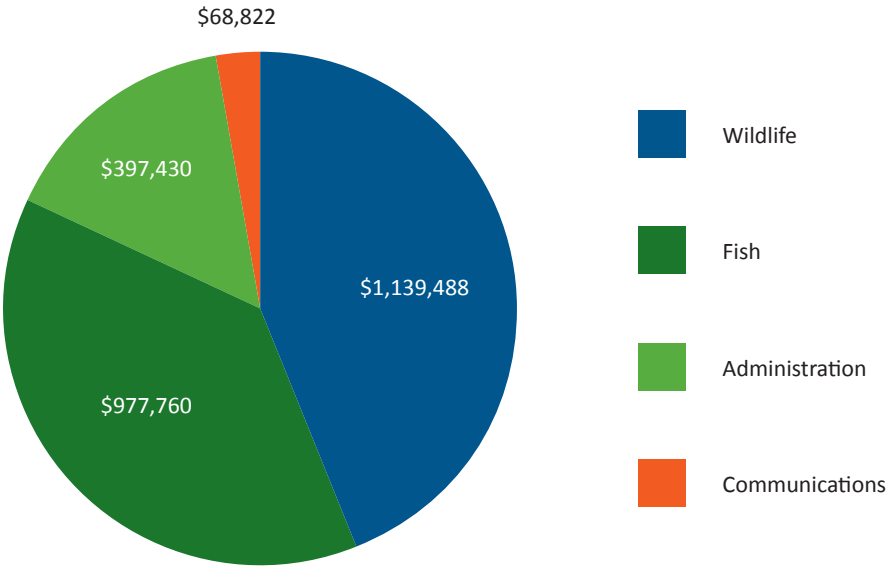

Figure 4.2: Breakdown of FWCP Peace Region F19 approved $2.583 million budget, as of April 1, 2018.

The FWCP encourages grant applicants to seek additional funding sources (e.g. other funding agencies, in-kind contributions) to leverage FWCP funding contributions. Demonstration that funds have been leveraged for a project is a consideration for the Board's decision-making. In F19, the FWCP funding allocation for grant-based projects was $1.446 million. The total value of the projects was just under $2.817 million as a result of financial partnerships and in-kind contributions. In other words, for every $1 dollar invested by FWCP, others contributed 94 cents, greatly increasing the value of the FWCP's investment overall.

The pie chart below provides a breakdown of the approved projects by type for F19.

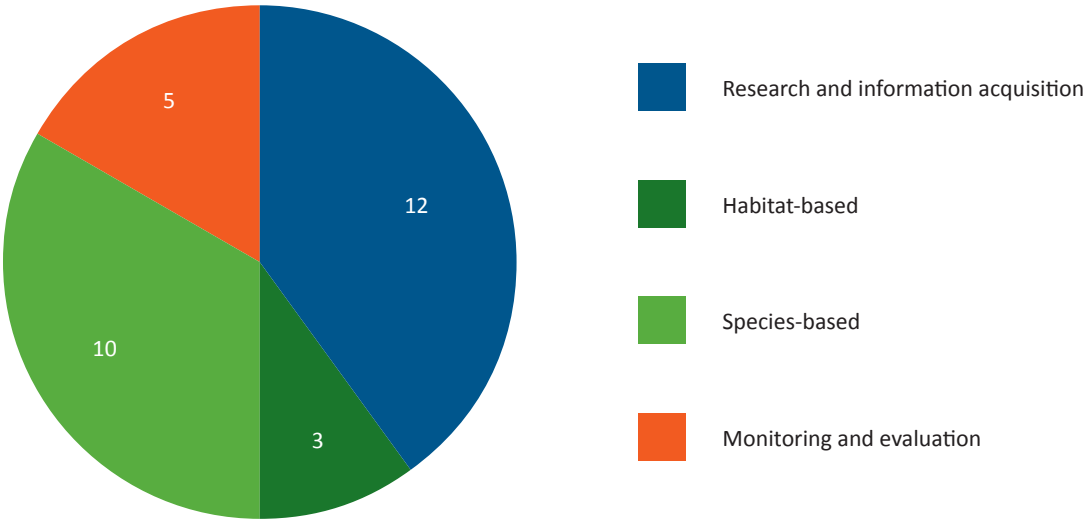

Figure 4.3: Breakdown of approved F19 Peace Region budget by project type.

A summary of planned and realized expenditures at the end of F19 by major budget category is provided in Table 4.1. This represents a "snapshot" in time of actual expenditures, as these values will change over the following months, as F19 approved projects become finalized and final payments are issued.

On occasion projects come in under budget ("Unspent funds" in Table 4.1). Any funds not spent once a project is completed will be carried forward as unspent surplus budget and made available for future spending. The fund categories of "Fish" and "Wildlife" include both grant-based and directed projects. The fund category of "X-Plan", as outlined in Table 4.1 below, is a new budget item approved by the Board after April 1, 2018 that is not associated with a currently funded project or administrative category.

A total of 39% ($1.033 million) of the approved budget (i.e. committed spend) had yet to be spent by March 31, 2019 due to ongoing projects that had not yet submitted final expenditures. There were no unspent funds available at March 31, 2019 and instead the F19 approved budget was overspent by $72,000. This overspend was primarily a result of two fish and wildlife directed project budgets, which were approved by the Board after April 1, 2018.

Table 4.1: F19 Peace Region budget status, as of March 31, 2019.

Fund category	F19 approved budget	Paid up to March 31, 2019	Committed spend[1]	Unspent funds[2]
Fish	$977,760	$658,292	$409,701	$(90,233)
Wildlife	$1,139,488	$702,749	$504,168	$(67,429)
Land Securement	$-	$-	$-	$-
Administration	$397,430	$256,593	$53,955	$86,882
Communications	$68,822	$50,685	$20,195	$(2,058)
SUB-TOTAL	$2,583,500	$1,668,319	$988,019	$(72,838)
X-Plan	$65,000	$19,807	$45,193	$-
TOTAL	$2,648,500	$1,688,126	$1,033,212	$(72,838)

Note[1]: Committed spend represents expected invoices for approved, ongoing projects that have not yet submitted final reports by March 31.
Note[2]: Unspent funds are carried forward and made available for future spending.

At the end of F19 (March 31, 2019), $1.688 million of the F19 budget had been spent, while $988,000 remained as an F19 commitment to spend in F20 and $45,193 remained as an F19 "X-Plan" commitment to spend in F20 (Table 4.1, Figure 4.4). In addition, the F18 carry-over commitments spent in F19 were $1.120 million, with $225,581 anticipated to be carried over and spent in F20. The F17 and F16 carry-over commitments spent in F19 were $100,780 and $7,162 respectively, with no carry-over into F20, resulting in an expected unspent surplus of $1.271 million (Figure 4.4).

