

Issue 21

FREE
MAGAZINE

THE FOOTPRINT PRESS

Passages from
Silverdale, Mission,
and beyond.

Message from the Editorial Committee

No element, or commodity, is more essential to our health than pure, fresh water. Water is necessary for all life- all plants and animals, both human and nonhuman. Our bodies are composed mostly of water, and we need daily access to it in order to stay healthy. Without water, life rapidly desiccates and disappears.

When we take water for granted, to accommodate industry and development, we risk our own lives and those of future generations. And as waterbodies become too polluted to support the life which depends on them, conflict and hardship are sure to follow. It is time to create a vision of the future in which water is given the respect and care it deserves. Protecting our aquifers, ponds, wetlands, streams, rivers, and oceans from contamination, is an investment we can all make in the future, for life on earth.

Cover and editorial page photos: Great Blue Herons, Bruce Klassen.
Photos taken at the Great Blue Heron Nature Reserve.

*The time will soon be here when my grandchild will long for the cry of a loon,
the flash of a salmon, the whisper of spruce needles, or the screech of an eagle.
But he will not make friends with any of these creatures and when
his heart aches with longing, he will curse me.*

*Have I done all to keep the air fresh?
Have I cared enough about the water?
Have I left the eagle to soar in freedom?
Have I done everything I could
to earn my grandchild's fondness?*

Chief Dan George, Tsleil-Waututh

Getting to know our local Species-at-Risk: The Western Toad

There is a mini-migration that happens across the Fraser Valley each spring. Maybe the word migration brings images of flocks of birds, herds of caribou, or even pods of orcas to your mind. But what about a knot of toads? Each year, hoards of tiny toads make their way from their birth pond into the forests to find food and this is quite a sight to Fraser Valley residents!

Western toads (*Anaxyrus boreas*) are a blue-listed species in British Columbia. Their skin is warty and ranges from green, to red, to grey, to brown with a pale stripe down the back. Two large parotoid glands sit behind the eyes. These glands secrete a poison called bufotoxin, which protects the toad from most predators and may have caused your tongue to go numb if you dared to lick one as a child! Crows, raccoons and coyotes are amongst the predators who have learned to eat only the bellies of the toads to avoid the poison. Garter snakes have evolved an immunity and can eat the toads whole!

Western toads live in other parts of Canada as well, but our toads are unique. Toads on the western side of the Rocky Mountains are mute. They do not sing to their female counterparts like those of the east. Mating begins with adults migrating to communal breeding sites in the spring. The males then attempt to clasp anything that moves from behind in a position known as amplexus. If they clasp another male he will let out a small “peep”! The eggs laid in the wetland differ from our other amphibian species. Instead of forming a clump they form what looks like a

string of black pearls. They quickly hatch into swarms of small black tadpoles that congregate in the warm, shallow areas of a wetland. Their black bodies can further increase the temperature of the surrounding water by absorbing energy from the sun. The ones that survive to become toadlets may be as small as a pinky nail! This is the second mass migration - hundreds of tiny toadlets migrate in unison to the surrounding forest areas in search of food and overwintering habitat.

The tadpoles are generally herbivorous, without much for teeth they eat the algae from rocks and plants in the wetland, although I have seen them cannibalize unhatched eggs of their kin! As adults they eat any insect you can imagine- bees, ants, grasshoppers and more!

Life as a toad isn’t easy. Even if they can avoid their predators, there are two major threats to them here in the Fraser Valley: habitat loss and road mortality. Both the wetlands and forests they need to complete their life cycle are becoming scarce, and roadways often separate the ones that do remain. Like a real life game of “Frogger” these toads must make their way across busy streets as adults to lay their eggs, and as juveniles, to reach the tasty snacks of the forest. This poses a real problem as huge populations can be decimated during these short but massive migrations. Biologists have found up to 50 adult toads killed on a 400 m stretch of Mission’s Sylvester Road in one night!

After all these challenges, comes the peace of winter. Toads will hibernate under logs, in small mammal burrows, or in holes they dig themselves up to 1.3 metres below the surface to avoid frost. If you are lucky, you may see these toads overwintering in your warm garden soil. However, due to their permeable skin, they are susceptible to poisoning by fertilizers and pesticides, which can leach from nearby areas into wetland habitats.





So what can you do to help? The largest risk locally seems to be road mortality, so if a road is closed during toad migration please drive carefully. Plant local native plants, which don't require fertilizers, and use natural pest control options. And finally, observe these amazing creatures and educate your friends and family on this rare and unique animal in your own backyards.

