FWCP
Fish & Wildlife
COMPENSATION PROGRAM

Annual Report

Columbia Region
2020–2021

fwcp.ca

BC Hydro

British Columbia

Fisheries and Oceans Canada | Pêches et Océans Canada

The FWCP is a partnership between 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 our board co-chairs

Welcome to our annual report covering key highlights, decisions, and expenditures in our Columbia 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. Some project activities were postponed or modified to align with provincial health restrictions, but all but one of the 43 projects approved by our Columbia Region board went ahead. We certainly appreciate the contribution that our project proponents made to fish and wildlife during this difficult year.

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 that 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 objectives related to improving opportunities for sustainable use.
- We continue to reduce the total number of actions and action plans.
- We are increasing the number of directed projects.
- We are reviewing 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).
- The other recommendations are being addressed through a tri-region work plan.

The audit also recommended that the Columbia Region explore options to increase involvement of First Nations in the region's projects. Starting in late 2019, we began a process to increase involvement of the Ktunaxa, Okanagan-Syilx and Secwepemc Nations. A First Nations planning group was established and met 25 times to discuss a tri-Nation approach to project planning and delivery. Work began on a strategic plan to guide this important work that now includes increased involvement in leadership and decision-making, in addition to project delivery. We also clarified our guidance to grant applicants to include early engagement with First Nations prior to the submission of grant applications.

Our work is just beginning. The FWCP is committed to strengthening involvement of First Nations and working collaboratively to co-develop a path forward.

Finally, this year we say goodbye and a huge thank you to Trevor Oussoren, who served as our program manager for six years. I—Monique—am very honoured to join the FWCP team as the new program manager and co-chair of the FWCP Columbia Region board, following my previous role as senior strategic business advisor to BC Hydro's senior vice-president of capital infrastructure project delivery.

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

Sincerely

Monique Stevenson
FWCP Columbia Region
Board Co-Chair

John Krebs
FWCP Columbia Region
Board Co-Chair

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

Cover: Twenty-four northern leopard frog egg masses were found in the Creston Valley in the 2020 field season, one of the highest observed counts since monitoring started there in 2000. Mesh cages were set up to protect each egg mass (inset) to increase survival. (COL-F21-W-3235-DCA) Photos: Kat McGlynn

1.0 Organizational overview

1.1 INTRODUCTION

With annual funding from BC Hydro, the Fish & Wildlife Compensation Program (FWCP) conserves and enhances fish and wildlife in 31 watersheds impacted by existing BC Hydro dams. The FWCP directs those funds toward priority actions across its three regions—Coastal, Columbia, and Peace—to fulfill its mission and work toward its vision of thriving fish and wildlife populations in watersheds that are functioning and sustainable.

BC Hydro has water licence obligations in the Columbia and Peace regions and has made voluntary commitments to address the impacts of dams in the Coastal Region. BC Hydro fulfills the applicable obligations through the work of the FWCP. BC Hydro works in 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. Our 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 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 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 Columbia Region was established in 1995 to compensate for fish and wildlife populations affected by the construction of BC Hydro dams in Canada's portion of the Columbia Basin (Figure 1.2).

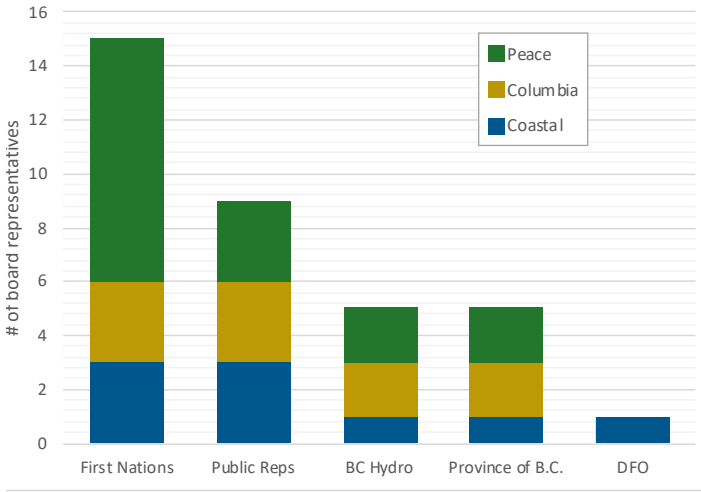


Figure 1.1: Board representation across all three FWCP regions

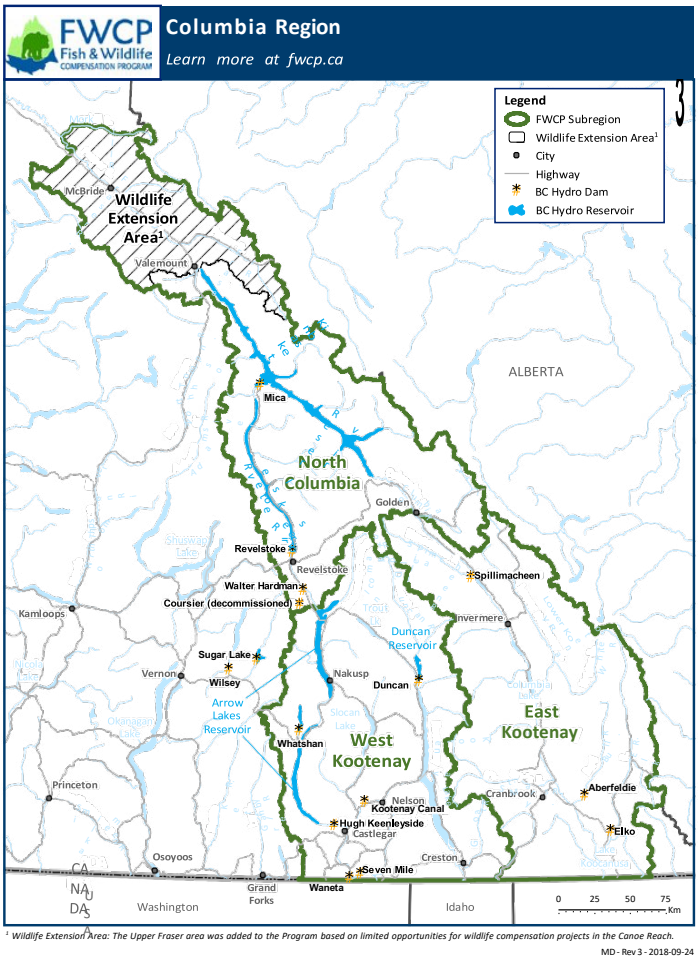


Figure 1.2: Map of the FWCP's Columbia Region

2.0 Our strategic approach

2.1 VISION AND MISSON

Our vision is for thriving fish and wildlife populations in watersheds that are functioning and sustainable, and our mission is to compensate for fish, wildlife, and their supporting habitats in watersheds impacted by BC Hydro 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. The FWCP's strategic objectives are:

Conservation

Maintain or improve the status of species or ecosystems of concern. Maintain or improve the integrity and productivity of ecosystems and habitats.

Sustainable use

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

Community engagement

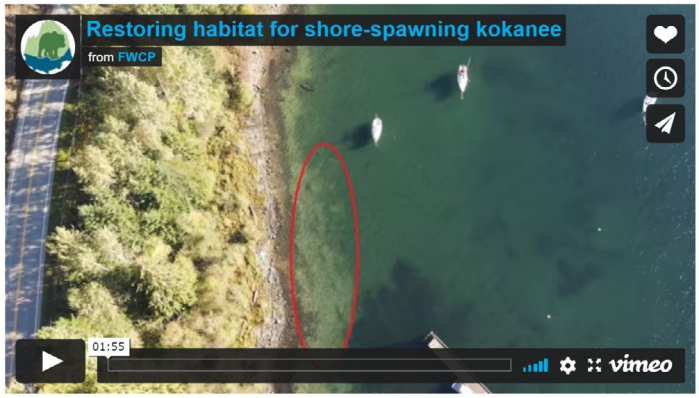
Build and maintain relationships with stakeholders and Indigenous communities. This objective stems from BC Hydro's social responsibility policy and the Province of B.C.'s shared stewardship objective.

More details on these objectives can be found in our governance manual.

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.

Our Columbia Region action plans were updated in 2019. They can be viewed at fwcp.ca/region/columbia-region/. The previous action plans, spanning the years 2012 to 2019, have been archived for reference and are at fwcp.ca/archived-action-plans/.



