

FWCP NEWS



UPDATE FROM THE FISH AND WILDLIFE COMPENSATION PROGRAM

fwcp.ca

SUPPORTING ECOSYSTEM-BASED RESTORATION

ZOOPLANKTON OFF THE CHARTS, PAGE 11



INNOVATIVE BEAR DENS

PAGE 5

INSIDE THIS ISSUE

COASTAL

- | | |
|--------------------------------|---|
| - Research on Endangered Owls | 4 |
| - Coquitlam River Improvements | 6 |
| - Side Channel at Salmon River | 8 |

COLUMBIA

- | | |
|------------------------------------|----|
| - Record Year for Endangered Frogs | 9 |
| - Wetland Will | 10 |
| - Work in Akisqnuq Community | 13 |

PEACE

- | | |
|-------------------------------|----|
| - Peace Plans and Projects | 14 |
| - Fire for Forage | 15 |
| - First Nations Working Group | 16 |

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 impacted by the construction of BC Hydro dams.

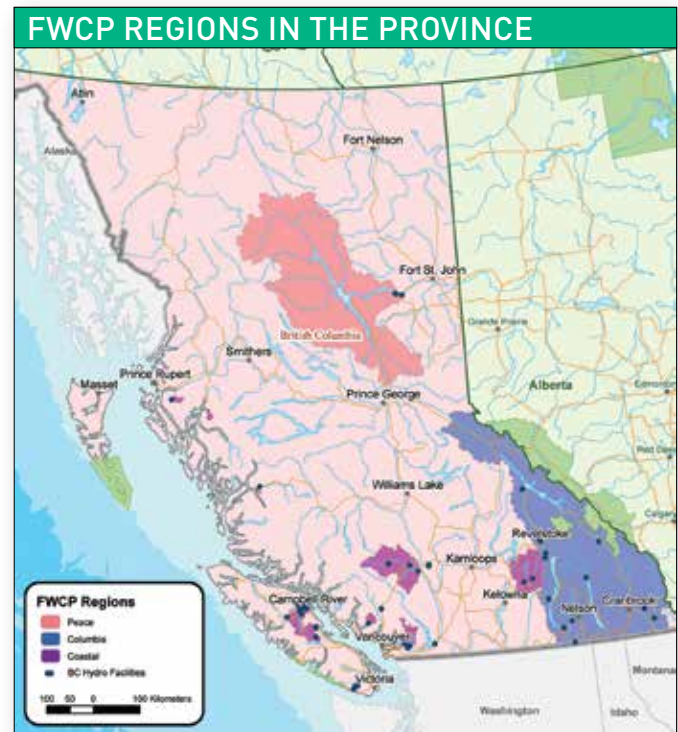
EIGHTY PROJECTS IN 2014

In 2014 the FWCP announced funding for 80 projects* to conserve and enhance fish and wildlife, and the ecosystems they rely on. Funding will go to Fish Nations, stewardship groups, agencies and consultants who applied to the FWCP to fund a range of projects that align with the FWCP's conservation priorities. Read the Regional Project Summaries online at www.fwcp.ca

In some cases FWCP is the sole funder and in many cases FWCP is one of many funding partners working together to make a difference. Projects funded by FWCP in 2014 will help, among other things:

- restore spawning habitat for salmon and other fish species;
- recovery efforts for endangered species including the Vancouver Island Marmot, Western Screech - Owls in the Columbia, and the Northern Leopard Frog – the most at-risk amphibian in B.C.; and
- support monitoring of migrating birds in the Peace Region.

* For a full list of the project summaries visit fwcp.ca



FWCP BACKGROUND

1. The Fish and Wildlife Compensation Program is a partnership between BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations, and public stakeholders.
2. The FWCP and its partners work to conserve and enhance fish and wildlife impacted by BC Hydro dams in the Coastal, Columbia and Peace regions of B.C.
3. The FWCP takes a holistic watershed-based approach to conserving and enhancing fish and wildlife that is future-looking and goes beyond direct impacts from construction of BC Hydro dams.
4. The FWCP envisions thriving fish and wildlife populations in watersheds that are functioning and sustainable.
5. BC Hydro funds the FWCP and is taking responsibility for impacts associated with dam construction, recognizing that entire ecosystems were impacted by dams, and that compensating and mitigating

will require a broad, holistic, watershed-based approach, and the involvement of many partners.

6. With annual funding of more than \$8 million in 2014 the FWCP directly delivers and provides funding to technically-sound projects that are in alignment with its regional conservation and enhancement objectives, and are carefully monitored to maximize the benefits to fish, wildlife and their habitats.

NEW FWCP MANAGER ANNOUNCED

After three years of managing and supporting the FWCP Patrice Rother is leaving to take on another exciting opportunity within BC Hydro. During Patrice's time with the Program, both managing the FWCP as a whole and the Coastal Region, it has gone through considerable change and she was pleased

to work with the regional Boards and Program Partners to bring the new delivery model to life. She will be missed!

Trevor Oussoren, who has a wealth of FWCP experience (he currently manages FWCP-Columbia), will take on overall management of the FWCP in October and will transition into the role of FWCP-Coastal Manager by spring 2014.



Above: spawning kokanee.

Front Cover Images: Magnified Daphnia: Brian Briscoe
Black Bear: Steve Williamson



FUNDING FAQs

FWCP FUNDING APPLICATIONS DUE EACH FALL

The FWCP funds fish and wildlife projects in alignment with its vision and conservation priorities.