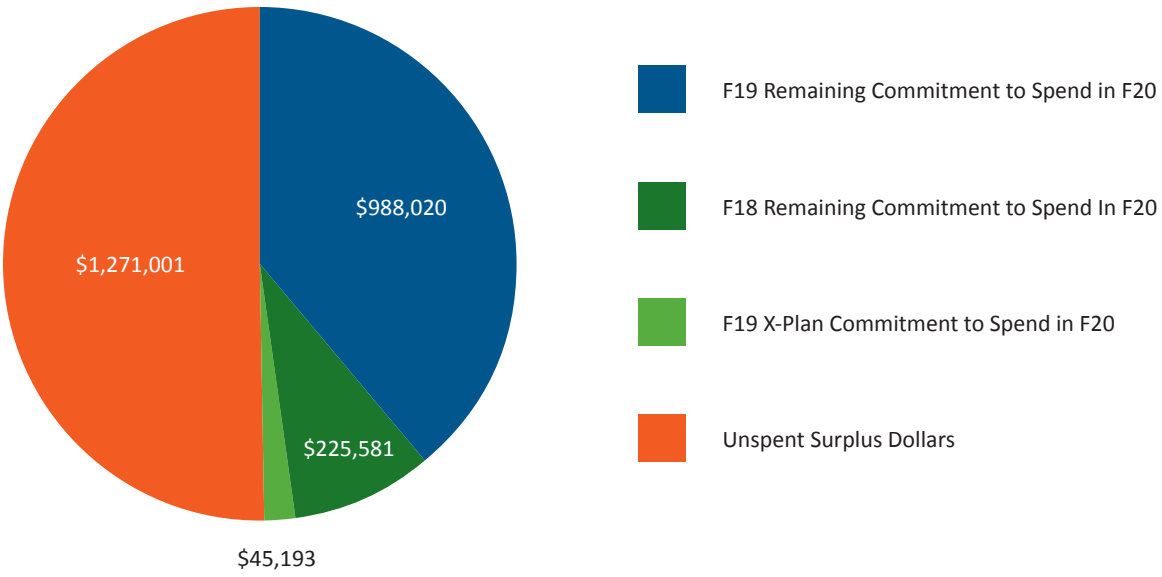

Figure 4.4: Financial Summary of FWCP Peace Region, as of March 31, 2019 (end of fiscal year).

4.5 F19 PROJECTS

Table 4.2 provides a listing of 2018–2019 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, 2018, due to project budget increases or decreases as projects progressed throughout the fiscal year. Final reports for all projects are posted to the appropriate Provincial databases once available. Visit fwcp.ca/results for an updated list of all available final reports.

Table 4.2: 2018–2019 Projects

Project ID	2018 - 2019 Grant-Based Fish Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-F-2593	**Studying Arctic Grayling and Bull Trout interactions in Williston Reservoir** *Spatial ecology of Arctic Grayling in the Parsnip core area* This 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. The 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 moderate and high immediacy 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.	University of Northern British Columbia (UNBC)	$168,253	Research & Information Acquisition	Streams Action Plan	Parsnip Arm	**Sixty-three fish tagged in Year 1** In Year 1 (2018), 63 fish (50 Arctic Grayling and 13 Bull Trout) were tagged (acoustic transmitters, and/or PIT [Passive Integrated Transponder] and anchor tags), mostly in the Anzac River. Fifty-four acoustic receivers were deployed in the Parsnip River Watershed and one in the lower Pack River. Data loggers were deployed to monitor air and water temperature throughout the Parsnip Watershed. A total of 89 samples (adipose fin, muscle, invertebrates, plants, particulate organic matter) were obtained for stable isotope analysis of carbon and nitrogen. The analysis is currently being conducted in the Environmental Isotope Laboratory, University of Waterloo.
PEA-F19-F-2622	**Studying Lake Trout in Williston Reservoir** *Peace Reach Lake Trout movements* In Year one (2016-2017) of this project, 66 adult Lake Trout were sampled and acoustic transmitters were implanted in 40. In Year two (2017-2018), data from of 27 data-logging hydrophone receivers (maintained by Carleton University and BC Hydro as part of a concurrent study) and four additional hydrophones deployed in the Finlay and Parsnip reaches, were used to focus field sampling in fall 2017. In Year three (2018-2019), acoustic transmitters will be implanted on 20 additional Lake Trout, additional receivers will be placed in the Finlay and Parsnip reaches, a second year of movement data will be recovered and fall survey work will focus on potential Lake Trout spawning or fall congregation areas, identified in 2017.	Diversified Environmental Services	$78,874	Research & Information Acquisition	Reservoirs Action Plan	Basin-Wide	**Alternate spawning area found in Nation Arm** As in Years 1 and 2, approximately 75% of implanted Peace Reach Lake Trout aggregated within the Ignatieff Bay area of interest, during peak spawning in early October. Using transmitter monitoring, targeted angling, and underwater video transects, spawning behavior was documented. Additional data from the Peace Reach receiver array and preliminary data from Parsnip Reach receiver stations, supported the Year 2 assertion that up to 25% of implanted Peace Reach Lake Trout may be using alternate spawning habitat outside the Peace Reach. Data analysis in Year 3, and recently acquired anecdotal evidence, suggests the likelihood of a second spawning zone in the vicinity of the Nation Arm. Fieldwork proposed for Year 4 includes identifying a potential secondary sub-population using an alternate reproductive strategy in this area.