More than 80 m^3 of clean spawning gravel was added to a 50-m-long stretch of water near the shoreline along the West Arm of Kootenay Lake, north of Nelson. It provides new habitat for declining shore-spawning kokanee and reduces the risk of redds being dewatered in the spring. Friends of Kootenay Lake led the project with help from the Province of B.C. (COL-F21-F-3248) Photo: FWCP.

Watch the video: fwcp.ca/project/restoring-habitat-for-shore-spawning-kokanee-in-kootenay-lake

3.0 Board and committee members

FWCP Columbia Region board 2020–2021

The board guides our work and is responsible for approving our Columbia Region projects and budget. In addition to funding projects through our annual grants, the board may choose to direct projects and approve funding to address regional priorities. The Columbia Region board members during F21 were:

Trevor Oussoren/ Monique Stevenson, Co-Chair	BC Hydro
John Krebs, Co-Chair	Ministry of Forests, Lands, Natural Resources and Rural Development (FLNRORD)
Damien Joly	Ministry of Environment and Climate Change Strategy
Kim Cox	BC Hydro
Misun Kang	Ktunaxa Nation Council
Mark Thomas	Secwepemc Nation
Howie Wright	Okanagan Nation Alliance
Moss Giasson	Public
Rob Neil / Giles Shearing	Public
Wendy Booth	Public

Technical committees

The board is supported by two technical committees, one for wildlife projects and one for fish projects. 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; supporting the development of strategic plans; assisting in the development and oversight of directed projects; and providing advice on the effective implementation of action plans.

Fish technical committee

Karen Bray, Chair	BC Hydro
Will Warnock	FLNRORD
Tyler Weir	FLNRORD
James Crossman	BC Hydro
Amy Duncan	Okanagan Nation Alliance
Ben Meunier	Ktunaxa Nation Council
Vacant	Secwepemc Nation

Wildlife technical committee

Lindsay Anderson, Chair	FLNRORD
Tom Appleby	BC Hydro
Cathy Conroy	Ktunaxa Nation Council
David DeRosa	Okanagan Nation Alliance
Patrick Stent	FLNRORD
Vacant	Secwepemc Nation

Policy committee

Cheryl Webb/Brian Fanos, Regional Director Pacific Region, Fisheries and Oceans Canada
Jennifer McGuire / James Mack,, Assistant Deputy Minister, Ministry of Environment
& Climate Change Strategy B.C.
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.

Management and support

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. In our FWCP Columbia Region during F21, Crystal Klym was also our dedicated region manager.

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 COLUMBIA REGION PROJECT FUNDING

In our Columbia Region, the FWCP supports the delivery of fish and wildlife projects in a variety of ways, including grant applications, long-term agreements, and directed projects. Forty-three projects were approved for F21, for approximately $5.5 million in funding from the FWCP Columbia Region board.

Grant applications

The FWCP's annual grant intake opens each summer and closes in late fall. All grant applications go through a three-stage review process. For more details, visit our FAQs at fwcp.ca/apply-for-funding/.

In F21, a total of 51 grant applications were received, and our Columbia Region board approved 28 projects for a total funding contribution of more than $950,000. First Nations, stewardship groups, consultants and agencies are leading the 23 wildlife projects (approximately $836,000) and five fish projects (approximately $115,000) that will help conserve and enhance fish and wildlife in watersheds impacted by BC Hydro dams.

Annual and ongoing projects

In F21, our Columbia Region board approved a total funding contribution of nearly $4.5 million to support the implementation of 13 annual and ongoing fish and wildlife projects. These projects are typically comprised of multiple sub-projects and activities and are delivered with support from the Province of B.C. through a letter of agreement and other regional partners through contracts and contribution agreements.

For F21, there were five annual and ongoing fish projects for approximately $2.2 million in funding. These projects included adding nutrients to both Kootenay Lake North and Arrow Lakes Reservoir, recovering Columbia River white sturgeon, and operating and maintaining both Hill Creek (north of Nakusp) and Meadow Creek spawning channels.

For F21, there were eight wildlife projects for more than $2.3 million in FWCP funding. These projects included stewardship of conservation lands, enhancing upland and dryland species in the East and West Kootenay, enhancing non-game habitat, recovering caribou and northern leopard frog populations, restoring and enhancing wetlands, and securing conservation lands in partnership with local and regional land trusts and the Kootenay Conservation Program's Land Securement Committee.

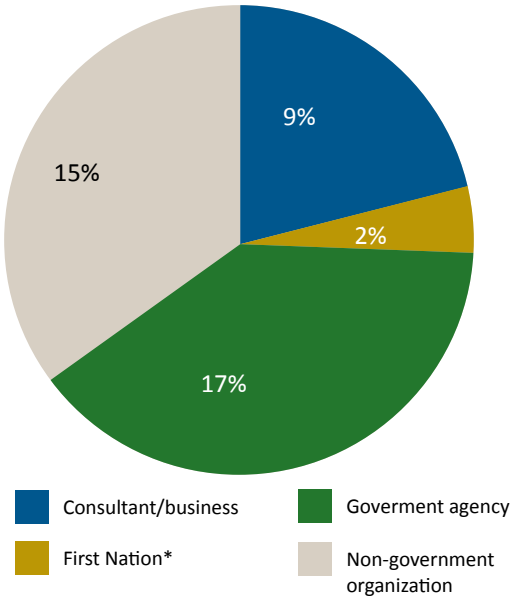
Directed projects

Our Columbia Region board approved two directed projects for implementation in F21: 1) a technical review of the Kootenay Lake North Nutrient Restoration Program[1] was funded for $75,000, and 2) a framework for the effectiveness evaluation of FWCP-funded wetland conservation efforts was funded for $35,000. Both of these projects are in progress and have an expected completion date of fall 2022 and fall 2021, respectively.

[1]Additional funding ($75,000) was approved in F22 to expand this technical review to include Arrow Lakes Nutrient Restoration.

Approved projects by proponent type

The FWCP Columbia Region board approved a total of 43 projects—28 grant application-based projects, 13 annual and ongoing projects and two directed projects. The majority were led by government agencies, and non-government organizations such as stewardship groups or non-profit environmental groups. Figure 4.1 below shows the split of approved projects by lead proponent type.



*Includes Indigenous-owned businesses and Indigenous organizations

Figure 4.1: F21 approved projects by lead proponent type

Approved projects by action type

Priority actions in our Columbia Region action plans are grouped into five broad action types: 1) research & information acquisition; 2) habitat-based; 3) species-based; 4) monitoring and evaluation; and 5) land securement.

In F21, 73% of projects funded were either habitat- or species-based. Figure 4.2 shows the split of approved projects by action type.

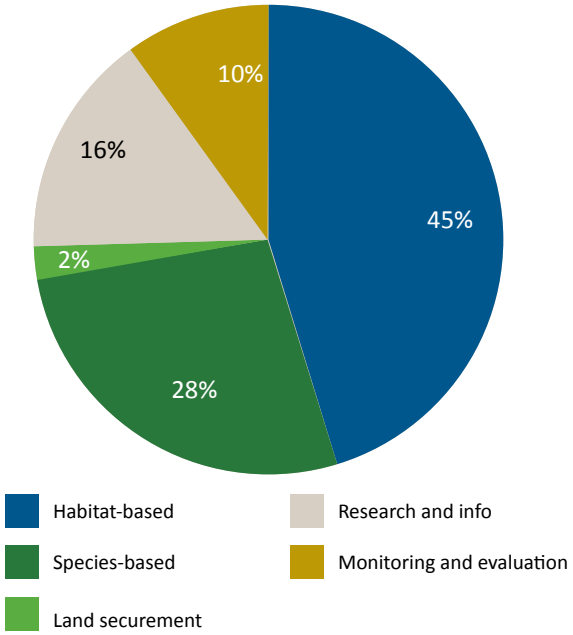


Figure 4.2: F21 approved projects by action type

Approved projects by sub-region

The FWCP Columbia Region is split into three sub-regions: North Columbia, East Kootenay and West Kootenay. Projects may also be delivered across the whole region, in which case they are categorized as “Basin-wide”. As shown in Figure 4.3, in F21 there was a relatively even split between the proportion of projects delivered in the East and West Kootenay and Basin-wide (approximately between 25% to 30%), with projects in the North Columbia making up 7%, with three projects.

