



Message from our board co-chairs

Welcome to our annual report covering key highlights, decisions, and expenditures in our Peace Region for the 2021 fiscal year (F21), from April 1, 2020, to March 31, 2021.

This year was defined in large part by the global COVID-19 pandemic, which impacted almost every aspect of life. In these challenging circumstances, our project proponents, including First Nations, stewardship organizations, and government agencies, worked extremely hard to deliver the FWCP-funded projects approved by the Peace Region board. Some project activities were postponed or modified to align with provincial health restrictions, but only one of the 28 projects was cancelled. We certainly appreciate the contribution that our project proponents made to fish and wildlife during this difficult year.

After a robust engagement process spanning 18 months, we finalized updates to our regional action plans in August 2020. The ecosystem-based plans reflect emerging issues and ecological priorities to help conserve and enhance priority species, upland areas, wetland and riparian areas, as well as rivers, lakes, and reservoirs. We also created a new cross-ecosystem action plan with several broad actions that apply to more than one ecosystem.

In 2019, we received the final report from our independent third-party audit, as required by our governance manual. The key findings and conclusions are available at fwcp.ca/evaluation-audit-2018-2019, and the FWCP's policy committee developed nine priority actions to address the auditor's recommendations. A snapshot of our progress on some of these recommendations is as follows:

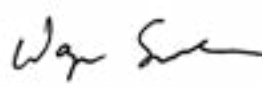
- We are close to finalizing work to clarify the scope and intended outcomes of our strategic objective related to improving opportunities for sustainable use.
- We continue to reduce the total number of actions and action plans as we update the plans.
- We are increasing the number of directed projects.
- We are updating our governance manual to ensure it is up to date and reflects current practices and priorities.
- We continue to build understanding about our work related to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

We are proud to count the Williston Wetland Explorer online mapping tool among our achievements this year. Developed by the B.C. Ministry of Environment and Climate Change with FWCP funding, the machine learning model uses several layers of data, including elevation data, satellite imagery, and high-resolution spatial climate data, to help predict the abundance, distribution, and connectivity of wetlands and riparian areas throughout our Peace Region. Identifying wetlands and riparian areas and the disturbances that are impacting their functionality is the first step of prioritizing them for conservation and enhancement. This technological approach is an efficient and cost-effective method in our region due to its size—about 7.2 million hectares!

Finally, we would like to thank Trevor Oussoren, who served as our program manager for six years, and we welcomed Monique Stevenson to the team, who was formerly the senior strategic business advisor to BC Hydro's senior vice-president of capital infrastructure project delivery.

Thank you to our board, First Nations Working Group, fish and wildlife technical committees, and staff for your contributions to the FWCP's Peace Region during this extraordinary year.

Sincerely,



Wayne Sawchuk
FWCP Peace Region,
Board Co-Chair



Monique Stevenson
FWCP Peace Region
Board Co-Chair

Cover page: Monitoring and maintenance are important to sustaining benefits for fish and wildlife. During F21, Blackbird Environmental inspected 53 nest structures in the Parsnip Arm. Here, an infertile egg is removed before fresh wood chips are added to the box. PEA-F21-W-3193. Photo: C. Coady



Annual reports are
also available for our
Columbia and Coastal
regions at
fwcp.ca

1.0 Organizational overview

1.1 INTRODUCTION

The Fish & Wildlife Compensation Program (FWCP) was established to compensate for the impacts to fish and wildlife resulting from the construction of BC Hydro dams. The FWCP conserves and enhances fish and wildlife in 31 watersheds impacted by BC Hydro dams. It is funded annually by BC Hydro and directs those funds toward priority actions across its three regions—Coastal, Columbia, and Peace—to conserve and enhance fish and wildlife in watersheds impacted by BC Hydro dam construction.

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 partnership with the Province of B.C., Fisheries and Oceans Canada (DFO), First Nations, and public stakeholders.

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 supports engagement and input from First Nations and public stakeholders. Board members in each region review, evaluate, and approve funding for all projects. Boards include representatives from each of our FWCP partners: BC Hydro, the Province of B.C., First Nations, and public stakeholders. The Coastal Region board also has a representative from the DFO. 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.

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. In F21, the

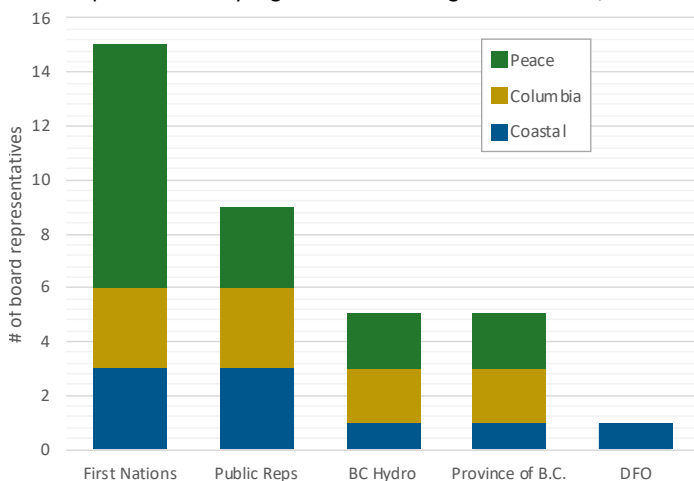


Figure 1.1: Board representation across all three FWCP regions

boards approved approximately \$8.7 million for 100 fish and wildlife projects.

Since 1988, BC Hydro has provided approximately \$191.5 million to the FWCP to compensate for dam impacts, and the FWCP has funded more than 2,100 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 the creation of the Williston and Dinosaur reservoirs (Figure 1.2).



Figure 1.2: Map of the FWCP Peace Region

2.0 Our strategic approach

2.1 VISION AND MISSION

Our vision is 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 dams.

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.

