FWCP Fish & Wildlife COMPENSATION PROGRAM NEWS

2018 ANNUAL NEWSLETTER

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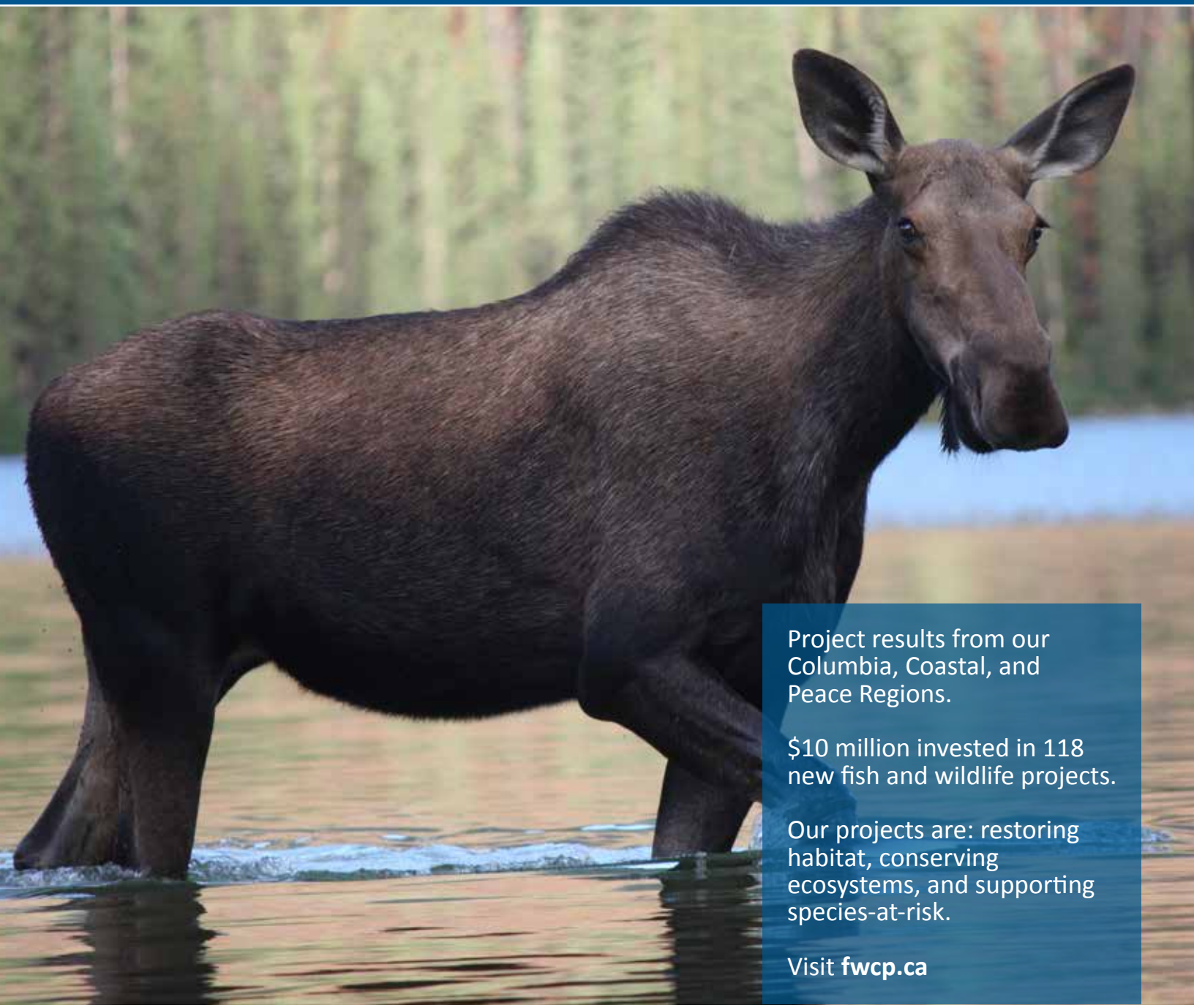


Project results from our Columbia, Coastal, and Peace Regions.

$10 million invested in 118 new fish and wildlife projects.

Our projects are: restoring habitat, conserving ecosystems, and supporting species-at-risk.

Visit **fwcp.ca**

BC Hydro

British Columbia

Fisheries and Oceans Canada | Pêches et Océans Canada

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

Continually improving: a message from our Program Manager

Thank you for picking up our annual Fish & Wildlife Compensation Program newsletter. Our 2018 newsletter reports on progress and results for select projects in each of our three regions: Coastal, Columbia, and Peace. This is just one way we share facts about our work and the species that benefit from the projects we fund in alignment with our Action Plans. In 2018–2019 our regional boards approved $10 million for 118 fish and wildlife projects. Please visit **fwcp.ca** and learn more about us. Check out our interactive project maps for each region.

To keep our fish and wildlife projects relevant, we updated Action Plans for the 14 watersheds in our Coastal Region in 2017, and we've started working on plans to update our Columbia Region Action Plans in 2018–2019. Our Peace Region Action Plans were finalized in 2014 and we're starting the planning process to update them.

We're doing a strategic project review in our Columbia Region that will help inform the update to our Action Plans. On projects in our Peace Region, we're continually refining our process to engage early with First Nations. In our Coastal Region, groups are working through the Fish Passage Decision Framework, and are expected to bring forward their fish passage plans and associated studies for FWCP Board review. With direction from our Policy Committee and input from our regional Boards, we are developing a framework for an evaluation and audit of the FWCP, to be completed by 2019.

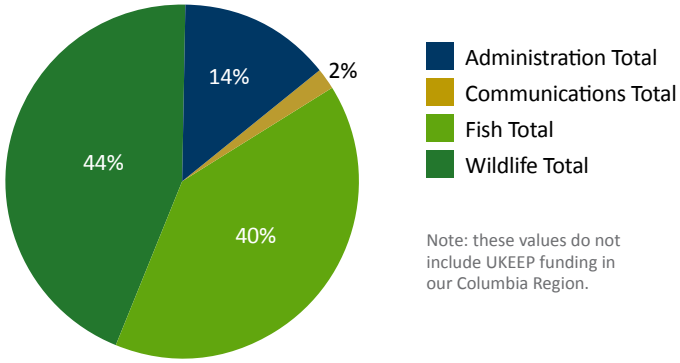
In each of our regions, we will continue working to define and improve how we collaborate and engage with First Nations to achieve our mission. And we'll continue to post final project reports on provincial databases so everyone has access to them. In 2018–2019, we'll publish a new results page at **fwcp.ca** so it'll be easier to find results and see how our funding is making a difference.