Project ID	2018 - 2019 Grant-Based Fish Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-F-2624	**Studying kokanee in Williston Reservoir** *Ecosystem impact/nutrient enrichment by kokanee in Williston Reservoir* Kokanee were introduced to Williston Reservoir in the 1990s and are present in large populations. This project will assess the impact of kokanee return by monitoring nutrient flow, aquatic invertebrate biodiversity, functional diversity, and lichen diversity in riparian areas. In years one and two, surveys were used to identify systems with, and without, kokanee for use in research, systems were surveyed to develop species lists, and biodiversity and nutrient flow were monitored in a comparative manner between streams with, and without, kokanee. Year three of this three-year project, will allow for data analysis completion, conducting of additional field monitoring where data gaps exist, and work with local First Nations and communities on the dissemination of project results.	University of Northern British Columbia (UNBC)	$95,550	Research & Information Acquisition	Reservoirs Action Plan	Basin-Wide	Reporting in progress.
PEA-F19-F-2625	**Studying Arctic Grayling in our Peace Region** *Parsnip watershed Arctic Grayling monitoring* This project will resume Arctic Grayling abundance monitoring in the Anzac and Table rivers, which were surveyed from 1995-2004, using snorkeling surveys. This project will also use snorkeling surveys to describe the distribution of critical Arctic Grayling habitats and abundance in the Missinka River watershed for the first time. Resulting monitoring data will address two major information gaps identified within the FWCP's Arctic Grayling synthesis and monitoring framework documents: 1) the lack of Arctic Grayling abundance monitoring since 2007, and 2) poor understanding of Arctic Grayling abundance and critical habitats in areas upstream of the Table River. These data are required to assess conservation status, identify locations for conservation or enhancement actions, and identify new opportunities for human use of fish.	Ministry of Forests, Lands, Natural Resource Operations and Rural Development	$64,137	Monitoring & Evaluation	Streams Action Plan	Parsnip Arm	**Arctic Grayling abundance could be trending upwards** 2018 snorkeling counts of Arctic Grayling in long-term index sections of the Parsnip River Watershed were the highest on record for five of the six sites surveyed (all but the lowest Anzac River site between 16 km – 12 km; measured along the stream from the mouth). Analysis of population trends indicate a significant increase in the abundance of Arctic Grayling: greater than 20 cm in index sites over the 1995-2018 period. This apparent positive trend is considered provisional and requires corroboration in 2019 and beyond, given the abundance data are not balanced across time, and there is uncertainty about whether the extreme low water conditions observed in August 2018 may have affected counts of Arctic Grayling. The urgency for habitat conservation and restoration actions is high in critical Arctic Grayling rearing habitat of the Parsnip River Watershed, given this habitat lies adjacent to the existing road network, where intensive forestry and road-building activity is now underway.

Project ID	2018 - 2019 Grant-Based Fish Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-F-2626	**Studying Bull Trout in Williston Reservoir** *2018 Bull Trout spawner abundance and critical habitats* This multi-year project is a partnership between the Province of B.C., McLeod Lake Indian Band, Tsay Keh Dene Nation, and consultant John Hagen. The key objective is to monitor trends in abundance of Bull Trout populations in the Williston Reservoir watershed. This project will perform redd counts in index sections of the Davis, Misinchinka, Scott, and Point systems, and will also study critical habitats and abundance in the Omineca River watershed. In 2015, the five-year review of the redd count program identified two key priorities for the next five years: 1) additional index sections to increase the spatial coverage of the program; and 2) additional calibrated aerial redd surveys to estimate critical habitats and abundance in watersheds with low information adequacy (e.g. Omineca River).	Ministry of Forests, Lands, Natural Resource Operations and Rural Development	$62,583	Monitoring & Evaluation	Streams Action Plan	Basin-Wide	**Bull Trout redd count updated** 2018 extends the time series of redd count data to 15 years (over an 18-year period) for the Davis River, 10 years (over a 13-year period) for Point Creek, and eight years (over a 10-year period) for Scott Creek. The Misinchinka River time series remains at nine years (over an 11-year period), due to two beaver dams. Among the time series of redd count data for the four index systems, only that of the Davis River marginally meets the minimum criterion of two generations (roughly 14 years in British Columbia) for evaluating trends in Bull Trout abundance data. Meaningful trends in Bull Trout spawner abundance are not apparent for the other time series. To-date, aerial redd surveys have had an overall detection probability in calibration sites of 53%, suggesting that: 1) aerial redd counts can be considered reliable for estimating the distribution of the most important critical habitats; but also 2) aerial redd count-based population estimates are insufficiently precise for monitoring abundance trends or effectiveness-monitoring.
PEA-F19-F-2647	**Studying Arctic Grayling in our Peace Region's Ingenika River** *Snorkeling to monitor Ingenika River Arctic Grayling abundance* This project will apply a standardized snorkeling survey methodology to index reaches of the Ingenika River to estimate Arctic Grayling abundance. An Ingenika snorkeling survey for grayling was designed and implemented in 2004. The methodology, index reaches, and recommendations for crew size and time budget are detailed in Cowie and Blackman (2012). This project will establish surveys in new reaches, as well as a preliminary time series for estimating trend. This project aligns with the FWCP Arctic Grayling synthesis report and monitoring framework, which identifies that the lack of population abundance monitoring since 2007 is one of six key gaps limiting the ability to assess Arctic Grayling conservation status, or to design and implement conservation and enhancement measures.	Chu Cho Environmental LLP	$66,146	Species-Based Actions	Streams Action Plan	Finlay Arm	**Arctic Grayling abundance appears stable in Ingenika River** 2018 snorkeling surveys were conducted in 17 index sites of the Ingenika River, in the same 2004 survey locations. In 2018, the total minimum estimate for the 109 km Ingenika River mainstem was just 318 Arctic Grayling, greater than 20 cm. The snorkeling counts also provisionally indicated stable Arctic Grayling abundance in the Ingenika core area, with the 2018 estimate being within 13% of the 2004 estimate of 282. Use of the 41 km lower reach of the Ingenika River by Arctic Grayling appears to be minimal in late summer. Arctic Grayling were distributed at relatively consistent densities throughout the 49km-long mid-reach, which is characterized by a frequently-braided channel, relatively low gradient, and fines/gravel/cobble substrate. The most important feature along the Ingenika River affecting the distribution of Arctic Grayling appears to be a chute, located approximately 95 km from the mouth, which divides the upper reach into two distinct sections.

Project ID	2018 - 2019 Grant-Based Fish Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-F-2659	**Studying Arctic Grayling in Williston Reservoir** *Williston Grayling distribution: environmental DNA study II* This project, which builds on work supported through an FWCP seed grant in 2017- 18 (PEA-F18-F-2352), aims to identify the distribution and habitat use of Arctic Grayling in small tributaries entering directly into Williston Reservoir: streams where populations have declined most significantly due to flooding. Identifying small tributaries that continue to provide Arctic Grayling habitat is key to understanding the existing (surviving) life history variation in the watershed and will facilitate further conservation and enhancement actions. A proven methodology for rapidly identifying Arctic Grayling presence in streams is the use of the environmental DNA assay (eDNA) using water samples collected from potential habitats. The project team proposes to use the eDNA analysis technique in order to identify the distribution and habitat use of Arctic Grayling in the reservoir basin.	Stamford Environmental	$55,418	Monitoring & Evaluation	Streams Action Plan	Basin-Wide	**eDNA expands Arctic Grayling distribution** Fifteen rivers and creeks were surveyed, with 44 field samples distributed amongst them. Of these, 19 yielded positive results for Arctic Grayling. These results expand the known Arctic Grayling distribution in the Williston Core Area to five additional streams. All Williston eastern slope tributaries tested positive for Arctic Grayling eDNA. This is a highly encouraging result, since it has been suggested that Arctic Grayling had been extirpated from the Ospika and Davis rivers and Chowika Creek. Of all the samples collected from Williston Reservoir, only one near the Finlay River yielded a positive result. This reinforces the notion that Arctic Grayling tend not to utilize the reservoir environment. These preliminary results suggest that eDNA sampling has the sensitivity to locate Arctic Grayling critical habitats.
		Fish Project Total:	**$590,961**				