Rebecca McMurray, BSc Ecology, Mission

Western toad photos courtesy **Mike Stefiuk**,
Maple Ridge



Kinder Morgan's spawning deterrent assault on BC salmon

In September 2017 while reading the Kinder Morgan Trans Mountain online newsletter, I discovered an article describing in-stream installation of snow fencing to deter salmon spawning in five B. C. watercourses. Being a member of the PIPE UP Network, a community group that has spent thousands of hours researching the risks from the proposed Kinder Morgan pipeline expansion, and having written an article for the Footprint Press in 2013 about the Environmental risks to the Fraser river watershed from the Kinder Morgan Trans Mountain pipeline expansion, I immediately realized the significance of this assault on salmon spawning beds. A lot of water has flowed through the Fraser River watershed to the Salish Sea in the past five years but fewer and fewer salmon are making their way back to their spawning grounds. This is especially true of the Chinook who spawn in watercourses at the beginning of the watershed just south of Mount Robson B.C. Salmon are a keystone species in B.C. because 137 other species, including humans, depend on them for sustenance and survival.

PIPE UP participated as Intervenor at the 2014 to 2016 National Energy Board hearings on the KM Trans mountain expansion application. We engaged Mike Pearson, a local fish biologist to submit expert evidence regarding the potential impact of pipeline construction, maintenance and operations, on numerous watercourses in the Fraser Valley. We also had the good fortune to collaborate with another Intervenor, the Salmon River Enhancement Society, who had engaged Dr. Marvin Rosenau, considered the expert on riparian areas in B.C. In addition, we attended stakeholder workshops hosted by Kinder Morgan regarding their "Environmental Protection Plan" (EPP) for local watercourses.

In the EPP workbook, I was shocked to learn that the proposed expansion would literally cut through over 900 B.C. watercourses, including 250 that were salmon habitat. Kinder Morgan gave assurances to us (and the NEB) that the "open-cut" trenched construction method would result in "no harm" to salmon habitat. They also asserted that riparian areas would be returned to their original state "to the extent practicable". Two years ago we gave our oral argument to the NEB which included a warning about the high risk to all 900 watercourses from the open-cut trenched construction methods and in-stream maintenance. We were disappointed that the NEB recommended approval of the expansion. We were angered at the federal Cabinet approval after they ignored the special panel report that articulated serious concerns and questions. Their 58 page report included this quote from Seabird Band member Tyrone McNeil "We haven't seen detailed design. We haven't seen emergency response plans. We haven't seen any analysis of the effect of a spill or a recovery strategy for salmon and sturgeon." The watercourse construction method is purportedly focused on pipeline safety and the possibility of a spill to the extent that habitat is permanently destroyed. The EPP workbook also provided proof that the requirement for healthy fish habitat and riparian areas come in a distant second to "pipeline safety" at the lowest cost possible. This is what the term "to the extent practicable" actually means to Kinder Morgan. There is an alternate and preferred

construction method to open-cut trench, known as HDD, which involves tunneling under watercourses. However, it is more expensive and takes longer than open-cut trenching.

How does the purported pipeline safety priority, using the cheapest and quickest construction methods, lead to Kinder Morgan’s plans to install plastic snow fencing in spawning beds of 26 watercourses as a way to deter spawning? In a word – negligence – on the part of the regulators, the NEB and the BC Oil and Gas Commission. This is evident in the 2010 and 2016 federal Auditor General reports, which have significant concerns of the poor pipeline condition enforcement by the NEB. An additional fact is the Memorandum of Understanding between the Department of Fisheries and Oceans, and the NEB, which excluded all regulatory oversight for pipelines by DFO and transferred them to the NEB.