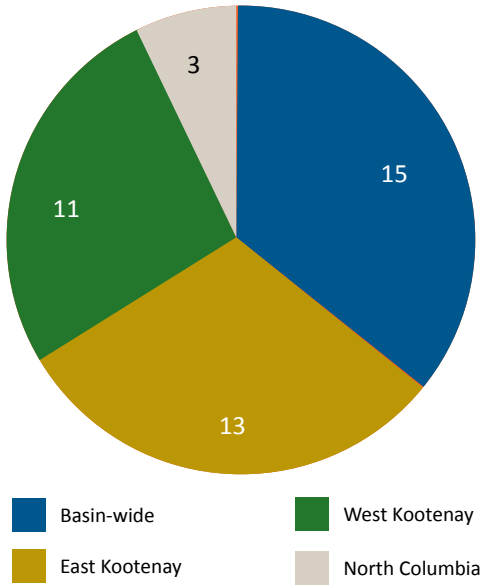


Figure 4.3: F21 approved projects by sub-region

Community Engagement Grant

The goal of the Community Engagement Grant (CEG) is to provide an opportunity for FWCP stakeholders and First Nations to apply for a small grant to support conservation and enhancement work that aligns with our action plans. Our Columbia Region manager approved 11 CEG applications, allocating $9,600 from the $10,000 available. The full list of CEGs approved for F21 is shown in Table 4.1.

Table 4.1: Community Engagement Grants provided in the Columbia Region for F21

Applicant	Project title	FWCP funding ($)
Valhalla Wilderness Foundation	Fish/Bear Lakes western toad mortality mitigation	$1,000
Valhalla Foundation for Ecology	Public outreach, Swamp Tails in Valley Voice	$750
Friends of Kootenay Lake SS	Kootenay Lake wetland monitoring program	$500
Slocan River Streamkeepers	Slocan River riparian enhancement project 2020	$1,000
Shlakoff Inland to Island Enterprises	Turtle awareness signage, Glade	$850
Trail Wildlife Association	Barbed wire removal to help white-tailed deer	$1,000
North Columbia Environmental Society	Western toad volunteer nights	$1,000
Revelstoke Bear Aware Society	Revelstoke bear aware online workshops	$1,000
Okanagan Nation Alliance	Murphy Creek spawning channel: history and possibilities webinar	$1,000
Friends of Kootenay Lake SS	2021 Kootenay Lake beach and lakebed clean-ups	$500
Simpcw Resources Group	Canoe Valley wetlands	$1,000
		TOTAL $9,600

More than 100 tires were removed from the shoreline as part of the Slocan River Riparian Enhancement Project led by the Slocan River Streamkeepers. Fifty native cottonwood, willow, alder, red osier dogwood, cedar, and spruce trees were planted, and five swallow nesting boxes were installed. Photo: Gregoire Lamoureux

5.0 Columbia Region financial report

5.1 APPROVED BUDGET AND EXPENDITURES

Annual funding is allocated by our Columbia Region board toward fish and wildlife projects, administration, and communications. These allocations form the annual operating plan. Any unallocated funds are carried forward as unspent surplus dollars[2] and are available for future spending.

Our Columbia Region board approved an F21 budget of approximately $6.11 million. The annual funding provided from BC Hydro to the region for the year was $5,118,430.

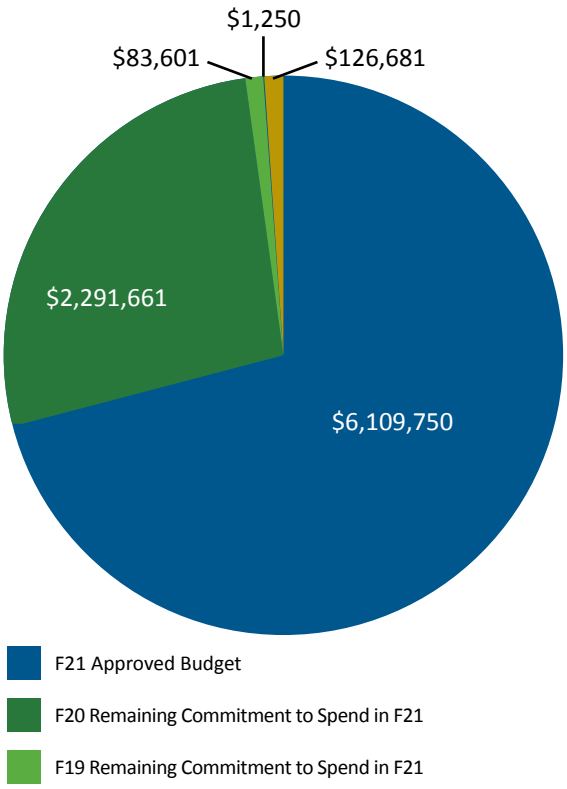


Figure 5.1: FWCP Columbia Region financial summary as of April 1, 2020

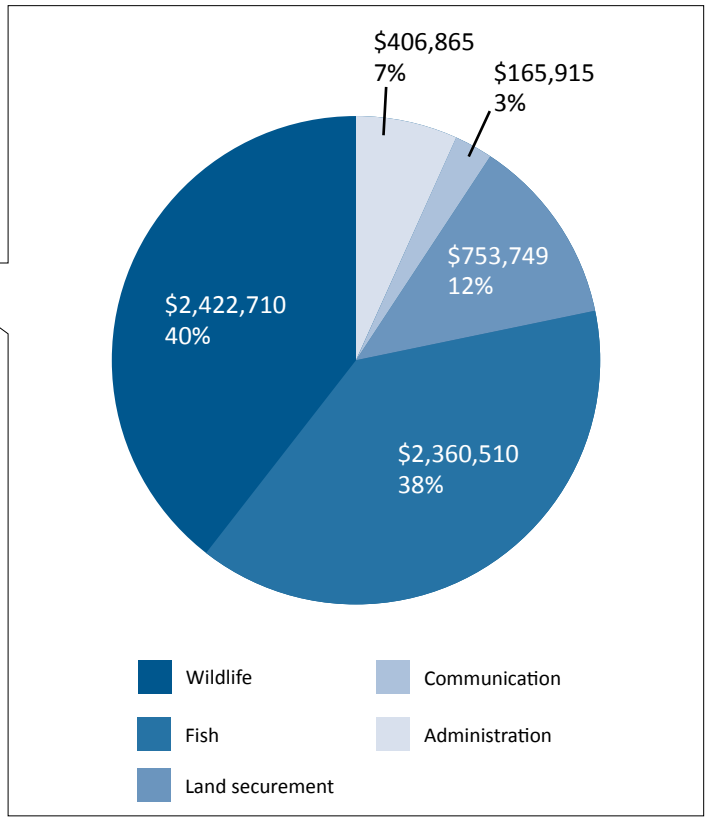


Figure 5.2: Breakdown of approved Columbia Region budget as of April 1, 2020

Figure 5.1 shows a total of just over $8.61 million in the FWCP Columbia Region account as of April 1, 2020. This total is comprised of the board approved F21 budget of approximately $6.11 million, an unspent surplus of nearly $127,000, and prior-year funding commitments that have been carried over (approximately $1,000, $84,000, and $2.3 million for F18, F19, and F20, respectively).

Figure 5.2 illustrates the approved F21 budget as of April 1, 2020. Funding for wildlife projects made up 40% of the total budget, and fish projects made up 38%. A further 12% of the total budget was allocated for land securement initiatives. Administrative costs made up approximately 7% of the total budget and includes regional manager salary and expenses; office-related expenditures; support staff, board, and technical committee costs; fees associated with uploading reports to the provincial data warehouses; and maintenance and refinements to our grant management system. The remaining allocation was for communications, for approximately 3% of the total budget.

The FWCP encourages grant applicants to seek additional funding sources (e.g., other funding agencies and 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 F21, the FWCP funding allocation for grant-based projects was nearly $980,000. As a result of financial partnerships and in-kind contributions, the total value of the projects was just over $3.6 million. In other words, for every dollar invested by the FWCP, others contributed nearly $2.7, greatly increasing the value of the FWCP's investment overall.

Columbia Region program expenditures up to March 31, 2020, are shown in Table 5.1. This reflects a snapshot of actual and planned payments made related to F21 projects. At the end of the fiscal year, approximately $2.85 million of the F21 budget had been spent, while just under $3 million remained as an F21 commitment to spend in F22, nearly $300,000 of which will go into the "unspent surplus funds."

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

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]
Administration	$406,865	$224,094	$88,849	$93,922
Communications	$165,916	$112,047	$36,618	$17,251
Land Securement	$753,749	$42,780	$710,969	$-
Fish	$2,360,510	$1,460,689	$880,863	$18,958
Wildlife	$2,422,710	$1,009,693	$1,248,081	$164,936
TOTAL	$6,109,750	$2,849,303	$2,965,380	$295,067

Note 1: Planned payments represent expected invoices for approved ongoing projects that have not yet submitted final reports by March 31, 2021.
Note 2: Unspent funds are carried forward and available for the next fiscal year.