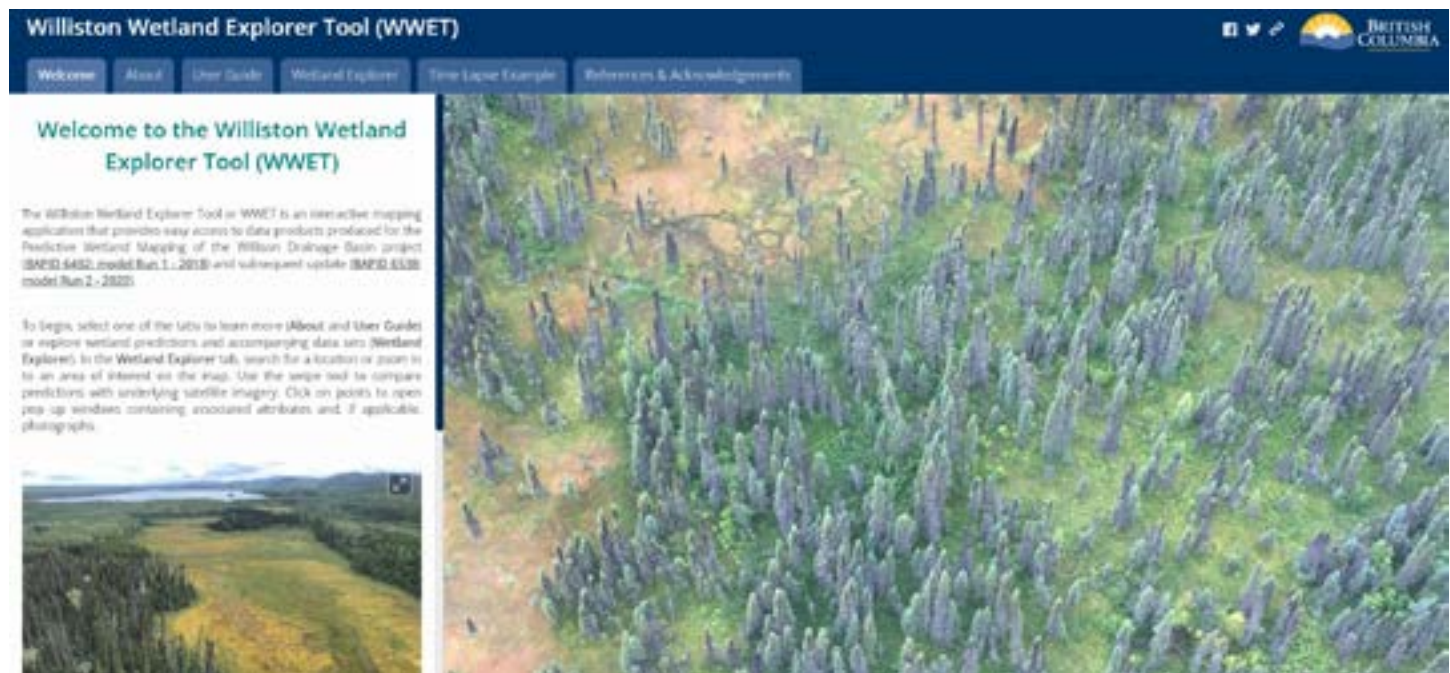
Sustainable use

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 First Nations.

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



The Williston Wetland Explorer Tool (WWET), led by B.C.'s Ministry of Environment & Climate Change Strategy, resulted in a predictive wetland riparian habitat model that identifies wetland and riparian areas across our Peace Region. The wetland and riparian areas are displayed through an ArcGIS platform that also shows other relevant information, such as roads and other disturbances on the landscape, that may impact wetlands and riparian areas. PEA-F19-W-2896-DC-105058. Photo: Province of B.C.

2.2 ACTION PLANS

Our action plans guide FWCP investments in fish and wildlife projects. They 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 four updated action plans, which were completed in 2020 in time for the F21 grant application intake, representing the ecosystems in the Peace Region:

- Cross-Ecosystem Action Plan
- Rivers, Lakes, & Reservoirs Action Plan
- Riparian & Wetlands Action Plan
- Uplands Action Plan

These updated action plans were developed with local input and provide strategic guidance on grant applications and funding decisions. The action plans and an overview document are available on our website at: fwcp.ca/action-plans-peace-region.

All F21 projects approved for funding by our board align with the priority actions identified in the former action plans—drafted in 2014. These have now been archived for reference, and are available at: fwcp.ca/archived-action-plans. F22 projects will align with the new action plans.



Sixty bird species were recorded at 24 sites in the Dinosaur Reservoir Watershed last summer, including five Species at Risk. The project, led by Zonal Ecosystem and Wildlife Consultants Ltd., used passive acoustic recorders (yellow circles) during the breeding season to identify songbirds, and will provide data for proposals to establish Wildlife Habitat Areas. PEA-F21-W-3191. Photo: Brian Paterson. Four at-risk species—all Provincially Blue-listed—were detected: black-throated green warbler, Canada warbler, winter wren, and the northern goshawk. Photos: Wikipedia

3.0 Board and committee members

FWCP Peace Region board 2020–2021

Stephanie Killam	Public
Wayne Sawchuk, Co-Chair	Public
Brian Paterson	Public
Ray Pillipow	Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)
Corey Erwin	Ministry of Environment & Climate Change Strategy BC Hydro
Monique Stevenson / Trevor Oussoren, Co-Chair	BC Hydro
Heather Middleton	Tsay Keh Dene Nation
Sina Abadzadesahraei	Treaty 8 Tribal Association
Vacant	Saulteau First Nations
Naomi Owens-Beek	Nak'azdli Whut'en
T. Rosemarie Sam	McLeod Lake Indian Band
Jayde Duranleau	Kwadacha Nation
Carolyn McCook	West Moberly First Nations
Tamara Dokkie	Prophet River First Nation
Debbie Hansen/Melissa Knight	Doig River First Nations
Gord Haines	

The board guides our work and is responsible for approving our Peace Region projects and budget.

First Nations Working Group

Sina Abadzadesahraei/ Sean Rapai	Tsay Keh Dene Nation
Vacant	Treaty 8 Tribal Association
Josh Foerderer & Lisa McArthur/ Fernie Garbitt, Co-Chair	Saulteau First Nations
George Desjarlais, Co-Chair & Walter Allison	West Moberly First Nations
Robin Tsakoza & Maurice Wolf	Prophet River First Nation
Charmayne Brinkworth & Madeline Oker	Doig River First Nations
Shawna Case	Kwadacha Nation
Arlene Solonas/Naiomi McKinnon	McLeod Lake Indian Band
T. Rosemarie Sam/Fred Sam	Nak'azdli Whut'en

Fish technical committee

Matthew Casselman/Erin Stoddard	BC Hydro
Randy Zemlak, Co-Chair	BC Hydro
Nikolaus Gantner	FLNRORD
Kristen Peck, Co-Chair	FLNRORD
Carmen Richter	Saulteau First Nations
Mark Shrimpton	Public

Wildlife technical committee

Carmen Richter	Saulteau First Nations
Kim Hawkins	BC Hydro
Michael Bridger	FLNRORD
Michael Klaczek Chair	FLNRORD
Brock Simons	BC Hydro

F21 policy committee

Cheryl Webb/Brad Fanos, Regional Director Pacific Region, Fisheries and Oceans Canada
Jennifer McGuire / James Mack, Assistant Deputy Minister, Ministry of Environment & Climate Change Strategy
Karen Popoff, Director, Environment, BC Hydro

The policy committee sets the overall policy direction for the FWCP including the governance structure, establishes the strategic framework, oversees periodic evaluations, approves significant changes to the FWCP, and addresses dispute resolution when necessary. For more details, refer to our [governance manual](#).

Roles and support

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

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

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

In each region, program management and operations were implemented by a region manager and supported by Monique Stevenson, FWCP program manager; Crystal Klym, team lead; and Lorraine Ens, business coordinator. Chelsea Coady was our dedicated Peace Region manager during F21.

4.0 Project funding and grants

4.1 PROVINCIAL PROJECT FUNDING

In F21, FWCP boards approved 100 projects for a total FWCP contribution of approximately \$8.7 million. The total value of these projects—including leveraged funding from other organizations and in-kind resources—was \$18.4 million.