All of these factors caused Kinder Morgan to act as if there was no one watching what they were doing to Chinook spawning areas in Swift Creek, Albreda River, and Moonbeam Creek. The snow fences were also installed in breach of the timing window permitted by B.C. for in-stream work. Discovery of this damaging and disruptive activity lead to five letters from groups and individuals to the NEB demanding that the spawning deterrent installations be stopped, and that the ones installed be removed. The NEB determined that the spawning deterrent installation constituted illegal construction, but refused to order their removal or issue any financial penalty. To date the B.C. Oil and Gas Commission has been absolutely silent and has refused to respond to pleas for enforcement of the Water Sustainability Act Sec 11 regulations. However, some of the spawning deterrents did get removed by salmon defenders at the request of Indigenous Elders. Dogwood Initiative took videos of Swift Creek from a drone which was posted on Facebook and viewed by over 600,000 people. The immediate angry response by thousands indicated how passionate the people of B.C. are about protecting salmon and their habitat. There were 10,000 emails to Premier Horgan demanding that he get the snow fencing removed and that his government prevent any more from being installed. Currently, some groups are trying to use the NEB Detailed Route hearings to force Kinder Morgan to use the HDD tunneling construction method. Some others are considering private prosecution under the Fisheries Act or B.C. Environment Act. All of us are hoping that the Federal Court rules that the NEB approval was unconstitutional due to the lack of meaningful consultation with Indigenous Peoples, whose unceded territories the expansion would harm, including salmon habitat crucial to their sacred traditions and sustenance.

Lynn Perrin, PIPE UP Network
Abbotsford

Photos of anti-spawning mats installed in Swift Creek by Kinder Morgan courtesy of Dogwood B.C.





Western toad painting,
Carrielynn Victor, Cheam Village
Photo courtesy South Coast
Conservation Program

when she speaks,
poetry is a croak.

she's
the weakest of water nymphs.
her ponds shrink
as you approach. then ...

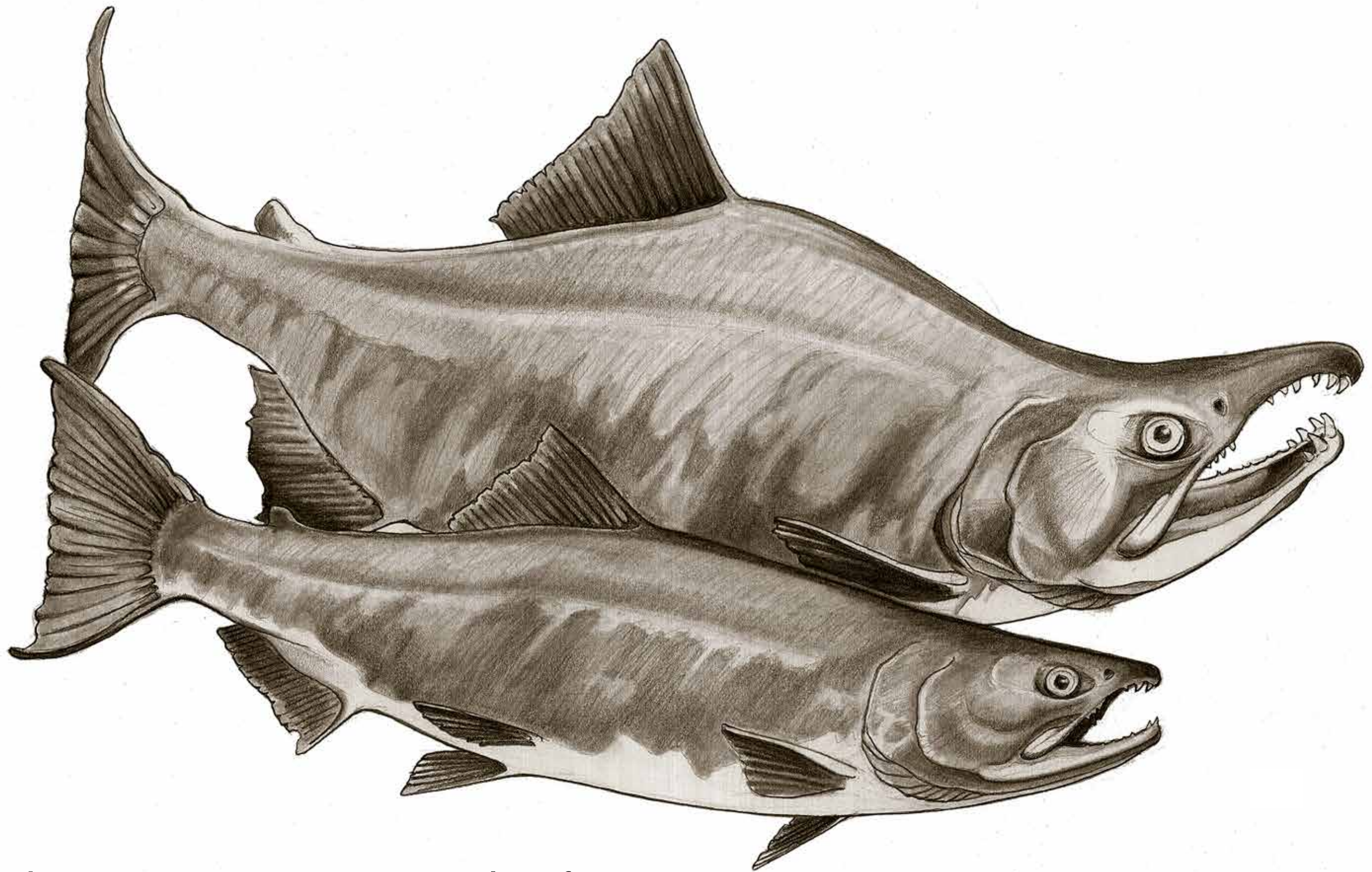
... you feel his exhaustion.
she has the power of dream.
mud, algae, waterlily,
as you glide into the drift,
as your footprint vanishes
in the swirl
of mist and grace.

