



Years of Frog Work Paying Off Excellent Year for the Endangered Northern Leopard Frogs

FWCP biologists have had to be patient but, together with lots of hard work, it may be paying off. Between 2001 and 2005 the FWCP has led a captive rearing and release program for endangered Northern Leopard Frogs in the Creston Valley Wildlife Management Area (CVWMA). During this time young frogs and tadpoles have been released at various locations in the Creston Valley and at Bummers Flats just north of Fort Steele.

In 2007, for the first time since the mid 1970s, a breeding population of Northern Leopard Frogs has been confirmed in Bummers Flats. Biologists working with FWCP heard three breeding males, two of which were caught. Both had markers on them confirming they had been raised and released from FWCP's captive rearing program in 2005.

The excitement of finding these breeding frogs is conveyed in an email, written late at night, from former FWCP contract Wildlife Biologist Doug Adama who has coordinated the recovery effort since 2001. It was sent to the rest of the Northern Leopard Frog Recovery Team upon returning from the field.

Eleven years ago, I tagged along with Penny [Ohanjanian, Wildlife Biologist and amphibian specialist] on a calling survey for leopard frogs in the Creston Valley Wildlife Management Area. That night we (more like Penny) located a couple of leopard frogs calling in Duck Lake Nesting Area for the first time in many years, confirming that they still existed in British Columbia. That was the last calling survey we did together until this evening.

Shortly after jumping into Penny's truck, I mentioned how funny it would be if we heard leopard frogs calling tonight, as we had in 1996. We both laughed and Penny said she had said the same thing to another person earlier today.

We'll imagine our surprise when we actually did hear male leopard frogs, three of them, calling at one of our calling stations in North Bummers Flats. We were both flabbergasted and elated.

.....Without calling everyone and waking you and your families, I wanted to share this fantastic news. I'll be looking for egg masses tomorrow.



Barb Houston, FWCP

Northern Leopard Frogs are still a rarity in B.C. but they are once again breeding in the East Kootenay thanks in part to the efforts of FWCP.

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Manager's Message:

A Year of Conservation & Enhancement Achievements



As 2007 draws to close, much of our attention is turning to the next fiscal year as we begin to make strategic choices about the conservation and enhancement work we will undertake in the months to come. Before we look to the future, I want to take a moment to reflect on the last 12 months and our many Fish and Wildlife Compensation Program (FWCP) achievements.

The FWCP helped purchase the Fort Shepherd Conservation Area near Trail and we are helping fund the purchase of another property at the north end of Kootenay Lake. These conservation properties are typically rich, valley bottom habitat, similar to the lands lost to reservoirs when BC Hydro dams were constructed in our area.

The spring 2007 birth of nine lambs to Rocky Mountain Bighorn sheep we helped re-locate in 2005, is a good indicator that efforts to bolster declining sheep herds in the East Kootenay are working. We will continue to monitor the relocated sheep, but we all feel really positive about this project.

And then there was the spring 2007 discovery of Northern Leopard Frog egg masses which also gave us a reason to celebrate. The new egg masses suggest that efforts are paying off to help this endangered species recover. We still have a long way to go, but the FWCP will continue to do our part.

The kokanee egg-to-fry survival rate at the Hill Creek Spawning Channel on the upper Arrow Lakes Reservoir (ALR) was 50% which translated into 5.5 million fry (young

kokanee) leaving the spawning channel. This number is well above the typical 5-14% survival rate in natural spawning creeks, and it bodes well for future spawning returns. The two spawning channels we operate with the B.C. Ministry of Environment at Hill Creek and Meadow Creek had strong returns and the egg targets were achieved.

On a smaller scale, the FWCP worked with community volunteers, and simply by removing a log jam on Deer Creek near Castlegar we enabled more than 3,000 kokanee spawners to use spawning above the obstruction. This project confirms that large and small efforts to conserve and enhance fish and wildlife are all important.

And finally, our GIS – geographic information systems – technology is breaking new ground. Our biologists rely heavily on this map-based technology that is extremely valuable when it comes to analysing information, measuring areas that have been restored and displaying fish and wildlife spatial data in a map-based format. Certainly the FWCP is very advanced when it comes to using GIS as a conservation planning tool.

I could go on and on but I won't. I have been the Acting Manager for about a year now and I am impressed with all that the Program has achieved on behalf of the B.C. Ministry of Environment, BC Hydro and Fisheries and Oceans Canada. We will do our best to keep you informed about our projects and how they address fish and wildlife impacted by the construction of BC Hydro dams. If you have any questions, at any time, please let me know.

A handwritten signature in black ink that reads "Ed Hill".