Final reports for all FWCP-funded projects are uploaded to [Ecocat](#) or [SIWE](#) provincial databases, and searchable spreadsheets of reports for each FWCP region are available at fwcp.ca/results/.

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. Twenty-eight projects (either through grant applications or directed project proposals) were approved for F21, for approximately \$1.5 million in funding from our Peace Region board.

Grant applications

The 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, read our FAQs at fwcp.ca/apply-for-funding/.

For the F21 grant intake, 42 NOIs were received and submitted to the First Nations Working Group. Subsequently, a total of 35 applications were received for review, requesting funding of approximately \$1.8 million for a total project value of approximately \$4.4 million.

Our Peace Region board approved over \$1.4 million in funding for 25 projects through our annual intake of grant applications. Seventeen were wildlife projects (\$867,918) and eight were fish projects (\$537,172). First Nations were involved in 17 of the 25 approved grant application projects.

Directed projects

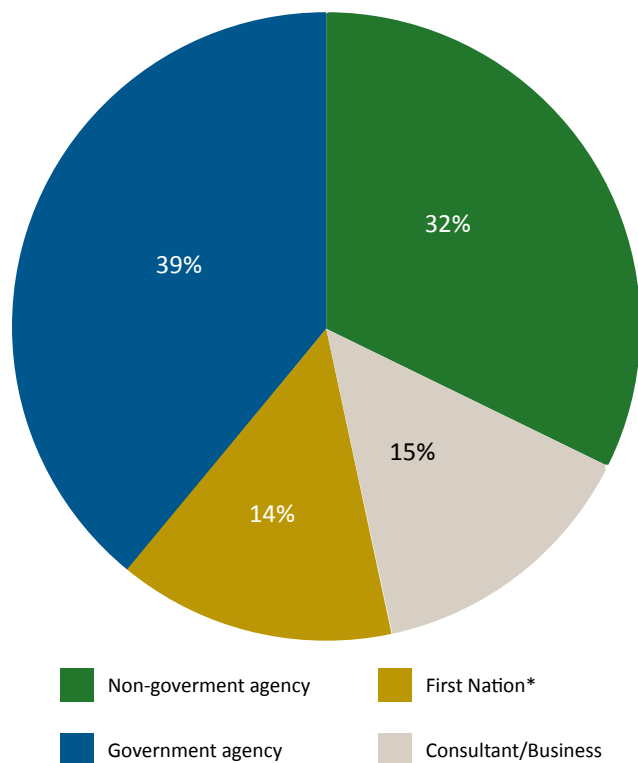
Our Peace Region board may also choose to direct projects and approve funding to address regional priorities. Priority actions in those plans that are identified as “Open” and “Directed/Open” are eligible for a grant. Actions identified as “Directed” are not eligible for a grant, our board directs these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

More than \$115,000 was approved for three directed projects. Nearly \$95,000 was approved for two kokanee assessment projects, and the Mugaha Marsh bird-banding station at the Mackenzie Nature Observatory was awarded more than \$20,000¹. See Table 6.1 for more details.

¹This project was cancelled due to COVID-19 restrictions.

Approved projects by proponent type

The FWCP Peace Region board approved 25 grant application projects and three directed projects. The majority were led by consultancies/ businesses and non-government agencies such as stewardship groups or non-profit environmental organizations. Figure 4.1 below shows the split of approved projects by proponent type.



*Includes Indigenous-owned businesses and Indigenous organizations

Figure 4.1: F21 Peace approved projects by lead proponent type

Approved projects by action type

We fund five types of projects:

- 1) research & information acquisition;
- 2) habitat-based;
- 3) species-based;
- 4) monitoring and evaluation; and
- 5) land securement.

In F21, 47% were research and information acquisition and over 20% were habitat-based. There were no land securement projects approved.

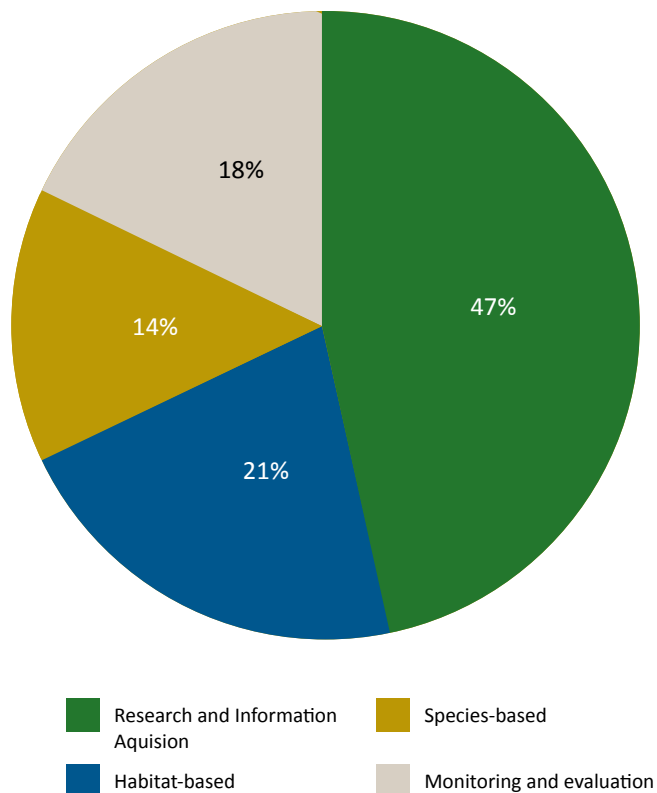


Figure 4.2 Approved projects by action type

Community Engagement Grant

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

Two Community Engagement Grant applications were received and both were accepted. One was led by the McLeod Lake Indian Band to raise awareness of mercury levels in fish in Williston and Dinosaur Reservoir watersheds. The second was led by the Mackenzie Nature Observatory to support Mugaha Marsh bird-banding online outreach activities. Each project was funded for \$1,000, so a total of \$2,000 of the \$5,000 of available funding was allocated.



The Mackenzie Nature Observatory received a Community Engagement Grant in F21 to produce a video (to be completed in F22) to showcase their work and encourage more volunteers at the bird-banding station at Mugaha Marsh. Here, a white-winged crossbill is getting processed. Photo: Serena Johnston

5.0 Peace Region financial report

5.1 APPROVED BUDGET AND EXPENDITURES

Annual funding is allocated by our Peace Region board toward fish and wildlife projects, administration, and communications. These allocations form the annual operating plan budget. Any unallocated funds are carried forward as unspent surplus dollars² and are available for future spending.