In addition, the balance of prior-year funding commitments anticipated to be spent in F21 was nearly $7,000 from F19 and $260,000 from F20, resulting in an unspent surplus of nearly $1.3 million (Figure 5.4).

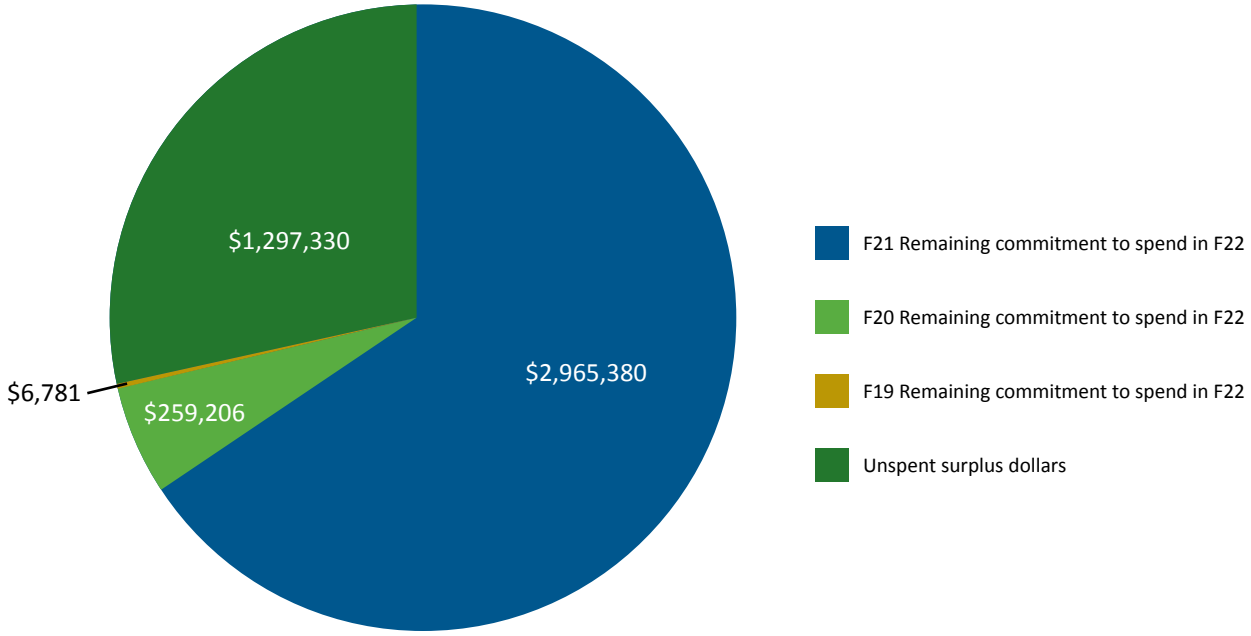


Figure 5.4: Financial summary of the FWCP's Columbia Region as of March 31, 2021 (end of fiscal year)

6.0 Columbia Region F21 projects and results

Table 6.1 provides a listing of 2020–2021 fish and wildlife projects approved for funding. 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 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 6.1: 2020–2021 approved projects

Project ID, proponent, FWCP $ amount, and sub-region	Grant-based fish projects: title and description	Project outcomes
COL-F21-F-3248, Friends of Kootenay Lake Stewardship Society, $18,000, West Kootenay	***Shore-spawning Kokanee Research and Restoration Project*** This project focuses on collecting data and restoring habitat for declining shore-spawning kokanee in the West Arm of Kootenay Lake. Gravel installed at a lower elevation than the current rearing habitat will encourage kokanee to spawn at elevations unaffected by fluctuations in the hydrograph. It is expected that kokanee will show a preference for restored habitat, reducing the risk of redds being de-watered in the spring.	***Over 600 shore-spawning kokanee using restored habitat*** Approximately 500 m^2 of kokanee shore-spawning habitat has been restored and enhanced at McDonald's Landing on the West Arm of Kootenay Lake. Up to 623 spawners were observed at the site at one time. Additionally, three new spawning sites were discovered north and south of McDonald's Landing, and 10 thermographs were created using temperature data loggers. Eight volunteers contributed 165 hours to this project.
COL-F21-F-3278, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $23,928, East Kootenay	***Conservation of Trout Habitat in the East Kootenay*** This project aims to conserve and improve the quality of critical spawning sites and early juvenile rearing habitat for two at-risk salmonid species (Westslope cutthroat trout and bull trout) in East Kootenay watersheds. This project will prioritize key trout habitat that has been impacted by human activities, and will inventory and assess habitat quality in newly proposed/established Wildlife Habitat Areas (WHAs). A subset of proposed/established WHAs will receive enhancement or restoration treatments.	Project in progress
COL-F21-F-3323, Living Lakes Canada, $50,000, East Kootenay	***Foreshore Inventory Mapping for Aquatic Species at Risk*** This project will evaluate and apply revised Foreshore Inventory Mapping (FIM) standards and methodologies drafted in March 2002 to ensure the long-term credibility of the methods, consider the various types of lakes to be assessed (e.g., regulated, natural, mountain ecosystem, boreal forest ecosystem, etc.), and provide a benchmark by which to compare habitat changes over time. The revised methodology will be applied to priority lakes, both new and re-FIM projects, assessing the rate of change of shoreline health.	***Four high-priority lakes mapped*** Foreshore inventory mapping was completed on four small high-priority East Kootenay lakes (Whitetail, White Swan, Moyie, and Windermere) and a lake prioritization report was drafted. Foreshore development guideline reports were drafted for each lake, and four webinars and one video tutorial were completed. The foreshore inventory mapping methodology was completed on Windermere Lake in August 2020 and Living Lakes Canada shared the results via its communications channels, including YouTube and the Columbia Basin Water Hub.
COL-F21-F-3335, Okanagan Nation Alliance, $17,701, West Kootenay	***Murphy Creek Spawning Channel Maintenance and Monitoring*** This project will continue monitoring rainbow trout and maintaining the spawning channel for a third year. Activities will include monitoring rainbow trout spawning, installing a passive PIT tag-reader system to record tagged fish as they enter the stream, monitoring water temperature, maintaining the spawning channel (removing debris, adding gravel, removing sediment), and managing invasive plant species. Continued maintenance of the spawning channel is imperative to its efficacy in providing spawning habitat for rainbow trout.	***Rainbow trout spawners using channel*** Sixty rainbow trout spawners were counted in Murphy Creek spawning channel during 30 surveys conducted from April 14 to June 23, 2020. Twenty tagged rainbow trout were recorded in the Murphy Creek system. Data indicate it may take fish an average of 7.4 days to reach the spawning channel from the outflow of Murphy Creek and they spend an average of 6.5 days in the channel.

