FISH & WILDLIFE COMPENSATION PROGRAM
COLUMBIA BASIN

Update

Fall/Winter 2009 Number 21

Record Egg Count for Channel

The number of kokanee eggs deposited in the gravel at Hill Creek Spawning Channel reached an all time high this fall. The total egg count surpassed 30 million, the highest ever since the channel was constructed in 1980. The second highest egg count was in 2000 at 22 million.

This high egg count comes hot on the heels of a record-setting egg-to-fry survival rate for the channel in spring 2009 at 69.4 per cent.

The 3.2 kilometre Hill Creek Spawning Channel was built with BC Hydro funding to compensate for the loss of spawning habitat due to the construction of Revelstoke Dam. It is located 56 kilometres north of Nakusp, near Galena Bay, and jointly managed by the Fish & Wildlife Compensation Program (FWCP) and the Ministry of Environment (MOE).

Each year the MOE hopes to have at least 12 million eggs deposited at Hill Creek Spawning Channel.

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Ministry of Environment

Angus Glass

There was no shortage of fish this year when Grade 6 students from Nakusp Elementary School had their field trip to Hill Creek Spawning Channel. As well as having an abundance of fish returning, the channel also recorded its highest ever number of eggs deposited – more than 30 million.

Contents

Toads Croak on Highway 6

As mass migrations go, a very impressive one occurs each August near Summit Lake south of Nakusp in the West Kootenay. Upwards of a million young western toads *(Bufo boreas)* make their way from the lake-shore breeding area to upland habitat.

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Angus Glass

This juvenile western toad was lucky and safely reached the other side of the road next to Summit Lake, but it was a different fate for tens of thousands of others.

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Spawning Channel Critical for Arrow Lakes Reservoir

"We are extremely pleased about these numbers," says Jeff Burrows, chair of the FWCP Fish Technical Committee and senior fish biologist for MOE. "Clearly the channel is working well and these numbers underscore the importance of Hill Creek Spawning Channel to the Arrow Lakes ecosystem."

Brian Barney, who looks after the day-to-day operations at Hill Creek Spawning Channel, is also extremely satisfied about the returns. "We work with some excellent local contractors and, together, have ensured that the spawning gravel is in top condition these last few years. Of course, with such a high egg count, the fall and winter work has just begun. We need to work hard to make sure that a substantial proportion of eggs survive, and good numbers of healthy fry swim out next year."

Depending on the year, the Hill Creek Spawning Channel may account for 80% or more of upper basin fry production and around 60% of total Arrow production.

In late winter the eggs hatch, turning into alevin - a small fish-like body with a yolk sac attached to its underside. They feed off the sac for about six weeks before emerging from the gravel as fry in the spring, after which they head downstream towards the reservoir. ■

Loafing Around Cranbrook

Wildlife Logs for Turtles

For humans loafing may mean idling away time at leisure, but for turtles loafing is serious business. It's extra serious business when the turtles are provincially blue-listed, meaning they are vulnerable to further decline due to habitat loss and destruction. That's why the Fish & Wildlife Compensation Program, with support from Tembec and The Nature Trust of BC (TNT), recently installed loafing logs for the western painted turtles in Elizabeth Lake just outside Cranbrook.

"Turtles are cold-blooded and require the sun's energy to regulate body temperature," says FWCP wildlife biologist Ross Clarke who led the project. "Basking out of the water is a critical element of their daily routine. A lack of basking structures such as logs or large rocks in Elizabeth Lake had previously been identified as an issue."

Basking plays a far more important role than purely increasing body temperature. Typically turtles need to obtain a body temperature of 18 C to digest food. Depending on the weather and time of year, western painted turtles spend up to two hours at a time basking in the sun out of the water. While they can absorb heat when they float near the surface, being out of the water is far more efficient. Basking is also important for turtles to rid themselves of algae and help promote healthy shell growth.

"Tembec was fantastic and without them this would not have been possible," added Clarke. "They donated a dozen old cedar logs which were kindly delivered by Baron Quaife Trucking." Members of the East Kootenay Conservation crew, from TNT, helped haul the logs into place. Additional support was received from the Ministry of Environment, City of Cranbrook, and Art Gruenig of the Rocky Mountain Naturalists who oversees the turtle nesting protection work at Elizabeth Lake.

Some of the logs are cabled in place so they will remain in the deeper water while others have been left to float around. The logs will also benefit the rich variety of waterfowl that frequent Elizabeth Lake.