START HERE TO BUILD A SUCCESSFUL FUNDING APPLICATION

1. Review our regional Basin, Watershed, and Action Plans at www.fwcp.ca to confirm our priority actions.
2. Align your project idea with our conservation action priorities in your region.
3. Select the funding application form that suits your project idea: seed, small or large.
4. Contact the Program Manager in your region if you have questions about your application.
5. In the FWCP-Peace Region you must submit a Notice of Intent form prior to the funding application deadline. Learn more at www.fwcp.ca.
6. Submit your funding application by the November deadline in your FWCP region. Late applications will not be accepted.

FWCP FUNDING APPLICATIONS

As of 2014, the FWCP accepts three types of funding applications: seed, small and large.

1. **SEED FUNDING APPLICATION:** this application is for funding to assist the applicant to develop an FWCP Large Project Application in a subsequent year. This funding category recognizes that some applicants may require financial support to prepare the technical information required for a detailed large application for complex projects or projects where the feasibility is uncertain.
2. **SMALL FUNDING APPLICATION:** the Small Project Application provides a simpler process for applicants who are looking to conduct smaller-scale projects with a maximum total cost of \$20,000. Small projects are typically, but not necessarily, proposed by stewardship groups to carry out small-scale enhancement projects. Total project cost includes funding sources other than the FWCP, all applicable taxes, and in-kind contributions.
3. **LARGE FUNDING APPLICATION:** this application provides a detailed information platform to allow the review of grant applications that have a total value greater than \$20,000 (including other funding sources and in-kind contributions).

The conservation priorities eligible for funding, application process and deadlines vary by region. All funding applications, including the Peace Region's mandatory Notice of Intent form, are available each year by early September at www.fwcp.ca. Contact us to learn more about the funding application process and requirements in your region.

Learn about our conservation priorities. Read the FWCP's Basin, Watershed, and Action Plans at www.fwcp.ca.

Proponents seeking funding must submit a completed funding application form in November of each year. Application deadlines and requirements vary by region. Learn more at www.fwcp.ca or contact us at fwcp@bchydro.com.



WHOOO NEEDS DATA AND RESEARCH? ASK AN OWL

Western Screech-Owls were once the most common raptor on B.C.'s coast. After a rapid decline the coastal sub-species (*kennicottii*) is now one of the rarest. In 1979, for example, 11 pairs were recorded on the University of Victoria campus. Today there are none. Recent surveys supported by the FWCP on the Sunshine Coast and Vancouver Island where this small owl - less than 25 centimetres long - used to be abundant, found one or two owls. In many cases no owls were found.

Western Screech-Owl.

Dave Fraser, from the Province's Species Conservation Science Unit explains, "By 2002 we knew the owl was a species of concern on the coast and in 2012 it was listed federally as a threatened species and provincially as blue-listed, giving it endangered status."

On the coast, Barred Owls were first recorded in B.C. in 1968. Today they are predating on the Western Screech-Owls and are presumed to be a key factor in the decline of the coastal sub-species. "Elsewhere the Screech-Owl species and Barred Owls seem to co-exist but for some reason the coastal sub-species has not adapted to this new predator," says Fraser.

"Finding Western Screech-Owls in the Clowhom watershed was incredibly exciting," says Dr. Michelle Evelyn, Leader of the Sunshine Coast Wildlife Project. During FWCP surveys in the fall of 2013, the Wildlife Project team detected six of the rare owls. This spring, they were able to document four Western Screech-Owl territories within the watershed, pinpoint one nest cavity and confirm successful fledging at that nest.

Twenty years ago there was very little data on the coastal sub-species. Today, FWCP research projects studying the coastal sub-species (*kennicottii*) on the Sunshine Coast and interior sub-species (*macfarlanei*) in the Shuswap and Columbia, have contributed to a better understanding of their distribution and home ranges.

"The FWCP has done several surveys to determine the range and abundance of these owls and that information is critical to understanding the status of this species on the coast and in the interior," says Fraser. "Decision-makers need the kind of information that FWCP is generating to inform their conservation planning and decisions."

For example, FWCP study results will contribute to an upcoming 2014 re-assessment of the coastal sub-species by COSEWIC, the federal Committee on the Status of Endangered Wildlife in Canada.

"We are concerned about the status of the coastal sub-species, which is why it's been listed as threatened and we are also concerned about the interior sub-species that appears to be relatively stable but at very low numbers," says Fraser.

In the Columbia Region, the FWCP has funded several projects to survey and monitor breeding pairs to help determine habitat needs and territory size. This work resulted in the establishment of a Wildlife Habitat Area to protect a breeding pair. In the Columbia, where habitat loss and degradation play a factor in the decline of the owl, the FWCP hosted workshops to teach residents how to build owl nesting boxes.

"Research and information gathering, as well as outreach, is an important part of the work we do," says Patrice Rother, FWCP Manager, "And it's great to see how the work we do can contribute to conservation planning and decision-making."

BLACK BEARS GET A HELPING HAND

An innovative project is underway in the Jordan River watershed that is attempting to create black bear dens by using plastic culverts. The three-metre-long culverts simulate naturally-occurring den structures but are made from plastic culverts closed at one end and open at the other, to allow entry by black bears. The team uses salal and conifer boughs and other bedding materials to make the new dens attractive to bears.

Three culverts were installed in summer 2014 at two locations on TimberWest Forest Products lands and one location on lands managed by Pacheedaht Andersen Timber Holdings LP.



"This technique has not been tried before so it will be important to monitor and assess this approach for effectiveness," says Helen Davis of Artemis Wildlife, who is leading the project.

"We know that the availability of naturally-occurring den structures has been reduced as a result of human activity, including hydro operations and forest management practices," says Davis adding, "This pilot project could help inform future conservation efforts if it's successful."

Just three days after installation, remote cameras recorded a bear inspecting a new den structure.

The Pacheedaht First Nation have been actively involved in installing and creating these dens, and is supportive of the project because black bears figure prominently in their culture, and it is their hope that improving and maintaining a supply of dens will support black bear populations.

