



# The Gumboot Gazette

The Lakelse Watershed Newsletter



## Walkabouts at Furlong Bay

This summer, we are proud to present interpretive walks at Furlong Bay. This is a chance for kids and adults to learn about the different fish species that live in Lakelse Lake, and practice identifying the different fish species. We will also be talking about the importance of riparian areas – the forest surrounding waterways – as well as fish food and habitat.



The photos above are examples of some of the hands-on fish sampling that will be taking place during the interpretive walks. This will be an interactive approach to learning about fragile ecosystems and how to respect and protect them and their inhabitants.

The dates of the interpretive walks are to be determined and posted at the Furlong Bay information booths. For more information, or to find out when these walks are taking place, contact us at [rmm.hrem@gmail.com](mailto:rmm.hrem@gmail.com). This will be an all ages events. Please feel free to bring gumboots or waders and be prepared to get wet!

# Calling All Volunteers

The Lakelse Watershed Stewardship Society (LWSS) is proud to sponsor a number of volunteer based projects oriented around environmental stewardship and the scientific collection of important baseline data relevant to a possible changing landscape and climate within the Lakelse Watershed.



This summer, the LWSS will be continuing the collection of baseline water quality samples. This is an opportunity to ensure that current industrial development is properly executed and meets environmental management standards. Multiple parameter measurements on a weekly basis will continue throughout the summer, compared to data collected in 2015, and archived for future reference.



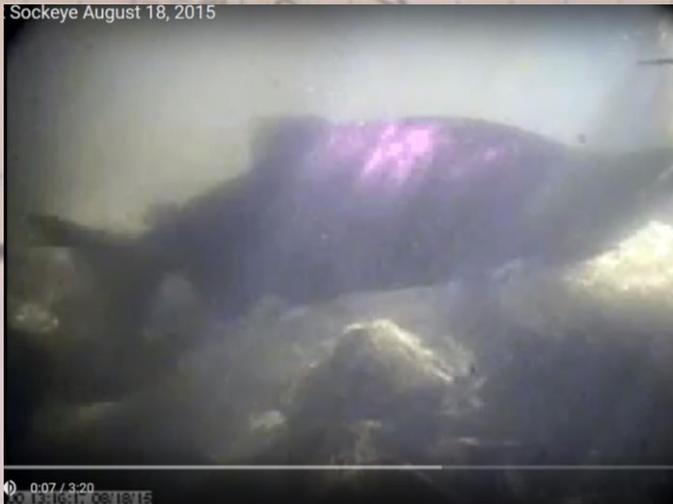
New to this year's sampling techniques is the Forest and Range Evaluation Program (FREP) riparian protocols. This program was designed by the Ministry of Forests to evaluate stream health and function to ensure that adequate environmental management is practiced. The FREP riparian protocols include analysing a number of criteria important to stream health and also includes collecting and identifying invertebrates.

Can you identify the insect in the photograph above? Invertebrate identification is an important aspect of ecological research.

This August, the DFO sponsored adult sockeye surveys on Williams Creek will continue. This involves both seining and gillnetting adult Sockeye Salmon two times per week for the month of August. This is a great opportunity to participate in a fun and important study!



Sockeye August 18, 2015



The Scully Creek aquatic camera will be used this year to perform a stock assessment of adult Sockeye Salmon in Scully Creek. Volunteers will be needed to do basic maintenance on the camera such as cleaning the camera lens. Below is a link to an example of last year's footage. <https://www.youtube.com/watch?v=bGoijiZR5Bo>

In order for this program to be successful, we will require volunteers to participate in any number of the projects that LWSS is hosting. Volunteers must be a member of an Organization that has valid insurance such as LWSS or the Rod and Gun Club. We would also like to invite volunteers that have boats who would like to participate in lake sampling. For more information or to volunteer, please contact us at [rmm.hrem@gmail.com](mailto:rmm.hrem@gmail.com).

# The *Other Fish* in Lakelse Lake

Other fish, you say? Introducing four fish that are lesser known in our Lakelse Lake watershed!