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2608	**Studying amphibians in our Peace Region's Williston Reservoir** *Amphibian wetland connectivity along Williston Reservoir* This four-year project is designed to investigate the ecology of amphibians in the Peace Region along Williston Reservoir. The research is being used to identify potential targets and methods for conservation-based interventions. A replicated occupancy study design is used to track individuals across habitats over time. The goal is to obtain estimates of abundance, occupancy, and biomass in two stage visits: spring and summer. Amphibians are surveyed in their habitats to understand how they are distributed, what environmental features are most important in their wetland and terrestrial habitats, and how they can be best managed in response to climate change, habitat loss, and other threats. Connectivity is a key theme in this project's communications, research, and management objectives. A public engagement program is tied to the research.	DWB Consulting Services Ltd.	$86,986	Species-Based Actions	Species of Interest Action Plan	Basin-Wide	**700 amphibians surveyed in multi-year project** Over the course of this four- year project, data have been gathered on the movements and habitat use of Western Toads, Long-toed Salamanders, Spotted, Wood, and Boreal Chorus frogs. To-date, 385 plots and 84 wetlands were surveyed alongside Williston Reservoir, with nearly 700 amphibians — including 366 Western Toads, 130 Wood Frogs, and 129 Long-toed Salamanders — photographed, measured, weighed, and catalogued. In addition, presentations, student field excursions, and stakeholder meetings were undertaken to promote conservation. One significant early finding is the importance of different types, mixtures, and volumes of coarse woody debris in upland areas around wetlands, where many amphibians spend most of their life. Outcomes of this project will be used to develop conservation and habitat enhancement recommendations and can be used to support regional forest managers and other partners to promote new silvicultural practices, with amphibians in mind. This may include prescriptions for specific classes and volumes of coarse woody debris, in addition to new considerations for landscapes and buffer design to maintain connectivity for amphibians in forests around wetlands.
PEA-F19-W-2611	**Building stewardship through Peace Region school program** *Williston school ecology program* Currently in its fourth year, this program is a community-based outdoor education program that extends classroom curricula and engages students with the northern outdoors. Ten modules (K-11) tie in with expected learning outcomes, and always use local ecology and First Nations knowledge to illustrate concepts and ideas (i.e. caribou to explore adaptation and evolution, spawning trout to explore life cycles). Currently the project is based in, and focused on Mackenzie and benefits from a close partnership with the McLeod Lake Indian Band. The project is well supported by the community, with high and consistent rates of volunteer contributions. The program has been extended to the Moberly Lake community, and many opportunities for further extension exist.	Wildlife Infometrics Inc.	$27,457	Habitat-Based Actions	Peace Basin Plan (Section 4.3)	Parsnip Arm	**375+ students get "schooled" in ecology** The Williston School Ecology Program has completed its fifth year, delivering the ecology modules to the majority of Mackenzie's (primary and secondary) student population, as well as the entire student population of Moberly Lake Elementary. This year, 12 ecology learning modules were delivered to 20 classes, ranging from kindergarten to Grade 11. These modules reached approximately 375 students, as well as the 22 teachers, administrators, and over 20 parents who chaperoned the activities. The field trips were made possible by the service of 33, predominantly local, volunteers. This year the Grade 7 tree-planting pilot was repeated, and a new timber-cruise oriented module was developed, to be piloted next year. The partnership and community engagement aspect of this program remains prominent, and is a key feature of its success.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2617	**Studying habitat alterations on Chase Caribou herd** *Chase Caribou herd response to habitat alterations: year two* Many caribou herds in B.C. are declining due to unsustainable predation, facilitated by habitat alteration. The Chase Caribou herd was once considered stable but has not been successfully monitored since 2009. Relatively few caribou were found in a survey attempted in 2017. Since 2009 the salvage of dead pine and the occurrence of large wildfires have contributed to extensive habitat disturbance. In year two of this five-year project, the potential impacts of habitat alteration will be assessed by monitoring collared female caribou (habitat use, adult mortality, calf survival) and observations will be contrasted to pre-disturbance parameters. The contrast will allow inferences about: a) potential impacts associated with recent disturbances; and b) conservation measures necessary to ensure resiliency of the herd.	Wildlife Infometrics Inc.	$99,476	Species-Based Actions	Species of Interest Action Plan	Finlay Arm	**Collaring caribou helps assess usage of altered habitat** In Year 2, a total of 34 caribou were safely captured and sampled. Of those, 19 were new captures and were collared, in addition to health and body-condition sampling, while 15 were repeated captures. To-date, five collared caribou have died from predation (three from wolves and two from Wolverine). The annual survival rate for collared females was 0.86 (CI: 0.76 – 0.96). Calf recruitment, based on March 2019 survey results, was 24 calves: 100 cows. Currently, natural disturbance represents the largest footprint on the landscape, with Mountain Pine Beetle (MPB) having the largest footprint, followed by wildfire. MPB started to increase in, or around, 2007 and was well established by 2010. The current rate of change due to forestry activity has changed from an average of 22 cutblocks/year, between 2004-2010, to 106 cutblocks/year, from 2017-2018. Outreach work has included regular meetings with the working group, updates with stakeholders, media relations and an “adopt-a-caribou” program.
PEA-F19-W-2621	**Training forestry industry to conserve fisher habitat in our Peace Region** *Fisher habitat conservation extension and field trials* Williston Reservoir greatly reduced the supply of habitats for fishers in the Upper Peace drainage. Ongoing forest harvesting continues to erode the ability of the landscape to support this priority furbearer. As such, conservation of important habitats on the remaining forested landbase in the region is critical. Using information from fisher research in the Williston region, training, tools, and best management practices will be provided to help forestry staff (from foresters to on-the-ground operators) retain important fisher habitats within their operations. In year two of this multi-year project, we will work with First Nation and industry partners to conduct field trials to determine if efforts are positively affecting the retention of fisher habitat within the landscape.	Ministry of Environment and Climate Change Strategy	$58,626	Habitat-Based Actions	Species of Interest Action Plan	Basin-Wide	Reporting in progress.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2623	**Helping UNBC share fish and wildlife knowledge** *2018-19 FWCP colloquium presentation series* This project provides an education and outreach venue for building connections and developing relationships with those who have an interest in the area. This series of presentations is an opportunity to share knowledge and expertise that is being developed in, or could be applied to, our Peace Region. The project will consist of a series of three invited speaker events, which will take place in the fall, winter and spring of each year; two in communities within the FWCP's Peace Region and a third in Prince George on the UNBC campus. Two of these events will feature researchers from British Columbia or Alberta, while 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 our Peace Region.	University of Northern British Columbia (UNBC)	$16,920	Research & Information Acquisition	Peace Basin Plan (Section 4.3)	Basin-Wide	**UNBC hosts presentations in our Peace Region** Three research colloquium presentations were delivered this year. Dr. Mark Shrimpton (University of Northern British Columba) presented on "One fish, two fish, red fish, lots of fish: Where did they come from and what are they doing?" in Mackenzie, on November 27, 2018. On February 21, 2019, Dr. Roy Rea (University of Northern British Columbia) discussed moose and forest management in his presentation "You cannot love softwoods and hate hardwoods… Considerations for moose in forest management," to an engaged audience in Fort St. John. And on April 11, 2019, Dr. Steve McAdam (BC Ministry of Environment and Climate Change) presented "White Sturgeon in B.C.: Moving from recruitment failure to restoration" to over 60 people in Prince George. The presentations were well attended by a broad cross-section of the local community, representing various interest areas (e.g. industry, academia, First Nations, government, and the general public) and generated many questions and interesting post-presentation discussions.
PEA-F19-W-2628	**Studying Wolverine Caribou herd population** *Population assessment of the Wolverine Caribou herd* The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNR), in collaboration with Tsay Keh Dene Nation and Nak'azdli Whut'en, initiated a three-year population assessment of the Wolverine herd in 2016. Years one and two were funded by FWCP and included deploying 30 GPS radio collars on adult female caribou, followed by a population census in February-March 2016. The census was followed by calf-recruitment surveys and mortality site investigations. The objective was to identify the primary limiting factors of adult female caribou and their calves. Year three will continue mortality site investigations and calf recruitment surveys within the Wolverine Caribou range for one more year (April 2018 to March 2019). The results of this project will support a survival analysis to assess the factors that influence caribou population dynamics in the Wolverine range.	Ministry of Forests, Lands, Natural Resource Operations and Rural Development	$95,004	Species-Based Actions	Species of Interest Action Plan	Finlay Arm	**Herd size continues to decline** For this three-year project, a total of 50 adult female caribou were captured and fitted with GPS-collars. Eight mortality site investigations were conducted; proximate causes of death were six wolf kills, one Wolverine kill, and one accidental death (i.e. caribou fell off a cornice). Five of the six caribou killed by wolves were within low elevation forests and one was killed in the subalpine. Adult female survival was estimated between 78% and 84%. Calf/cow ratios were estimated at 52 calves/100 cows in 2016-17 and 2017-18, and late-March recruitment was 29 and 32 calves/100 cows, respectively. Models were developed to quantify habitat selection at the home-range scale (3rd order) to delineate core seasonal ranges. The Wolverine subpopulation was estimated at 264 caribou (95% CI 252 – 316) with calves representing 17% of the population, confirming that the Wolverine subpopulation has been declining since the late-2000s, when over 350 caribou were estimated in the range.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2629	**Studying Finlay Caribou herd population** *Distribution and abundance of the Finlay Caribou herd* In 2017, FWCP funded the first year of a three-year population assessment of the Finlay Caribou herd, led by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNR), in collaboration with Tsay Keh Dene Nation and Kwadacha Nation (PEA-F18-W-2323). In this first year, a total of 20 GPS radio collars will be deployed on adult female caribou, followed by a population census in February-March 2018. For the second year of this project, FWCP funding will support late-winter calf surveys planned in March 2019, and collar data fees for the duration of collar life cycle (three years). The ultimate goal of this project is to determine the population status of the Finlay Caribou herd, and provide current information on the distribution and seasonal movements of the herd to delineate accurate range boundaries and core habitats within the range.	Ministry of Forests, Lands, Natural Resource Operations and Rural Development	$30,262	Monitoring & Evaluation	Species of Interest Action Plan	Finlay Arm	**2019 survey results: 84 animals in Finlay subpopulation** In March 2019, a total count survey, covering much of the core high elevation winter range, was shown to obtain a minimum count and estimate of calf recruitment. A total of 76 caribou were counted in 14 different groups within the Finlay range, and an additional 10 caribou in two groups were observed from tracking GPS collared females south of the Finlay range (East Williston). The population estimate for the Finlay subpopulation was 84 caribou. Results from the 2019 total count survey represent the highest number of caribou observed within the Finlay range. Of the nine GPS-collared adult female caribou collared in this project, four have moved into the Pink Mountain Caribou range, east of the study area, suggesting a relatively high degree of movement between the two subpopulations.