Thanks for your interest in the work we're doing with First Nations, agencies, stewardship groups, and others, and thanks for reading our newsletter.

Trevor Oussoren
Program Manager

Front cover photo: *Wildlife Infometrics*

Last year (2017–2018), 84 per cent of the FWCP's total annual budget of approximately $10 million went towards fish and wildlife projects. Read our annual reports at fwcp.ca.



Note: these values do not include UKEEP funding in our Columbia Region.

Land securement: 300 hectares conserved

Funding land acquisition or securement is one of FWCP's most effective tools to compensate for habitat loss resulting from the construction of BC Hydro dams. Land securement is when private land is purchased for conservation purposes and managed to maximize habitat values. While the initial capital cost is typically high, the long-term value for fish and wildlife can be outstanding. In the last year, FWCP approved funding for land conservation totalling nearly 300 hectares.

In 2017–18, our three regional Boards set aside a combined $1.45 million to support land securement initiatives.

Columbia Region Three land purchases have been approved, totalling approximately 69 hectares: These were the Anne Hicks Conservation Area (12 hectares) near Valemount, the Snk'mip Marsh Nature Preserve (14 hectares) at the north end of Slocan Lake, and Morrissey Meadows (43 hectares) near Fernie.

Coastal Region Project Watershed and the K'ómoks First Nation are planning to transform an 8.3-acre former sawmill site into a conservation area. Located next to the Courtenay River and near the estuary, the area will be renamed Kus-kus-sum.

Peace Region We're partnering with TNTBC to acquire approximately 230 hectares of valuable ungulate winter-range habitat, for caribou in the Parsnip sub-region. This is a rare opportunity to eliminate the risk of development of privately-owned land known to be highly used by caribou.

FWCP FUNDS FEASIBILITY STUDIES TO EXPLORE FISH PASSAGE

BC Hydro uses a seven-step Fish Passage Decision Framework to navigate improved fish passage at BC Hydro dams and generating stations.

Since 2003, the FWCP has been funding groups in the Alouette, Coquitlam, Shuswap, and Salmon River watersheds for fish passage feasibility studies. In 2018–2019, with funding from the FWCP, First Nations, stewardship groups, and others are continuing to work on improving fish passage in watersheds impacted by BC Hydro dams.

Alouette River Management Society

Each summer, Sockeye Salmon that reach the fish fence on the Alouette River in Maple Ridge, are collected and then transported upstream of the dam, where they are released to spawn. Historically Chinook, Chum, Sockeye, Coho, and Pink Salmon, plus Steelhead, used the Alouette River.

That's how upstream fish passage is handled now in this Lower Mainland watershed. But the Alouette River Management Society (ARMS) wants to improve fish passage.

"You need many committed partners to work through the Fish Passage Decision Framework, because it's complicated," says Greta Borick-Cunningham, ARMS Executive Director. "We're working with the Katzie First Nation and the other groups concerned with fish passage."

Despite the work of ARMS, returns have been limited. Since 2007, 331 adult Sockeye have returned.

The Alouette River Management Society received a Heritage Award for their efforts to improve fish passage.

Kwikwetlem Sockeye Restoration Program

In the Coquitlam River watershed, the focus is on getting Sockeye smolts to imprint on the reservoir water, leave the reservoir, and then return to spawn. The Kwikwetlem Sockeye Restoration Program anticipates a portion of the 5,000 hatchery-reared smolts released in spring 2017, will return to spawn in 2019. Previously, in 2017, only two adult Sockeye returned to spawn.

"We need to increase the number of smolts that leave the reservoir and our fish passage plan is looking at physical options to achieve this," says Dr. Craig Orr. FWCP has been funding the Kwikwetlem Sockeye Restoration Program in its pursuit of fish passage since 2005.

In 2008, the first Sockeye was released into the Coquitlam Reservoir after 100 years.

Salmon River Diversion dam removed

In 2017, BC Hydro's Salmon River Diversion dam was removed and the river bed was rehabilitated providing migrating Coho, Chinook, and Steelhead unimpeded access to about 40 km of upstream good-quality habitat.

Around 2008, work began to determine the potential benefits of improving fish passage at the facility. FWCP's funding of environmental and technical feasibility studies, along with other partner contributions, helped facilitate First Nations' engagement, as well as agency and stakeholder input.

"We worked towards the common goal for good fish passage. We were excited to be part of it, and really, what the end result means for fish," says Brian Assu, Project Co-Lead, Chief for We Wai Kai Nation, and member of the FWCP's Coastal Region Board.

The Salmon River Diversion dam was removed in 2017.

Wilsey Dam in Shuswap River watershed

In the Shuswap River watershed, the Wilsey Dam Fish Passage Committee plans to bring its fish passage plans to the FWCP's Coastal Region Board for endorsement in 2018. If endorsed, the plan will progress to BC Hydro for further review and consideration.

"This is a good news story that's waited a long time to be told," says Lee Hesketh, who's been working on fish passage for years. His advice to others, "Be patient and keep forcing the issue. Look for fish passage options that match the natural conditions and support species that would normally be present in the area."

Splatsin community members and others are committed to improving fish passage.

Maximizing off-channel habitat in Salmon Reserve

Cheakamus River Watershed

The Squamish River Watershed Society is well on its way to meeting some ambitious goals to help various salmonid species in the Dave Marshall Salmon Reserve. The overall approach is to build new channels and connect waterbodies to create as much off-channel habitat as possible, on the west side of the dyking along the Cheakamus River.

Large woody debris will be submerged when water is flowing in Kiwi Channel South. Photo: Edith Tobe

The habitat creation and restoration work centres around creating a new channel to connect the Far Point Channels across the Paradise Valley Road, to merge with the Emerald Forest Creek. The project, with funding from the FWCP and Recreation Fisheries Community Partnerships Program, aligns with the Cheakamus River Watershed Action Plan, since hydroelectric facilities in the area have removed or altered fish habitat.

Once the project is completed in 2018, over 1,800 m^2 of new channel will have been created, which in turn will improve over 10,000 m^2 of habitat by increasing the flows through Far Point and Emerald Forest Creeks. As well, over 400 native riparian shrubs will be planted to enhance the riparian area and prevent invasive species spreading. This will create off-channel habitat for Coho, Chum, Pink, Steelhead, and other salmonid species that require lower-gradient streams. There will also be large ponds for refuge provided, as well as spawning gravel, and overwintering habitat.