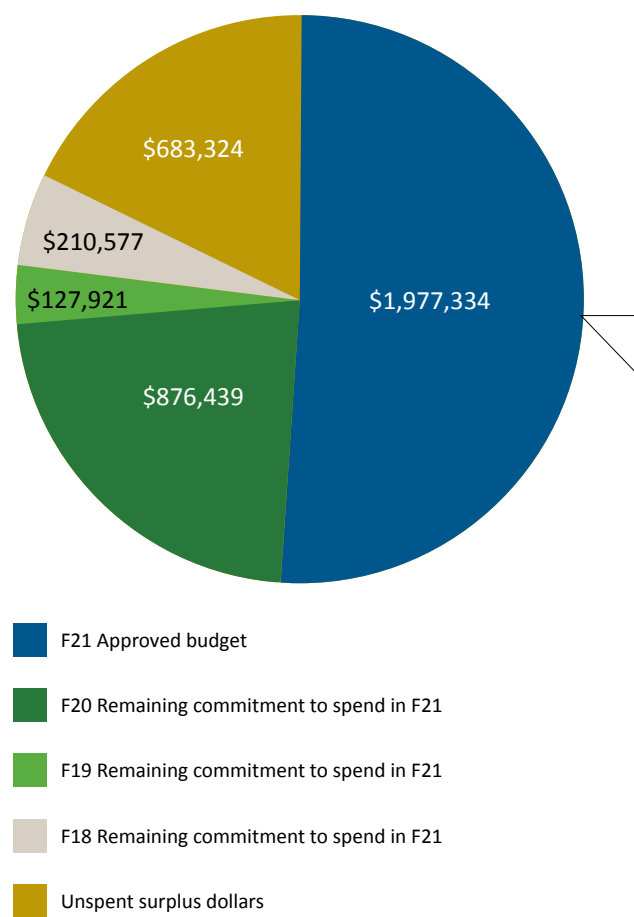


Figure 5.1. FWCP Peace Region financial summary as of April 1, 2020

Our Peace Region board approved an F21 budget of \$1,977,334. The annual funding from BC Hydro for the year was \$1,581,237, but due to surpluses in previous years, the board was able to allocate close to \$2 million.

Figure 5.1 shows a total of approximately \$3.9 million in the FWCP Peace Region account as of April 1, 2020. This comprises the approved budget of just under \$1.98 million, a remaining unspent surplus of approximately \$683,000, and prior-year funding commitment allocations of approximately \$211,000, \$128,000, and \$876,000 for F18, F19, and F20, respectively.

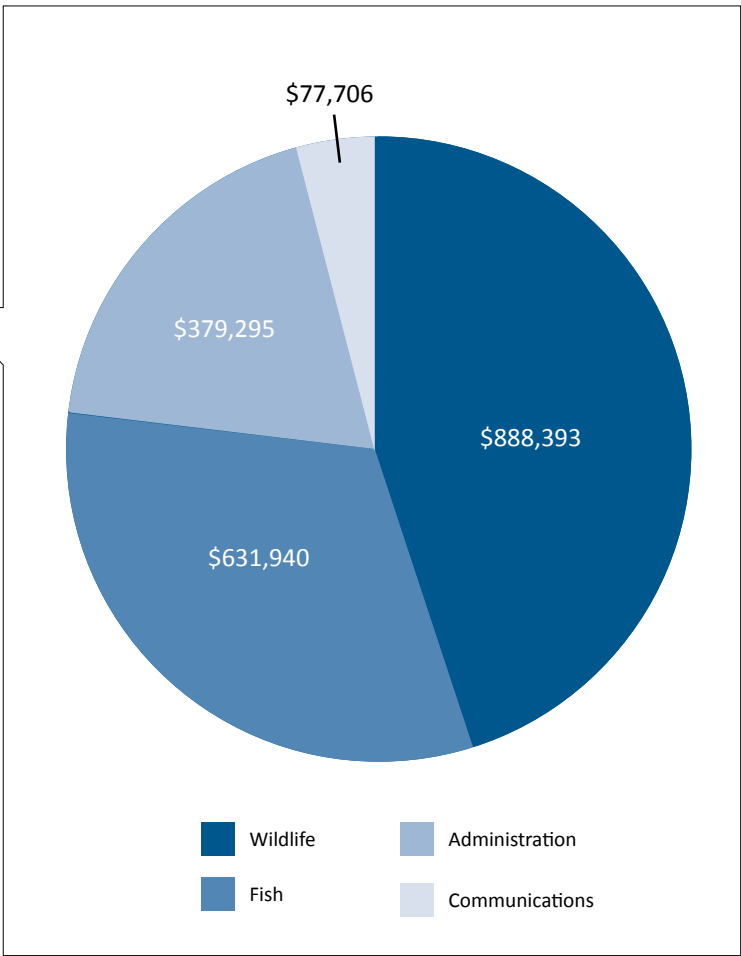


Figure 5.2. Breakdown of the approved Peace Region budget of approximately \$1.98 million as of April 1, 2020

Figure 5.2 illustrates the approved F21 budget as of April 1, 2020. Funding for wildlife projects made up 45% of the budget, and funding for fish projects made up 32%. Administrative costs made up approximately 19% of the total budget, including regional manager salary and expenses, costs to support the strategic planning for updating the Peace Region action plans, office-related expenditures, fees associated with uploading reports to the provincial data warehouses, maintenance and refinements to our grant management system, and support staff, board, First Nations Working Group, and technical committee costs. The remaining allocation was for communications, for approximately 4% of the annual budget.

² Unspent surplus is any unallocated funds available for future years spending.

The FWCP encourages grant applicants to seek additional funding sources (e.g., other funding organizations and in-kind contributions) to leverage FWCP funding contributions. In F21, the FWCP funding allocation for grant application projects was just over \$1.4 million. The total value of the projects was approximately \$4.4 million as a result of financial partnerships and in-kind contributions. In other words, for every dollar invested by the FWCP, others contributed nearly \$3, greatly increasing the value of the FWCP's investment overall.

Peace Region expenditures up to March 31, 2021, are shown in Table 5.1. This reflects a snapshot of actual and planned payments related to F21 projects. At the end of the fiscal year, \$1,230,134 of the F21 budget had been spent, \$573,186 remains as an F21 commitment to spend in F21, and unspent funds of just over \$174,000 are "unspent surplus funds."

Table 5.1: Program expenditures to March 31, 2021

Fund category	F21 approved budget	Paid up to March 31, 2021	Planned payments ¹	Unspent funds ²
Fish	\$631,940	\$ 490,411	\$133,957	\$7,572
Wildlife	\$888,393	\$468,595	\$392,970	\$26,828
Administration	\$379,295	\$214,473	\$33,127	\$131,695
Communications	\$77,706	\$56,655	\$13,132	\$7,919
TOTAL	\$1,977,334	\$1,230,134	\$573,186	\$174,014

1. Planned payments represent expected invoices for approved ongoing projects that have not yet submitted final reports by March 31, 2021.

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

In addition to the planned payments of \$573,186, the balance of prior-year funding commitments anticipated to be spent in F22 was \$61,645 from F20, \$53,792 from F19, and \$148,200 from F18, resulting in an unspent surplus of nearly \$1 million (Figure 5.3).