Threespine Stickleback derives its name from the spines in front of the dorsal fin. They usually appear green or silver-green, grey on top and silver on its belly. When spawning, the males develop bright red bellies and flanks, though some species have a black or bluish tinge instead, with bright blue eyes. The females may develop a pinkish belly and throat. They spawn in freshwater; so marine subspecies migrate from the ocean. The males are protective of the eggs. They build a nest that is bound together by a string-like substance produced from their kidneys and to entice the females, they move in zig-zag patterns towards the nest. Once fertilized, the males continue to protect and fan the eggs. With a life span on average of 2-5 years, they spawn usually only once in their lifetime.



The Redside Shiner gets its name from the red colouration by the gills. They prefer water with little to no current, such as ponds, lakes, ditches, springs, and sloughs. They usually reach four to five inches in length, though some may reach up to seven inches. They are a schooling fish and usually reside around rooted vegetation. The older shiners tend to gather in deeper waters, while the younger shiners are found near the surface or shore. Redside Shiners may compete with rainbow trout for food, as both have the same diet, including planktonic organisms, insects, and terrestrial organisms. They are also preyed upon by a variety of larger fishes.



The Prickly Sculpin reaches a maximum size of 15cm, though there have been reports of some up to 30cm. There are two subspecies of Prickly Sculpin – the saline-tolerant coastal variety and the inland variety. The inland variety lives in lakes, while the coastal variety are found in rivers. During spawning, the male creates a nest around boulders, guarding the eggs after they have been fertilized. Sculpin males may spawn with more than one female, as eggs have been found in various different stages in one nest. Its maximum age is seven years, reaching maturation at two to four years.



Northern Pike minnow, is native to most of the major BC rivers, including the Fraser, Skeena, and Columbia, and are also found in smaller streams. Their colouring is dark green or green-brown on the back, with a white or cream abdomen. Their fins are usually clear, with a deeply forked tail and the average adult size is 30-50cm. Northern Pike minnow are a scavenger fish, and eat insects as well as other fish such as shiners. They also eat salmon eggs and salmon fry, which is why many people see them as pests. They are not a targeted fish since they have poor eating quality due to how bony they are, but there has been success in canning them as the flesh itself is pleasant.

Other fish in the Lakelse Lake Watershed include...

Aleutian sculpin, longnose sucker, largescale sucker, mountain whitefish, Pacific and River lamprey,

# Wildfire Prevention



Wildfires often occur naturally, approximately 45% of wildfires are caused by lightning. Forest fires can help to promote the health and biodiversity of forests and in many cases occur in unpopulated areas with little to no affect on people; however, approximately 55% of forest fires are caused by humans and often occur in more heavily populated areas. Fire prevention and fire safety is very important and can save lives and property, especially during summer when the weather is drier and recreation activities increase.

Some common wildfire starters and prevention:

Backyard burning – have hand tools nearby, water, and enough people who can help you put it out if it gets out of hand, you can also save your burn pile for a rainy day.

Grass fires – place a firebreak around the perimeter.

Campfires – one of the leading causes; select a campfire site carefully, ensuring that all flammable material is removed from the area, including leaves and twigs. Do not leave it unattended and have enough water to put it out close by at all times. Ensure that it is extinguished entirely before you leave, with no embers or heat coming off it.

Other considerations would be to not burn in dry or windy conditions and not to discard cigarettes or other smoking materials from vehicles. Any lawn or farm equipment should have spark arresters and be aware that All Terrain Vehicles (ATVs) can start fires by igniting brush from their exhaust systems that generate a lot of heat. Always be aware of current fire bans and regulations and follow them accordingly!

For more information about wildfires, safety and prevention, please follow this link to a pamphlet <http://bcwildfire.ca/FightingWildfire/safety/pamphlets/FireSmart-BC4.pdf>

If you see a fire or smell smoke, report it. The BC number is 1-800-663-5555 or \*5555 on cellular

# WHAT WOULD YOU LIKE TO SEE?

We would like your feedback! If there is something that you would like to see in an upcoming issue of the Gumboot Gazette please contact us. We understand that there are many concerns and general interests concerning the Lakelse watershed. We would be please to investigate any questions you may have. If you have any questions or concerns about the volunteer projects happening or have any ideas of projects you would like to see happen within your area, we would be happy to reply to your comments and enquiries at [rmm.hrem@gmail.com](mailto:rmm.hrem@gmail.com).