Robert Martens, Abbotsford

toad

when i'm exhausted, he said,
freedom is near.

she's
the homeliest of water nymphs.
her tongue's a sticky dart.
her eyes, protrusions
from another world. her
skin, warty and bulging, down
to her ponderous feet.



Sea lice and treatment resistance in open-net salmon farms

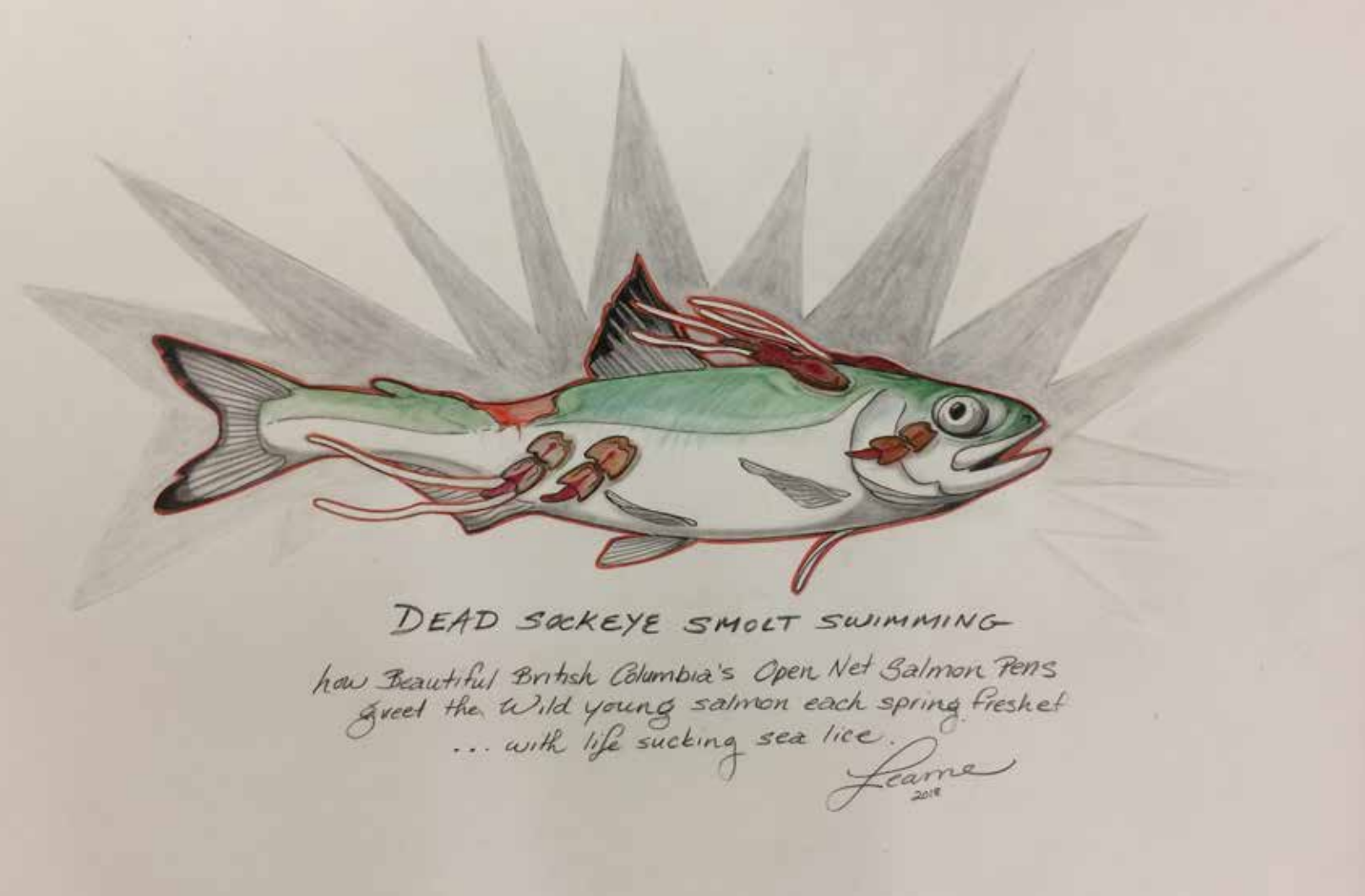
Sea lice are small crustaceans (copepod ectoparasites), which reproduce quickly and, as parasites, affect a wide variety of fish species. The control of sea lice has been a critical problem for salmon farmers since intensive farming practices began in the 1970s. Intensive salmon farming in open-net pens provide better conditions for parasites to grow and distribute into the