"This wetland contains a locally important population of western painted turtles," says FWCP co-chair Wayne Stetski. "The habitat enhancement work will help in ensuring not only the survival but potential growth of this turtle population into the future." ■

Ross Clarke

Tembec donated old cedar logs that will help western painted turtles, and a wide variety of waterfowl, at Elizabeth Lake.

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Toads Croak: Efforts Made to Reduce Death Toll

In their path, however, is busy Highway 6, with vehicles claiming the lives of thousands.

During a two-day period an estimated 90,000 dead toadlets were found on a one kilometre stretch of the highway. While the problem is not new, biologists from the Fish & Wildlife Compensation Program (FWCP) took action this year to improve the toads chances of survival.

"Currently there is some wildlife fencing, covering a portion of their migration path, directing the toadlets to use one of two culverts but both the fence line and the culverts were extremely dry," says FWCP senior wildlife biologist John Krebs. "We sent a team to set-up a gravity-fed sprinkling system from a nearby creek in order to thoroughly wet the key areas."

The goal was to encourage the amphibians to keep to the wet areas (to promote culvert use rather than the road), and to reduce the risk of dehydration of the toads.

In Canada, western toads are federally listed as a "special concern" and worldwide (by the International Union for Conservation of Nature) as "near threatened" with a downward population trend.

"The importance of the Summit Lake breeding area for western toads cannot be over-stated," added Krebs. "Toads were once widespread throughout North America but B.C. is now the continent's stronghold for western toads. The West Kootenay provides some of the best habitat in the province and within the region the breeding phenomenon at Summit Lake is second to none. That's why the FWCP chose to act."

"Adult western toads converge in the shallows of Summit Lake to breed in late April," said FWCP co-chair Wayne Stetski. "The emerging tadpoles stay in the warm shallow waters and, in mid-summer, metamorphosis occurs and they transform into toadlets. At the end of summer they gather in massive numbers before making their way to upland habitat. It really is an amazing sight!"

Globally there are likely a multitude of reasons for the sharp decline in western toads, loss of wetland habitat among them. Studies have shown that the species is also sensitive to environmental stressors such as UV exposure and drought. This recent action by the FWCP should help the situation but more work will likely be needed in the future. If you are interested in helping the western toads at Summit Lake next year please email info@fwcp.ca with the subject header "Helping Toads", or call us at 250-352-6874 ■

Western Toads & Moisture Control

- Their relatively thick skin helps them retain moisture.
- They have specially designed hind limbs to dig themselves into a hole if they become too dry.
- They have a patch of skin (actually called a "drink patch") on their ventral (under) side which is thinner and helps them absorb moisture directly from the ground.
- Their dorsal (top) side absorbs heat energy and the ventral side helps cool it.
- They tend to forage at night, especially during drier times of the year, only being more active during the day during wet or overcast weather.
- Touching their skin will not give you warts but it is extremely distasteful to would-be predators.

Update Newsletter

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Front cover: long-toed salamander, photo Barb Houston

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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:

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Kootenay Lake Kokanee

Restoration Work in Streams Pays Off

Three out of four is pretty good. Not perfect, but good all the same. That's the number of tributaries in the South Arm of Kootenay Lake that have shown significant improvement in kokanee returns following years of restoration work. The work has been spearheaded by the Ministry of Environment (MOE) with the support of the Kootenai Tribe of Idaho, the Bonneville Power Administration, the Freshwater Fisheries Society of BC, the Fish & Wildlife Compensation Program and Creston Valley Rod & Gun Club.

The four tributaries in question are Summit Creek, Goat River, Crawford Creek and Boulder Creek. Since 2005 all four have been receiving fertilized kokanee eyed-eggs taken from Meadow Creek Spawning Channel, which is jointly managed by the FWCP and MOE. The Freshwater Fisheries Society harvest the excess eggs, fertilize them, and then keep them in a controlled environment in a hatchery until they reach the eyed-egg stage at approximately one-month-old.

"Given the four-year life cycle of kokanee, all eyes were on these tributaries in 2009 to see if an increase in numbers could be observed," says FWCP senior fisheries biologist James Baxter.

Total estimates on kokanee returns in these tributaries are not carried out, but "index" sites on each system are visited each fall and the number of kokanee spawners recorded. While this does not give a full count of the system, it allows biologists to compare the same location on a long-term basis from year to year.