Do not hesitate to share your knowledge. We are always keen to hear about historical, environmental, and cultural facts about Lakelse Lake.



“The earth, the air, the land and the water are not an inheritance from our fore fathers but on loan from our children. So we have to handover to them at least as it was handed over to us.”

-Mahatma Gandhi

If you would like to become a member of the Lakelse Watershed Stewardship Society please contact Kelly Kline at [rkkline@netbistro.com](mailto:rkkline@netbistro.com). A small membership fee will be required.

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## V for Volunteers

The Lakelse Watershed Stewardship Society (LWSS) is continuing to sponsor a number of fun projects this summer. The projects are focused on our local environment and keeping it healthy for both us and all the other organisms who inhabit this area with us. If you want to join us in stewardship of the environment and helping to collect scientific data, come join! We are looking for volunteers for a number of the projects occurring.



Working hard on seining

### Seining on Williams Creek

We will once again be doing seining and gill netting of adult sockeye salmon on Williams Creek to collect information for adult sockeye surveys. It occurs twice a week in August and is sponsored by the DFO.

### Scully Creek Camera

Also continuing this year in July is putting in the Scully Creek aquatic camera. This will enable us to perform stock assessments of adult Sockeye Salmon in the creek. Volunteers will be asked to do simple maintenance such as cleaning the lens. If you want to see past footage, check out this link!  
<https://www.youtube.com/watch?v=bGoijZR5Bo>



Scully Creek footage, 2015

## Baseline Studies

We do two baseline study circuits in the Lakelse Watershed. We record a range of parameters including pH, temperature, and turbidity.

One of the circuits we do is the watershed circuit, and it takes a full day - about six to seven hours. It occurs once a week. We have 15 creeks on this circuit. We do provide a lunch for volunteers and it happens once a week. This is a great opportunity to explore our area and see creeks that perhaps you've never noticed before!

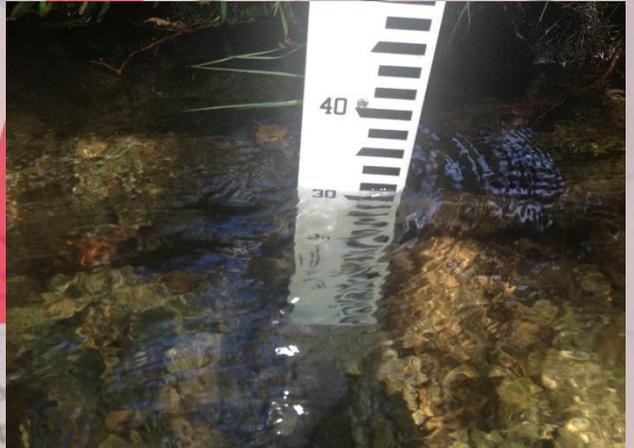


Monitoring on Granite Creek with the PRO YSI

The second circuit occurs on Lakelse Lake, so for this one we require volunteers who have a boat. It takes about one to two hours, and we do the same four spots each time. At each spot, we take measurements every two metres until we reach bottom. It occurs once a week.



Monitoring at the Lake



Staff gage on Sockeye Creek

To participate in any of these projects, we do require that you have valid insurance such as obtained by joining the Lakelse Watershed Stewardship Society (LWSS) or the Terrace Rod and Gun Club. There is a small membership fee. We require this for your safety. For more information or to volunteer, please contact us at [monika.c.b@hotmail.ca](mailto:monika.c.b@hotmail.ca). Thank you to all those who already have volunteered their time!

# Furlong Bay Walks

We are doing interpretive walks at Furlong Bay this summer. We'd love for you to join us and learn about fish species, fish habitat, and local vegetation in the Lakelse Provincial Park. The walk occurs on the Twin Spruce trail at Furlong Bay, ending with a fish ID station at Salmon Creek. This is a great opportunity to learn about our local environment. All ages are welcome. We hope to see you there!