PEA-F19-W-2631	**Creating wildlife trees in our Peace Region** *Enhancing habitat for wildlife tree-dependent species* Dead and dying trees (aka wildlife trees) provide denning, roosting, nesting and feeding habitat for over 70 species of wildlife in B.C., including woodpeckers and sapsuckers, numerous cavity nesting birds such as small owls, some ducks and swallows, kestrels, bats and furbearers including fishers, martens, and squirrels. Some of these species, including Pileated Woodpecker and fisher, are considered keystone species in forest ecosystems. Consequently, wildlife trees are a critical component of all healthy forests. However, in some landscapes their supply has decreased as a result of natural and anthropogenic disturbances. This project seeks to create wildlife trees within the Finlay Reach of Williston Reservoir through fungal inoculation treatments that will benefit a variety of wildlife tree-dependent species.	Strategic Resource Solutions	$31,235	Species-Based Actions	Species of Interest Action Plan	Finlay Arm	**60 wildlife trees created** Using fungal inoculation and mechanical modification techniques, 60 wildlife trees were created in the area around Tsay Keh Dene (TKD), B.C., in September 2018. Important regional wildlife species that will benefit include woodpeckers, owls, furbearers (particularly Fisher and marten), and bats. Two field technicians from Tsay Keh Dene Nation (working for Chu Cho Environmental) were employed. Two excellent opportunities for community education and outreach also took place, including a slideshow and talk given to 15 school students and two teachers at the local TKD school on September 20, followed by a field demonstration tour for students and interested community members that same day. Community members included TKD elders, as well as other FWCP project participants. Based on the treatments conducted in 2018, recommendations for future wildlife tree enhancement treatments and effectiveness-monitoring were made.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2635	**Supporting Kwadacha land guardians in our Peace Region** *Kwadacha Nation Dene Nan Yǝdā' land guardian program* The Kwadacha land guardians (Dene Nan Yǝdā') program will monitor, collect information, and engage with the community on culturally important wildlife and plants. The main objectives of the project are to achieve: • information collection, including traditional and community knowledge, on the distribution, abundance, and health of culturally important plants and wildlife; • tools for community-based decision-making on culturally important wildlife, plants, and habitat, including distribution, health, medicinal uses, land uses, and harvesting; and • capacity training for guardians, such as cultural/environmental monitoring, sampling, digital tools (tablets), first aid, land-use monitoring, standardized reporting and information collection.	Kwadacha Nation	$66,650	Research & Information Acquisition	Species of Interest Action Plan	Finlay Arm	**Land Guardians collect cultural information** The Kwadacha Dene Nan Yǝdā' Land Guardians Program (DNY) established a program of monitoring, collecting information, and engaging with the community on culturally important wildlife and plants. The main outcomes of the project included: employment of two full-time DNY Land Guardians; training for guardian capacity and upgrading of tools for digital data capture; and development of systematic approaches for land- and resource-monitoring on culturally important wildlife and plants. On-the-land surveys and data collection occurred from September 2018 to February 2019. Over 300 samples, or observations by guardians on culturally important wildlife and plants, were collected.
PEA-F19-W-2639	**Restoring habitat to support endangered caribou** *Bickford habitat restoration pilot* Due to population declines of the Klinse-Za Caribou herd, recovery actions such as predator control and maternal penning have occurred since 2014. To ensure long-term sustainability of these populations, habitat restoration and access management are needed to reduce the impacts of disturbance features. This project proposes to continue to test the feasibility of using mechanical and ecological restoration methods to block human access, and restore ecosystem function along the upper portion of the Fisher Creek FSR, adjacent to Bickford Mountain. Outcomes expected include measures of success in reducing human access to caribou habitat and accelerated vegetation response. Results will also guide landscape-level habitat restoration planning for the Klinse-Za and Scott East herds.	Nun wa dee Stewardship Society	$43,698	Species-Based Actions	Species of Interest Action Plan	Basin-Wide	**Over 12,000 seedlings planted for Caribou habitat restoration** Camera-trap data collected pre-treatment, post-treatment, and on an untreated section of the Fisher Creek FSR was analyzed to measure the effectiveness of the restoration treatment and reducing human access. Vehicular use and access along the restored corridor were eliminated in snow-free periods and only five snowmobiles were successful at accessing and travelling along the restoration site during winter 2017-2018. Wildlife use also decreased compared to pre-restoration levels. Reforestation (i.e. ecological restoration) of the Bickford Mountain-Fisher Creek FSR was also completed. Approximately 9,690 conifer seedlings (hybrid White-Engelmann spruce, Subalpine Fir) and 2,500 Sitka Alder seedlings were planted along the 2.3 km linear corridor. Trail camera photos were collected throughout the year along the restoration site and provided a measure of corridor use by vehicles and wildlife.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2640	**Improving berry distribution and abundance knowledge to support traditional use and bears** *Characterizing edible berry distribution in the Peace Basin* Berries are an important food resource for people and wildlife across B.C.'s northern interior, but baseline information about abundance and distribution of berry types is lacking, preventing meaningful management. This seed funding will be used to write a proposal for developing a predictive, spatial model for key berry species based on field sampling, Traditional Knowledge and expert opinion. Engagement with First Nations and regional ecology experts during proposal development will help identify key project partners, and develop a meaningful sampling design and useful deliverables. Depending on partner interest, the model can be used to ask if berry resources are meeting traditional use needs, applied to Grizzly Bear inventory and habitat mapping, and used to develop management recommendations.	Wildlife Infometrics Inc.	$4,994	Research & Information Acquisition	Species of Interest Action Plan	Basin-Wide	**Information gained to support berry abundance mapping** For this seed project, a literature review confirmed that non-timber forest products, including edible berries, constitute a major research, and management, gap across the province. Several researchers who have directly or indirectly worked on documenting or modeling wild berry abundance in B.C. were contacted. A dataset containing records of plant species' presence and/or absence (and quantity) in several hundred vegetation plots sampled across the study area was obtained, which would enable the first round of modeling, and guide field sampling site selection for summer 2019.
PEA-F19-W-2645	**Studying threatened Olive-sided Flycatchers in our Peace Region** *Identifying Olive-sided Flycatcher breeding populations* British Columbia supports a large portion of the remaining Olive-sided Flycatcher breeding population. Although northern B.C. has suitable habitat for this songbird, there is limited knowledge regarding abundance and breeding success. Due to a population decline of approximately 70 per cent in the last 45 years, this species has been listed as threatened by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) and blue-listed in British Columbia. The Government of Canada has identified reduced breeding habitat quality as a potential source of population decline, and cites increased monitoring and research on the breeding grounds as high priority actions. This project aims to identify breeding populations of Olive-sided Flycatchers in northern B.C., to establish study populations for future research and monitoring.	Chu Cho Environmental LLP	$34,933	Species-Based Actions	Species of Interest Action Plan	Finlay Arm	**Three male Olive-sided Flycatchers located** In May-June 2018, survey efforts were concentrated in three areas within the study area: 1) Fort Ware, Kwadacha survey area; 2) Tsay Keh Dene survey area; and 3) the 2014 Tenakihi-Mesilinka burn site, Tenakihi-Mesilinka survey area. These areas contain habitat suitable for Olive-sided Flycatchers, including wetlands, cutblocks of varying ages, and recent burns. One hundred and thirteen call-playback surveys were conducted and three male Olive-sided Flycatchers were positively identified. Further surveys and a greater sample size of positive detections are necessary before conclusions can be drawn regarding population estimates, distribution, or the ability of the habitat to support this species.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2650	**Identifying caribou habitat restoration priorities in our Peace Region** *Identifying forest roadways for rehabilitation* The recovery strategy for Woodland Caribou (Southern Mountain population), has identified unnaturally high predation rates resulting from altered predator-prey dynamics, human-caused and natural habitat loss, degradation and fragmentation, as the primary threats to this population of caribou. Conservation efforts must focus on minimizing habitat fragmentation, access to caribou range, and the availability of early seral habitat. This project will identify, map and classify forest roadways within the Chase and Wolverine herd boundaries, according to vegetation cover, site lines, species composition and caribou movement data to identify priorities for the rehabilitation of forest roadways within the Chase and Wolverine Caribou herd boundaries.	Chu Cho Environmental LLP	$42,067	Species-Based Actions	Species of Interest Action Plan	Finlay Arm	**1943 kilometres of roads identified** A previously developed GIS algorithm was applied to produce a list of candidate roads selected for rehabilitation, which was further refined through engagement with licensees operating on the land base that could be affected by these decisions. In total, 1,942.8 km of road with potential for rehabilitation and/or reforestation activities across the entire Chase Caribou herd boundary was identified. Tsay Keh Dene membership identified areas of seasonal use and archaeological history that may be relevant to project goals. Priority areas and roads for restoration activities were identified near Johanson Lake and at various points along the Tenakihi Forest Service Road, Tutizzi Lake, the Swannell River drainage, the Ravenal and Flood Creek area to the south of the Ingenika River. The next step is to develop and implement treatment prescriptions to restore and decommission these sites, to benefit the Chase Caribou.
PEA-F19-W-2651	**Helping restore wetlands through training and education in our Peace Region** *Enhancing stewardship capacity for wetland restoration* The BC Wildlife Federation will offer four wetland inventory and restoration design workshops with partnering communities (i.e. Mackenzie, Nak'azdli, Saulteau and West Moberly, Tsay Keh Dene and Kwadacha). The wetland inventory training will enhance local capacity to ground truth and interpret wetland information, which will add value to the FWCP's Williston Reservoir wetland inventory initiative. Participants will also receive hands-on training to identify and develop restoration design prescriptions. BC Wildlife Federation staff, restoration expert, Tom Biebighauser, and at least one First Nation technician will be involved in a minimum of five days of wetland restoration reconnaissance in the FWCP's Peace Region to prepare restoration designs. Restoration would be pursued in future years.	British Columbia Wildlife Federation	$39,300	Habitat-Based Actions	Riparian and Wetlands Action Plan	Basin-Wide	**63 people attend wetland workshops** In 2018, the BC Wildlife Federation's Wetlands Education Program successfully hosted: a Wetlandkeepers Workshop in Mackenzie (11 participants); Wetlandkeepers Workshop in Moberly Lake (23 participants); Wetlandkeepers Workshop in Tsay Keh Dene (10 participants); Wetlandkeepers Workshop in Fort St. James (six participants); facilitated a meeting to support restoration in Tsay Keh Dene territory (six participants); hosted a public wetland restoration talk in Moberly Lake (seven participants); completed five days of reconnaissance to identify wetland restoration projects; and designed a wetland restoration plan for eight sites, including two that will be going ahead in 2019. The other sites require input and support from land managers and landowners before proceeding.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2661	**Studying use of bat caves by other species in our Peace Region** *Wildlife use of karst and cave features* While completing the three-year, FWCP-funded study to locate bat hibernacula in the Peace Reach (PEA-F18-W-2319), a number of cave and karst features were documented. Many are being used by denning and potentially hibernating wildlife, including bears, porcupines, and wolverine, as well as non-denning animals, such as Mountain Goats. This was considered unusual by the cavers, who have experience throughout B.C. Leveraging existing funding to retrieve bat detectors located in caves in the summer of 2018, game cameras will be installed to document wildlife use of these habitat features. Karst and cave features could represent an important habitat type that is limited on the landscape and this project aims to explore the potential importance of these habitat features.	Zonal Ecosystem and Wildlife Consultants Ltd.	$12,750	Research & Information Acquisition	Uplands Action Plan	Peace Arm	Reporting in progress.
PEA-F19-W-2668	**Studying Northern Myotis Bats near Williston Reservoir in our Peace Region** *Williston Reservoir Northern Myotis maternal roost study* Northern Myotis is a federally endangered bat species facing devastating population declines in the eastern part of its range due to White Nose Syndrome (WNS). Little is known about the habitat requirements of this species. It is not currently known whether Northern Myotis occur on the western side of Williston Reservoir; the existing range map only assumes a presence east of the northern Rockies. Unlike Little Brown Myotis, which readily occupies anthropogenic structures, Northern Myotis is an interior forest specialist often utilizing mature deciduous trees, rock crevices and sometimes buildings for maternal colonies. This project will focus on acoustic detectors to determine presence with capture and telemetry to follow reproductive females to maternal colony locations. The outcomes of this potential multi-year study would include forestry/industry extension programs to facilitate habitat conservation, land-use planning and management for the benefit of this species at risk.	Zonal Ecosystem and Wildlife Consultants Ltd.	$72,018	Research & Information Acquisition	Species of Interest Action Plan	Basin-Wide	**29 bats captured** In Year 1, 58,322 bat passes from 895 detector nights of recording at 28 locations were analyzed. A total of 29 bats were captured, including four Northern Myotis. VHF transmitters were affixed to two lactating females; however, the transmitters were either groomed off shortly after deployment or not relocated. One of the lactating females was tracked to a stand of aspen on the north side of the Peace River; however, the following day her transmitter was found, groomed off, on an island near the Peace Canyon Dam. A single Little Brown Myotis was also tracked to a natural tree roost. Recommendations have been included to increase capture and tracking success in Year 2. Capture efforts also revealed a likely Long-eared Myotis maternal roost in rock bluffs, along the north side of the Peace Reach of Williston Lake (Torwood Bluffs). Acoustic bat monitoring yielded a number of important observations for bat species in the region.