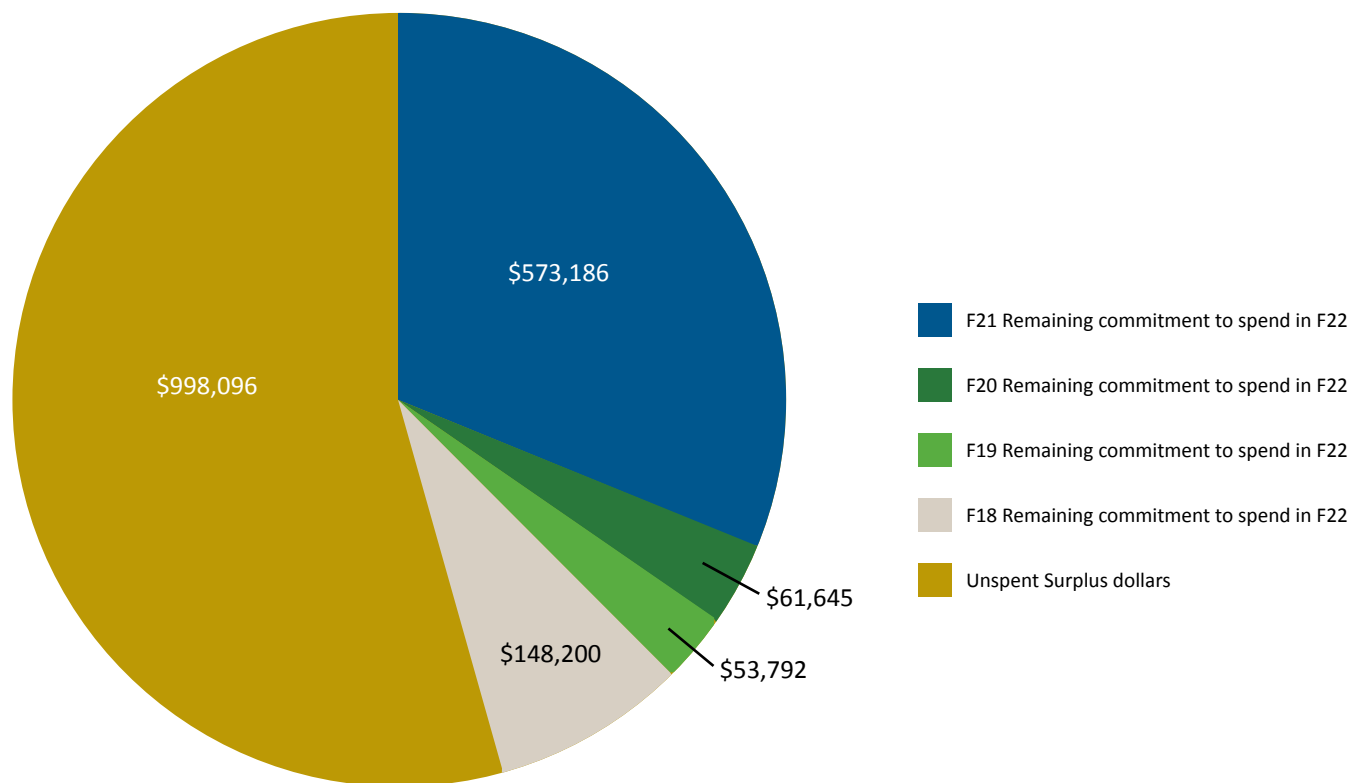


Figure 5.3: Financial summary of the FWCP's Peace Region as of March 31, 2021 (end of fiscal year)

6.0 F21 Peace Region projects and results

Table 6.1 provides a listing of 2020–2021 fish and wildlife projects approved for funding, including their alignment with action plan priorities. Funding identified in the following tables may vary from the approved budget, as of April 1, 2020, 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 for an updated list of all available final reports.

Table 6.1: 2020–2021 projects

Project ID, proponent, FWCP \$ amount, and sub-region	Grant-based fish projects: title and description	Project outcomes
PEA-F21-F-3172, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, \$83,806, Basin-wide	Bull Trout Spawner Abundance and Critical Habitats 2019–2020: Year 2 This multi-year project will estimate bull trout spawner abundance, in order to identify important populations and critical habitats. The results will inform conservation and enhancement actions. This project addresses priority monitoring needs, identified in the FWCP's Bull Trout Information Synthesis and Monitoring Framework.	Over 380 km of streams assessed for bull trout spawning A calibrated aerial redd count methodology was applied to approximately 390 km of accessible streams in the Williston Reservoir Watershed. On the east shore of Finlay Reach, Bruin, Collins, and Lafferty creeks were all found to be used by bull trout spawners. These data were combined with juvenile bull trout sampling records to delineate 24 new critical habitat segments, including 16 critical spawning zones. This increases the total number of bull trout critical habitat segments for the Williston Reservoir Watershed to 133, including 72 critical spawning zones. Three new index sections were surveyed: Collins Creek (east shore of Finlay Reach: 39 redds), Pesika Creek tributary (109 redds), and Silver Creek (146 redds).
PEA-F21-F-3176, University of Northern British Columbia, \$16,485, Basin-wide	Spawning Site Fidelity of Columbia Kokanee in Williston Reservoir This project, led by the University of Northern British Columbia, will use otolith microchemistry to identify whether spawning Columbia-origin kokanee are homing and returning to their natal streams. Columbia-origin kokanee were introduced into the Williston Reservoir Watershed, and within seven generations after stocking, kokanee have distributed throughout the reservoir, suggesting considerable straying. Results of this project will fill information gaps about introduced kokanee and inform future conservation and/or management actions.	Project delayed due to COVID-19
PEA-F21-F-3178, University of Northern British Columbia, \$176,492, Parsnip	Spatial Ecology of Arctic Grayling in the Parsnip Core Area This project, led by the University of Northern British Columbia, is year three of a multi-year project, which will investigate the spatial ecology of subadult 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.	Over 65 fish tagged in the Parsnip Watershed A total of 69 fish (44 Arctic grayling and 25 bull trout) were tagged in the Parsnip Watershed, increasing the project total to 157 grayling and 63 bull trout since 2018. Coarse telemetry analyses showed that Arctic grayling on average moved 4.3 ± 6.3 km per movement event lasting less than 24 hours, while bull trout moved 12.3 ± 8.3 km per event. Eight new water temperature logging stations were deployed in the Parsnip watershed, and data from 65 water temperature loggers and 40 air temperature loggers were downloaded. The mean 2020 summer water temperature in the Parsnip River was 9.47°C . A total of 167 biological samples—comprised of adipose fin, fish muscle, invertebrate, plant, and particulate organic matter—were collected for stable isotope analysis, adding to 235 samples collected in previous years of the project.
PEA-F21-F-3198, Stamford Environmental, \$68,325, Basin-wide	Williston Grayling Distribution: Parsnip, Peace, Dinosaur This project, led by Stamford Environmental, 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.	Twenty-two tributaries assessed for Arctic grayling eDNA One-hundred and fifteen samples and field controls (blanks) were submitted for laboratory analyses from streams draining into Parsnip River, Parsnip Reach, Peace Reach, and Williston Reservoir. Among the 22 tributaries assessed, Arctic grayling eDNA was detected in only four streams (five sites) and was not detected in any sites associated with critical habitats based on previous records. However sparse the distribution of eDNA in Parsnip and Peace reaches in only four streams, the detections suggest that Arctic grayling continue to disperse through the reservoir to find rearing habitats in small streams.