environment compared with natural conditions. This creates problems for both the salmon farming industry and wild salmonids. Salmon farms are often situated near wild salmon migration routes, with smolts being particularly vulnerable to sea lice infestation. Salmonids, such as sea trout, swimming close to salmon farms have been found to be carrying significantly higher levels of sea lice

infestation than those swimming further away from such farms. A definitive review of over 300 scientific publications and a team of top international scientists from Norway, Scotland and Ireland in 2014 reviewed all available published studies on the effects of sea lice and have now concluded that sea lice have negatively impacted wild salmonids in salmon farming areas in Ireland, Scot-

land and Norway. In addition to direct damage to their hosts, sea lice are also known vectors of disease, such as infectious salmon anemia (ISA) and sea lice treatments are known to damage non-target animals such as shrimp, lobsters, and the small crustaceans at the base of marine food webs.

Sustained and increasing levels of medicinal treatment



of farmed salmon has led to extensive use of available chemicals. This has resulted in drug-resistant parasites occurring on farmed and possibly wild salmonids. From 2009 to 2015, the chemicals used for lice treatments have increased. Except for the flubenzuron in Norway, all approved chemicals now show reduced effect, including hydrogen peroxide treatment (Jackson et al, 2017). There is also concern regarding the increasing freshwater tolerance of the sea lice and the potential for increased virulence due to farm management practices. Genetic studies have shown that resistance has the potential to spread rapidly throughout the north Atlantic salmon lice populations (Jackson et al, 2017). Thus, it can be assumed that the near complete resistance situation seen in Norway may develop at any time in the rest of the Atlantic salmon farming industry, and represents a threat to the development of the industry as well as wild fish.

Hydrogen peroxide is used widely for the treatment of sea lice by the salmon industry, in Canada and globally, at the current time. Field sea lice counts seem to indicate that fish treated with hydrogen peroxide suffer from a higher re-infestation than fish treated with other bath chemicals. Canadian researchers have suggested that

hydrogen peroxide may affect the ultrastructure of the skin epithelium, and subsequently, the composition of the mucous layer, thus making it easier for sea lice re-attachment on farmed salmon (Canadian aquaculture R&D review 2011). They also indicate that this treatment may release semiochemicals or chemo-attractants causing sea lice to seek out and re-infest peroxide-treated fish. As with all other chemical treatments, resistance towards hydrogen peroxide is becoming a problem for salmon lice control.

Taken together, after several decades of open-net pen salmon farming we must now face that we cannot adequately control sea lice, due to their ability to quickly adapt and become resistant to known treatments. For the sake of farming Atlantic salmon, we unnecessarily risk wild fisheries and marine ecosystems with ever increasing chemical treatments that continue to lack sustained efficacy against sea lice.

Dr. Claire Bethune

Salmon artwork by **Leanne Hodges**,
Instagram: westcoastwildartist
www.leannehodges.ca

Chilliwack's concerns with the Kinder Morgan Trans Mountain Expansion Project

In a February 13, 2018 interview Prime Minister Trudeau admitted that federal approval of Kinder Morgan's Trans Mountain Expansion Project was linked to Alberta climate action.