Project ID	2018 - 2019 Grant-Based Wildlife Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
PEA-F19-W-2670	**Evaluating caribou health in maternity pens in our Peace Region** *Klinse-Za / Scott East Caribou maternal pen health evaluation* Declines in B.C.'s Caribou herds initiated a cascade of management actions, including two maternal penning pilots. Over four years, the Klinse-Za pen project resulted in improved calf/cow survival. However, capturing and penning wild caribou has direct and indirect health consequences, and little is known of their health overall. This project proposes to evaluate penning on two key health indicators: stress levels and selected pathogens. The project has archived biological samples from caribou captured for the pen and unpenned animals. This project's objective is to: 1) compare acute (from serum), mid-term (fecal) and long-term (hair) cortisol levels between penned and wild animals, and 2) characterize specific pathogen exposure of the entire herd, following a protocol developed by the B.C. Boreal Caribou Health Research Program (BCHRP).	Nun wa dee Stewardship Society	$22,943	Species-Based Actions	Species of Interest Action Plan	Peace Arm	**Caribou penning does not appear to impact health** Four-hundred eighty-eight (488) fecal samples collected during the 2017 and 2018 calving season, and 56 blood serum samples collected during March capture in 2014–2018 were analyzed. Fecal cortisol levels in penned and wild cows are fairly similar pre-calving, but increase significantly after calving; cortisol levels in wild animals (median 136 ng/g, range 18.7–1273.3ng/g) is significantly higher than in penned animals (median 90 ng/g, range 17.3–687.7 ng/g). There was no relationship between the number of times a cow has been penned and her average pre-calving or post-calving fecal cortisol level. Individual pathogens did not appear strongly correlated with reproductive success/failure. Levels of trace nutrients do not appear to increase or decrease systematically as a function of repeated penning. This study provides some data to suggest that penning is not having an imminently negative effect on the health of cows.
PEA-F19-W-2671	**Improving Caribou calf survival and herd size through maternity penning** *Enhancing Caribou survival within the Klinse-Za / Scott East herd* The goal of this project is to sufficiently enhance survival of caribou cows and calves within the Klinse-Za and Scott East herd areas to allow for a positive population trajectory. Ultimately, the work aims to achieve a combined herd that is self-sustaining. Pregnant cow caribou are captured in early March and relocated to a protective pen situated in natural calving range. The cows are fed and protected during their advanced pregnancies, the calving season, and after calving. 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). The maternal pen project has been a success in its first four years of operation and this project will continue the maternal pen for a fifth year.	Nun wa dee Stewardship Society	$70,055	Species-Based Actions	Species of Interest Action Plan	Basin-Wide	**Herd size increases to 73** The desired goal for the number of penned cows (n = 20) was not reached, but 41% of the adult cow population (n = 12 cows, two yearlings) were captured and penned. No mortalities and no apparent adverse effects on the health of captured animals occurred. No predators gained access to the pen and the pen structure itself was not compromised in any way during the pen operation in 2018. Guardians observed predators and/or predator signs around the pen, and on the access road up to the pen. Grizzly bears are the main predator species consistently observed around the maternity pen. The population size of the combined Klinse-Za and Scott East Caribou herd is estimated to have increased from 36 individuals in 2013, to 73 in 2019. Continuation of the maternity pen project is recommended.
		Wildlife Project Total:	**$855,374**				