Cannibalism event leads to retrofitting Fisher den boxes

Bridge-Seton Watershed

Video monitoring has resulted in a quick and inexpensive fix that may save the lives of many Fisher kits in the future.

Over the last five years, wildlife biologist, Larry Davis, and his team have installed 56 den boxes, about half of which are in the Bridge River watershed. Urban development, including reservoir creation, has resulted in the loss of large-diameter trees, which may be a limiting factor for Fisher reproduction.

The project's main goal is to determine the extent to which these artificial den boxes will be used by female Fishers. Overall, the occupancy has been higher than anticipated, with between two and four boxes used in the last three denning seasons. In 2017, four of them had between one and three Fisher kits inside.

Predation of the kits can sometimes come from male Fishers, which are much larger than the females. The behaviour is to ensure that progeny from another male does not survive. Rare video footage captured a male in a persistent effort to chew his way into a box to carry out an act of cannibalism, while the female was out foraging. Two kits were killed in the event.

Female Fisher inside the artificial den boxes. Photo: Larry Davis.

As a result, the biologists retrofitted every box with 2x4-centimetre door frames, made from solid wood, to prevent any future access from male Fishers and, in early 2018, no evidence of chewing on the frames was found. Monitoring has led to a simple fix that will help increase Fisher survival rates.

To see video of fascinating Fisher behaviour, go to: **fwcp.ca/fisher-behaviour-captured-video**

Northern Spotted Owl

In 2018–2019 the FWCP is helping Canada's most endangered owl on its

March 2017:
Two eggs were laid by Shania, the first captive-born Northern Spotted Owl in B.C. One egg was fertile.

April 19, 2017:
After 84 hours of hatching, a chick emerged.

New spawning habitat in the lower Jordan River

Jordan River Watershed

Located in the southwest corner of Vancouver Island, the Jordan River has a long history of impacts from mining, logging, hydroelectric development, and other industries. But significant steps have been made in the last few years to improve its fish habitat.

Most recently, in 2017 with funding from the FWCP, 696 m^2 of new spawning gravel for Pink and Chum Salmon has been added 80 m downstream of BC Hydro's Jordan River Generating Station. It has the potential to support up to 2,200 Pink and 1,000 Chum spawners.

Historically, the lower Jordan River supported runs of several thousand Pink, Chum, and Coho Salmon. These were driven to extinction in the 1950s primarily due to copper contamination from mining activities, and aggravated by the upgrades to the Jordan hydroelectric project in 1971.

This situation improved dramatically in 2008 when BC Hydro installed a pipe in Elliott Dam and began releasing water for fish. This extra water increased available fish habitat downstream of the dam, and provided sufficient dilution of copper so that salmon and trout were able to complete their freshwater life stages.

Before and after. In 2017, more than 660 m^2 of new spawning habitat was added to the lower Jordan River to support Pink and Chum Salmon. Photo: D. Burt.

The recent restoration work, led by Pacheedaht First Nation, with biological and engineering support provided by D. Burt and Associates and Northwest Hydraulics Consultants, is the first of eight proposed instream projects.

Funding from the FWCP in 2014 kicked off the initiative with creation of the restoration plan, followed by a BC Hydro-funded 2D model for the lower river, then development of design drawings and a work plan, and finally implementation of the gravel placement in September 2017.

The physical work goes beyond helping fish. There is still a long way to go, but it has already brought many people together, working towards a common goal of having thriving and sustainable salmon and trout populations back in the lower Jordan River.

500 marmots released

The 500th Vancouver Island Marmot born in captivity has been released into the wild. The FWCP has been helping support recovery of endangered marmots since releases started in 2003. More at **fwcp.ca**.

Photo: Marmot Recovery Foundation.

road to recovery with the captive breeding program and habitat restoration.

May 2017:
The chick spent nearly two weeks in intensive care.

May 5, 2017:
Chick D returned to the nest.

Fall 2017:
Vet confirms Chick D is a boy.

Community helps remove 7,000 kgs of invasive plants

Bridge-Seton Watershed

People power gets results. That's one of the take-aways the Lillooet Regional Invasive Species Society (LRISS) discovered when evaluating its project to remove invasive plants – particularly Yellow Flag Iris – in select tributaries of the Bridge-Seton watershed. The contribution by the community, in addition to FWCP funding, has resulted in a reduction of the plant by an impressive 80 per cent in the project area.

The LRISS recently completed the three-year project that aligns with priority actions set out in the FWCP's Bridge-Seton Riparian and Wetlands Action Plan. The work took place in riparian areas around Tyaughton Lake and Portage Creek, near Goldbridge. Years one and two focused on inventory and plant removal, with evaluation and monitoring occurring in year three.

"Year one was a slow start," said LRISS's Jacquie Rasmussen. "Yellow Flag Iris are extremely difficult to remove by hand. The plants are typically in water, cover more than a square metre, and weigh up to 100 lbs each. It would take more than an hour to dig one plant up."

Then, in year two, there was much more community involvement. In Seton Portage, Tsal'alh First Nation members were trained and hired to remove plants, and on Tyaughten Lake, the local residence association got involved. The association was able to supply significant resources, much of it in-kind, including an excavator and a dump truck, that fast-tracked the work. Eleven Yellow Flag Iris sites were treated, and over 7,000 kilograms of invasive plant matter were taken to the Lillooet landfill.

The majority of the Yellow Flag Iris has been successfully removed and most importantly, one year later, there were no signs of it growing back in treated areas. In the future, LRISS plans to work with T'it'q'et and Tsal'alh partners to treat the Himalayan Blackberry and Japanese Knotweed sites, where removal will require multiple treatments over multiple years.

Community involvement accelerated the removal of Yellow Flag Iris (inset) near Goldbridge.

Campbell River gravel plan

Discussions to develop a long-term gravel placement and monitoring plan will start in 2018. This is a priority action in our Campbell River Watershed Action Plan. In 2016, the FWCP funded a new skyline to deliver gravel into the Campbell River at Elk Falls Canyon.

Why are "potatoes" being planted in a habitat restoration project?

Alouette River Watershed

Creating valuable side-channel habitat off the Alouette River. Photo: Roma Leon, Katzie First Nation. Distinctive leaves of the Wapato plant (inset). Photo: Istock, Emer1940

A project being delivered next to the Lower Alouette River in Ridge Meadows, by the Katzie Development Limited Partnership is integrating the principles of restoration science, together with Katzie traditional knowledge and values.