"We are a proud supporter of the black bear den creation project," says Loren Perraton on behalf of Pacheedaht Andersen Timber Holdings LP. "Projects of this nature allow researchers to gather accurate data about our local bears' general living and territorial habits. This data provides excellent information for forest management planning, recreational planning and for the general well-being of the bears in our area."

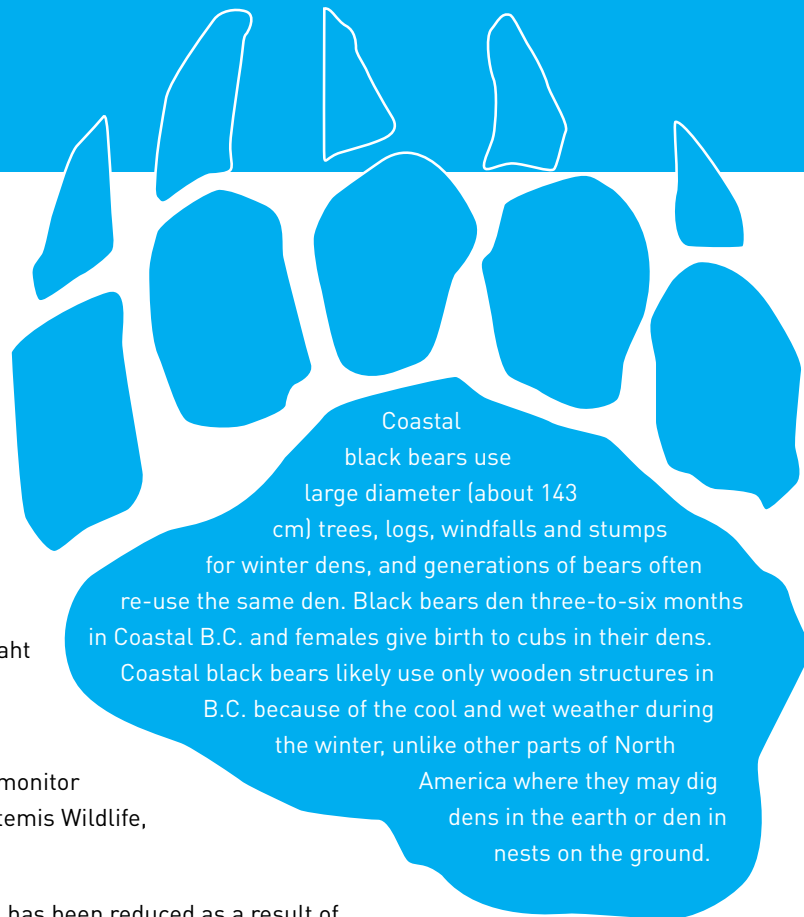
In addition to installing artificial dens, Davis and her crew are improving available den habitat by cutting entrances into standing large hollow cedar trees to provide access to the cavity for bears, and turning large stumps with hollow centres into dens by covering the top and creating an entry for bears.

"TimberWest is happy to support this investigation into bear den enhancement in our second growth forests," says Senior Biologist Dave Lindsay, who initiated a company-wide bear den inventory in the early 1990s, which has been diligently maintained and continues today. "The results of this study combined with our den inventory will help us maintain healthy black bear populations across our land base."

Michael Charlie (AKA "Bear") opens up the access to a hollow tree for a prospective bear den.

Above: A remote camera catches three bears checking-out a new structure. Hopefully they will "check-in."

Photos: H. Davis.



COQUITLAM RIVER HABITAT IMPROVEMENTS COMPLETE

Fields and an old horse ring have been transformed into prime fish and wildlife habitat alongside the Coquitlam River. The work, now complete after two years, includes a re-vegetated riparian forest measuring about the size of a football field and improved riparian habitat at Colony Farm and Coquitlam River Park.

"The project team was a partnership of the Watershed Watch Salmon Society and the Kwikwetlem First Nation, who put together a great 'on-the-ground' habitat restoration project," said FWCP manager Patrice Rother.

"The end result is a much richer ecosystem that will benefit four species of salmonids using these waters and the wildlife inhabiting the riparian zone."

Planting riparian habitat at Oxbox Pond. Photo: Watershed Watch Salmon Society

Previous restoration work by the project team, under the direction of DFO, included the creation of Oxbox Pond tidal channel in Coquitlam River Park. Major tidal channels were also constructed at Colony Farm and successfully recreated the former tidal floodplain along the Coquitlam River.

The most recent component of the project – the riparian planting – was conceived and implemented by the Watershed Watch Salmon Society with support from the Kwikwetlem First Nation, and funding from the Fish and Wildlife Compensation Program – Coastal.

"The Kwikwetlem First Nation has been central to the success of this project," said Tanis Gower, on behalf of the Watershed Watch Salmon Society. "It has supported, and been a part of, the work at every step along the way, including providing a committed and dedicated field crew to clear the sites and plant the trees."

An archaeological reconnaissance, undertaken by the Kwikwetlem First Nation, was part of the work. As a result, an archaeological site located at Sheep Paddocks was left unplanted to avoid future disturbance of the artifacts.

SALMON SPAWNING IN NEW CHEAKAMUS RIVER HABITAT

Coho salmon are already taking advantage of newly-created habitat in the Cheakamus River floodplain at the Dave Marshall Salmon Reserve near Squamish. The new habitat is part of a multi-year project to create spawning and rearing habitat primarily for Coho.

In 2013 2,200m² of high quality rearing habitat and over 700m² of spawning habitat was restored by re-watering channels that had been dyked off and improving the habitat in those channels. The gravel size and placement, addition of large woody debris and boulders, as well as the creation of over-wintering pools are aimed at Coho but will also benefit Chum, Chinook and Pink Salmon as well as Cutthroat and Steelhead Trout. Pink salmon started using the new channels immediately and in fall 2013 Chum and Coho were seen spawning in the new channels.