Ed Hill, *Acting Manager*

Ed.hill@bchydro.com

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Years of Frog Work Paying Off

Excellent Year for the Endangered Northern Leopard Frogs

While no egg masses were discovered, young frogs were found later on in the season confirming that breeding was successful.

There was other good news for the recovery effort. A total of 13 egg masses were found in Leach Lake and Duck Lake at the CVWMA, the highest number since 2001. There is a direct link between these positive numbers and the captive rearing program. Of 18 breeding frogs caught, eight (44%) were marked indicating that they were released in 2005.

"The number of egg masses the FWCP staff found this year is good news and we will continue to monitor the progress the Northern Leopard Frogs are making," says FWCP volunteer Public Representative, Gerry Thompson. "However the species is still vulnerable to the threat of chytrid fungus and we will be monitoring that closely."

The fungus infects the skin of the frogs through which they breathe and absorb water. It is affecting amphibian populations in many parts of the globe. About 50% of the tissue samples collected from Northern Leopard Frogs during 2007 tested positive.

Other partners in the Northern Leopard Frog recovery work include Fortis BC, World Wildlife Fund, B.C. Ministry of Environment, Columbia Basin Trust, St. Mary's and Lower Kootenay Indian Bands, Environment Canada and the CVWMA.

WWWant to know more about chytrid fungus? Visit www.fwcp.ca, click on communications archives and see "Global Disease" January 2005

Fish – Small Projects

Small Funding – Big Results

The Fish & Wildlife Compensation Program (FWCP) is better known for larger-scale projects on the fisheries side of the equation. They include the Fertilization and Monitoring Programs in Kootenay Lake and upper Arrow Lakes Reservoir and the two kokanee spawning channels; all operated jointly with the B.C. Ministry of Environment. These, together with the sturgeon recovery work, absorb approximately 85% of the FWCP's fisheries budget. These worthwhile projects are continuing, but in 2007 the FWCP also supported a number of smaller-scale fisheries projects, many of which require the backing, and often muscle-power, of local community groups.

Murphy Creek

The section of the Columbia River south of Castlegar to the U.S. border supports a world-renowned fishery for Rainbow trout. Small tributaries flowing into the river provide important trout spawning and juvenile rearing areas and Murphy Creek, north of Trail, is one such tributary.

Improvements to a man-made spawning channel that runs parallel to Murphy Creek for 225 metres were funded through the FWCP's Small Project funding in the fall of 2007. The funds were used to improve the spawning habitat for Rainbow trout.

Fisheries Biologist, Michael Zimmer, worked with students from J.L. Crowe Secondary School to place and disperse spawning gravel in each of the 26 "step pools" in the side channel. The gravel was transported to the site by staff from the Rossland Trail Country Club which draws water from Murphy Creek. Zimmer also worked with members of the Trail Wildlife Association and the West Kootenay Fly-Fishers to improve the settling basin and remove woody debris that was impeding upstream movement. A real community effort.



Angus Glass

Jacob Hamilton and Anthony Krueger-Austin were among the students from J.L. Crowe Secondary School helping to restore spawning habitat at Murphy Creek.

Lardeau River

Small project, big fish? The mighty Gerrard Rainbow trout, named after the now deserted community once located at the outlet of Trout Lake, is the largest subspecies of Rainbow trout in the world! This year the FWCP gave some of its Small Project funds to the B.C.

Ministry of Environment (MoE) to improve sampling of spawning Gerrard rainbow trout in the Lardeau River. Accurate counts are critical in order to assist the fisheries biologists to effectively manage the stocks.

In 2007 (between mid-April and mid-May) the number of returning adults moving from Kootenay Lake to the spawning grounds in the Lardeau River was relatively high. The peak count of 464 fish on May 4th was the third highest in forty years. The peak count is estimated to represent about one-third of the total run.

"This was the third year in a row that the peak count exceeded 400," says FWCP volunteer Public Representative Grant Trower. "These relatively high returns indicate that the Gerrard rainbow trout is clearly benefiting from the Fertilization & Monitoring Program jointly delivered by the Compensation Program and the Ministry of Environment."

Deer Creek

Small Project funds from the FWCP also found their way to Deer Creek, a tributary of lower Arrow Lakes Reservoir. A log jam was acting as a barrier to kokanee trying to access upstream spawning habitat. Due to a strong turnout of the members from the Deer Park Residents Association and the



John Haggren

James Baxter, FWCP Senior Fisheries Biologist.



Michael Zimmer



Michael Zimmer

Many hands, many metres of fish habitat opened up? Local groups made short work of clearing the debris pile that was stopping kokanee swim upstream to find spawning habitat in Deer Creek.