In 2017, the Partnership transformed a 1.2-hectare site, which was primarily reed canary grass, into a functioning tidal marsh ecosystem. There will be many beneficiaries, including waterfowl, Western Toads, Western Painted Turtles, Barn Swallows, Great Blue Herons, and a variety of fish species. Equally important are the benefits for the Katzie First Nation, who will be able to harvest wapato from the site in the years ahead.

This newly-formed marsh will be planted primarily with wapato, also known as duck potato or arrrowroot. Wapato grows in the silt and has distinctive, arrow-shaped leaves. Its aquatic tubers, about the size of chestnuts, served as a nutritious carbohydrate when cooked and were an important dietary staple for many indigenous communities. The plant was once cultivated extensively by Katzie people, who were renowned for their large wapato gardens that were shared with neighbouring communities. Wapato has been referred to as a cultural keystone species because of its central role in shaping the Katzie livelihood prior to the arrival of Europeans. Katzie archaeologists unearthed a 3,800-year-old wapato garden recently, making the site the oldest example of the cultivation of a non-domesticated crop in North America.

Effectiveness monitoring is a significant part of the work. With funding from AFSAR (Aboriginal Fund for Species at Risk) the Katzie staff and contract biologists were able to collect a couple years' worth of data, prior to the restoration work's implementation. Now Katzie staff and biologists will be able to measure the changes in biodiversity and species richness at the site. And, with funding from Habitat Conservation Trust Foundation, the Partnership is now able to include fish in its effectiveness monitoring. Future habitat restoration work, therefore, may include improving over-wintering habitat for salmonids.

The project aligns with the FWCP's Alouette River Watershed Action Plan, and is part of an overall proposed five-year Eco-cultural Restoration Plan for Katzie traditional territory. It's a good example of a forward-looking project funded by the FWCP, that takes a holistic approach, with multiple values and considerations.

Update: Kokanee in Arrow Lakes Reservoir and Kootenay Lake

Arrow Lakes Reservoir

Photo: Ministry of Environment

In autumn 2017, more than 700,000 Kokanee spawned in Arrow Lakes Reservoir tributaries – the highest number of returning spawners since 2004.

In-lake conditions, such as limited top-down threats from predators, water flow, and food availability, were favourable for Kokanee. A significant part of food availability is a result of the Nutrient Restoration Program (NRP), which is coordinated by the Province of B.C., with funding from the FWCP and Columbia Power Corporation.

Through the NRP, essential nutrients – a liquid blend of nitrogen and phosphorus, which feeds the smaller, microscopic life forms in the water – are dispersed over the surface of the reservoir from late spring to early fall, to replace nutrients trapped upstream by dams.

FWCP also funds the Kokanee spawning channel at Hill Creek. While the channel is an important component for kokanee spawning habitat in Arrow Lakes Reservoir, it is other tributaries that have seen a dramatic increase in spawning numbers. Tributaries with increases include Burton and Snow (124,700), Mosquito (124,200), Caribou (84,600), Deer (31,200), Taite (19,500), Drimmie (24,000), Halfway (18,400), and Kuskanax (15,700).

Kootenay Lake's North Arm

Kokanee spawner returns in the North Arm of Kootenay Lake continue to be low as in the last few years. In 2017, the total escapement was just over 12,000, which includes 6,218 in the Lardeau River and 5,856 in Meadow Creek (4,346 of which entered the spawning channel).

The Province of B.C. continues to implement a Recovery Plan for Kootenay Lake Kokanee following a steep decrease in populations that began in 2013. The decline is believed to have been caused primarily by increased predator abundance that ultimately drove the Kokanee to unprecedented low numbers.

As with the Arrow Lakes Reservoir, the FWCP is the primary funder of the Nutrient Restoration Program in the North Arm of Kootenay Lake, which is coordinated by the Province of B.C. This ensures that when Kokanee do rebound to the numbers observed prior to 2013, there will be good food conditions, especially Daphnia, a preferred food source.

Results from 2017 confirm that there is a sufficient biomass of Daphnia in Kootenay Lake; biomass continues to be three times higher than the average prior to the Kokanee decline.

Visit fwcp.ca/supporting-kokanee to see the latest counts and results.

1. Learn what they sound like
2. Know what they look like
3. Report bullfrogs to the Province at **250-354-6333** or **kootenaybullfrog@gov.bc.ca**
4. Never release your unwanted pets into the wild
5. Never move amphibians, or eggs, from one waterbody to another

The battle is on with the American Bullfrog. Photo: Terry Anderson

Bullfrogs threaten Northern Leopard Frogs

Creston Valley

For nearly 20 years, the FWCP has been funding work to conserve Northern Leopard Frogs in the Creston Valley. Results have been positive, with some success in re-introducing this endangered species to its historical range in the East Kootenay. But now the aggressive and voracious American Bullfrog has arrived, creating a direct threat to native fish, salamanders, snakes, lizards, birds, turtles, and endangered Northern Leopard Frogs.

Right now, there is an established (reproducing) population of bullfrogs south of Salmo. More recently, adult bullfrogs – no tadpoles yet – have been recorded north of the Rykerts border crossing, about 13 kilometres south of Creston.

With funding from the FWCP, the Central Kootenay Invasive Species Society (CKISS), together with the Northern Leopard Frog Recovery Team, the Province of B.C., and other partners, are working on three fronts to reduce the threat of bullfrogs:

1. Surveillance: Surveillance includes visual and acoustic monitoring, and environmental DNA testing of water samples to detect bullfrog presence.

2. Eradication: In 2017, eradication was successfully completed in five sites, where the captured bullfrogs were euthanized in accordance with Canadian Council for Animal Care guidelines. Project partners are aware, however, that eradication from these sites may be temporary, as more bullfrogs continue to push up from Idaho.

3. Education: Public outreach and education undertaken by CKISS to raise awareness about American Bullfrogs led to the first confirmed sighting of this species in Creston. CKISS will build on previous communication successes, and expand landowner outreach in the Creston Valley in 2018.

118 FISH & WILDLIFE PROJECTS

The Fish & Wildlife Compensation Program conserves and enhances fish and wildlife in watersheds impacted by BC Hydro dams.

$10 million approved by regional Boards

In 2018–2019, our three regional Boards – Coastal, Columbia, and Peace – approved funding for 118 fish and wildlife projects, valued at approximately $10 million. Each project went through a three-stage review and evaluation process prior to a final decision by our local Boards. Each project addresses one or more conservation priorities in our Action Plans. Projects are being led by First Nations, agencies, stewardship groups, and consultants.