"Although the absolute numbers are relatively small, the order of magnitude of the increases are significant," added Baxter. "Only one tributary, Boulder Creek, has shown no sign of kokanee increases."

Of the four tributaries, the Goat River recorded the largest increase in index counts.

"The mean index count for the Goat River over a ten-year period up to and including 2008 was 0.2 kokanee spawners," explained MOE senior fish biologist and FWCP Fish Technical Committee chair Jeff Burrows. "This means on average, less than one kokanee was observed at the index sites each year. In 2009 the index count was 187. This increase can only be attributed to the eyed-eggs placed in the gravel in 2005. While the total number counted might not be huge – perhaps not large enough to be the basis of a self-sustaining population – the percentage increase is unreal."

A little over 93,000 per cent if you are wondering.

Summit Creek index counts went from a 10 year average (again, up to 2008) of 0.2 to 114 in 2009 and Crawford Creek from 1.3 to 22 respectively.

The lack of positive results for Boulder Creek has not affected the determination or the enthusiasm of members of the Creston Valley Rod & Gun Club. They were out in force during the summer, with support from the FWCP, hand hauling gravel to improve spawning habitat and removing a beaver dam that was a potential barrier to fish passage.

"Given the positive results from the other tributaries, and the great efforts made by the Creston club, we will continue to place eyed-eggs into Boulder Creek," added Burrows. "In fact, in 2010 we plan to ramp up the planting numbers in all four creeks in order to reach our goal of producing some self-sustaining runs." ■

Angus Glass

Volunteers from the Creston Valley Rod & Gun Club were out in force once more, improving the fish spawning habitat in Boulder Creek.

For a short video showing the eyed-eggs being buried in the gravel as part of the restoration work, click on the "videos" link on the FWCP website (www.fwcp.ca)

Bug Beat

Leaf through any FWCP newsletter and you will likely notice more references to the area's mega fauna (larger animals) and fewer to the smaller critters. Yet bugs and insects, in all their shapes and sizes, are a critical part of our biodiversity and maintaining a healthy and diverse ecosystem is a big part of what the FWCP does. The following includes a few bugs (all native to North America) that came to the attention of our biologists over the summer.

Ten Line June Beetle

(Polyphylla decemlineata)

FWCP wildlife biologist Irene Manley found many holes in the soil as if it had been aerated (lower left); upon closer inspection she found ten line June beetle larvae (below).

Life cycle:

Three or four years. Adults over winter in the soil, and emerge on warm evenings in June (thus the name) to mate and return to the soil to lay eggs. Eggs hatch and the larvae feed on organic matter and roots near the soil surface for two years before pupation takes place. The adult beetle remains in the soil for another year before emerging and mating.

Other facts:

In the larvae stage you can see the body parts through the translucent skin; the adults can hiss and squeal when handled; and if infestations occur they can cause severe damage to trees and orchards (from the larvae eating the roots.)

Irene Manley

Tell-tale signs (above) of the June beetle larvae.

Irene Manley

Angus Glass

Six year old Lucas Soukochoff displays an adult ten line June beetle found outside the Nelson FWCP office.

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Raspberry Crown Borer Moth

(*Pennisetia marginata*), from the clearwing moth family, or "wasp" moths.

Found on a FWCP vehicle (alive and well) it appears to be a wasp but on closer inspection…

Life cycle:

Irene Manley

Looks can be deceiving; It's a moth not a wasp.

The larvae feed off a variety of cane fruits such as raspberry, loganberry and blackberry plants. Adult moths lay their eggs mid-to-late summer and, after hatching, the larvae make their way to the base of the plant. The first year the larvae feed off the new cane growth at the crown, the second eating the cane or the roots at the base, which can kill the plant.

Other facts:

Although it closely mimics the look of a yellow jacket wasp, the moth has furry antennae and a much wider "waist." It is difficult to get a definitive identification on the different clearwing moths without close examination under a scope, but this is likely the raspberry crown borer.

Giant Silkworm Moth

(Hyalophora euryalis Boisduval)

While monitoring a parcel of land in the East Kootenay (Bull River) that received restoration treatment in 2000, FWCP student biologist Claire Schadeli found this spectacularly colourful caterpillar on a stem of antelope bitterbrush *(Purshia tridentata).*

Life cycle:

In early summer the female moth will lay her eggs on the underside of a leaf. After the eggs hatch the caterpillar goes through several molts before spinning a weather-resistant cocoon for winter, with metamorphosis occurring the following year.