Project ID, proponent, FWCP \$ amount, and sub-region	Grant-based fish projects: title and description	Project outcomes
PEA-F21-F-3201, John Hagen and Associates, \$4,988, Basin-wide	Williston Bull Trout Population Structure and Life History This Seed Grant project, led by John Hagen and Associates, will support development of a larger project that aims to address two critical information gaps identified in the FWCP's 2019 Bull Trout Synthesis Report: 1) the lack of genetic data indicating population structure, which is needed to confirm conservation units (core areas) and assess the effects of reservoir creation on gene flow; and 2) the lack of biological sampling to assess changes in age, life history, and growth across time.	Six actions identified to support future bull trout project This project highlighted critical information that could support the development of a larger project to conserve bull trout by: 1) delineating six research questions relevant to bull trout conservation; 2) identifying two alternative study designs: a core study component focused on basic conservation needs and a more costly alternative to learn about potential reservoir effects on behaviour and gene flow; 3) completing a list of target sampling reaches; 4) compiling a list of potential partner organizations contacted for field sample collection or collaboration; 5) identifying a potential partner genetics laboratory; and 6) identifying additional sampling requirements to monitor age, life history, and growth.
PEA-F21-F-3203, John Hagen and Associates, \$78,360, Parsnip	2020 Parsnip Arctic Grayling Abundance and Critical Habitats This multi-year project, led by John Hagen and Associates, in partnership with the BC Ministry of Forests, Lands, Natural Resource Operations, and Rural Development, McLeod Lake Indian Band, and the University of Northern British Columbia (UNBC), will address important information gaps identified in the FWCP's Arctic Grayling Synthesis and Monitoring Framework. This project includes the third consecutive year of Arctic Grayling abundance monitoring in index sections of the Anzac and Table rivers, using replicated snorkeling surveys validated by mark-recapture. It also encompasses snorkeling to estimate Arctic Grayling abundance and critical habitats in previously unsurveyed reaches of the Parsnip River Watershed.	Arctic grayling surveys improve understanding Successful reconnaissance snorkeling surveys in the Hominka River and Wichcika Creek led to improved understanding of Arctic grayling abundance and trends. New analytical approaches were used to estimate abundance and snorkeling detection probability from replicated count data. Due to unsuitable underwater visibility in the Anzac River, only two of six planned surveys were completed.
PEA-F21-F-3209, Chu Cho Environmental LLP, \$83,219, Finlay	Ingenika Watershed Arctic Grayling Monitoring 2020–2021 This project will continue work from 2018 and 2019 performing Arctic grayling snorkeling surveys in the Ingenika River. This work supports a proposed framework of long-term population monitoring in three rivers (Ingenika, Finlay, and 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.	Five key study components completed to monitor Arctic grayling A multi-year project to survey Arctic grayling in the Ingenika River completed five key components: 1) snorkeling surveys in 13 long-term index sections of the Ingenika River Watershed. Counts in August 2020 were low relative to previous surveys over the 2004–2019 period, but statistical analysis did not indicate a significant negative trend; 2) an analysis of snorkeling detection probability using two independent methods; 3) the estimation of total abundance of Arctic grayling >20 cm, based on snorkeling count data and model estimates of detection probability; 4) the estimation of size-at-age for Arctic grayling in the Ingenika River; and 5) the delineation of critical summer rearing habitats for adult/subadult Arctic grayling based on 2004–2020 snorkeling survey results.
PEA-F21-F-3217, University of Northern British Columbia, \$4,788, Basin-wide	Developing an Aquatic Survey eDNA Degradation Rate Assay This Seed Grant project will help develop a common environmental DNA (eDNA) degradation rate assay that could be applied to a range of aquatic systems/eDNA surveys. It is anticipated that the results of this Seed Grant project will lead to a future grant application for a larger project to investigate degradation rates throughout the Peace Region, which will improve eDNA use assays to test for the presence of a species in aquatic environments by providing an estimate of the last occupancy.	eDNA degradation rate assay confirmed An aquarium tank experiment shows that it is possible to accurately measure the degradation rate of lambda DNA and that it reflects the degradation of eDNA from the aquarium species. Additional activities included studying the range of degradation rates in a number of natural sources, with the assessment of degradation rates at five locations in Northern B.C. completed. The results showed significant variation in degradation rates among sites. A time series assay that can be performed in less than 12 hours was designed. The time series analysis utilized for the field studies was conducted over the space of five hours, making it possible to complete within a typical seven-hour workday.

Project ID, proponent, FWCP \$ amount, and sub-region	Grant-based wildlife projects: title and description	Project outcomes
PEA-F21-W-3170, Invasive Species Council of British Columbia, \$47,520, Peace	Indigenous Partnerships and Invasive Species Management: Peace This project will increase the capacity of Saulteau and West Moberly First Nations, and potentially others, to identify, manage, and monitor new and emerging invasive species in the Peace Reach. This program will build on the Indigenous community toolkit for managing invasive species. It will provide employment skills training and mentoring, as well as regionally relevant resources, signage, and community presentations. A key deliverable will be the development of specific invasive plant management plans for Indigenous communities in the region.	Project delayed due to COVID-19
PEA-F21-W-3173, University of Northern British Columbia, \$16,648, Basin-wide	2020–2021 Colloquium Presentation Series This project provides education and outreach by building connections and developing relationships through a series of free presentations focused on research that is underway in, 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. It will feature researchers from British Columbia or Alberta and a national or international speaker, who will present on topics related to fish and/or wildlife species in the Peace Region.	Five online presentations delivered The five online presentations delivered were as follows: 1) Dr. Scott McNay, “Navigating the uncertain and difficult road to restoration and recovery of Klinse-Za caribou.” 2) John Hagen, “Status and critical habitats for bull trout in the Williston Reservoir Watershed.” 3) Rich Weir, “A tale of two populations: Why are fishers in the Peace different from 200 km away?” 4) Dan Kraus, “Dammed if we don’t: Exploring opportunities to restore connectivity in rivers and streams and why it matters”. 5) Dr. Eric Taylor, “Genomic analysis within Salvelinus; understanding speciation and information management.”
PEA-F21-W-3179, Chu Cho Environmental LLP, \$69,442, Finlay	Identifying Opportunities for Wetland Restoration 2020–2021 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 that will enable TKD citizens to continue to utilize these wetlands for food and medicine in the future	Four wetlands assessed to determine restoration options A wetland restoration specialist assessed four wetland sites to improve understanding of the distribution of wetlands in the Finlay Reach of the Williston Reservoir prior to inundation. A herpetofauna expert provided insight into amphibian habitat potential and use at three of these sites. Restoration options and recommendations for all four sites were provided. The Traditional Ecological Knowledge study conducted in 2019 was validated with some of the original participants, as well as other community Elders and knowledge holders.
PEA-F21-W-3181, Wild Sheep Society of British Columbia, \$59,768, Peace	Health and Behaviour of BC’s Southern-most Stone’s Sheep This multi-year project will focus on the two southern-most, functionally viable Stone’s sheep populations: the Dunlevy and Schooler herds. Due to their proximity to domestic farms and overlap with elk, these wild sheep are at high risk. The project will reassess their health and examine population demographics, behaviour, distribution, and habitat use of Stone’s sheep through use of GPS collars. Information gained from this project could be used to inform future conservation and enhancement actions for Stone’s sheep.	10 more Stone’s sheep collared and health assessed Ten Stone’s sheep were collared this year, increasing the collared sample size to 16: 13 in the Dunlevy herd and three in the Schooler herd. All previously collared individuals (n= 6) survived the year. Fifty sheep were observed during the late March 2021 survey of the Dunlevy herd, suggesting the population has remained relatively stable in the last 16 years. During this survey, six lambs were observed (two from collared ewes), and it was assumed they will become successful recruits in the population. Health results for all eight sheep captured in 2020 were negative for five viral and bacterial pathogens commonly carried by domestic ruminants and known to affect wild sheep. Fecal glucocorticoid metabolite levels indicate that the Williston sheep are at significantly higher stress levels than other herds.
PEA-F21-W-3184, Nikanese Wah tzee Stewardship Society, \$67,879, Basin-wide	Restoring Caribou Habitat in the Klinse-Za/Scott East Herd This project will implement functional and ecological restoration of linear corridors identified as near- and long-term priority sites. Outcomes expected include restoration of linear corridors, ultimately resulting in the reduction of human access, and predator use and movement rates, as well as improving caribou habitat at the herd-level.	More than 3,000 ha of caribou habitat restored Reforestation and tree falling activities resulted in 3,183 ha of caribou habitat being functionally restored. One hundred and thirty-six new juvenile trees are benefitting caribou by decreasing lines of sight along the corridor for predators. Since the start of this multi-year project, more than 100,000 seedlings have been planted and tree falling activities have been completed on five restoration sites in the Klinse-Za range, for a total of 35 km restored. Restoration efforts to-date have resulted in 13% of the existing disturbance (26,906 ha) in the watershed being restored.
PEA-F21-W-3186, Wildlife Infometrics Inc., \$25,218, Parsnip	Williston School Ecology Program This project will improve 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 well-being, and foster an appreciation of native flora and fauna.	Over 200 students benefit from ecology modules Six ecology learning modules and a virtual presentation have been delivered to nine classes, reaching more than 200 students, 15 teachers and administrators, parents, and chaperones. Unfortunately, school closures in the last part of the school year, due to the global COVID-19 pandemic, prevented the delivery of the spring modules. The fall and winter modules were presented with minor modifications to follow public health protocols. Three new modules are in the works for 2021: fungi, wildfire ecology, and invasive plants.