1

Why does BC Hydro fund the FWCP?

2

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

BC Hydro has water licence obligations in the Columbia and Peace regions, and has made voluntary commitments to address the impacts of dams of the Coastal Region. BC Hydro fulfills the applicable obligations through the work of the FWCP.

BC Hydro works in equal partnership with the Province of B.C., Fisheries and Oceans Canada, First Nations and Public Stakeholders by participating on FWCP's regional Boards, which review projects and make all funding decisions.

Who decides?

Independent Board Members in each region review, evaluate, and approve funding for all projects. Our Boards include representatives from each of our FWCP partners: BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations, and Public Stakeholders. 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**.

Project results are online at fwcp.ca

The projects we fund are restoring critical habitats, conserving ecosystems, and supporting at-risk species. Find out more about our results and the species that benefit. We post final reports for all FWCP-funded projects on provincial databases, so everyone can see the results and outcomes. We also post a searchable spreadsheet to make it easier to find the report you want. Read our annual reports for an overview of projects and outcomes. Learn more at **fwcp.ca/search**

Learn more about projects

Find out what projects we're funding and how to apply for a grant at **fwcp.ca**.

Subscribe now at **fwcp.ca/subscribe**.

All FWCP projects are evaluated for technical merit, feasibility, and the benefit to fish and wildlife.

Photos:

1. Whitebark Pine seedlings at Splitrock Environmental Nursery. Photo by Kim North.
2. Northern Leopard Frog. Photo by Barb Houston.
3. Bighorn Sheep. Photo by Ben Meunier.

FUNDED BY FWCP IN 2018–2019

Coastal Region

33 projects: 20 fish and 13 wildlife
$1.8 million in 2018-19

Fish projects

- Assessing spawning channel function
- Helping rebuild Chinook stocks
- Improving access to salmon habitat
- Improving estuary function
- Improving fish passage
- Improving flows and habitat for Coho
- Improving spawning and rearing habitat
- Improving understanding of deep-water fish species
- Monitoring Salmon River Coho
- Protecting K'omoks Estuary marsh
- Securing important land for conservation
- Studying Bull Trout
- Studying Eulachon
- Studying summer-run Chinook

Wildlife Projects

- Conserving biodiversity
- Creating and enhancing wetland and riparian habitat
- Growing endangered Whitebark Pine
- Helping Canada's most-endangered owl
- Managing invasive plants
- Monitoring bat roosts
- Securing conservation lands
- Supporting habitat assessment mapping
- Supporting Mule Deer and habitat

Columbia Region

55 projects: 19 fish and 36 wildlife
$6.1 million in 2018-19

Fish projects

- Adding nutrients to Arrow Lakes Reservoir
- Adding nutrients to Kootenay Lake
- Assessing Bull Trout spawning habitat
- Developing a Burbot conservation strategy
- Documenting Bull Trout abundance
- Enhancing food for fish
- Funding Hill Creek spawning channel
- Funding Meadow Creek spawning channel
- Improving fish habitat
- Improving Rainbow Trout habitat
- Monitoring Kokanee
- Rehabilitating Joseph Creek
- Studying Bull Trout in the Wild Horse River
- Studying Gerrard Rainbow Trout
- Studying Westslope Cutthroat Trout
- Supporting sturgeon recovery

Wildlife projects

- Collecting baseline bat data
- Connecting wolverine habitat
- Conserving at-risk reptiles
- Enhancing game and non-game habitat
- Filling information gaps about marsh birds
- Managing invasive species
- Monitoring wetland restoration
- Protecting Bighorn Sheep habitat
- Protecting Northern Leopard Frogs
- Protecting grizzlies
- Restoring riparian and wetland habitat
- Restoring ungulate habitat
- Securing lands for conservation
- Studying elk migration
- Supporting caribou recovery

Read our complete project lists at **fwcp.ca/projectlists**

Learn more at **fwcp.ca/our-work-in-your-region/**

Peace Region

30 projects: 10 fish and 20 wildlife
$2.1 million for 2018-19

Fish projects

- Assessing influence of Kokanee
- Investigating mercury levels in fish
- Assessing Arctic Grayling
- Monitoring and managing fish enhancement structures
- Monitoring Bull Trout
- Sampling Lake Trout
- Studying Arctic Grayling and Bull Trout interactions
- Studying Kokanee

Wildlife projects

- Assessing caribou herd populations
- Creating wildlife trees
- Encouraging stewardship with students
- Helping restore wetlands
- Improving caribou calf survival and herd size through maternity penning
- Improving knowledge of berries to support traditional use and bears
- Investigating factors limiting moose
- Restoring habitat to support caribou
- Studying amphibians
- Studying caribou habitat alterations
- Studying Northern Myotis bats
- Studying threatened flycatchers
- Supporting Kwadacha land guardians
- Supporting Mugaha Marsh bird banding
- Conserving Fisher habitat

Wetland habitat is a priority

Low elevation wetlands have been significantly affected by reservoir creation resulting from dam construction and other human activities throughout the Columbia Region. Over the past several years, our FWCP Columbia Board identified wetland restoration and conservation projects as regional priorities.

This call-to-action has been very well-received and much has been accomplished either through FWCP grants or the FWCP's long-term agreement with the Ministry of Forests Lands Natural Resource Operations and Rural Development (FLNR).

Wetland restoration at Cherry Creek

Led by: The Nature Trust of BC (TNTBC) Eight hectares of wetlands have been restored, plus an additional 11 hectares of wet meadow habitat has been enhanced. More work is planned for late summer 2018.

The project is on TNTBC-owned conservation property, where endangered Northern Leopard Frogs have been detected, after being introduced to nearby Bummers Flats.

Wetland restoration at Cherry Meadows

Led by: The Nature Conservancy of Canada (NCC) The goal is to transform former hay fields that are now dominated by reed canary grass and dense thickets of Willow, back to their natural state of functioning wetlands.

Nine hectares of wetlands have already been restored, which will provide the necessary conditions for native sedges and aquatic grasses to out-compete the invasive agricultural grasses and willows. An additional nine hectares of habitat restoration is planned for 2019.

Native species of plants are being sown in and around the new wetlands to improve habitat for wildlife and pollinators, such as bees and butterflies.