Other facts:

Unlike most moths, the giant silkworm moth does not feed - it has no proboscis - and therefore it lives for only a couple of weeks. It is the largest moth found in BC with a wingspan of 3.5 to 5 inches. ■

Claire Schadeli

The amazing colours of the giant silkworm moth caterpillar.

Fort Shepherd: Land Management Plan is Working

There is often great fanfare when funds are gathered and the purchase of a conservation property is signed, sealed and delivered. After the fanfare, however, is when the work really starts. This is the case with the Fort Shepherd Conservation Area, now owned by The Land Conservancy. The FWCP provided funding for the development of a Land Management Plan (now complete) and the work of implementing the plan has started.

Part of the plan, as reported in the FWCP spring newsletter, included the installation of 400 meters of fencing, two gates and a kiosk. This work was made possible by a small army of volunteers from the Trail Wildlife Association (TWA), the support of numerous local clubs and businesses, and funds from the Public Assistance Conservation Fund (part of the Habitat Conservation Trust Foundation), BC Transmission Corporation, Columbia Basin Trust and FortisBC.

A significant investment from all parties was made and the results have been positive. "We attempted to meet a couple of goals," says Rick Fillmore with the TWA. "First we want to let people know that the property has changed hands and where the boundary lies, and secondly we want to promote responsible use of the property. We have certainly seen a reduction in off-road use in the area. It is our hope that, over time, this sensitive habitat will bounce back and be more productive for wildlife in the future." ■

Partners Help Elk and Bighorns Near Elkford

Local elk and Rocky Mountain bighorn sheep will benefit from an ecosystem restoration project near Elkford started last summer. Slashing work on a key winter range in Todhunter Creek will create better foraging opportunities, especially during winter and spring. This is part of a larger scale restoration project that ties into some recently-harvested timber areas and will ultimately provide more open-forest and grassland habitat.

"We are really pleased with the support from a variety of partners," says project leader and wildlife biologist with the Fish & Wildlife Compensation Program, Larry Ingham. "The Ministry of Environment, Habitat Conservation Trust Foundation and East Kootenay Big Game Club all came to the table with significant funds, so it was a real joint effort."

The work completed to date, by Cranbrook-based Purcell Resources, consists of hand- slashing brush on a relatively steep, mid-elevation, south-facing slope. The brush piles will be burned by spring 2010.

"Todhunter is one of the prime high elevation grassland winter ranges along the east side of the Elk Valley. Enhancing the amount of grassland habitat will benefit bighorn sheep, elk and mule deer," says Irene Teske. "Open areas with south-facing slopes have lower snow coverage and faster green-up times, so this type of habitat is essential to the survival of these large ungulates during the winter months." ■

Purcell Resources

Slashing at Todhunter Creek will help a variety of wildlife, including bighorn sheep, elk and deer, by improving the quality and quantity of forage available.

So You Think You Know It All?

Answers on page 12

Rod Woodburn

1. They are called white sturgeon because of their white stomachs but why are hatchery-raised juveniles so dark on top when they are released in to the river?
2. How many eyes does a spider have?
3. What is aposematic colouration?
4. Do all bees sting?
5. Can you identify this amphibian?

Angus Glass

Swift Success for Giant Nest Boxes

Huge nest boxes installed across the West Kootenay by the Fish & Wildlife Compensation Program are already showing signs of success. Monitoring during early August revealed that one box – in the Smallwood Creek area between Nelson and Castlegar – is being used by a family of Vaux's swifts. Given the early signs of success there are high hopes for the remaining 26 boxes.

The chimney-like bird houses were built by volunteer Gerry Thompson, a FWCP public representative. Although the Vaux's swift is a relatively small bird each box stands over 3.6m (12 feet) in height and required more than 50 linear board feet of cedar. While it looks like a French word, the name comes from an English ornithologist, William Vaux, and is pronounced "vawks."

"Typically when you install new nest boxes for a species, they remain unused for the first few seasons," said FWCP wildlife biologist Irene Manley who leads the project. "So we were thrilled when we discovered Vaux's swifts have already taken up residence in one of them."

This particular swift is a small cigar-shaped bird that eats insects, and feeds entirely in flight. The southern portion of the Columbia Basin provides critical habitat for them as they prefer Interior Cedar Hemlock. More than half of their global breeding sites occur in B.C.