Project ID, proponent, FWCP $ amount, and sub-region	Grant-based wildlife projects: title and description	Project outcomes
COL-F21-W-3258, Central Kootenay Invasive Species Society, $44,055, West Kootenay	***Northern Leopard Frog Preservation and American Bullfrog Control*** This project aims to conduct a comprehensive and targeted surveillance and eradication program on American bullfrogs. The intent of this project is to protect the productivity of the wetland ecosystem and habitats required by endangered northern leopard frogs from the highly invasive American bullfrog. Eradicating bullfrogs will enhance potential pond habitat for northern leopard frogs, as bullfrogs are an obligate aquatic species that occupy lakes, ponds, swamps, bogs, backwaters, reservoirs, marshes, streams, irrigation ponds, and ditches. In addition, bullfrog tadpoles are considered to be ''ecosystem engineers,'' altering the biomass, structure, and composition of algal communities.	***171 invasive American bullfrogs removed*** Observations and captures of bullfrogs in the Creston Valley in 2020 were significantly lower than in 2019: there were 171 captures in 2020 compared with 814 in 2019, a decrease of 78%. This reduction is likely a result of the control work that has taken place in the Creston Valley since 2016.
COL-F21-W-3260, Goldeneye Ecological Services, $5,000, North Columbia	***Wetlands Inventory and Stewardship in the North Columbia*** This project, led by Goldeneye Ecological Services, will gather and compile information about different wetland classes and site units found in the North Columbia sub-region to identify any unique or rare wetland features, identify disturbances or threats to these wetlands, and make recommendations for restoration or conservation initiatives. This project will raise public awareness about wetlands and engage community members in wetland data collection.	***Four at-risk species recorded at North Columbia wetlands*** Seven wetlands near Golden were inventoried, three through the Wetlands Inventory and Stewardship in the North Columbia project. Four at-risk species were located: peregrine falcon, pygmy waterlily, barn swallow, and Loesel's liparis. The bird point counts completed at four of the wetland plots identified 35 bird species using the higher elevation wetlands. It is likely that those birds are breeding at those higher elevation wetlands (given the season when those point counts were conducted), but nest searches were not performed as it was beyond the scope of this project.
COL-F21-W-3263, University of Alberta, $27,400, East Kootenay	***Rates and Mechanisms of Grizzly Bear Mortality in Elk Valley*** This project will use radio telemetry to identify rates and causes of grizzly bear mortality and reproduction in a population of bears with the highest human-caused mortality rates recorded in British Columbia. This project will focus on the lower Elk, Kootenay, and Bull river drainages, where human settlement, resource extraction, and hydroelectric reservoirs occur in grizzly bear habitat, impact connectivity, and contribute to high mortality. This project will result in meaningful stewardship measures for bears and communities.	***Predator-proof carcass enclosures constructed*** Two predator-proof carcass enclosures were constructed, significantly reducing roadkill as an attractant and changing the behaviour of the bears. Information was provided to support highway mitigation actions regarding the retrofitting of two underpasses and guidance was provided resulting in many kilometres of resource road closures.
COL-F21-W-3265, East Kootenay Invasive Species Council, $30,750, East Kootenay	***Invasive Plant Management and Restoration of Protected Areas*** This project aims to retain functional and sustainable ecosystems in protected areas of the East Kootenay by mitigating the impacts of invasive species through control and preventative measures. Benefits include controlling the spread from neighbouring invasive species populations, wildlife habitat conservation, long-term cost-savings through collaborative invasive species management action, and the enhancement of degraded areas with desirable plant species.	***Over 42 ha treated for invasive plants in East Kootenay*** Invasive plant inventories, treatments, and monitoring visits were completed in high-priority areas on and adjacent to 12 conservation properties. With multiple funding partners, including the FWCP, 185 invasive plant treatments were completed covering 42.9 ha. The FWCP exclusively funded treatments at 113 sites, covering an area of 20.5 ha. Other invasive management activities included plant surveys at three conservation properties, treatment efficacy monitoring at approximately 15% of treatment sites, and grass seeding and restoration at three conservation properties.
COL-F21-W-3268, Ducks Unlimited Canada, $64,680, East Kootenay	***Ducks Unlimited Canada and FWCP Columbia Region Partnership*** This project aims to restore wetland and riparian habitat for waterfowl, fish, and wildlife. The project will restore high-priority habitats to maximize conservation benefits beyond waterfowl in the Columbia Region.	***Planning for wetland and riparian habitat restoration completed at eight sites*** Planning that will result in future on-the-ground work was completed at multiple sites across the Columbia Region, including 24 ha of marsh habitat to be maintained at Mayook; 243 ha of floodplain wetland to be reconnected at Moberly Marsh; and habitat restoration at Bummers Marsh, Wolf Creek Marsh, Suzanne Creek Marsh, Spring Lake, Bronze Lakes, and Pickering Lakes.
COL-F21-W-3272, Moody Tree, $32,870, Basin-wide	***Whitebark Pine Planting in East Kootenay Wildfire Areas*** This project will support whitebark pine recovery by planting an estimated 5,000 seedlings over 10 ha, improve growing conditions for naturally regenerating trees, and work with industry to improve management approaches. Whitebark pine is a keystone species of high-elevation ecosystems. It provides important food for wildlife. Due to the introduced white pine blister rust, mountain pine beetle, changes to fire regimes, and climate change, numbers of whitebark pine have dramatically decreased, leading to it being listed as endangered under the Species at Risk Act.	***5,700 whitebark pine seedlings planted*** 5,700 whitebark pine seedlings were planted over 8.55 ha and competing vegetation was removed from around whitebark pine trees over 16.2 ha. The majority of seedlings (4,500) were planted in Kinauko Provincial Park east of Boswell, and the remainder at Hourglass Lake near Kimberley and in the Kootenay Pass between Salmo and Creston.

Project ID, proponent, FWCP $ amount, and sub-region	Grant-based wildlife projects: title and description	Project outcomes
COL-F21-W-3280, Wildlife Conservation Society Canada, $59,312, Basin-wide	***Establishing and Monitoring Bat Abundance and Diversity*** This project will employ the North American Bat Monitoring protocol to establish baseline diversity and relative abundance of bats and monitor provincial trends. This project will also monitor sentinel roost sites (i.e., significant maternity, hibernation, and year-round roosts) and locate bat hibernacula through collaboration with local stewardship groups and cavers, such as BatCaver.org, because white-nose syndrome kills bats while they hibernate.	***Baseline data collection about bats underway*** Roughly 80 bat detectors were installed in the FWCP's Columbia Region to identify and monitor bat hibernacula. The project confirmed bats are using the 28 hibernacula surveyed. Five volunteers helped radio track silver-haired bats and identify the roost trees and crevices critical to their overwintering behaviour. The project also monitored three sentinel roost sites, and volunteers completed bat sampling at 16 grid cells, representing 31% of the monitoring grids in the province.
COL-F21-W-3284, Sanders Environmental Services, $21,650, Basin-wide	***Grizzly Bear Coexistence Solutions*** This project will promote coexistence between grizzly bears and rural residents through education, collaboration, and the use of practical tools, such as correctly installed electric fencing, to prevent bear conflicts and associated grizzly bear mortalities in low-elevation linkage habitats that often overlap with agricultural lands. As conflicts are reduced, there will be improved grizzly bear conservation status in the region, including enhanced connectivity between core grizzly bear populations.	***Collaboration leads to 98 electric fences installed, outreach conducted*** Combined partnership funds led to the installation of 98 electric fences in 2020 and five electric fencing workshops. Ongoing partnerships and collaboration resulted in four grizzly bear safety workshops and a new educational video, which was produced in partnership with the Kootenay Conservation Program.
COL-F21-W-3285, Seepanee Ecological Consulting, $30,605, Basin-wide	***Wolverine Reproductive Dens in the Columbia Mountains*** Wolverine have low reproductive rates and are vulnerable to disturbance, particularly in denning areas. This project intends to locate wolverine den sites using known female locations, habitat-based modelling, citizen science, and targeted searches with unmanned aerial vehicles (AUVs) to minimize disturbance. This information will enable managers to focus protection and/or access management on areas with the greatest potential for conservation benefit.	Project in progress
COL-F21-W-3286, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $20,000, East Kootenay	***Invasive Plant Management on Bighorn Sheep Winter Ranges*** This project will implement a cooperative management and treatment strategy for invasive plants that will improve the existing quality of bighorn sheep ranges and reduce invasive plant coverage. Invasive plants are compromising the quality of low-elevation bighorn sheep winter ranges, particularly in Wigwam Flats and Bull River. Without a comprehensive invasive-plant management program, the continued rapid loss of forage quality and quantity will ultimately result in bighorn sheep population decline.	***Over 13 ha of bighorn sheep habitat treated for invasives in the East Kootenay*** 13.57 ha of bighorn sheep habitat in Bull River, Wigwam Flats, and Columbia Lake East were treated for invasives, including 400 kg of fertilizer applied to 4.9 ha in the Bull River area and 1,600 kg applied to 8.7 ha in Wigwam Flats. Approximately 150 kg of groundcover—including orchard grass, sheep fescue, June grass, and fall rye seed mix—was placed in Bull River area and a further 100 kg at Wigwam Flats. It was distributed along the treated roadside and low slopes.
COL-F21-W-3293, Nature Conservancy of Canada, $32,000, East Kootenay	***Luxor Linkage Forest Restoration Project*** This project will enhance freshwater values on the Luxor Linkage Conservation Area by increasing soil water availability and helping safeguard nearby communities from high-intensity wildfire. By thinning forests to restore open-forest grassland ecosystems, the NCC will improve the viability of biodiversity and build resilience in a regionally important ecosystem that is susceptible to the impacts of climate change and an important corridor for grizzly bears, mule deer, mountain goat, and Rocky Mountain bighorn sheep, which migrate across the landscape from the Purcells and Kootenay National Park.	***Nearly 30 ha of habitat restored*** A total of 28.3 hectares of dry open forest and grassland habitat has been restored in the Rocky Mountain Trench.
COL-F21-W-3298, East Kootenay Invasive Species Council, $27,885, East Kootenay	***Elk Valley Invasive Plant Management*** This project will provide a multi-stakeholder framework to minimize and contain invasive plant species and maintain biodiversity and ecological function in the upper Elk Valley with an emphasis on areas of high habitat value (such as bighorn sheep habitat and conservation properties). With an effective plan in place, multi-stakeholder groups will work collaboratively to coordinate and implement a management plan designed to prevent, educate, inventory, contain, reduce, and monitor invasive plant species in identified priority areas.	***Invasive plant inventories completed along 333 km of rights of way*** Invasive plant inventories were conducted on approximately 330 km of forest service roads and transport, hydro, and recreation trail rights of way. As part of the project, 342 inventory points were collected and invasive plant species and distribution data were expanded to the upper two-thirds of the Elk Valley. Invasive treatments were applied to ~52 km, focusing on high-value wildlife habitat and access management areas, forest service road segments scheduled for deactivation, and important recreation trails. Ten permanent effectiveness monitoring plots were established, and standard treatment monitoring visits were conducted to evaluate treatment efficacy and site completeness.