"It was always a question of, if we could move forward responsibly on the Kinder Morgan pipeline, then Alberta would be able to be as ambitious as we needed Alberta to be and get on with the national climate change plan... Yes, they were linked to each other."

The problem with that link? Alberta's climate plan was announced November 2015. The Kinder Morgan National Energy Board (NEB) hearing was still

under way. Final arguments were filed January/February 2016. The NEB recommendation report was issued May 2016- seemingly at least 6 months after the federal decision to trade pipeline approval for the Alberta climate plan.

Any wonder our pleas to protect Chilliwack and Yarrow's water sources from the pipeline fall on deaf ears in Ottawa?

In Chilliwack the pipeline runs too close to City wells, across Chilliwack's two most significant salmon habitat areas, upstream of Yarrow Waterworks wells on the banks of the Vedder River, and upstream of the Great Blue Heron Nature Reserve-one of the last wetland habitats in the Fraser Valley still freely connected to a river.

Chilliwack was probably not a place Kinder Morgan expected opposition. Although, in 2015 public outcry led to Chilliwack being the first to refuse a Com-



community Benefits offer, turning down \$800,000 over the ethics of such offers being made during the NEB hearing. Chilliwack made a deal after the hearing for \$1.4-million.

Chilliwack-based WaterWealth Project urged a route change in the NEB hearing, to the Ministerial Panel, and to provincial and federal decision makers. If Kinder Morgan is going to dig a new trench across Chilliwack, it could follow Highway 1 between points the pipeline already crosses to the east and west. Unlike the planned route, a route along the highway would have no community wells, no salmon habitat enhancement areas, no schools or residential neighbourhoods, and would not threaten the Heron Reserve.

However, sentiments in the community ran quite favourable to the pipeline. The December 2, 2016 Chilliwack Progress reported “the preferred routing for Chilliwack is a twinning of the existing route, said [Chilliwack Mayor] Gaetz, rather than pursuing the right of way option down Highway 1, as urged by Water Wealth Project”.

WaterWealth persisted and others helped, including the Council of Canadians Chilliwack chapter and local Dogwood volunteers. Like any idea whose time has come, residents galvanized around protection of community wells. Even people staunchly in favour of the pipeline could see the sense in making the system, and the community, safer.

By the deadline for statements of opposition to the pipeline route, a deadline extended from 30 to 54 days due to process errors by the company, Chilliwack residents had filed over 200 statements of opposition. This was roughly half of all statements filed, considerably more than even Burnaby’s 135. And by October 2017 the City had come around, writing to the NEB “The City categorically opposes the routing of the project through lands proximate to the Aquifer. The project must be routed away from

the City’s drinking water source.”

The Expansion Project has 7 major segments. The route change Chilliwack residents want, would affect sub-segments 6.1 to 6.5. Kinder Morgan applied for a route change in sub-segment 6.3 to actually move the pipeline closer to City wells. A realignment hearing was held but continues at time of writing with a late filing by Kinder Morgan and motion by WaterWealth in response. With sub-segment 6.3 undetermined, segment 6 remains the only major segment for which detailed route hearings have yet to be announced.

There is no justice in residents of affected communities having to go up against Kinder Morgan’s billions of dollars, teams of lawyers, and technical experts in NEB hearings. But that is what WaterWealth and residents of Chilliwack will continue to do through at least most of 2018. Perhaps justice will be found in winning!

Ian Stephen, WaterWealth
Chilliwack



Great Blue Heron Nature Reserve, Chilliwack

Helping our local Swallows (is simple and easy)

There are several swallow species in the Fraser Valley including the Barn Swallow (*Hirundo Rustica*), the Tree Swallow (*Tachycineta bicolor*), and the Violet Green Swallow (*Tachycineta Thalassina*). These Swallows are all “insectivores” which means they catch insects in the air. They are also called “Neotropical Migrants” which means they winter in warmer climates.

Under the Migratory Birds Convention (1995 Protocol) all swallows and their eggs and nesting habitats are protected from disturbance or destruction. It is illegal under the BC Wildlife Act to destroy these birds or their eggs.

Swallow populations are declining along with the insect population. In addition, land development is leaving fewer natural habitats for the Swallow’s reproduction cycle. We all can help by maintaining (or re-establishing) natural habitats or by creating manmade nesting habitats.