"A pair of adults took up residence in our nest box and successfully raised between five and seven fledglings," added Manley. "While we were observing, every five minutes or so one of the adults returned loaded with insects for the young and the cacophony of noise from the box was pretty exciting to hear."

The Vaux's swifts are facing a number of threats to its roosting and nesting sites which have historically consisted of hollow trees often found in old-growth forests. With the creation of regional reservoirs and changes in forestry practices such habitat has become more limited. In fact the majority of recorded nest sites are now in man-made brick chimneys. As more brick chimneys are converted to steel or aluminum, even this man-made habitat is in decline.

"It is really satisfying to get some early success with these boxes and it makes the effort of putting them together and installing them all the more rewarding," says Wynndel resident Thompson. He donated his time and equipment for the project while the FWCP paid for the materials. ■

Angus Glass

FWCP's Amy Waterhouse records the feeding times of the Vaux's swifts. Although large (more than three meters in length), the chimney nest box is home to just one family of swifts.

Fragility of the Species Highlighted

The total number of western screech-owls monitored over the summer is small (four) but, given the exhaustive search to find them, this sample represents a pretty significant portion of the region's total population.

That's why it's of great concern to biologists heading the project that two of the four adults were killed, perhaps by other owls, during the summer. While unsettling, the information indicates how challenging it is for western screech-owls to successfully reproduce. It also highlights the fact that even mature owls are still far from being out of the woods.

The monitoring is all part of the West Kootenay Western Screech-Owl Inventory Project. Biologists hope to better understand the distribution, range, population and territorial habits of this bird and promote better stewardship to help the species regain a foothold in the region. The western screech-owl is endangered in Canada and red-listed (threatened) in B.C.

Funded by the Fish & Wildlife Compensation Program and Columbia Basin Trust, the project is headed by wildlife biologists Doris Hausleitner and Jakob Dulisse.

In spring 2009, extensive call-back surveys pin-pointed two breeding pairs in the region; one near Creston and one near Fruitvale. The biologists were able to capture all four adults and each was fitted with a small transmitter. Between them at least five eggs successfully hatched, producing young.

"The preliminary results of the work have already told us a couple of things," says Doris. "First that even after they reach maturity, there is still significant risk to screech-owls. In both of cases just one adult was left to feed its young; in Creston the female remained and in Fruitvale it was the male. Needless to say this puts tremendous pressure on the remaining adult to find enough food for the fledglings and protect them from predators.

"Secondly, the range roamed by the adults during the breeding season was far greater than we would have expected. In both cases it was several kilometres in each direction, often overlapping with human-altered habitat."

Jakob Dulisse

Following the FWCP call to the public for wildlife reports, an additional suspected screech-owl sighting was reported near Castlegar. This was confirmed by Doris and Jakob and, in September, the owl was captured and fitted with a transmitter.

Western screech-owls require a mixture of forests, with an abundance of small mammals and insect prey, as well as dead or diseased wildlife trees with cavities for nesting.

"They really like lowland broadleaf forests, such as black cottonwoods, especially in riparian woodlands along river bottoms," says FWCP public representative Gerry Thompson. "Typically this is found in low elevation areas where impacts from human development are concentrated. Therefore we must do what we can to look after remaining habitat, whether on private or crown land." ■

To see a video clip of a western screech-owl being fitted with a transmitter, and to hear its distinctive call, visit www.fwcp.ca

Leaning on Locals to Track Endangered Fauna

Meet Louie Zsoldos. Millwright, forest worker and part-time *Otus kennicotti marfarlanei* tracker. In his spare time Louie is an integral part of the western screech-owl project (see previous page). Once or twice a week he will go out into the woods behind his house near Creston armed with an antenna, receiver and notebook. He listens for "blips" from the receiver, allowing him to hone in on Patricia (caught on St Patrick's Day), a female western screech-owl.

While both a male and female had been caught and fitted with radio transmitters in late spring, by mid-summer only Patricia was emitting a signal. Louie the male (and yes, his namesake) met an early demise, most likely in the talons of another predatory bird, leaving Patricia to fend for her young - at last count three.

Given that the range of the bird extends several kilometres in each direction, the work that Louie undertakes is not always easy, often requiring a lot of walking or scrambling. But the personal payback is huge.

"I've always been attached to nature and feel very lucky that the adult pair of western screech-owls took up residence in the area," says Louie. "They are beautiful birds and I have been fortunate enough to see the fledglings on three different occasions. It would be a terrible loss if this species was unable to survive here and disappeared from the area."