Project ID, proponent, FWCP $ amount, and sub-region	Grant-based wildlife projects: title and description	Project outcomes
COL-F21-W-3303, British Columbia Wildlife Federation, $200,000, Basin-wide	***Advancing Wetland Stewardship and Restoration in the Kootenays*** This project will restore up to 93 ha of wetland and floodplain habitat on Yaqan Nukiy lands near Creston and the Snk'mip Marsh near New Denver, and prepare for a future restoration project at Earl Ranch near Newgate. This project will include a Wetlandkeepers Workshop to support the Joseph Creek Watershed Initiative in Cranbook, a Map our Marshes Workshop in Crawford Bay, and a Restoration Workshop in New Denver. Past restoration projects will also be monitored for their success and enhanced where necessary.	Project in progress
COL-F21-W-3304, Kootenay Native Plant Society, $37,146, West Kootenay	***Bee Abundance and Diversity Baseline in Camas Meadows*** This project will document native bee abundance, diversity, and habitat use in wet Camas meadows in the West Kootenay. Camas is a vital food plant for First Nations, and Indigenous cultivation likely supported high pollinator diversity in the past. Pollination sustains native ecosystem health and function, but little is known about the identity, status, habitat use, and pollinator-plant relationships in these ecosystems. Eco-cultural restoration of these meadows requires good baseline data to inform conservation efforts and measure recovery of bio-cultural diversity against.	***Nine camas meadows surveyed*** Nine camas meadows in the West Kootenay were assessed for bee abundance and diversity. The surveys documented 84 bee species—including the at-risk western bumblebee and the at-risk Fernald's cuckoo bumblebee—and 106 flowering plants.
COL-F21-W-3307, Birchdale Ecological, $39,900, Basin-wide	***Kootenay Connect: Riparian Wildlife Climate Change Corridors*** This project will identify and develop conservation strategies to identify, protect, and improve management for 12 important wildlife corridors and promote landscape connectivity across the Columbia River Basin. This project will integrate data about large carnivores (grizzly bears), ungulates, and other wildlife species with large riparian-wetland complexes that link critical valley bottom and upland habitats at a regional scale. Research shows riparian-wetland systems are biodiversity hotspots and climate refugia that also act as wildlife linkages across human-settled valleys.	***Mapping and workshops conducted in 2020–2021*** In Year 2 of this project, an extensive GIS database was developed to help map carnivore, wildlife, species-at-risk, riparian, and climate change corridors to be considered for enhanced protection and connectivity management. New GIS layers were integrated to identify specific conservation targets and strategies, including climate adaptation work. Private land was identified for conservation opportunities within riparian-wetland complexes. Detailed GIS maps were produced for each of the Year 2 four focal corridors. Workshops were organized to consult with local stewardship groups; First Nations; local, regional, and provincial land managers; and other regional experts to review mapping and identify corridor-specific threats and conservation opportunities
COL-F21-W-3312, Alberta Biodiversity Monitoring Institute, $41,860, North Columbia	***Monitoring White-tail Deer in the Columbia Mountains*** The project will evaluate factors influencing white-tailed deer populations in the Columbia Mountains to support mountain caribou management decisions in a high-stakes socio-economic landscape. This project will also collect baseline data to evaluate the efficacy of white-tail deer reductions via increased hunter harvest. Understanding and monitoring additional limiting factors that may be preventing caribou population growth is critical for effective adaptive management and recovery.	***Six deer outfitted with GPS collars*** Four white-tailed does and two mule deer does were outfitted with GPS collars in Year 3 of a project to evaluate white-tailed deer populations to support caribou management. One white-tailed buck fawn was captured, ear-tagged, and released, and two other white-tailed does were recaptured, sampled, and released. Two mule deer does were darted. There are currently 15 active collars: 11 white-tailed deer and four mule deer.
COL-F21-W-3313, Ministry of Forests Lands Natural Resource Operations and Rural Development, $40,000, East Kootenay	***Safe Passages for Wildlife in the Southern Canadian Rockies*** The aim of the project is to improve wildlife connectivity and human safety along Highway 3 in the southern Canadian Rockies by identifying hotspots for wildlife collisions and crossings that would benefit from highway mitigation. Year one of this project will see the retrofitting of two existing bridges to create suitable wildlife underpasses and fencing between them. This will guide wildlife to the crossing structures, preventing wildlife-vehicle collisions, and increase ecosystem connectivity in the Alexander Michel Linkage, a six-km stretch of Highway 3 near the Alberta border.	***Improving wildlife crossing in the Southern Canadian Rockies*** Two wildlife crossing structures along Highway 3 near the Alberta border were created to help mitigate wildlife and vehicle collisions, and 35 wildlife cameras were installed to identify crossing hotspots for future mitigation measures. Twenty-five volunteers helped with this project, including the planning and installation of 5 km of fencing to further reduce collisions.