Existing floodplain habitat was impacted by construction of BC Hydro's operations at Daisy Lake Reservoir, transmission lines and road construction. This multi-year floodplain restoration project is coordinated by the Squamish River Watershed Society in partnership with the Squamish First Nation, which owns part of the land and is hands-on in the restoration work. Other partners include School District #44, which owns some of the land and uses the salmon reserve as part of the curricula offered at the Cheakamus Centre; and Fisheries and Oceans Canada, which provides support. Funding for this important restoration work comes from the Fish and Wildlife Compensation Program.

"The effective partnerships are key to our success," says Edith Tobe, Executive Director, Squamish River Watershed Society, "Restoring salmon habitat is a team effort that requires a long-term commitment from everyone."

The partners hope to continue this work in order to help compensate for the dykes, dams and other obstructions that hope to restore the Coho to pre-reservoir construction numbers and have impacted fish populations for more than past 50 years.

UPDATE:

COMOX LAKE SUMMER CHINOOK STOCKS

For the past three years, FWCP has been funding research on summer Chinook stocks in Comox Lake. The study is exploring if Chinook juveniles released in Comox Lake will imprint and successfully return to the lake as adults, where their chances of surviving to successfully spawn are greatest.

Results from this multi-year research could change where hatchery-raised Chinook are released in order to boost survival rates. The data will be compiled, analyzed and a final report is expected in 2015.

Spawning summer Chinook navigate up the Puntledge River, through two fish ways that bypass BC Hydro's Diversion and Comox Impoundment dams on their way to Comox Lake. The earlier the fish migrate up the Puntledge River, when water temperatures are lower and flows in the river are higher, the better their chances of surviving to spawn.

"When the results are in we will know if hatchery-raised smolts released into Comox Lake return to the lake as adults in higher numbers compared to adult returns that originated from smolts released in the lower river," says Esther Guimond, Project Biologist working with the Comox Valley Project Watershed Society. "This will assist in adaptive management of the stock, and help guide decisions related to smolt release."

Returning three-year-old Chinook adults released as juveniles in 2011 were captured by the project team at the lower Puntledge River Hatchery and then released after being equipped with PIT (Passive Integrated Transponder) tags to track their migration at the Puntledge Diversion Dam and Comox Impoundment Dam Fishway. In addition, a sonar camera at the Impoundment Dam helps monitor non-tagged fish migrating into Comox Lake. Monitoring non-tagged fish provides an overall assessment of adult migration into Comox Lake and will allow an estimate on upper watershed Chinook production.

"This is an excellent example of a research project, one of the priority actions in FWCP's Puntledge Salmonid Action Plan, that is designed to support conservation management and planning," says Patrice Rother, manager of the Fish and Wildlife Compensation Program, which is funding the project.

PIT Tags

Pit Tags – passive integrated transponder tags – are the size of a grain of rice. The tags are injected under the skin and carry a unique electronic code that can be "read" with a hand-held scanner when the fish is recaptured further upstream or passes through a fixed scanner, which are used at various locations, such as at fish ladders, to monitor tagged fish.

Photos courtesy:
Comox Valley Project
Watershed Society





Intake pool at the Big Tree Side Channel. Photos courtesy: BCCF

SALMON RIVER: ADD WATER AND THE FISH WILL COME

The results are in: five years after construction in 2008, a healthy population of Coho are using a new 1.2 km-long channel on the Salmon River, north of Campbell River. A recent study shows 9,000 juvenile Coho in a new channel on the Salmon River where flows were often non-existent in the summer months and fish were often stranded.

“By creating a new channel and adding stable water flows year-round we have created new summer rearing and safe overwintering habitat for Coho and other species,” says Jeremy Damborg, project biologist with the BC Conservation Foundation, one of several partners in this important project. Damborg adds the stable water flows have re-watered existing braided habitat downstream that would otherwise be dry providing up to 10,000 m² of additional high value habitat and 9,350 m² of rearing and spawning habitat.



Freshwater recovery bucket.

Decades ago a structure built by BC Hydro to divert water from the Salmon River, into the Campbell River hydroelectric system reduced spring and summer flows in the main stem Salmon. Despite the best efforts of the Sayward Fish and Game Association

to rescue fry, fish were being impacted and a feasibility study determined that side channel restoration and year-round stable water levels offered the greatest likelihood of increasing salmon and steelhead in this watershed.

The Salmon River’s wild steelhead, resident trout and salmon species are valuable to First Nations and support recreational and commercial fishing interests in the region. “Year-round water in the new channel and downstream floodplain means little creeks and streams are now watered and act like tributaries, says Damborg, “The fish may imprint on the tributaries flowing into the channel that may help create a return run haven for spawners,” says Damborg.

A 2013 evaluation of the Big Tree Side Channel assessed its productivity (i.e. the growth rate of biomass in the ecosystem), flows - which are designed to mimic the natural regime, and how much it is being utilized by fish species for rearing. The results, gathered during a five-day mark-recapture study completed at four sites within the new channel and one site in the natural channel downstream, estimated 9,000 Coho in the channel, along with Rainbow (Steelhead) and Cutthroat Trout.

“We expect the habitat quality and spawning returns will continue to improve as the riparian vegetation in the new side channel re-naturalizes,” added Damborg.

The Big Tree Side Channel was built in 2008 with support from the BC Conservation Foundation, Habitat Conservation Trust Foundation, Western Forest Products through FIA, the Sayward Fish and Game Club, the A-Tlegay Fisheries Society, Living Rivers – Georgia Basin/Vancouver Island, the Province, DFO, and the Fish and Wildlife Compensation Program.