Project ID, proponent, FWCP \$ amount, and sub-region	Grant-based wildlife projects: title and description	Project outcomes
PEA-F21-W-3188, Zonal Ecosystem and Wildlife Consultants Ltd., \$64,400, Basin-wide	Bat Use of Karst Features in Williston Reservoir This project will improve understanding of bat use of karst features and a newly discovered large cave hibernaculum (the first discovered in B.C.), which may be very important for long-term monitoring of northern bat populations under threat from white-nose syndrome (WNS). This project will continue work with experienced cavers to extend surveys into this newly discovered cave system (almost 200 metres underground), further establish bat use of this feature, record microclimates, and explore additional caves.	Project delayed due to COVID-19
PEA-F21-W-3190, Birds Canada, \$73,474, Basin-wide	Motus Wildlife Tracking System: Peace Basin Expansion This project will expand use of the Motus Wildlife Tracking System to track birds and bats affixed with digitally encoded radio transmitters. Results can track animals across a diversity of landscapes, covering thousands of kilometres, and will support projects on key species, such as little brown myotis bats. This project will involve community groups, installing stations at schools and other locations, to incorporate the Motus Education Program that builds knowledge about birds, bats, and conservation, for grades 7-12.	Project delayed due to COVID-19
PEA-F21-W-3191, Zonal Ecosystem and Wildlife Consultants Ltd., \$19,055, Dinosaur	Detection of Identified Wildlife (Songbirds) for WHAs This project will use passive acoustic surveys during the breeding season to identify upland habitat for bay-breasted warbler, black-throated green warbler, Cape May warbler, Connecticut warbler, and Nelson's sharp-tailed sparrow. These are all designated under the Forests and Range Practices Act as "identified wildlife", for which Wildlife Habitat Areas can be established to conserve important habitat.	Surveys detect 2,795 birds Passive acoustic surveys detected 2,795 birds of 60 species, including five species-at-risk: black-throated green warbler, Canada warbler, evening grosbeak, northern goshawk, and winter wren. Species richness and diversity estimators were calculated for all recording sites. This inventory provides the basis for the proposal and establishment of multiple provincial Wildlife Habitat Areas to protect important breeding habitat for black-throated green warblers and protecting important habitat for secondary species, including Canada warbler, fishers, and northern myotis bats.
PEA-F21-W-3193, Blackbird Environmental Ltd., \$72,218, Parsnip	Enhancing Waterfowl Nesting Opportunities in the Parsnip Arm This project will locate previously installed nesting structures in the Parsnip Arm, inspect their condition, assess their use by target species, and repair or replace damaged structures, as needed. These structures can provide crucial tools to increase reproductive success of wildlife species in areas where the natural availability of nest sites have been reduced by human activity.	More than 70 nesting structures inspected A total of 74 artificial nesting structures were inspected in the Parsnip Arm sub-region. Fifty nest boxes were successfully maintained, and 13 new nest boxes were installed to replace old ones. Maintenance was performed on 17 floating islands. Eleven deteriorating floating islands were removed, and 10 newly designed ones were installed. Community engagement directly involved the McLeod Lake Indian Band, which provided two land monitors for maintenance activities. Additional engagement was unsuccessful due to COVID-19 protocols.
PEA-F21-W-3195, Nikanese Wah tsee Stewardship Society, \$50,519, Basin-wide	Enhancing Caribou Survival in the Klinse-Za/Scott East Herd Area The seventh year of this multi-year project is to enhance the survival rate of caribou cows and calves in the Klinse-Za and Scott East herds. Pregnant cow caribou will be captured in early March and transported to a protective maternity pen located in natural calving range. The cows will be fed and monitored through late July, until calves have grown to a point where they are less susceptible to predation by wolves and bears, after which all are released back to the wild. Surveys will be undertaken to assess effectiveness of maternal penning, relative to other management measures undertaken as part of the overall population recovery program.	Caribou herd grows by 13 to 101 It is estimated that the population size of the combined Klinse-Za and Scott East caribou herd (referred to as the Klinse-Za) has increased from 36 individuals in 2013 to 101 in 2021. Ten months after the 2020 calving season, seven calves from 13 penned cows were observed and seven calves from 19 free-ranging cows were still alive and presumed to become successful recruits. Despite apparent successes in observed population growth and recruited juveniles over multiple years, the increase in the female reproductive population, about 10 cows, has been limited, due to mortalities from avalanches and significant predation.
PEA-F21-W-3197, British Columbia Wildlife Federation, \$79,700, Basin-wide	Advancing Wetland Capacity and Stewardship The fourth year of this multi-year project, led by the BC Wildlife Federation, in partnership with Doig River First Nation, Kwadacha Nation, and the McLeod Lake Indian Band, will offer wetland inventory and health assessment workshops in Fort Ware, Mackenzie, and Doig River. Workshops will enhance capacity for wetland plant identification, inventory, restoration, and classification. Potential wetland restoration sites will be identified within the FWCP Peace Region, and a wetland will be restored at Mackenzie Secondary School to provide students with an invaluable educational tool.	Project delayed due to COVID-19