BChydro



The FWCP works on behalf of its Program Partners BC Hydro, the B.C. Ministry of Environment and Fisheries and Oceans Canada to conserve and enhance fish and wildlife populations affected by the construction of BC Hydro dams in the Columbia Basin.

Partners in Conservation & Enhancement

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Fish – Small Projects

Small Funding – Big Results

West Kootenay Fly Fishing Club it didn't take long for the obstruction to be removed.

"This project effectively doubles the amount of habitat available for kokanee spawners" says Jeff Burrows of the B.C. Ministry of Environment who Chairs the FWCP's Fish Technical Committee. "There are an additional 940 metres of habitat and the debris removal allowed more than 3,000 kokanee spawners to migrate upstream to use that habitat during the fall of 2007."

A small project with the potential of producing very positive results, especially since the FWCP had funded previous work improving upstream spawning habitat for kokanee.

Cottonwood Creek

Many years ago kokanee and Rainbow trout spawned in the lower reaches of Cottonwood Creek near Nelson. Not any more. Urbanization and highway development, commercial development, creek channelization and contamination from

railway operations have contributed to degraded spawning habitat. Plus, the creek currently carries high loads of sediment that prevent good spawning conditions.

Restoration of Cottonwood Creek is underway. This is a large undertaking being led by the Nelson Rod and Gun Club with many partners including Selkirk College, CP Rail, Columbia Basin Trust, Columbia-Kootenay Fisheries Renewal Partnership, local businesses, the Regional District of Central Kootenay and the City of Nelson. The planned work scheduled for 2007/2008 includes planting trees and shrubs in riparian areas, stabilizing banks and installing information signs. The FWCP is contributing funds to help pay for a study determining the major sources of sediment to the creek and whether there are feasible ways of reducing them.

Interested in applying for Small Project funding? Go to www.fwcp.ca and click on "Funding," or call (250) 352-6874 or contact us at info@fwcp.ca.

So You Think You Know It All? Answers on page 14

1 There are three grass-like plants in the Columbia Basin, each with distinctive stems. Match the characteristic with the correct plant community.

- | | |
|-------------------|----------|
| (1). Angular stem | A. Grass |
| (2). Hollow stem | B. Sedge |
| (3). Round stem | C. Rush |

2 Why do beavers (and several other species of animals) excrete two types of pellets?

3 Over the years, the FWCP has done a lot of restoration work in the Pend d'Oreille Valley. Where does the valley get its name from?

4 This fish is sometimes called a blueback; silver trout, silver, or kickininee

5 What is this? (photo to the right)



Erecting Barriers – To Help Wildlife

FWCP Works with Ranchers Co-op

You can steer a steer to water but will it drink? Actually whether it drinks or not is beside the point because, from a wildlife perspective, the damage that cattle can create once they get to the water is the important factor. In an effort to reduce such damage Mayook Ranchers Co-op and the East Kootenay Chapter of the Naturalist Association approached the FWCP to fund the construction of a fence around an open-water wetland 10 km east of Cranbrook.

The project consisted of erecting over a kilometre of cattle-proof fencing on crown land around the City Pasture Pot Hole – a year-round shallow open pond about two metres in depth. It includes a five metre wide access point for cattle, allowing them to drink the water but keeping them away from the most sensitive riparian areas.

Cattle can quickly degrade wildlife habitat and reduce water quality in and around water for a number of reasons. If left to roam freely, the cattle can trample and graze the shoreline vegetation. Fecal matter deposited in the water can lead to algae blooms that negatively impact water quality.

“It is early days but it looks like the vegetation is already starting to rebound within the fenced area,” says rancher Anna Fontana. “The goal is to improve the habitat for waterfowl and songbirds, and increase species diversity. We also know that the pond is home to a population of Western Painted turtles so better water quality should help them as well.”

There is an additional access point for the public as the pond is a popular recreational spot, especially for skating, for Cranbrook residents.

Fontana added that the ranchers plan to add shrubs and trees to further enhance the wildlife habitat, and have committed to maintain the fence for its expected lifespan of between 20 and 30 years.

“This type of project really shows how the FWCP can effectively work with local ranchers,” says FWCP Public Representative Greg Mustard. “It works for wildlife and it’s great that we can give ranchers a helping hand.”



John Krebs, FWCP

There is one cattle access point (centre of image) in the newly fenced area around City Pasture Pot Hole near Cranbrook.

Update Newsletter

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We Would Appreciate Your Feedback

Let us know if you have questions or comments about the newsletter, or the Compensation Program.