RECORD-BREAKING YEAR FOR ENDANGERED FROGS

A record number of Northern Leopard Frog eggs masses were detected in the Creston Valley this spring. The 39 egg masses are almost double the previous record of 22 detected in 2012. The findings are good news for one of the most at-risk amphibians in B.C.

"It's taken a team effort to get to this point," says Dr. Purnima Govindarajulu, who specializes in amphibians, reptiles and small mammals for the B.C. Ministry of Environment, and chairs the Northern Leopard Frog Recovery Team.

This year's record-breaking find of egg masses is directly related to the increasing number of egg masses that were observed starting in 2011-2012, and those eggs having turned into frogs that are now of breeding age. It seems that the population is increasing likely due to a combination of factors including: efforts to protect egg masses (with mesh cages placed around the eggs) from predators, changing some land management practices with the support of land owners, as well as other factors. It is also possible that the population now has a higher resistance to

the fatal fungal disease Chytridiomycosis.

"Finding so many egg masses is very positive news for both the Creston Valley frog population and the wider recovery effort," says wildlife biologist Barb Houston who manages the Northern Leopard Frog project for the Fish and Wildlife Compensation Program.

Over the last four years the FWCP has also supported recovery efforts by moving about 30,000 tadpoles from the Creston Valley to Bummers Flats north of Cranbrook in the East Kootenay, and this year there is evidence (through surveying funded by Columbia Basin Trust, and the Aboriginal Fund for Species at Risk through the Ktunaxa Nation) that the work is paying off, as breeding was confirmed. The re-introduction of Northern Leopard Frogs to the East Kootenay has hinged on finding, and protecting, a sufficient number of egg masses in the Creston Valley, so the high numbers currently observed is good news for both sites.

The FWCP also supplies tadpoles annually to the Vancouver Aquarium to support



Release day in the Columbia Marshes. Photo: P. Govindarajulu

their captive assurance colony. This colony is an insurance policy of sorts, where the tadpoles have been reared and bred in captivity, with the progeny used to support endangered Northern Leopard Frog recovery efforts in the Columbia Marshes.

The record number of egg masses this year is good news for Northern Leopard Frogs and the partners on the Recovery Team are cautiously optimistic about the future.

SHEEP, DEER, AND ELK BENEFIT FROM BREWERY RIDGE BURN

With support from FWCP-Columbia, the Trench Ecosystem Restoration (ER) Program and the BC Wildfire Management Branch have restored ungulate habitat on Brewery Ridge, north of Cranbrook. Very soon after the spring 2014 prescribed burn, the site between Fort Steele and Fisher Peak is rich with new growth and is being used by ungulates.

"This burn met our ecosystem restoration objectives," says Randy Harris, Team Leader for the Trench ER Program. "We've had a massive re-sprouting of high-value shrubs, especially ceanothus and Saskatoon berries, which is what we were aiming for. And we are seeing new growth

of Pin Cherry and Nine Bark Mallow, which are native species not seen on this site before and that's great news because they are excellent nutrition sources for ungulates."

The area is traditional winter range for Rocky Mountain bighorn sheep, and Brewery Ridge is home to the Wildhorse herd, which had been dwindling since a population die-off in 1981 related to illness caused by nose-to-nose contact with domestic sheep.

"By 1990, the Wildhorse herd had recovered," said Larry Ingham, project biologist delivering the work on behalf of the FWCP and with Ministry of Forests,

Lands and Natural Resource Operations (FLNRO). "But the herd started to dwindle again partly due to the in-growth at Brewery Ridge —historically grassy and shrubby— and restoration work like this reduces in-growth and creates new habitat."

This prescribed burn was coordinated with the Southeast Fire Centre Wildfire Management Branch.

"The ridge is already providing improved grazing and habitat for our ungulates," Harris said. "I saw a mother elk and her new calf on site on the day I went out to measure results."

(Continued on page 11)

WHERE THERE'S A WILL THERE'S A WETLAND

Locals are giving Mother Nature a hand and are learning how to build wetlands in the Columbia Region with the help of Tom Biebighauser, an expert when it comes to creating wetlands.

"The wetlands in the Columbia Basin have been significantly impacted as a result of the construction of the dams and as a result, they are one of the priority areas for action in our region," says FWCP-Columbia public representative Grant Trower, who attended a recent wetland workshop in Meadow Creek hosted by the Wetland Education Program of the BC Wildlife Federation, with funding provided by the FWCP and others. "It's a perfect fit for the FWCP to be behind both the stewardship of existing wetlands, and the construction of new ones; and it's great to see the BC Wildlife Federation funding training workshops that have such practical and tangible results."

Biebighauser was kept extremely busy during his time in the Kootenay region, identifying sites with drained and filled wetlands that can be restored to functioning wetland habitat.

In total, nearly 50 participants attended the two 2-day workshops. During the workshops and the associated wetland tour, approximately 25 potential wetlands were mapped on private property, crown land, and conservation properties.

Ministry of Forests, Lands and Natural Resource Operations wildlife biologist Irene Manley, who attended one of the workshops and organized the wetland tour with Biebighauser, has high hopes. "There are certainly plenty of opportunities for wetland projects in the Columbia Region. The beauty of Tom Biebighauser's approach is that he is world-renowned for cost effectively restoring degraded sites to properly functioning wetlands that are incredibly rich for many wildlife species."