Louie was instructed by wildlife biologist Doris Hausleitner on how to use the equipment and organize the data. Periodically Doris joins Louie in the field to undertake night-calling surveys. This is when western screech-owl calls are relayed through loud speakers to see if any birds call back. It was the call of the screech-owl that first alerted Louie that he had something different in his neighbourhood.

"We get a lot of owls calling around these parts but this was very strange.
It sounded just like a bouncing ball with the call getting quicker," added Louie. "I hadn't a clue what it was. Sometime later Doris came knocking on doors in the area, suspecting that screech-owls were present, and she played the call for me. That was it!"

Angus Glass

A great example of local stewardship. In his spare time Louie Zsoldos is out combing the area, recording the movements of endangered western screech owls.

The data that Louie is collecting is very valuable in assisting biologists in their quest to develop solutions to help this threatened bird. Having a local steward keeping a finger on the pulse (or ear on the blip) of things is proving to be very rewarding for all involved. ■

Slocan River Island Purchase

Conservation Property

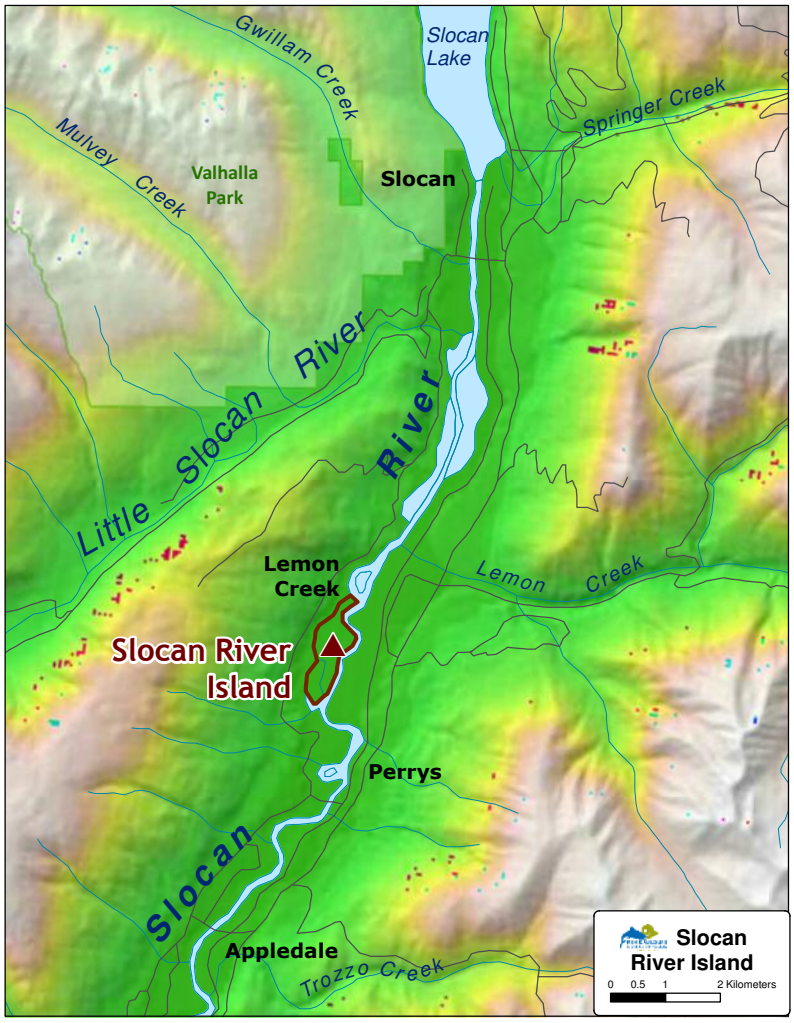
Although B.C.'s Columbia River Basin is large, human settlement is disproportionately concentrated in lower elevation habitat. Dam impacts, transportation links, urbanization, agriculture and forestry have cumulatively added enormous pressure to valley bottom ecosystems. Therefore, when properties like Slocan River Island can be purchased and set aside for conservation purposes, the pressure valve is released – somewhat.

Case in point: the recent purchase, led by The Nature Trust of BC (TNT), of the 142-acre river island property near Winlaw in the West Kootenay. This purchase was made possible by a variety of funding contributors including FortisBC, Columbia Basin Trust, BC Conservation Foundation, Kootenay Wildlife Heritage Fund, and the Fish & Wildlife Compensation Program.