If you would like to receive our newsletter electronically, contact:

Beth Woodbridge at the FWCP (250)

352-6874 or e-mail info@fwcp.ca

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Kokanee Spawning Channels

The mandate of the Fish & Wildlife Compensation Program is to conserve and enhance fish and wildlife impacted by the construction of BC Hydro dams. Therefore, its support for two large kokanee spawning channels in the Columbia Basin - one at Meadow Creek near the north end of Kootenay Lake, and the other at Hill Creek near Galena Bay on the upper Arrow Lakes Reservoir - comes as no surprise. Both are operated jointly with the B.C. Ministry of Environment.

The goal of both channels is to help build healthy kokanee populations by replacing spawning habitat that was flooded or blocked by dam construction. Egg-to-fry survival rates in spawning channels are over and above what is typically found in the "natural" environment which is usually less than 15%. In the man-made kokanee spawning channels egg-to-fry survival rates are often greater than 30%. This year at Hill Creek Spawning Channel it was above 50%. This means that for every 100 eggs deposited in fall 2006, over 50 fry left the channel in spring 2007.

In spawning channels the very best characteristics of spawning habitat that are preferred (gentle stream gradient, size of gravel, constant clean water supply, etc.) are replicated in the man-made spawning channel. The channels should not, however, be confused with hatcheries as there is no human involvement with egg fertilization or fish feeding.



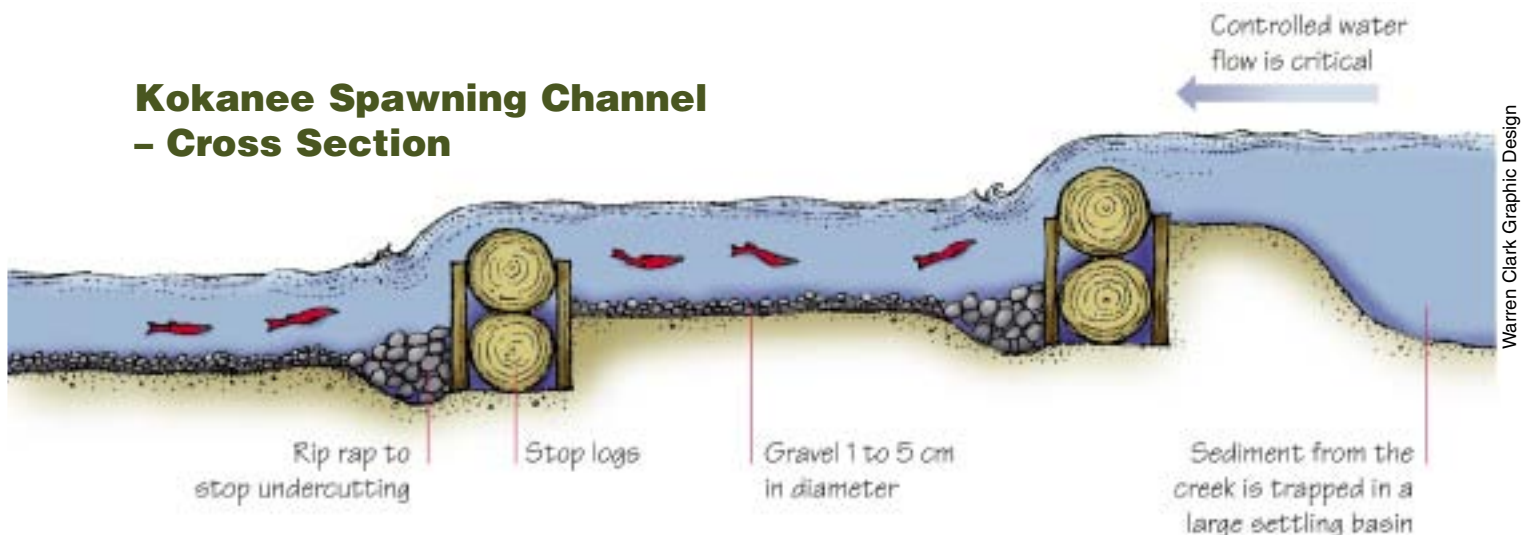
Spawning time can be an amazing sight with thousands of kokanee gathering at the downstream end of the channels (lower centre). When fish and eggs are not present, scarification occurs that includes stirring up the gravel with heavy machinery (top centre) that allows the finer sediments to be taken downstream by the current. The kokanee are counted, and controlled, entering the channel, before the females lay several hundred small pea-sized eggs in the gravel.

Photos: Angus Glass, Beth Woodbridge and Brian Barney

There is, however, extensive human involvement when it comes to channel operations and maintenance. In summer, when eggs and fish are not present, a large settling basin at the upstream end of each channel is emptied, and scarification (removal of the finer sediments) of the channel is carried out.