Barn Swallow:

The Barn Swallow is one species that builds its own breeding habitat (or nest). The nest is made from mud, grass and feathers and is usually located on building rafters, eaves, bridges, mine shafts, and other man-made structures. Natural nesting sites include cliffs, canyon walls and other natural vertical walls that are protected from direct rain. Barn Swallows measure around 6 inches in length, have blue/black backs, reddish breasts, rust or buff coloured bellies, and deep forked tails.

Barn Swallows forage within 30 feet of the ground and close to a water source. They eat mayflies, mosquitoes, beetles, moths and many other flying insects. During breeding, they visit and feed their young over 400 times per day. Their breeding starts in late April. A second brood is often reared, and in total, each nest can consume more than 5 million insects each season. Barn Swallows usually nest in single pairs. Both parents care and feed the young. The time from the start of nest building until

departure is around 44 to 58 days.

In late September Barn Swallows migrate to Central and South America for the winter months, returning to the Fraser Valley to nest in early April. They will travel up to 600 miles per day.

There has been a decline of Barn Swallows over the last 30 years by about 2.9% annually, up to 7.6% annually in the last decade. This is due to loss of nesting and foraging habitats and a decline of insect populations due to widespread use of pesticides.

Tree Swallow and Violet Green Swallow:

The Tree Swallow and the Violet Green Swallow like open areas such as backyards, pond shorelines, open fields and even urban areas for breeding. Because they do not

build their own habitats, these Swallows depend upon natural or manmade nesting sites such as tree stumps and nesting boxes.

Violet Green Swallows feed on flying insects such as flies, leafhoppers, leafbugs, mosquitos, aphids, beetles and other flying bugs, and they catch them in-flight. In Mission, the Violet Green Swallow performs acrobatic maneuvers in search of flying insects. They are common in the Fraser Valley in the spring and summer, but they migrate to Mexico and Central America during the winter months.

Violet Green Swallows arrive in the spring a couple of weeks before breeding in search of nesting habitats. Copulation usually takes place mid-May, and eggs are produced by the start of June. Incubation takes a cou-

ple of weeks with typically 5 eggs. Both parents care and feed the young and after approximately 3 weeks the young are able to leave the nest. Typically, the Violet Green Swallow reproduces once per season, but on occasion, reproduces a second time.

We have had success with our manmade Swallow nesting box with the Violet Green Swallow. We noticed Swallows flying around our nesting box in early spring (May). The male and female gather feathers and straw to build a bed in the nesting box. In late June we saw and heard the young while both parents continuously cared for and fed them. By the third week in July, the cycle was complete. When they were building their nesting bed, we left string and twigs close to the box and the Swallows did make use of these.

During the day we noticed one of the Swallows perched on the nesting box roof and again on the roof of our home watching and guarding the box during breeding time. This last season, crows were the only issue for these Swallows but this did not last long. Our nesting box is mounted 9 feet up on a pole in our backyard. Our backyard faces an open park area. For this coming season we have added a second nesting box around the same height, around 20 feet away.



We found it easy to provide nesting habitat for the Violet Green Swallow and at the same time, we learned something about helping nature. If we are concerned with bothersome insects during the spring and summer

time, Swallows are able to provide a free and natural way to help control the insects. It’s easy and is a win-win!

Carl R. Koehler, Carl’s Wood Works, Mission



Baby Animal Names- Ann Murdoch, Mission

Adult-Baby

- fox-kit, cub or pup
- bat-pup
- deer-fawn
- bobcat-kitten or cub
- coyote-pup or whelp
- crow and crane-chick
- dove-squab or chick
- duck-duckling
- eagle-fledgling or eaglet
- owl-fledgling or owlet
- frog-tadpole, polliwog or froglet
- moose-calf
- mouse-pup, pinkie or kitten
- muskrat-kit
- otter-whelp or pup
- squirrel-pup, kit or kitten
- porcupine-porcupette
- rabbit-kitten, bunny or kit
- rat-pup, pinkie or kitten
- skunk-kit

Clarification/Correction

The scientific name for the red-listed subspecies of Snowshoe hare is *Lepus americanus washingtonii*. Other subspecies of Snowshoe hare are not listed. The scientific name for the red-listed Oregon forestsnail is *Allogona townsendiana* while the name of the Pacific Sideband snail is *Monadenia fidelis*. These names were reversed in issue 16. Many thanks to the South Coast Conservation Program (SCCP) for providing these clarifications/corrections to enhance the scientific accuracy of our publication.





Frog, **Peter Wayne Gong**
(Squamish), Mission

THE FOOTPRINT PRESS

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