Project ID	2018 - 2019 Fish and Wildlife Directed Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
	Monitoring and managing fish enhancement structures *Managing fish habitat enhancement structures* Large woody debris structures were added to embayments of Dinosaur Reservoir in an attempt to enhance fish habitat several years ago. These enhancement structures need to be monitored and managed.	BC Hydro	$5,000	Research & Information Acquisition	Reservoirs Action Plan	Dinosaur Reservoir	**Aged fish habitat structures recommended for removal** Large woody debris structures were added to embayments to Dinosaur Reservoir, in an attempt to enhance fish habitat (e.g. Blackman, et al. 2004). These enhancement structures need to be surveyed annually to ensure they are safely secured, and any necessary repairs need to be made. In 2017 and 2018, the FWCP requested an inspection of the habitat structures on Dinosaur Reservoir. In 2018, 14 sites with structures were surveyed. Several had broken apart and crews assessed if structures were secured to shore and if not, temporarily secured them to shore with rope. Since yearly maintenance is required, it is recommended that the Peace Board develop a plan to remove the structures that appear to provide minimal fish habitat.
	Studying kokanee in our Peace Region *Kokanee assessment study* 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"	Ministry of Forests, Lands, Natural Resource Operations and Rural Development / University of Northern British Columbia (UNBC)	$119,529	Research & Information Acquisition	Reservoirs Action Plan	Basin-Wide	**28 tributaries surveyed for Kokanee** In September 2018, aerial enumeration surveys were conducted over 28 tributaries across the four main sub-watersheds of Williston Reservoir (Finlay, Omineca, Peace, and Parsnip). Results of these surveys were compared to spawner surveys conducted in three previous years: 2002, 2006, and 2010. At the reservoir-scale, a modest increase (1.2 fold) in spawner abundance was observed between 2006 and 2010, followed by a substantial (3.2 fold) decrease between 2010 and 2018. Among the four sub-watersheds, the Omineca and Finlay reaches had the highest proportion of Kokanee spawners enumerated in 2010 and 2018, a finding consistent with results from 2002 and 2006 surveys. Kokanee distribution generally decreased in the 2018 survey, which is thought to be a result of an overall reduction in fish abundance. Changes in spawner abundance between years, particularly between 2010 and 2018, may be due to density-dependent effects, resulting in lower recruitment into spawning populations.
	Supporting Mugaha Marsh bird banding station *Mugaha Marsh bird banding station* Mackenzie Nature Observatory operates the Mugaha Marsh Sensitive Area bird banding station on the Parsnip Reach of Williston Reservoir. The 2018 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.	Mackenzie Nature Observatory	$19,310	Monitoring & Evaluation	Peace Basin Plan	Parsnip Arm	**62 species and 2,700 birds+ banded** A total of 2,734 birds were banded, inclusive of 62 species, similar to the long-term average since 1995. Overall, most species experienced average or below-average numbers. Species that were above average numbers included: Yellow-bellied Flycatchers (seven), Swainson's Thrush (154), Magnolia Warbler (105), Wilson's Warbler (129), White-throated Sparrow (95), Western Tanager (18), Rusty Blackbird (seven), and Purple Finch (12). Below average numbers included Least Flycatchers (49), Alder Flycatchers (62), Hammond's Flycatcher (26), Cedar Waxwing (eight), Northern Waterthrush (77), Tennessee Warbler (23), Song Sparrow (21), and Pine Siskin (47). In total, 2273 volunteer hours were recorded, in addition to several volunteer hours by the bird banders.