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Kokanee Spawning Channel - Cross Section



Kokanee Spawning Channels

When fish and eggs are in the channel, water levels and quality are closely monitored and controlled. At both channels water can be sourced from two creeks to ensure an adequate water supply and to allow switching so that if one is very turbid (sediment filled) the other can be used. There is a diversion channel around the spawning areas so that turbid, or excess, water can be re-routed.

At spawning time, the fish entering the channel (through a gate at the downstream end) are counted and controlled to ensure that not too many get in. If this occurs then productivity can be reduced because of competition for spawning space and disruption of eggs already deposited.

Success of the spawning channels is not measured by the total number of spawners returning but by the number of eggs deposited, and of course the subsequent egg-to-fry survival rate. Returns may be very high in a given year, but if those returns are characterized by smaller females, in poorer condition, carrying fewer eggs, then the total number of eggs deposited may be lower. Fecundity (the average number of eggs a female is carrying) is measured and is an important factor when biologists are considering the capacity of the spawning channel and the number of females allowed in. The average number of eggs retained (i.e. left in the females after spawning occurs) is also recorded so that biologists have an accurate estimate of how

many eggs are actually deposited in the channel. Typically biologists would like to see in excess of 10 million eggs deposited in Hill Creek Spawning Channel and more than 40 million in Meadow Creek Spawning Channel. If the channel is at full capacity the gates can be closed and any surplus adults spawn elsewhere.

Hill Creek Spawning Channel accounts for approximately 83% of total kokanee fry production in upper Arrow Lakes Reservoir, and 62% of total Arrow production. Meadow Creek Spawning Channel accounts for about 75% of total kokanee fry production in Kootenay Lake.

Kokanee Life Cycle:

- Between late August and October, mature kokanee move into the spawning areas;
- The female turns on her side to dig a nest (redd) with her tail. With the male at her side, eggs and sperm are shed simultaneously and then she immediately covers the eggs with gravel;
- This may be repeated several times in different spots, not always with the same male. She may deposit a total of between 200 and 400 eggs;
- Like other salmon, kokanee die once they have spawned;
- During late winter the eggs hatch and become alevins, remaining in the protection of the gravel;
- The alevins feed off their yolk sacks for about six weeks before emerging from the gravel (and becoming fry) between mid April and mid June;
- The fry leave the spawning area almost immediately and swim downstream to the lake or reservoir;
- The kokanee remain in the lake or reservoir between three and five years, growing to an average length of between 20cm and 30cm, before returning to the same spawning area and repeating the cycle.

Did You Know?

Kokanee:

- Are sockeye salmon that spend their entire life in freshwater;
- Strain zooplankton, their main food source, from the water with fine combs on their gills called "gill rakers";
- Benefit greatly from the Kootenay Lake and upper Arrow Lakes Reservoir fertilization programs which add nutrients that feed microscopic phytoplankton that in turn feed the larger zooplankton;
- Get their orange-red flesh colour from the carotenes found in the skeletal structures of zooplankton;
- Are found in North America from California to Alaska, and in north-east Asia;
- Are a key food source for large rainbow and bull trout. Each consume about two kokanee daily throughout the year.

Seed Sourcing

FWCP Explores the Collection of Native Seeds

It is common for the FWCP to undertake ecosystem restoration work that includes selective harvesting, thinning, slashing or prescribed burns. Doing this work can mean that heavy machinery may negatively impact small areas of land. Typically these areas are re-seeded as quickly as possible to promote regeneration and reduce the spread of invasive weeds.

This summer some FWCP biologists took a closer look at re-seeding practices to check if it was feasible (and cost effective) to re-seed areas with native grass seeds. How to collect native seeds is the problem since the nearest farmers' supply store is unlikely to carry them.

As for what constitutes a native plant, FWCP biologists use the rule of thumb that the seeds should come from naturally occurring plants and grasses in the same ecosystem (and similar elevation), within a 350 km radius.

Borrowing a design concept from Darryl Smith and Phil Burke at the Invermere Forest Service, the FWCP field-tested their native grass seed collector in the summer of 2007. It consisted of an ATV, with a large (6 ft.) steel trough, or half barrel, fixed across the front. Using said contraption, the biologist drives through the grassland knocking the seeds into the metal trough. From there they are transferred into paper bags where they are fully dried.

Timing is critical. Native grass seed-heads normally ripen from the top down and they are ready to harvest when the seed-head tips begin to shatter, and when the seed kernel is

fairly solid - at the medium to "hard dough" stage. Hard dough is when firm thumbnail pressure is needed to make an imprint on the kernel.