Project ID, proponent, FWCP $ amount, and sub-region	Grant-based wildlife projects: title and description	Project outcomes
COL-F21-W-3319, British Columbia Conservation Data Centre, $42,736, East Kootenay	***Elk Valley Bighorn Sheep Winter Range Re-assessment*** This project will focus on high-value bighorn sheep winter ranges that occur primarily on Red-listed high-elevation grasslands in the Elk Valley. Concentrated grazing pressure on a reduced area of winter range is likely to degrade existing intact grasslands and reduce the amount of available forage. To improve future conservation outcomes, this project seeks to gather knowledge to inform ungulate management strategies by identifying where and how changes to high-elevation grasslands have occurred in the past decade. Data on the current condition of high-elevation grasslands will be collected and compared with baseline data on ecosystem condition that was collected from the same locations in 2009.	Project in progress
COL-F21-W-3342, Baynes Lake Community Society, $3,716, East Kootenay	***Increasing Western Painted Turtle Survival at Baynes Lake*** This project will focus on road mortality of western painted turtles at Baynes Lake, where at least 15 adult turtles were killed in 2019. This project will incorporate citizen science to collect information about where the turtles are coming from and where they are laying their eggs. It will assess the feasibility and cost of installing wildlife fencing and establishing an alternative nesting site area.	***New turtle culvert installed at Baynes Lake*** Road surveys helped confirm the site of a new culvert installed to help at-risk western painted turtles cross the Jaffray Baynes Lake Road in Baynes Lake in the East Kootenay. The location is a hotspot for turtle mortality: at least 15 adult turtles were killed by vehicles on this road in 2019. The Ministry of Transportation and Infrastructure also installed two playground signs along this stretch of road, which will help slow traffic.
COL-F21-W-3343, The Nature Trust of British Columbia, $15,000, Basin-wide	***NTBC-Land Stewardship Activities F21*** This project will focus crew work on operations and stewardship projects that maintain and enhance biodiversity and wildlife values on conservation properties. This project also has the added benefit of providing crew members with important work-related experience in a career field that they are interested in pursuing.	***Wildlife values maintained at 21 conservation properties*** Twenty-one conservation properties across the region were inspected, maintained, and enhanced. Two were assessed for danger trees and 28 conservation signs were installed. A total of 1.35 ha were mechanically treated for invasive plants, and 36 ha of wetland habitat were assessed for purple loosestrife and 12 bags of the invasive plant were removed. One property was inspected for invasive plant bio-control presence and two “boot-brush” signs were installed, instructing people to brush their footwear with the brush provided. Approximately 17 km of boundary fence was inspected and repaired, and seven wildlife crossing points were installed along newly constructed fence lines. Seven properties were partially inventoried and mapped for invasive plants, and game cameras were installed or monitored at 11 sites. Sixteen wildlife exclosure fencing blocks were repaired.
COL-F21-W-3347, Golden District Rod and Gun Club, $10,300, North Columbia	***Golden Rocky Mountain Bighorn Sheep Project*** This project will document movements of bighorn sheep in the Golden-Kicking Horse River area and collect baseline health data. Movement data will be used to minimize negative impacts on this herd during a spring 2020 highway construction project. Data will be used to adapt highway crossing structures and determine the appropriate population size of this herd. Important habitat features (such as lambing areas) will also be identified, and the habitat analyses will inform future habitat-enhancement projects. DNA samples will also be used to explore questions of genetic inbreeding in this isolated mountain herd.	***Five Rocky Mountain bighorn sheep collared*** Two ewes and three rams from the Kicking Horse Canyon herd of Rocky Mountain bighorn sheep were collared and sampled for standard health markers, including harmful bacterium, stress levels, genetic variation, reproductive status, and general fitness. Over 10,000 location points have been collected from the collared sheep to provide a baseline of herd habitat use and seasonal movements. Three motion-activated cameras have been installed to confirm outlying habitat use among these points. Four update reports have been supplied to stakeholders and an outreach video has been produced.
COL-F21-W-3350, Cirque Environmental Consulting, $4,654, Basin-wide	***Golden Area Ungulate Winter Range Project Development*** Led by Cirque Environmental Consulting, this project will bring information together to design a future project to restore and enhance ungulate winter range for elk and mule deer in the Golden area. This Seed Grant project will include a literature review and public engagement to gather academic, local, and traditional knowledge to plan a project needing large grant funding.	***Three habitat enhancement projects prioritized for action*** Three habitat enhancement projects for elk and mule deer near at Willowbank Mountain, Kicking Horse Canyon and Vacation Creek, all near Golden, have been identified for immediate action and further suggestions have been made for additional projects. Areas of focus for future efforts have been identified through past habitat enhancement, inventory, and distribution surveys.
COL-F21-W-3352, VAST Resource Solutions Inc., $4,740, East Kootenay	***Creating a Framework for Evaluating Bat-friendly Communities*** This project will create a framework for identifying and evaluating habitat features that may affect bat abundance and diversity. This will be achieved by collecting baseline data on relative bat abundance and diversity within an urban community and its surrounding natural areas, and identifying metrics to evaluate the bat-friendly community program. It is anticipated that this Seed Grant project will lead to a larger future project.	***Nine landscape-level habitat features identified for further evaluation*** Biologists at the Ktunaxa Nation Council and ʔaq'am Lands and Natural Resources Department were consulted to identify important bat habitat features to evaluate in a future project, and a literature review was completed. Nine landscape features related to roosting and habitat quality, habitat connectivity, and anthropogenic disturbance were identified for further evaluation. Baseline bat occurrence data were collected in Kimberley and surrounding non-urban areas. A subsequent project was developed to evaluate how the identified features support bat populations and whether community-level changes to bat habitat result in positive changes to bat populations.

Project ID, proponent, FWCP $ amount, and sub-region	Annual and ongoing fish projects	Project outcomes
COL-F21-F-3226-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $749,736, West Kootenay	***F21 Arrow Lakes Reservoir Nutrient Restoration Program*** The Arrow Lakes Nutrient Restoration Program addresses the nutrient losses in the Arrow Lakes Reservoir, a result of the construction of the Mica and Revelstoke dams, with a bottom-up approach. It sees the addition of nitrogen and phosphorus, in the form of liquid agricultural-grade fertilizer, to support phytoplankton populations that are suitable for the production of daphnia, a main food source for Kokanee.	***Nutrient additions support kokanee in Arrow Lakes Reservoir*** Liquid agricultural-grade fertilizer has been added to the Upper Arrow Lake again this year. In total, 43 metric tonnes (MT) of phosphorus and 244.4 MT of nitrogen were added to the reservoir between early May and the end of September. The annual tonnes of phosphorus from fertilizer additions has been around 40 MT since 2016. Kokanee spawner returns in 2020 declined from 2019 in both Upper Arrow Lake and Lower Arrow Lake. The under one and age one to three kokanee populations for both basins combined in 2020 were among the lowest since nutrients have been added at 3.3 million and 1 million, respectively.
COL-F21-F-3227-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $903,001, West Kootenay	***F21 Kootenay Lake Nutrient Restoration Program*** The Kootenay Lake Nutrient Restoration Program—North Arm addresses the nutrient losses in Kootenay Lake, a result of the construction of the Duncan and Libby dams, with a bottom-up approach. It sees the addition of nitrogen and phosphorus, in the form of liquid agricultural-grade fertilizer, to support phytoplankton populations that are suitable for the production of daphnia, a main food source for Kokanee.	***Nutrient additions support kokanee in Kootenay Lake*** Daphnia biomass continues to be higher than the long-term average due to low kokanee numbers in Kootenay Lake. Although the overall 2020 daphnia biomass was high, they were first detected later in the season, likely due to cold spring temperatures. Conclusions from a peer review of phytoplankton and zooplankton populations indicated that nutrient additions have been successful over the duration of the project by providing sufficient zooplankton as a food source for kokanee. Although kokanee abundance in the population under age one (fry) was the highest since 2015, it was still lower than the historical mean. Abundance of kokanee aged one to three remained low in 2020, and survival of in-lake kokanee aged zero to one and one to two also remained low. The spawning biomass has remained similarly low in all years after 2014.
COL-F21-F-3228-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $187,356, West Kootenay	***F21 Hill Creek Spawning Channel*** This project supports ongoing operations, maintenance, and monitoring at the Hill Creek spawning channel. Monitoring includes kokanee fry emigration; rainbow trout redd counts and fry emergence; adult kokanee size, fecundity, and escapement; overwintering egg survival; and water quality at the spawning channel. The spawning channel was built as compensation for spawning habitat lost due to the construction of the Revelstoke Dam, and it now provides additional spawning habitat for kokanee and rainbow trout from Arrow Lakes Reservoir.	***Nearly 1.5 million kokanee fry produced in the spring, and 87,000 adults spawned in the fall*** Kokanee fry counts and rainbow trout redd counts were conducted in the spring and settling pond and gravel cleaning took place in summer. Adult kokanee counts and sampling were done in the fall. Kokanee fry production in 2020 was 1.47 million, with an egg-to-fry survival of 23% (in natural streams it is typically under 5%). Rainbow trout redd counts totalled 81, of which 16 were classed as “large” piscivore redds. The total fall return of adult kokanee to Hill Creek was 87,000, with 69,000 adults admitted into the spawning channel for a potential egg deposition of 8.2 million. Kokanee average size was small (22 cm), leading to a relatively low fecundity (252 eggs/female). Most spawning fish were age three (71%) with the remainder age two.
COL-F21-F-3229-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $230,089, West Kootenay	***F21 Meadow Creek Spawning Channel*** This project supports ongoing operations, maintenance, and monitoring at the Meadow Creek spawning channel. The channel provides spawning habitat for a large proportion of Kootenay Lake kokanee, which are the primary prey species for both bull trout and Gerrard rainbow trout. BC Hydro built the spawning channel in 1967 to compensate for natural kokanee habitat lost due to the construction of the Duncan Dam.	***More than 4.5 million kokanee spring fry, highest adult fall returns since 2015*** Spring fry production in 2020 was 4.66 million, including naturally spawned fry from Kootenay Lake kokanee and fry from supplementary eggs planted into the channel (from sources outside Kootenay Lake). The egg-to-fry survival rate was estimated at 54% for naturally spawned eggs. Although lower than the previous three years, this rate is much higher than it was prior to the installation of electric fencing in the fall of 2016 to protect spawning kokanee in the channel from bear predation. The total fall return of adult kokanee to Meadow Creek in 2020 was estimated at 48,622, which is the highest return since 2015. A total of 39,155 adults reached the spawning channel, resulting in a potential channel egg deposition of 14.5 million. No additional eyed eggs were planted in 2020. Male and female kokanee length averaged 34.5 cm and 35.9 cm, respectively. Average fecundity was very high at 817 eggs/female. All sampled adults were age three except for one fish, which was age two.
COL-F21-F-3238-DCA, Freshwater Fisheries Society of B.C., $100,000, West Kootenay	***F21 Upper Columbia Sturgeon*** This project, implemented through BC Hydro’s White Sturgeon Management Plan under the Columbia River Water Use Plan, is contributing to the White Sturgeon Conservation Aquaculture Program in the Canadian portion of the Columbia River Basin.	***200 juvenile white sturgeon released*** Two hundred wild-origin juvenile white sturgeon were released into the lower Columbia River in 2021, meeting the target set by the recovery team.