Project ID, proponent, FWCP \$ amount, and sub-region	Grant-based wildlife projects: title and description	Project outcomes
PEA-F21-W-3208, Wildlife Infometrics Inc., \$79,957, Finlay	Chase Caribou Response to Habitat Alterations: Year 4 In Year 4 of this project, work will continue to assess the influence of habitat changes on caribou by monitoring collared caribou (habitat use, adult mortality, and calf survival) and their habitat, and contrasting these results to similar parameters, prior to 2009. This contrast will help identify the potential impacts associated with recent disturbances and the conservation measures necessary to ensure the resiliency of the Chase herd for future generations.	Improving understanding of caribou response to habitat alterations Chase caribou and their habitat were monitored, and 12 caribou have died to date. 10 from definitive or probable predation, one due to an accident, and one of unknown causes. The calf:cow recruitment ratio across the population was 33:100. The population census in March 2021 counted 480 caribou across 44 groups throughout the herd's range. Currently, natural disturbance represents the largest footprint on the landscape, led by mountain pine beetle and wildfire. However, a change in the footprints of these disturbances was observed during this year. The number (51) and spatial extent (1,353 ha) of cutblocks decreased, while the length (79 km) and overall footprint (39 ha) of roads increased.
PEA-F21-W-3210, Ministry of Environment and Climate Change Strategy, \$24,494, Finlay	Effects of Habitat Change on Fisher and Marten Populations The second year of this multi-year project will improve understanding of the abundance, distribution, and trend of furbearing species, including fisher and marten, which have been impacted by significant habitat loss and change (e.g. reservoir-creation, logging of beetle-infested forest). Results of this multi-year project will contribute to functioning and sustainable fisher and marten populations in the Williston Basin, by helping to inform decision-making for continuing conservation.	Project delayed due to COVID-19
PEA-F21-W-3222, Ecologic Consulting Ltd, \$95,806, Basin-wide	Habitat Restoration and Priority Trials for Amphibians This project will support recovery actions for the at-risk western toad by filling knowledge gaps on restoration methods, effects of restoration, and monitoring of populations in strategic locations across the species' range.	Over 40 ponds surveyed for western toad habitat use Forty-two road ponds (i.e., flooded road ditch habitat) along the Webberly Forest Service Road were surveyed for use by at-risk western toads. A total of 30 individuals were tracked at four study sites: Blue Lake, Carp Lake, Middle Creek, and Webberly Lake. An amphibian restoration framework and management guide was drafted. Attempts were made to establish Carp Lake as an ecological reference site, but beetle kill and dead trees made access too challenging and unsafe.
PEA-F21-W-3223, Blackbird Environmental Ltd., \$17,606, Dinosaur	Enhance Waterfowl Nesting Habitat in the Dinosaur Watershed This project will use existing research and newly available predictive wetland and riparian habitat modelling to identify suitable enhancement areas in the Dinosaur Reservoir Watershed. Results of this review will inform efforts to construct, install, and monitor artificial nesting structures. The Dinosaur Watershed is uniquely suited for this project, as it provides opportunities to engage the public (i.e., Hudson's Hope schools, First Nations communities, volunteer groups) and share information about FWCP's habitat enhancement efforts.	Community helps install 17 nest boxes, two floating islands With the help of community members, 17 nest boxes and two floating islands have been installed for waterfowl in the Dinosaur sub-region. Families from Hudson's Hope Elementary and Secondary School helped construct the nest box kits and completed activity packages, and members of Saukteau First Nations assisted with monitoring. No additional engagement was implemented due to COVID-19 restrictions.
PEA-F21-W-3224, Blackbird Environmental Ltd., \$4,935, Basin-wide	Mapping Invasive Plant Risk Factors for Peace Wetlands This Seed Grant project is a desktop review that will utilize newly released predictive wetland ecosystem modelling data, in conjunction with other spatial information (e.g., from local governments and invasive plant committees), to assess risk and identify knowledge gaps and priority areas. It is anticipated that results from this Seed Grant project will lead to a larger future project to conserve the ecological functionality of wetlands threatened by invasive plant species.	Maps help assess risk and identify knowledge gaps on invasive plants During this desktop analysis, six maps were compiled that could support a larger future project to conserve the ecological functionality of wetlands threatened by invasive plant species.

Project ID, proponent, FWCP \$ amount, and sub-region	Directed projects: title and description	Project outcomes
PEA-F21-F-3363-DC-109837, Ministry of Forests, Land, Natural Resource Operations and Rural Development, \$77,800, Basin-wide	F21 Kokanee Spawning Surveys (Ministry of Forests, Lands, Natural Resource Operations and Rural Development LoA): Year 3 This project will provide a third 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.	Kokanee spawner abundance up in three of four watersheds In September 2020, aerial enumeration surveys were conducted for kokanee spawners over 29 tributaries across the four main sub-watersheds of the Williston Reservoir and compared with previous years. At the reservoir scale, a 1.7-fold increase in spawner abundance was observed in 2020 relative to 2019, compared to a 4.5-fold decrease between 2019 and 2018, and a comparable (3.2-fold) decrease in 2018 relative to 2010. In 2020, increases in spawner abundance were observed in three of four sub-watersheds: the Finlay, Omineca, and Peace Reaches. A small decrease was observed in the Parsnip Reach, with 2020 counts being similar to those in 2019.
PEA-F21-W-3362-DCA, Mackenzie Nature Observatory, \$20,475, Parsnip	F21 Mackenzie Nature Observatory (DCA): Year 4 of Agreement Mackenzie Nature Observatory operates the Mugaha Marsh Sensitive Area bird-banding station on the Parsnip Reach of Williston Reservoir. The 2020 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.	Project cancelled due to COVID-19
PEA-F21-F-3361-DCA, University of Northern British Columbia, \$16,968, Finlay	F21 Native Kokanee Persistence in Williston Reservoir Kokanee gill-netted in Williston Reservoir in 2000, were genotyped and the samples were comprised of both Columbia-origin and the native Williston Watershed kokanee. Samples from kokanee caught in 2006 and 2018 from spawning tributaries, however, reveal genetic signatures that are exclusively Columbia-origin fish. By sampling tributaries in mid-September, it is possible to miss the native kokanee that were not previously observed in tributary streams and appear to spawn later in the fall, based on stage of maturation. A survey similar to that conducted in 2000 should be undertaken to determine whether native kokanee have persisted in the reservoir. Once this is known, then appropriate management efforts can be made to preserve the native population of kokanee.	Project delayed due to COVID-19