Slope steepness was also a factor. Biologists were limited to collecting seed on flatter ground because, on steeper ground, the ATV could cause more soil disturbance and the seed collected could more easily spill out of the trough.

And the results from all these efforts? "They vary by grass species," says FWCP Wildlife Biologist Dave Lewis who undertook the fieldwork. "Bunch grasses proved problematic, mainly because they are more commonly found on the steeper south-western facing slopes."

Lewis added that efforts to collect *Achnatherum richardsonii*, (commonly known as Richardson's, or spreading, needlegrass), proved to be more successful. "We collected more than 25 bags that will be broadcast spread over disturbed areas this fall or next spring to mimic the natural seeding process. Hopefully this will help get native grasses established earlier and reduce the chance for invasive weeds."

Plans to collect more native grass seeds in the future have also taken root.

WWWant

more information on grasslands in BC?

Log on to www.bcgrasslands.org/
or www.trenchsociety.com

Improving the Science

FWCP Work Gets International Recognition

The biologists with the FWCP always have an end goal in sight - conserving local fish and wildlife populations for the benefit of, well, the local fish and wildlife. But along the way, the FWCP staff often bring their findings to the larger stage. This is generally accomplished through presentations at international conferences or by submitting papers to peer reviewed journals read by scientists around the world.

Having papers accepted by these scientific journals is a significant achievement. It is like receiving the "nod" from the scientific community. It is acknowledgement that the work has been credible, well executed, and with sufficient substance for others to learn from. If one or two papers represent a nod of approval, FWCP wildlife biologists have,

in recent times, been riding a veritable wave of endorsement.

The work on wolverines by our Senior Wildlife Biologist, John Krebs, has been getting attention recently. In September 2007 two papers appeared in the *Journal of Wildlife Management* (JWM). One, with Eric Lofroth of the B.C. Ministry of Environment, studied the abundance and distribution of wolverines in the province. The other, co-authored with Lofroth and Ian Parfitt of Selkirk College analysed wolverine habitat selection related to food needs, predation risk and human impacts. A third wolverine paper, analysing food habits, appeared in *Wildlife Biology*, October 2007.

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Improving the Science

FWCP Work Gets International Recognition

FWCP Wildlife Biologist Ross Clarke co-authored a paper with Catherine Lambert on cougar population densities in the Pacific Northwest. Contrary to popular belief, perhaps, the authors showed that cougar populations are declining in the region. Their paper appears in the *Journal of Wildlife Management (JWM)*, Dec 2006. Another paper on mule deer and cougar interaction, again co-authored by Clarke, is expected to be published in spring 2008

There have been many other papers accepted over the years and all are important pieces of work. The FWCP prides itself on collecting credible information, and then making measured decisions on the selection of fish and wildlife projects for implementation.

“Sharing the results with the scientific community is very important,” says Krebs. “It is another way the FWCP is helping to improve awareness, increase scientific knowledge and ultimately to help conserve and enhance vulnerable wildlife populations.”

Keeping the Wetland Flourishing

Working with Ducks Unlimited Near Valemount

Cranberry Marsh, south of Valemount, is a 345 hectare wetland that is a remnant of a flat bottom lake located in the Rocky Mountain Trench. The lake gradually filled in, resulting in a wetland complex overgrown with bulrush and sedge, with only a few small open water pockets.

The marsh straddles the R.W. Starratt Wildlife Management Area, a highly productive wildlife sanctuary that provides staging habitat for Trumpeter Swans, Canada Geese and many other waterfowl common to the region. Moose, black bear, beaver, otter, deer, coyote, fox and other wildlife also regularly visit the sanctuary, which is managed by the provincial government.

About 25 years ago Ducks Unlimited Canada (DUC) installed dykes and water control structures but, over the years, those structures have degraded and one was needed to be replaced. The replacement work was undertaken in September of 2007 with funding assistance from the Fish & Wildlife Compensation Program.

“As a result of technological improvements over the years, the new control structures we’re using today have a much longer anticipated lifespan than the structures installed in our earlier days of working in the province,” says Nichole Rae of DUC.

The work will ensure the water level in the wetland is maintained and that the marsh continues to provide valuable habitat for waterfowl, and other wetland-dependent wildlife, for the next century.

There is a seven km loop trail skirting the marsh that includes a couple of viewing towers and interpretive signs installed by the local community. Now that the habitat will be maintained for the foreseeable future make sure that you get out on the trail for some great wildlife spotting!

In addition to the FWCP and DUC, other supporters include the Columbia Basin Trust, Columbia-Kootenay Fisheries Renewal Partnership and the Habitat Conservation Trust Fund.