The previous owners also donated a significant portion of the value of the land under Canada's Ecological Gifts Program.

"We were very pleased to conclude the purchase arrangement with the Nixon family," says TNT's Kootenay Conservation Land Manager Rob Neil. "The property's principal values relate to its riparian mixed forest-wetland habitat which has inherently high fish and wildlife habitat capability, its close proximity to TNT's Walter Clough Sanctuary and its relative remoteness. Currently, there is no road access to the property."

Slocan River Island is also the first piece of property downstream of the Lemon Creek confluence that has a largely intact riparian zone with excellent habitat for blue-listed (vulnerable) bull trout.



Amy Waterhouse

Angus Glass

The purchase of Slocan River Island (centre) will benefit a wide variety of both wildlife and fish in the valley.

"The Compensation Program is a strong supporter of land acquisition for conservation," says FWCP senior wildlife biologist John Krebs. "Undertaking habitat restoration work can be an expensive
business and, while the capital outlay for these properties is high, the return on investment for fish and wildlife production is excellent. Most importantly it will be protected and managed for conservation purposes for generations to come."

The species most likely to benefit for generations include rainbow trout, bull trout and waterfowl that use the back channels; moose and elk that use the island for winter range; and a variety of species-at-risk including Townsend's big-eared bats, great blue herons and possibly western screech-owls.

If you are a landowner and want to know more about the Ecological Gifts Program visit: www.cws-scf.ec.gc.ca/egp-pde or contact The Nature Trust of BC 604-924-9771. In August this year the program recently celebrated its 100th eco-donation in B.C. ■

Club Taking Action to Solve Sediment Issue

Getting Kokanee Back to Cottonwood Creek

Cottonwood Creek enters Kootenay Lake within Nelson's city limits. The creek once supported healthy kokanee numbers below the falls but now is devoid of the red fish. It is believed that sedimentation is a leading cause for this negative change. The Nelson District Rod and Gun Club has been working hard to restore fish habitat and the FWCP assisted the club by funding a study to determine the primary sources of the sediment.

Sedimentation can cause a variety of problems for fish habitat: silt settling in spawning gravel can compact and suffocate eggs and alevin; suspended solids can increase turbidity reducing sunlight and aquatic plant growth; and sediments can transport higher levels of pollutants such as heavy metals, herbicides and fertilizers.

The 2009 study, completed for the club by Alan Thomson of Mountain Station Consultants Inc. in Nelson, indicated that sedimentation has significantly contributed to the degradation of kokanee spawning habitat below the falls. It highlighted three primary sources of sedimentation: natural erosion of upslope forested areas of the watershed; the storm-water system within the city of Nelson; and from Highway 6, especially from winter sanding and plowing operations.

The City of Nelson, with funding support from the federal government, has made positive moves to reduce sediments entering the lower portion of the creek. For example, three buried sediment retention devices have been installed in the storm-water drainage system to trap sediments before they enter Cottonwood Creek. The study recommends that these devices be monitored and that similar devices be added to other catchment areas.

Other recommendations include reviewing winter sanding operations and the cleaning procedures of the storm-water infrastructure; requesting that the Ministry of Transportation and Infrastructure review snow-plowing practices on the highway adjacent to the creek; and encouraging the municipality and regional district to adopt an erosion and sediment control bylaw.

Significant steps have been made by the Nelson District Rod and Gun Club, and its various partners, to identify problem areas and reduce sediment collecting in the creek's lower reaches. If these efforts continue and these recommendations are acted upon, then perhaps one day the brilliant bright red fish will spawn once more in Cottonwood Creek below the falls.

"Reviving a sustainable kokanee population in Cottonwood Creek is a challenging task that will require a concerted and lasting effort from several partners," said Thomson. "However, this goal is completely realistic and I encourage the community to embrace and advocate for the creek and its potential to function naturally once again." ■

So You Think You Know It All?

Answers from page 7

1 Juvenile white sturgeon raised in the FWCP-supported aquaculture program are raised in tanks in a large hatchery building with plenty of light. The darkening of cultured sturgeon is a result of an increase in pigment to prevent them from being sunburned. After their release and subsequent reduction in light exposure their skin tone lightens considerably.

Angus Glass

This six year old sturgeon has paler skin compared to when it was released five years ago.