Project ID	2018 - 2019 Fish and Wildlife Directed Projects	Project Lead	FWCP Funding	Project Type	Action Plan Alignment	Watershed	Project Outcomes
	Investigating factors limiting moose *Moose limiting factors* This project 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.	Wildlife Infometrics Inc.	$264,800	Research & Information Acquisition	Species of Interest Action Plan	Peace and Parsnip Arm	**Survival and calf production rates vary in Year 4** In Year 4, of this five-year directed project, three collared female moose died, all in the West Parsnip study area. All 40 collared cows in the Moberly remained alive all year. Calf production (and neo-natal survival) was higher in the Moberly (60%) than the West Parsnip (26%). By December, the Moberly had 43% calf survival, while the West Parsnip only had 21%. Calf survival in March, based on the collared female moose alive at the beginning of the year, was 19% in the West Parsnip and 35% in the Moberly. Population growth rates were positive in both study areas. In Year 5, efforts will focus on a multi-year meta-analysis of: 1) demographics and survival; and 2) female moose habitat use/selection; as well as looking closer at how calf status relates to the previous parameters.
	Investigating mercury levels in fish *Mercury in fish investigation* The purpose of this project is to continue to implement a robust mercury sampling plan that will gather enough information to improve understanding of mercury levels in fish tissue in the Williston Reservoir watershed. This project aims to directly engage First Nation communities that fish in the reservoir and tributaries, in the data collection.	Azimuth Consulting Group Partnership	$262,267	Research & Information Acquisition	Reservoirs Action Plan	Basin-Wide	Reporting in progress.
		Directed Project Total:	**$670,906**				
		2018 - 2019 Project Spend Total:	**$2,117,241**				

BCH19-620