Project ID, proponent, FWCP $ amount, and sub-region	Annual and ongoing wildlife projects	Project outcomes
COL-F21-W-3230-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $175,122, West Kootenay	***F21 West Kootenay Ecosystem Enhancement*** This project, led by the Province of B.C., focuses on the oversight, coordination, and implementation of upland and dryland restoration activities in the West Kootenay, including prescription development, slashing, piling, burn planning, burning, post-burn monitoring, and reporting.	***West Kootenay ecosystem restoration: prescriptions prepared and units treated*** Ecosystem restoration (ER) prescriptions were prepared for seven Lower Arrow Lake sites for burn-only treatments. The Van Houten burn (220 ha) was postponed to spring 2021. Restoration treatments were implemented on 44.3 ha of the Deer Park Mountain ecosystem restoration unit, and restoration prescriptions were prepared for the remaining 402 ha. Restoration and fuel management prescriptions were prepared for the Deer Park Conservation Area treatment unit (103 ha). Pre-treatment vegetation monitoring was conducted at eight plots in the Deer Park Mountain ecosystem restoration unit, and post-treatment monitoring was completed at Greywolf South, Tulip Creek, and three control plots. Backpack herbicide treatments were done on 2.2 ha, and roadside herbicide treatment was conducted along 16.4 km of Forest Service Road. In 2020, 85 wildlife trees were enhanced for a total of nearly 1,100 since 2007. Ungulate annual night counts in the Pend d'Oreille Conservation Area were completed for the 23rd consecutive year, with high recorded counts of 118 and 24 for deer and elk, respectively.
COL-F21-W-3231-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $384,945, East Kootenay	***F21 East Kootenay Ecosystem Enhancement*** This project, led by the Province of B.C., focuses on the oversight, coordination, and implementation of restoration activities in the East Kootenay, including prescription development, slashing, piling, pile burning, masticating, burn planning, prescribed burning, and post-burn monitoring and reporting.	***East Kootenay ecosystem enhancement completed*** Ecosystem enhancement completed in the East Kootenay includes preparation for the 300 ha prescribed burn at McDonald treatment area (south of Grasmere); 52 ha of slashing at Forsyth Creek to prepare for a future prescribed burn; 60 ha of invasive weed treatment in the Lizard and Galton Ranges; the development of a 300 ha stand-management prescription at Cadorna Creek; the creation and monitoring of more than 80 wildlife trees; and vegetation monitoring at Wolf Creek, East Columbia Lake, and McGuire Creek.
COL-F21-W-3232-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $209,810, Basin-wide	***F21 Non-game Enhancement*** This project focuses on non-game enhancement. It includes projects that maintain and enhance critical habitat features, such as the roosting, denning, and nesting habitat important for the reproduction and survival of species impacted by reservoir construction and habitat losses.	***Loons, Townsend's big-eared bats, swifts, owls, and turtles helped*** During this project year, several tasks benefitting multiple species were completed: six Townsend's big-eared bat maternity roost investigations were completed; nine confirmed Lewis' woodpecker nests were located during monitoring, including four in the Pend d'Oreille and five at the Upper Slocan River area; 100 turtle nests were documented at Elizabeth Lake and 12 in Argenta; twenty-four swift nest boxes were maintained, and seven owl survey transects were complete; monitoring confirmed four loon pairs nesting on platforms and three of these successfully hatched young in 2020 (the presence of shell fragments in the fourth nest, suggests it was also used this year). In total, 100% of nesting pairs successfully hatched young, producing four juvenile loons.
COL-F21-W-3233-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $753,749, Basin-wide	***F21 Land Securement*** This project will designate funds for high-priority land-securement projects identified in coordination and collaboration with Kootenay Conservation Program's securement committee, as well as local and regional land trusts and other partners. Land securement is a critical action for habitat protection and conservation in the Columbia Region.	***Over 70 ha of land secured*** Land trust partners acquired 71 ha of valuable habitat in 2020–2021, with the help of FWCP funding. Eighty per cent of Conservation Action Forum actions were pursued, including habitat protection, restoration, and mitigation. Local conservation funds have supported on-the-ground projects this year, including invasive plant control, habitat restoration, species-at-risk surveys and protection, and the acquisition of land at Cottonwood Lake near Nelson.
COL-F21-W-3234-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $105,262, Basin-wide	***F21 Caribou Recovery*** This project is a multi-agency effort to recover threatened caribou sub-populations. Actions funded by the FWCP this year include: mortality investigations for Central Selkirk caribou, cougar, and wolves and wolf pack size determinations; participation in caribou census and collaring; predator track surveys in the Central Selkirks; and a survey of moose in the Revelstoke sub-unit.	***Censuses and predator surveys support caribou recovery*** A predator track survey conducted to support caribou populations documented 10 wolves in six separate packs. Moose and caribou census results will be provided when reports are completed.

Project ID, proponent, FWCP $ amount, and sub-region	Annual and ongoing wildlife projects	Project outcomes
COL-F21-W-3235-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $197,631, Basin-wide	***F21 Northern Leopard Frog Recovery*** This project involves the inventory monitoring and stewardship of the Endangered northern leopard frog population at the Creston Valley Wildlife Management Area. This population is the majority of remaining northern leopard frogs in the province, and it serves as the source population for re-introductions and captive assurance populations at the Vancouver Aquarium and Calgary Zoo.	***More than 10,000 eggs and tadpoles moved from Creston Valley to the East Kootenay*** Monitoring and stewardship of the Endangered northern leopard frog saw 65 breeding season surveys completed by foot, canoe, and paddleboard. An additional 34 summer visual encounter surveys were completed for a total of 71 person hours. Twenty-two egg masses were located and caged to protect them from predators, and 10,963 tadpoles and eggs were moved from the Creston Valley Wildlife Management Area to Brisco. A total of 809 northern leopard frog detections were documented, and 220 frogs were PIT-tagged.
COL-F21-W-3236-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $159,808, Basin-wide	***F21 Wetland and Riparian Enhancement*** The goal of this project is to deliver wetland restoration work, continue to develop new projects, and monitor completed projects. This involves identifying candidate restoration sites, compiling background information, conducting pre-treatment inventory of sites, working with a wetland specialist to complete restoration plans, and developing partnerships, permits, and budgets for the implementation of the restoration projects.	***Six wetlands monitored*** Wetland monitoring was completed at six project locations. Pre-treatment monitoring occurred at Six Mile Slough and post-treatment monitoring was conducted at Meadow Creek DL881, DL570, Creston, and Cherry Creek.
COL-F21-W-3237-DCA, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, $318,874	***F21 Land Management Operations*** This project focuses on the coordination, oversight, and implementation of land-stewardship activities associated with conservation lands.	***Invasive burdock and more than 300 kg of garbage removed*** Invasive species were treated in the Duncan-Lardeau conservation properties, with a focus on the complete removal of common burdock at nine high-priority sites. Other conservation areas were treated for invasive species, including Marsden, Walter Clough, Coleman Ranch, Deer Park, Broadwater, and Pend d'Oreille. Greywolf, Tulip, Broadwater, Deer Park Mountain, Twobit Creek, and Sunshine Creek ecosystem restoration units were also treated. Ministry staff also conducted 9.5 days of enforcement patrols in the conservation areas, in addition to four days with Okanagan Nation Alliance members. A total of 305 kg of illegally dumped waste was removed from conservation areas. Thirty-four signs were installed in the Pend d'Oreille Conservation Area, and 5.5 ha of slashing was completed in Marsden Conservation Area.

Project ID, proponent, FWCP $ amount, and sub-region	Fish and wildlife directed projects	Project outcomes
COL-F21-F-3227, Project lead TBD, $75,000, West Kootenay	***Detailed Review of Kootenay Lake Nutrient Restoration*** Undertake a detailed review of the overall effectiveness of the Kootenay Lake Nutrient Restoration Program. It will include a review of the stated objectives of the program and recommendations of frequency of trend monitoring.	Project in progress
COL-F21-W-3236, Project lead TBD, $35,000, Basin-wide	***Assessment of historical wetland restoration projects in our Columbia Region*** Effectiveness monitoring of past wetland restoration projects (F14 to F20) Monitor and evaluate the effectiveness of previous FWCP wetland and riparian restoration projects.	Project in progress