John Renner

The water level in Cranberry Marsh will be maintained for many decades now that a water control structure has been upgraded.

Location, Location, Location!

Covenants Explored to Ease Wildlife Real Estate Pressure

Many private landowners care about animals in the Columbia Basin and want to protect wildlife habitat but, once the land is passed on to the next generation or sold to an outside buyer, they have no control over how it is used or developed. Typically, if they want any portion of their land protected they would need to sell (or give) it to a non-profit conservation organization that would own and manage it for future generations. Is that the only option? No.

Enter the Nature Conservancy of Canada (NCC) and the FWCP. They have teamed up to explore the concept of conservation (or stewardship) covenants. A conservation covenant is a legal agreement between a landowner and a conservation organization that outlines what can and can't be done on the identified land. This agreement remains with the title of the property in perpetuity. With a covenant no purchase occurs but the land in question remains protected.

"In essence this means that conservation organizations don't have to raise the capital required to buy land outright, and it also means that landowners have other options when trying to conserve habitat," says FWCP's Steering Committee Co-Chair Wayne Stetski from the B.C. Ministry of Environment. "With covenants, they can stay on the land, hand it on to other family members, or sell it to outside interests at a later date, with the knowledge that the wildlife habitat will remain forever."

Given the long-term implications, covenants are not straightforward to establish, and a land purchase, by comparison, is administratively far simpler. With that in mind the NCC is currently assessing the costs, benefits and feasibility of protecting more parcels of land in the Columbia Basin using covenants.

NCC and FWCP will work together over the coming year to reach out directly to more landowners with the hope that more land may be voluntarily set aside for wildlife in the future.



This endangered juvenile Western Screech Owl, with its nest site on private land, would face a more secure future if the area became part of a covenant agreement.

Jakob Dulisse

Sturgeon Broodstock Collection

FWCP Helps Endangered Species

The FWCP and the B.C. Ministry of Environment (through the Freshwater Fisheries Society of BC) funds the upper Columbia white sturgeon aquaculture (hatchery) program. Before any juveniles can be reared in captivity, however, there is the challenge of collecting eggs and milt (sperm) from adult sturgeon. Given that the upper Columbia white sturgeon population is endangered - and the fish are very large! - finding and “processing” them is no small feat. The rearing and release of juvenile sturgeon is just one component in the recovery effort that is being coordinated by the Upper Columbia White Sturgeon Recovery Initiative. Biologists are still working towards solving the mystery of why sturgeon are not reproducing in the wild, and more work has to be done on improving habitat. That said, the aquaculture component has played a key role in helping the white sturgeon. In the last five years more than 80,000 ten-month old juveniles have been released into the upper Columbia River.

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A 6 ft. long sturgeon emerges from the water, complete with kokanee bait.



1 Set lines (one long line weighted to the river bed, with 8-30 hooks extending from it) are baited with whole kokanee and left overnight. The following morning each set line is pulled in by hand.



2 Each sturgeon is weighed after being carefully loaded into a sling that can be winched aboard the research vessel.



3 They are scanned for PIT (Passive Integrated Transponder) tags to see if they have been caught before. Each PIT tag, about the size of a grain of rice, carries a unique code number.



4 If an adult has not been caught previously a PIT tag is implanted underneath its skins.



5 Each is measured and visually inspected to gauge its condition and to record any distinctive features. The fish remains in the sling for the entire procedure (between 5 and 25 minutes) with the head resting in a large pocket that receives a constant supply of fresh water.

Sturgeon Broodstock Collection

FWCP Helps Endangered Species



6 A sample of “urogenital fluid” is taken from the males; if cloudy it indicates that he is ready for spawning and transferred to the hatchery. Males reach reproductive maturity between 15 and 20 years of age, while for females it is about 30 years. (MoE photo).



7 Prospective females are given a small incision to allow for the egg inspection. These black eggs indicate that she is ripe. (MoE photo).



8 All the data collected is entered immediately into a database. If the fish has been caught previously the database provides information on capture location, date, growth rate, and general condition.

To rear approximately 12,000 juveniles each year the hatchery requires six to eight adult families (the broodstock). A female only spawns every four to seven years, and only when the water conditions are right. If not, she will re-absorb her eggs. In the natural environment a female may broadcast between 100,000 and 1,000,000 sticky eggs that will adhere to the river bottom, with one or more males fertilizing them. In the controlled setting of the hatchery, this is mimicked with the eggs of one female being mixed with the milt of more than one male.

The broodstock collection usually occurs in June, near spawning locations in the Columbia River between the U.S. border and Hugh Keenleyside Dam near Castlegar.