Wildlife biologist Irene Manley records GPS coordinates, and Tom Biebighauser (center) explains how the wetland might look. Photos: A. Glass



ZOOPLANKTON “OFF THE CHARTS” IN KOOTENAY LAKE



Showing the size of Daphnia, on the edge of a dime. Photo: Brian Briscoe

The zooplankton in Kootenay Lake are doing exceedingly well. If not “off the charts,” then it would be accurate to say the charts have been dramatically extended to accommodate the numbers. In 2013 in the North Arm of Kootenay Lake (where the FWCP and BC Hydro are the primary funders for nutrient additions), the recorded annual mean biomass (weight) of Daphnia was 2.6 times higher than the previous high in 2003. Daphnia is a type of zooplankton and the preferred food source for kokanee.

This is important because, to biologist Marley Bassett, zooplankton are a key metric when it comes to the monitoring of the effectiveness of Kootenay Lake’s Nutrient Restoration Program. It is managed by the Ministry of Forests Lands and Natural Resource Operations (FLNRO), and primarily funded by the FWCP.

“This is great news for the Kootenay Lake ecosystem because it is critical that we have a good food source for the kokanee when their numbers rebound,” says Bassett.

Bassett is the project lead for the Nutrient Restoration Program with FLNRO. The objective of the Nutrient Restoration Program is to support the lake’s ecosystem by replacing the nutrients trapped upstream by the Duncan and Libby dams. Nutrients are derived from decaying organic material and transported in the sediments that flow with a river. When a river is dammed, sediments settle out and deposit behind the dam, cutting off the flow of nutrients to downstream waters. This can result in reduced plankton communities and, ultimately, declines in fish populations.

But why the large jump in zooplankton numbers? According to Bassett it is likely due to a number of factors, and all not entirely positive. “We take an adaptive management approach to the nutrient restoration program that has been very successful helping us fine-tune how much, when, and in what proportions we add the nitrogen and phosphorus. However, this dramatic jump may be due to the lack of top ‘down pressure’, meaning there are not enough predators – especially kokanee – grazing on the zooplankton, allowing them to swell in numbers.”

The lack of kokanee is confirmed by both hydro acoustic estimates in Kootenay Lake and adult spawner returns to Meadow Creek Spawning Channel. In 2014, the channel had 53,500 kokanee spawners, the lowest on record since it was constructed in 1967. This year the females, on average, were the largest recorded with more than 500 eggs each. The latest (fall 2013) hydro acoustic numbers tally approximately 17 million fry in Kootenay Lake, (five per cent below the 10-year average of 17.9 million), and a little over 1.1 million kokanee aged one-year or older (a substantial reduction from the ten-year average of 6.7 million).

Kokanee populations, much like Sockeye (their ocean-going relatives) tend to cycle in abundance. The reasons for this cycle are the subject of much debate in scientific literature but relate to the complex interactions between the various levels of their food web; predators, competitors and prey.

SHEEP, DEER, AND ELK BENEFIT (Continued from page 9)

Bighorns prefer straight, open sightlines so in addition to the restoration work, the team is removing the lower branches of larger trees and creating a sheep corridor between Brewery Ridge and Lakit Ridge, one hundred metres wide and nearly a kilometre long.

“The Rocky Mountain Trench Ecosystem Restoration Program would like to thank the Fish and Wildlife Compensation Program for its commitment to these sites and the in-kind contribution of labour and expertise from the Wildfire Management Branch,” says Harris.

Brewery and its twin site, Lakit Ridge, are key habitats for ungulates. Total FWCP funding to-date at Brewery and Lakit ridges is \$138,000.

ARROW LAKES RESERVOIR - A COMPLEX SYSTEM FOR THE NUTRIENT RESTORATION PROGRAM

The Nutrient Restoration Program (NRP) in Arrow Lakes Reservoir replaces nutrients that would otherwise be flowing into the reservoir but are trapped upstream by dams. The nutrient additions are intended to support the food chain, starting with micro-organisms, and lead up to kokanee and piscivorous (fish-eating) bull and rainbow trout. But managing the NRP can be a challenging prospect.

That management challenge falls to the Ministry of Forests, Lands and Natural Resource Operations (FLNRO), which is also responsible for setting fishery objectives and managing freshwater fisheries across the province. The FWCP funds approximately 75 per cent of the annual cost of the NRP in Arrow Lakes Reservoir while Columbia Power Corporation provides the remaining 25 per cent.

In the years following the start of the NRP (1999), angling results for larger rainbow trout and bull trout improved, and their average condition factor (i.e. the fatness of the fish) improved in all years except one (2013) compared to the pre-nutrient additions average. Similarly, overall kokanee biomass has increased 2.5 times in the post-nutrient addition period.

Over much of the last decade, however,

angling results have been relatively poor when compared with the peak angling years between 2001 and 2005, and recent rainbow and bull trout annual harvests have been below that of the peak period. Compared to before the NRP started in Arrow Lakes Reservoir, kokanee harvest since 1999 has been well below pre-nutrient addition levels, while the harvest results for large rainbow trout and bull trout have largely remained unchanged.

There has been a similar pattern with the total number kokanee spawners around Arrow Lakes Reservoir: an initial increase after the NRP started, followed by an overall decline after 2005, and an upward trend in the last two years. The latest figures available (fall 2014) show the total number of kokanee spawners in all tributaries at approximately 247,500 which is about 20 per cent below the 10-year average.

The challenge is that the Arrow Lakes Reservoir is a huge and complex system, with many variables and large volumes of water flowing through it. Trying to optimize the "uptake" of nutrients to benefit the reservoir's food chain – the trophic levels – can be difficult.

"Ensuring optimal uptake of nutrients will continue to be a challenge," says FLNRO

fisheries biologist Marley Bassett, who coordinates the NRP. "While the NRP is believed to be improving the overall productivity of the entire reservoir food chain, productivity fluctuations and cycles can be seen in historical data. The ecosystem is large and complex, and influenced year-to-year from climatic conditions, reservoir levels, and flow."