Wetland restoration at Meadow Creek

Led by: FLNR At the start of 2018, wetland restoration took place on TNTBC-owned property, near Cooper Creek. Nineteen wetlands of various depths, totaling 3.2 hectares in size, were restored, including two areas of wetland that were enhanced. In addition, a total of 5.9 hectares were seeded, including wetland basins and soil mounds.

Excavators were used to transplant live Hawthorn, Willow, Hazelnut, and Red-osier Dogwood, and sand and gravel was placed in 11 mounds throughout the restoration area to provide better turtle nesting habitat.

Assessment of wetland restoration projects at Meadow Creek and Creston Valley

Led by: FLNR During the 2017 field season, FNLR initiated a monitoring program of two wetland sites: one on the TNTBC-owned conservation properties near Meadow Creek, and the other in the Creston Valley Wildlife Management Area.

A total of 22 constructed wetland pools were monitored for water levels, periods of wetness, water temperatures, amphibian occupancy, incidental wildlife observations, and invasive species.

Results confirmed that at both sites adequate water levels were maintained for amphibian species development throughout the prime breeding season, with some pools even maintaining water during the intense summer heatwave, providing further development and foraging opportunities. Each wetland complex offered a diversity of ephemeral and permanent wetlands with a diversity of cover.

Restored wetland near Meadow Creek. Photo: Kat McGlynn

Western Painted Turtles are among the species that benefit from the wetland work. Photo: Marc-Andre Beaucher

Aerial view of wetland creation in the East Kootenay's Cherry Creek. Photo: Doug Newbigging

Assessment at Meadow Creek and Slocan Valley

Led by: Slocan Solutions Society This monitoring project focuses on the total abundance and biodiversity of invertebrates – or genus richness. The two restoration sites under the microscope were on the TNTBC-owned conservation properties at Meadow Creek and at Crooked Horn Farm in the Slocan Valley.

Results indicate, at both sites, that there was a large or significant increase in abundance and biodiversity of invertebrates relative to reference sites, compared to the pre-restoration monitoring.

Wetland education at Canal Flats and Salmo

Western Toads need aquatic and wetland habitat for breeding. Photo: Kat McGlynn

Led by: BC Wildlife Federation In 2017, the BCWF's Wetlands Program hosted its Wetlands Institute Course in the East Kootenay with some attendees taking the information straight back to their respective stewardship groups to share. The course, held near Canal Flats, was very hands-on and participants helped restore three wetlands, totalling over 2.5 hectares, at Turtle Lake and Gyppo Logging Basin, west of Canal Flats, and on the Hoodoos Conservation Property near Fairmont Hot Springs.

The courses are about sharing knowledge, enhancing capacity, and building relationships. As a result of the 2017 course, BCWF entered into a partnership with the Lower Kootenay Indian Band to enhance the Yaqan Nukiy wetlands near Creston in 2018, again with FWCP funding.

BCWF also worked with the Salmo Watershed Streamkeepers Society and local school students, to plant about 2,000 native wetland plants at KP Park in Salmo.

Thirty-two small wetlands in the East Kootenay were assessed as part of the field testing. Photo: J. Dulisse

32 wetlands assessed as "seed" project grows

East Kootenay

There's thinking big, and then there's thinking really big. In 2016, wildlife biologist, Jakob Dulisse, received an FWCP seed grant to develop his idea to restore and protect small wetlands in the Upper Kootenay River watershed. Then, in 2017, field testing was implemented with the help of a large project grant from the FWCP, with funding from the Columbia Basin Trust under the Upper Kootenay Ecosystem Enhancement Plan (UKEEP).

Dulisse used the rapid Wetland Health Assessment protocol, developed in Montana and Alberta that enables field workers to quickly score the relative ecological function of riparian areas (wetlands, lakes, and creeks), based on a rigorous scientific scoring system. This is critical because biologists need to know the effectiveness of any restoration treatment implemented, such as fence installation, alternative drinking sources for cattle, or the removal of invasive species. The wetlands are assessed both pre- and post-treatment. This assessment method is effective, efficient, and engages local stewards.

Due to the success of this field testing, when 32 small wetlands were assessed, the Province of B.C. is now interested in expanding the work to a larger provincial scale. It is working with BC Wildlife Federation's Wetlands Education Program (WEP) to develop a province-wide protocol.

Columbia Region wetlands were significantly impacted by reservoirs resulting from construction of BC Hydro dams, and Libby Dam in the United States. This project aligns with UKEEP's Wetland Action Plan.

Now, across the province, it appears that many more wetlands, and the species that call them home, will benefit from this work that started with an FWCP seed grant.

400+ hectares of badger habitat restored

Rocky Mountain Trench

Improving habitat for Columbia Ground Squirrels is one of the best ways to improve habitat for badgers. That's because ground squirrels are high on the badgers' list of preferred foods in the East Kootenay. The Rocky Mountain Trench Natural Resources Society is in the process of restoring an impressive 412 hectares of grassland and open forest habitat at Ta Ta Creek, just west of Wasa Lake.

There are estimated to be fewer than 350 badgers in B.C. – about one-third live in the East Kootenay and are the subspecies *T. taxus jeffersonii*, commonly known as the American Badger or Yellow Badger because of its yellow underside. They are Red Listed provincially and listed as endangered federally.

One way to improve badger habitat is to improve ground squirrel habitat. Photo: R. Klafki

Badgers, one of several FWCP focal species in the Columbia Region, are thought to be in long-term decline, and continue to face threats from habitat loss (i.e. fewer denning environments).

This is due to a variety of factors, including urbanization, reservoir creation and invasive plants. Research has found that road mortality is the largest source of badger deaths in B.C.

The restoration work primarily involves hand-slashing to reduce the density of small-diameter coniferous trees that are crowding out native plants and bunchgrasses in the area. This pre-treatment work will prepare the area for a prescribed burn, anticipated to take place in the next couple years.

This important work is being conducted as badgers need large areas to sustain their populations. A typical female will have a territory of between 35-50 square kilometres, while a male will overlap several female territories and range about 350 – sometimes up to 500 – square kilometres.

Caribou maternity pen helps calf survival

Revelstoke

The Revelstoke Caribou Rearing in the Wild Society, a multi-partner, community-led conservation initiative, is now in the fifth and final year of its pilot caribou maternity penning project. The preliminary conclusion is that the pens work, but they are not a "silver bullet." Other conservation tools—habitat protection and managing predator/prey dynamics—still need to be implemented to support the long-term survival of endangered Mountain Caribou.

The survival rate for calves from the maternity pen is just under 43 per cent for the first three years of penning. The survival rate for calves born in the wild has been recorded as 20 – 27 per cent.