As with many components of the Sturgeon Recovery Initiative, broodstock collection involves many partners. Extensive in-kind support is provided each year from BC Hydro, the B.C. Ministry of Environment and the Freshwater Fisheries Society of BC.

Want to know more?

For a life history and biology tour of the upper Columbia River white sturgeon visit <http://uppercolumbiasturgeon.org/Tours/Tour-Biology1.html>

Photos: Angus Glass, FWCP
Pictured are Ron Ek, Freshwater Fisheries Society of BC;
Matt Neufeld, B.C. Ministry of Environment; and
Bob Chapman, Golder Associates



9 Fish selected for broodstock are transported to the hatchery where they are usually kept for between 1 and 5 weeks, and later released back into the river.

To see the adult sturgeon being caught and processed during the 2007 broodstock collection visit www.fwcp.ca and follow the sturgeon link.

Mudboggers Wreck Habitat

Birds Observed One Week, Gone the Next

What a difference a week can make. While using Columbia River mudflats and shallows near the Fort Shepherd Conservation Area south of Trail as their playground, mudboggers have destroyed sensitive habitat for a variety of birds, including at least one species-at-risk. Mudbogging, or driving on soft, super saturated land with ATV's, dirt bikes or 4x4 pickup trucks, can quickly destroy wetlands, wet meadows, mudflats, sand bars and other riparian habitats in a matter of hours. Water quality can also be impacted over the longterm.

Towards the end of September 2007, Marlene Machmer, a wildlife biologist contracted with the Fish & Wildlife Compensation Program (FWCP), observed the Fort Shepherd mudflats and surrounding shallows literally teeming with birds, including blue-listed (special concern) Great Blue Herons and red-listed (threatened) Western Grebes. One week later, she witnessed the aftermath of the mudboggers' actions: the riverbank, shoreline and associated mudflats and shallows were covered in a network of deep tire tracks scarred with ruts. The sensitive habitat was destroyed, and the birds were gone too.

"Such habitats are critical for both migratory and resident species and the number of these large riverine mudflats left between Revelstoke and the U.S. border is very limited," says FWCP Wildlife

Biologist Irene Manley. "Birds consistently use these as feeding and resting areas free from human disturbance and they are critical for fish and amphibians as well, so impacting even one can be significant. Unfortunately this is not a one-off occurrence as I have observed similar damage at the mudflats and old river channel near Selkirk College in Castlegar."

Manley also stated that birds like Great Blue Herons, Western Grebes, other waterfowl and shorebirds are sensitive to noise and will leave at the first sign of disturbance.

It is four-wheeling actions like this that recently spurred the B.C. government to beef up penalties to prevent ecosystem damage. In May 2007, the Forests and Range Statutes Amendment Act was passed. Under the new provision, individuals found to have caused environmental damage through mudbogging may face penalties of up to \$100,000 and up to a year behind bars.

Conservation officers with the B.C. Ministry of Environment have been sent the information and will be jointly investigating the offence with Ministry of Forests Compliance & Enforcement staff. Anyone with any information or observing such activities directly is asked to immediately call the RAPP (Report All Poachers & Polluters) line at 1-877-952-7277.



Marlene Machmer

Common Mistake



Barb Houston, FWCP

Perhaps a common mistake for many of us: we don't pay enough attention to the natural world around us. Here, you might see a colourful mosaic of lichen, twigs, stones and grasses but look more carefully and a fledgling Common Nighthawk should appear. This picture was taken while FWCP biologists were evaluating ecosystem restoration work in the Stoddart Creek area near Invermere (see Update Newsletter #16 page 8). Such evaluation work looks at how productive grasses and shrubs are post restoration, but it is always a bonus to spot wildlife actually utilizing the improved habitat; especially when it happens to be a federally listed "threatened" species like the Common Nighthawk.

So You Think You Know It All? **Answers from page 4**

- 1 1B; 2A; 3C.
Some of you may have heard the little ditty: "Sedges have edges, rushes are round, grasses are hollow right up from the ground."
- 2 They practice coprophagy, which is re-ingesting their own feces to absorb more of their vitamins and nutrients. Those feces re-ingested are usually softer and lighter in colour than the final scats which are darker and drier. Coprophagy usually occurs when the animal is resting following periods of activity.
- 3 When the first European Settlers arrived in the region, many Native Americans south of the border wore large shell earrings. The English translation (from French) of *Pend d'Oreilles* is 'Earring People' or 'Hanging Ears.'
- 4 Kokanee.
- 5 Magnified cross section of a sturgeon's otolith. In fish, the otolith serves as a sensory organ, playing a role in hearing and balance. The rings can be counted to determine the age of a fish, similar to aging a tree.