Under the watchful eye of BC Hydro, reservoir levels and discharges are determined by basin runoff conditions, the requirements of the Columbia River Treaty, and other reservoir operating agreements that support flood control and power generation.

There are positive signs: for example in 2013 the biomass of Daphnia (the preferred food source for adult kokanee) was the highest recorded in the upper Arrow Lakes Reservoir since the start of nutrient additions, and second highest in the lower Basin.

"Variations in results are to be expected in ecosystems, and there will always be cycles of abundance in a body of water as dynamic as this, but with the recent levels of zooplankton, coupled with the increase in kokanee spawner numbers in the last couple of years, there is room for optimism," added Bassett.

READY FOR ACTION: UPPER KOOTENAY ECOSYSTEM ENHANCEMENT PLAN IS FINAL

A plan to conserve and enhance ecosystems in the Upper Kootenay River watershed, including the Koocanusa Reservoir, was completed in spring 2014 and reflects the input from many local residents and stakeholders. The Upper Kootenay Ecosystem Enhancement Plan (UKEEP), which reflects local input and the best available science, identifies the FWCP's priorities for conserving and enhancing species of interest and four

ecosystems: wetland and riparian areas, uplands and drylands, lakes and streams.

The Plan will guide funding decisions and on-the-ground conservation projects for the next three to five years. If you have an interest in conserving this watershed or an idea for a potential conservation or enhancement project, read the Plan. Then apply to FWCP for funding to undertake an action project in alignment with the

Plan. Funding applications are due each November and are available at www.fwcp.ca.

The Plan was developed jointly by the Fish and Wildlife Compensation Program and Columbia Basin Trust following the spring 2013 announcement that the Trust would dedicate \$3 million to conservation in the Upper Kootenay River watershed.

FWCP HELPS RESTORE WILDLIFE HABITAT IN AKISQNUK COMMUNITY

Approximately 650 hectares of land on the Akisqnuq First Nation Reserve, to the east of Windermere at the foot of the Rocky Mountains, have been included in a wildlife ecosystem restoration plan. To-date, about 50 hectares have been recently treated to restore and enhance wildlife habitat values. Similar to other restoration work that the FWCP undertakes, the objectives include promoting a healthier ecosystem, maintaining habitat for Red- and Blue-listed species, and reducing both the risk of catastrophic wildfires and infestations of invasive weeds. For this project, the objectives also include maintaining cultural values, and protecting archeological values.

The work was carried out by the Akisqnuq First Nation, and knowledge and skills training were integral to the success of the project. With the support of the FWCP the Akisqnuq First Nation hired and trained a crew of up to 15 to initiate the Wildlife Habitat Restoration Project.

"We're really happy to be working with the Akisqnuq First Nation" says Trevor Oussoren, FWCP-Columbia

Program Manager. "The project undoubtedly benefits from their expertise and historical knowledge of the land; and, of course, we are happy to provide some opportunities that support both sustainable and thriving watersheds, and local communities. Most importantly, the crews did a first-class job."

On-the-ground work involved a range of activities, all with the primary goal of restoring and enhancing wildlife habitat. Trees and shrubs were pruned to improve ungulate forage and bighorn sheep sightlines and help them escape predators. Smaller diameter coniferous trees were slashed and piled for future burning to reduce forest in-

growth and create more open forest and grassland habitat.

Future plans for the site include creating between five and 10 wildlife trees per hectare by manually girdling trees (removing a ring of bark), and/or injecting heart-rot fungus, which does not kill the tree but helps start decay and rot from within.

An extensive inventory of invasive weeds was conducted that included spotted knapweed, diffuse knapweed, giant burdock, and hound's-tongue. Infestations were removed by hand along roadways entering the work areas, and chemical treatment will be considered to reduce further spread.

"The end result will certainly help ungulates such as elk and deer, as well as many bird species that like more open grassland habitat," said FWCP Board Member, and Akisqnuq band member Joe Nicholas. "And we hope this is just the start; with more partners onboard in the future we could do a lot more restoration work to help support wildlife in this area."



Question: What is the measurement of a satisfactory line-of-sight for bighorn sheep to see predators? **Answer:** a one-metre-square piece of plywood or canvas, divided into 36 equally sized squares is positioned 100 yards away. If you can see 62 per cent or more of all portions of the squares, it's considered suitable for detection of predators by Bighorns.

MATCH YOUR IDEAS TO OUR BASIN AND ACTION PLANS

Our recently completed Basin Plan provides a historical overview of the program and our forward-looking priorities for conserving fish and wildlife. The Action Plans spell out recommended priority actions for riparian areas and wetlands, streams, reservoirs, uplands, lakes and species of interest. The plans are online at fwcp.ca and are must-reads for anyone applying to FWCP for funding.

Contact FWCP-Peace to discuss your ideas, learn more about involving First Nations and how applications are evaluated. Let us help you build a successful funding application to help fish and wildlife.

SMALL COMMUNITY DONATION FUNDS AVAILABLE

FWCP-Peace has a modest Community Donation Fund. This year, a total of \$5,000 is available to support activities such as workshops, conferences and association meetings that promote the conservation, enhancement, protection or management of species and their habitats in the FWCP-Peace Region. Contact Dan Bouillon, FWCP-Peace Program Manager for more information: dan.bouillon@bchydro.com or 250 783 7509

FWCP-PEACE ACTION PLANS

These plans define our priorities and will help you shape your funding application.

- Lakes Action Plan
- Reservoirs Action Plan
- Riparian and Wetlands Action Plan
- Species of Interest Action Plan
- Streams Action Plan
- Uplands Action Plan

PEACE INVESTS IN DIRECTED PROJECTS

The application-intake process each fall is just one method by which fish and wildlife projects in the FWCP-Peace Region get delivered. Another is through projects being "directed": for example, when specific projects have been clearly identified as work being required, and the FWCP takes the lead role in implementing, or directing, them.