Watch this video about the Revelstoke caribou maternity pen at fwcp.ca/supporting-risk-caribou-herds

The project is close to reaching its target of 45 per cent of calves born in the maternity pen surviving to 10 months.

There is a 95 per cent pregnancy rate for female caribou within the North Columbia herd and modeling indicates that capturing 30 per cent (23 cows) in a 10-year period would result in a small and slow increase in population of 1.5 per cent/year. However, this is only if other conservation measures are in place.

FWCP is also funding work on improving knowledge about caribou predators in the South and Central Selkirks, and South Purcell Mountains, led by Province of B.C. biologists. These actions include caribou mortality investigations, predator tracking surveys, determining wolf pack sizes, as well as undertaking moose surveys, and caribou census and collaring.

Updating our Action Plans

We'll be updating our Columbia Region Action Plans in 2019. Subscribe and we'll let you know how you can join the discussion. fwcp.ca/subscribe

FWCP is funding maternity pens in the Columbia and Peace Regions. Photo: Rob Buchanen

FWCP's guidance document outlines priority work to support Arctic Grayling. Photo: Istock, Pi-lens

New projects to research and understand Arctic Grayling abundance and presence in our Peace Region are starting in 2018.

Our Peace Region Board approved more than $353,000 for four Arctic Grayling research projects in 2018–2019. These projects are filling information gaps, and are an essential first step before hands-on conservation and enhancement projects can be implemented to address this once-plentiful fish. Since completion of BC Hydro's W.A.C. Bennett Dam in 1968, self-sustaining Arctic Grayling populations are limited, and in many flooded reaches they are not present at all.

"Our 2017 monitoring framework spelled out high priority information and monitoring needs for Arctic Grayling," says Peace Region Manager, Chelsea Coady. "We will continue to fund projects for this important species of interest that align with this framework."
Learn more at **fwcp.ca/arctic-grayling**.

Using eDNA in tributaries

Using emerging environmental DNA (eDNA) technology, the research team will study small tributaries that flow into Williston Reservoir to detect Arctic Grayling presence.

Snorkeling in the Ingenika River

This research focuses on reaches of the Ingenika River to establish Arctic Grayling presence and abundance.

Snorkeling in the Anzac, Table, and Missinka rivers

This project will assess trends and abundance in the Anzac and Table rivers, and will also determine Arctic Grayling presence and identify suitable habitat in the under-studied Missinka River.

Arctic Grayling and Bull Trout

This project will focus on the Parsnip, Anzac, and Table rivers, in order to study Arctic Grayling interactions with Bull Trout, as well as migration, distribution, and habitat use.

Delving deeper into understanding Lake Trout

Understanding the potential competitive interactions between Lake Trout and blue-listed Bull Trout in the Peace Reach of Williston Reservoir is at the crux of a project led by Diversified Environmental Services (DES). Now, two years into a proposed four-year project, important data gaps are being filled.

Lake Trout are a freshwater char, native to many lakes in northern B.C. In Williston Reservoir there has been a dramatic increase in numbers, and knowing more about their seasonal movements, spawning areas and potential interactions with Bull Trout is a priority in our Reservoirs Action Plan.

In 2016, 40 Lake Trout were fitted with acoustic transmitters and hydrophones were positioned throughout the Peace Reach. The hydrophones are managed by Carleton University for a concurrent Bull Trout movement study. With 2017 data, the study team has been able to document for the first time, potential spawning areas in Williston Reservoir.

"In natural systems, they typically spawn on cobble shoals and shorelines," says DES biologist, Ted Euchner. "While not unusual, Lake Trout in Williston Reservoir must spawn deeper than the 15 m drawdown depth, in order to reproduce successfully. Potential spawning sites identified in 2017 appear to coincide with rocky slopes that are now inundated."

At one location, fish were frequently recorded at depths between 22 and 32 metres. An October 2017 temperature profile found an abrupt thermocline between 20 and 22 metres, where the water temperature dropped from nine to three degrees Celsius.

The research also found that the reservoir's Lake Trout appear to form a single, wide-ranging population that move extensively throughout the entire reservoir. After transmitter deployment in June 2016, more than two thirds (68 per cent) of the tagged fish left the Peace Reach and returned by May 2017.

Lake Trout were frequently found recorded at depths in excess of 20 metres. Photo: Diversified Environmental Services

In 2018, more fish are being fitted with transmitters in the Parsnip and Finlay Arms, and more hydrophones are being deployed outside of the Peace Arm.

When all the work is completed and the data analysed, the knowledge gained about Lake Trout will help inform future fisheries management strategies in Williston Reservoir.

New wetland and riparian mapping tool: accurate and affordable

Riparian areas and wetlands are a critical habitat type and a conservation priority for the FWCP. In our Peace Region, a multi-year project undertaken by the FWCP and the Province, is developing and testing a new approach to mapping riparian areas and wetlands that is proving to be reliable, accurate, and affordable.

The predictive wetland and riparian mapping project uses spatial data and the power of a machine-learning algorithm to predict where wetlands are likely to exist, and what type they are likely to be. It can achieve 90 per cent accuracy for predicting locations of wetlands, terrestrial areas and other water features, and provides 54 – 65 per cent accuracy for predicting different wetland classifications. And this approach has produced inventory maps at a cost of $0.02 per hectare, significantly more affordable than similar PEM projects and Terrestrial Ecosystem Mapping.

This new predictive wetland approach has mapped 7.28 million hectares in the Peace Region and identified 263,688 ha of wetlands – that's 43 per cent more wetlands than current TRIM (Terrestrial Resource Inventory Management) data show. The model fully describes the wetland complex composition, and captures many smaller wetlands not in the TRIM dataset.

"This project has resulted in an invaluable inventory of existing wetland habitats – many we were not aware of until now – and it is a critical first step to developing targets, plans and priorities for wetland restoration or enhancement in the future," says FWCP Peace Region Manager, Chelsea Coady.

A final report will be available at fwcp.ca and the data will be made available to groups with GIS capabilities interested in understanding more about where wetlands and riparian areas are in the region.

During field data collection, the project team identified rare wetland types, like this calcareous wetland that could be listed provincially, demonstrating the power and importance of this new approach.

Reducing wildlife vehicle collisions

With FWCP funding, the Yellowstone to Yukon Conservation Initiative Foundation (Y2Y) has assembled a research team, involving the BC Conservation Foundation, University of Northern B.C., and First Nations, to develop recommendations to reduce wildlife road mortality. Their task is to identify wildlife-vehicle collision problem areas along highways and recommend cost-effective solutions.