2 Spiders typically have six or eight eyes, often with two of them being larger than the others.

3 Many plants, animals or fish that are poisonous or distasteful are brightly coloured. It's a warning sign to would-be predators to say "keep away," and it's called aposematic colouration. It is so effective that some harmless creatures mimic aposematic colouration (see wasp moth, page 4.)

4 No, not all bees sting. Male bees do not sting. Also there is a greater tendency for "social bees" that live in hives or colonies (such as non-native honey bees) to sting to defend their nest, than native solitary bees that tend to be far less aggressive.

5 Pacific chorus frog, sometimes called a Pacific tree frog. Identifying features include the mask or broad strip across the eyes; plus it has no webbed feet but instead little round toe-pads at the end of the slender toes.

Don't Fence Me In – Fence Me Through

Badgers guided under the road rather than over it

Generally wildlife and roads do not mix well. This is especially the case when the wildlife in question is a threatened species like the badger. Even the loss of a few can have a huge influence on its chances of survival in B.C.

FWCP biologists, together with Trevor Kinley of Sylvan Consulting, recently erected over 300 metres of wildlife "drift" fencing on each side of Highway 3 at Mayook, east of Cranbrook. The aim is to help guide badgers into one of two culverts under the road rather than risking life and limb on the black-top.

"The area is a known badger crossing point, and we are optimistic that this will help them," says Kinley. "The badgers frequent the area because they are travelling from one Columbian ground squirrel colony to another on opposite sides of the road."

It is riskier for a badger to seek a morsel of ground squirrel than for us to pick out some ground beef at the supermarket. On average, one badger is killed on the road in the Mayook area each year. If this fencing saves just one badger over the next few years then the effort will have been worth it," says Kinley.

"Just in case any badgers do get around the fencing and find themselves on the road, we have installed a couple of one-way openings in the middle of the fences to get them back to safety.

We will be monitoring the fencing to see how effectively it works and how well the materials hold up in the long run."

The Ministry of Transportation and Infrastructure supported the project by cleaning plugged culverts - both at Mayook, and other key badger locations. The FWCP also erected several "badger crossing" warning signs for motorists.

Trevor Kinley

The fencing will guide badgers toward using one of two culvert crossings (foreground) that will help reduce the number of highway badger mortalities.

Richard Klafki

There are seven species of badger (*Taxidea*) in the world, and one, the American badger (*Taxidea taxus*), lives on this continent. There are four subspecies of the American badger and only one, *Taxidea* taxus jeffersonii, is found in the province. The badger is one of B.C.'s most endangered mammals with a provincial population estimate of fewer than 340 adults. It is provincially red listed ("threatened") and federally listed as endangered.

"We think there are less than 200 badgers in the East Kootenay," says FWCP wildlife biologist Larry Ingham. "There is anecdotal evidence to suggest that the population is growing slowly and its territory expanding northwards but, given the low numbers, reducing road mortality is a priority."

This is not the first time the FWCP has helped badgers in the East Kootenay. It has supported the background research and management efforts for several years as well as funding a badger relocation program. Sixteen badgers were transplanted from Montana to the upper Columbia Valley between 2002 and 2004. These efforts have paid off and the relocated badgers have, for the most part, settled in and reproduced successfully. ■

Send Us Your Photos

If you have a great photo of local fish or wildlife in the Columbia Basin, send it to us. If we publish your photo you'll get a FWCP shirt or hat. Do not harass or disturb wildlife. Send your images to info@fwcp.ca.

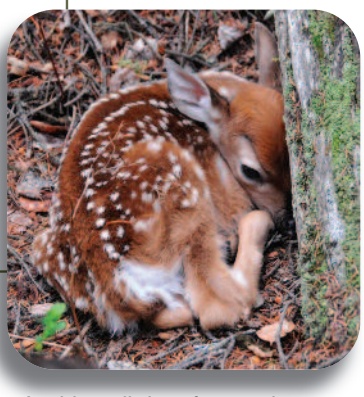
A "high quality" setting on your digital camera is preferred.

FWCP Shirt Winners

Wildlife Report Sighting: Dr. Alex Melnychuk

New Subscriber: Peter Jonker

Reader Response Card: Judy McKessock



Larry Halverson

A white-tail deer fawn trying not to draw attention to itself.

Adam Croxall

This western terrestrial garter snake was found at Walter Hardman Powerhouse south of Revelstoke, trying to finish his breakfast.