Through the FWCP-Peace Basin planning process, these projects have been identified by the Board as priorities. Once a detailed scope of work is developed for these projects, FWCP-Peace will work with consultants, First Nations, stakeholders or other qualified proponents to help deliver them.

During the latter part of 2014 and into 2015, FWCP-Peace is initiating four separate directed projects as follows:

- Arctic Grayling in Williston Reservoir: explore the status and trends of Arctic Grayling to help prioritize potential streams for enhancement work.
- Mercury investigations in the Williston and Dinosaur Reservoirs.
- Moose limiting factors: improve the understanding of the ecological factors that limit moose survival in selected portions of the region.
- Wetland and riparian habitat inventory.





Prescribed burning near the Williston Reservoir. Photo courtesy: S. Rooke

FIRE FOR FORAGE TO HELP MOOSE AND OTHER UNGULATES

Jordy McAuley, owner of Finlay River Outfitters, has lived in the north his whole life and worked in the bush for much of it. He has seen how “prescribed” or controlled burns have enhanced ungulate winter forage. Last year Jordy, together with support from Wildlife Infometrics, applied for and received funding from the Fish and Wildlife Compensation Program – Peace to burn 400 hectares in the spring of this year adjacent to Ospika Arm of the Williston Reservoir, approximately 95 kilometres north of Mackenzie.

“It is truly amazing to see how the habitat just opens up after a burn, and how the ungulates respond to the changes,” says McAuley. “And the improved forage opportunities for ungulates can last 10, or even 15 years into the future.”

The burn was part of a five-year program that will see up to an additional 9,000 - 11,000 hectares treated. Much of the planning occurred last year, funded by the Habitat Conservation Trust Foundation, and this year the FWCP supported the burn activities and monitoring for a total of about \$155,000. Proposed future activities include burns in the Collins-Davis, Pesika, and Akie, Resource Management Zones in the Williston area. The three major funding partners are the Wildfire Management Branch of the Ministry of Forests who carried out the burn (all prescribed burns are planned and regulated by the Province of B.C.), the Habitat Conservation Trust Foundation and the Fish and Wildlife Compensation Program (FWCP).

“Prescribed burns reduce the understory – typically smaller trees or large shrubs – and enable the growth of grasses and new shrubs that provide excellent forage for ungulates. We are excited

to provide significant support for this habitat enhancement activity and to work with other dedicated partners.” says FWCP-Peace Program Manager Dan Bouillon. “The creation and enhancement of habitat is a priority objective of the Fish and Wildlife Compensation Program.”

Decades of wildfire suppression have altered the forest composition but prescribed burns can mimic the natural occurrence of more frequent, smaller intensity wildfires, and remove the build-up of forest fuels that can be the source of catastrophic wildfires.

While elk, deer, sheep and goat will all benefit from the burn treatment, moose are the target species. By providing a long-term, sustainable food supply for the moose, it is hoped that both aboriginal food supply and hunting opportunities will be enhanced.

“To the best of my knowledge this is the first prescribed burn in the McKenzie Forest District so it is understandable that this took significant effort by all the partners and stakeholders to get where we are now,” added McAuley. “But now that we have a process in place, we can fine-tune our approach and are extremely optimistic that this long-term plan will provide significant benefits to a variety of ungulate species in the future, and the communities that depend on them.”





FIRST NATIONS WORKING GROUP ESTABLISHED

Since 2008, FWCP-Peace has worked closely with regional First Nations to determine how best to incorporate their interests and facilitate their partnership and participation in the Program.

A Memorandum of Understanding, completed in 2012, provided the foundation for this participation, and the First Nations Working Group was subsequently established. The Working Group, unique to FWCP-Peace, is responsible for ensuring that First Nations considerations and input are provided to all aspects of planning and delivery of the FWCP-Peace. This includes participation in strategic planning, development of annual operating plans for approval, project initiation and review, project delivery, community liaison and capacity-building.

"Now we are at the level where we have a pre-consultation phase and, to the best of my knowledge, it is the first time this is occurring within the framework of an annually-funded fish and wildlife program in the province," says Luke Gleeson, chair of the First Nations Working Group, and Director of Land and Resources for the Tsay Keh Dene Nation. "A key component with respect to pre-consultation is a new Notice of Intent form that applicants seeking funding support from FWCP-Peace must submit prior to completing a funding application. This will help guide the proponents, and help identify appropriate First Nation contacts so that input and recommendations from First Nations can be made."

The Notice of Intent form can be found at fwcp.ca.

Education and communication are essential roles the First Nations Working Group will undertake, whether they are with FWCP-Peace committees, the Board, project proponents, the public, or with First Nations themselves.

"I hope all aspects of our involvement will lead to one thing: a more effective and inclusive Program in general," added Gleeson.

Represented on the First Nations Working Group are Tsay Keh Dene, West Moberly, Prophet River, McLeod Lake, Kwadacha, Doig River, Saulteau, Nak'azdli, and the Treaty 8 Tribal Association.

"The First Nations Working Group has become an integral element of FWCP-Peace and is working with the Board and Program Manager to support Program function," says FWCP-Peace Board Chair, Ted Down. "It provides a First Nations perspective in all decisions, encourages First Nations participation, and ensures active communication."

"We are extremely fortunate to have the First Nations Working Group, and have high hopes it will help the Program move forward. On behalf of the Board, I would like to thank all of its members for their much-valued involvement in the process."

We would appreciate your feedback. Let us know if you have any questions or comments about the newsletter or Program.

STAYING CONNECTED



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The FWCP is a partnership of BC Hydro, the Province of B.C., Fisheries and Oceans Canada, First Nations and public stakeholders.