"There are two broad methods for reducing wildlife-vehicle collisions," says Y2Y project lead, Tim Burkhart. "One is to change driver behaviour and the other is to change animal behaviour. It is generally more effective to do the latter, although a mixture of the two will likely achieve the best results."

The team identified 17 hotspots – areas with a high frequency of collisions involving wildlife – on highways #97 and #29. Six moose, five deer, three elk, one bear, and other species were involved in collisions at these hotspots; only one had wildlife warning signs for drivers.

"Right now, motorists enter these sites without any warning that it is a hotspot," says Dr. Roy Rea of UNBC. "Sign placement should reflect current data trends." Improving signage or implementing speed restrictions are just part of the solution.

Photo: Roy Rea

The northern landscape has been influenced by a wide variety of human impacts, including road construction and reservoir creation. Barriers like these can create "islands" of wildlife. These islands typically exist in wilderness or protected areas. Maintaining connectivity between populations – by creating safer passage for wildlife around and across highways – is key to generating and maintaining biodiversity.

The research team is working with the Ministry of Transportation and Infrastructure to install warning signs for each hotspot. Other recommendations being explored include controlling mineral licks, brushing to improve sightlines, and removing food availability.

Number of driver fatalities involving wildlife each year in BC: 3
Number of those on northern roads: 2
Costs associated with wildlife collisions: $6,617 per deer / $30,760 per moose

Source: BC Nature Magazine, Winter 2017

Update: mercury in fish investigations

2018 is the final year of fish sampling and data collection for our investigation of mercury levels in fish.

When complete, this project will update information on mercury levels in fish from Williston and Dinosaur Reservoir watersheds. The goal is to improve our understanding of mercury in fish in all parts of the reservoir system, and to provide this information to agencies responsible for advising the public on fish consumption. This project is a priority in our Reservoirs Action Plan.

First Nations have been actively involved in this project by taking training, then helping with collection of tissue samples and contributing 42 samples in 2017.

In previous years, the team collected samples from the Parsnip, Peace, and Finlay Reaches. The team has collected 551 samples to-date, including samples from reference areas outside of the watershed. More sample collection is planned in 2018. A final report is expected in 2019. More at **fwcp.ca/mercury-in-fish-investigation-in-williston-dinosaur-basins**.

In 2017, the team collected 115 samples from 10 species in the Peace Reach of Williston Reservoir using a mix of short-set gill nets and angling Photo: Azimuth Consulting.

Year four of moose study approved in Peace Region

Recent surveys suggest moose populations are declining in some parts of BC, and in response, the Ministry of Forests, Lands, Natural Resource Operations and Rural Development is leading a multi-year provincial moose study to understand possible causes of the decline. In the Peace Region, moose populations appear stable. As a complement to the provincial study, the FWCP is funding research on limiting factors affecting moose in the Moberly and West Parsnip areas.

Moose are an important wildlife species ecologically, for First Nations' sustenance, and for resident and non-resident hunters in Northern B.C. This work is a priority action in the FWCP's Species of Interest Action Plan.

In 2018–2019 our Peace Region Board approved funding for year four of this project, led by Wildlife Infometrics and Diversified Environmental Services. Upcoming field work includes: monitoring 81 collared cow moose, investigating mortalities, and three calf surveys to determine calf production, calf survival, and calf recruitment (the number that survive to be one-year old).

102 cow moose captured and collared since 2016

- **56 captures in West Parsnip**
- **46 captures in Moberly**

16 mortalities to-date

- **West Parsnip**
  - **Annual cow survival rate 83%.**
  - **Eight of 11 mortalities in West Parsnip due to predators (i.e. wolf or Grizzly Bear).**
- **Moberly**
  - **Annual cow survival rate 92%.**
  - **Two out of five mortalities in Moberly due to predators (i.e. wolf or Grizzly Bear).**
- **Other causes of mortalities were due to accident or malnutrition in both study areas.**
- **Recruitment surveys revealed that Moberly calf survival is estimated at 18% and West Parsnip calf survival is estimated at 51%.**

Supporting **5** caribou herds

We're funding projects to support the Chase, Finlay, Klinse-Za/Scott, Pink Mountain, and Wolverine Caribou herds in our Peace Region. Learn more at **fwcp.ca/supporting-risk-caribou-herds**.

Photo: FWCP

Project helps prepare for White Nose Syndrome

White Nose Syndrome (WNS) strikes in the winter, killing bats while they hibernate, so a team of wildlife biologists, with funding from the FWCP, is identifying important over-wintering habitat.

While WNS has not been confirmed in B.C. yet, it is only a matter of time. Biologists with Zonal Ecosystem and Wildlife Consultants Ltd., and the Province of B.C., are pointing to a glimmer of hope, in the Peace Region. Elsewhere in North America, bats tend to hibernate together in large numbers in caves or abandoned mines so if the fatal fungus strikes, fatalities can be catastrophic. In the Peace Region, biologists are finding evidence that bats may over-winter in smaller groups in cracks and crevices. This could reduce the speed of WNS spread once it hits B.C. Of the 15 hibernacula detected in the winter of 2016–2017, all but one were in rock cracks or crevices.

"While smaller congregations of bats may help against the spread of WNS, the task for us to locate these small-scale hibernacula, dispersed widely across the landscape, is very difficult, especially with our winters," says wildlife biologist, Inge-Jean Hansen. "We've learned that monitoring potential hibernacula with acoustic detection equipment in the late fall and the early spring, may be a better method for detecting Myotis species' hibernacula than setting up our equipment in the depths of winter when only Big Brown Bats are generally active."

There are eight species of bats in the Peace Region, and five over-winter: Northern Myotis, Little Brown Myotis, Long-eared Myotis, Long-legged Myotis, and the Big Brown Bat. Of these, the biologists are most concerned about the Northern and Little Brown Bats, since they are both susceptible to WNS and are federally listed as endangered.

The 2017–2018 data will be shared with the provincial and federal governments to determine if there are protection measures that can be implemented for high-priority hibernacula sites.

Bat hibernacula (winter roosting) can be found at high elevations. Photo: Inge Jean Hansen

Contact a Regional Manager anytime to learn more about the FWCP

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We can help with your grant application by exploring your project idea and providing guidance on eligibility and alignment with Action Plans and priorities. Email fwcp@bchydro.com and we'll keep you posted about our fall webinars.

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