## Upcoming Dates

July 16, 30

August 11

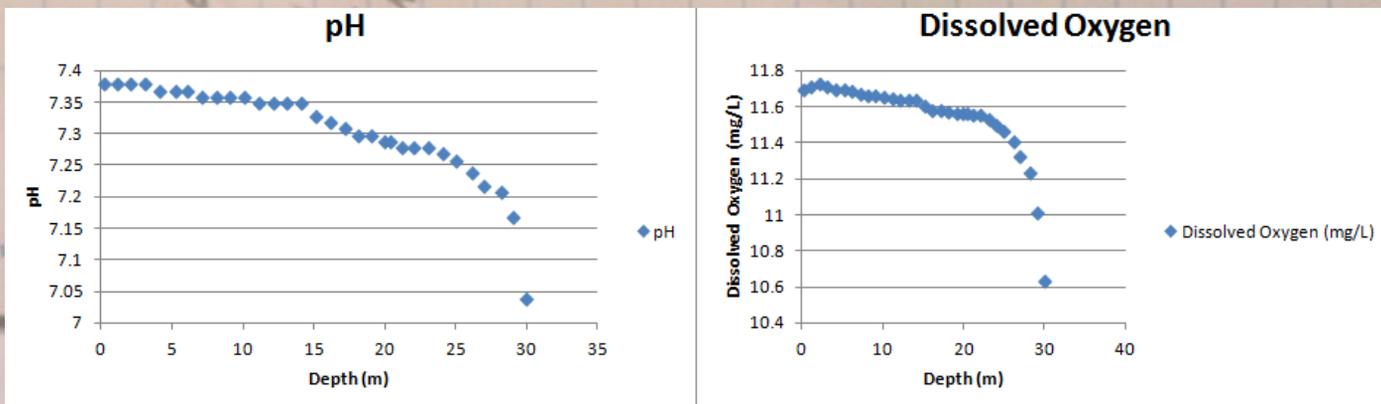
Meet @ amphitheatre

All start @ 7pm

# The Shape of BC Lakes

Documenting lake health is an important step for proper lake stewardship. This summer, the Ministry of Environment is conducting a province wide study, documenting the health of various lakes in British Columbia, including the Lakelse Lake.

Several different parameters are measured to test the health of the lake, including pH and dissolved oxygen, as shown in the picture, but temperature, turbidity, conductivity, depth, and pressure are also recorded.



Above is an example of some of the baseline data that is being collected and analyzed.

The Lakelse Watershed Stewardship Society coordinators were please to be involved and share data collected over the past year with Ministry of Environment, Environmental Protection Impact Biologists.



Lakelse Lake

# The Rough-skinned Newt

The Rough-skinned Newt, known for its bright red, orange or, yellow belly and rough skin on its black back is native to the West Coast of British Columbia. They are often found in the moist ground underneath logs and live in temperate coastal woodlands.

Although these newts may not seem vicious at first glance, do not let their size fool you; their conspicuous bellies are a warning to predators. The Rough-Skinned Newt contains enough Tetrodotoxin in their skin to easily kill an adult human being. Although many people have handled these amphibians and not suffered any consequences, if residual Tetrodotoxin is left on the hands it can cause severe gastrointestinal, skin, and eye irritation and in some very severe cases, death. The toxin that Rough-skinned Newts secrete is the same neurotoxin found in the glands of Puffer Fish which must be handled very carefully when served as the Japanese delicacy. This toxin is not their only defense against predators.



Picture taken from: <https://nextdoornature.org>

Rough-skinned Newts, like many other newts, have the ability to regenerate body parts such as their tails, limbs, spinal chords, and hearts. This allows the newt's delicate body to survive attacks from predators.

The next time you see this colourful newt in the forest, observe but do not touch this deadly little amphibian. Although it has defenses against predation, when the newt secretes its neurotoxin it can have costly health risks to the newt as well as its predator.

# Hydrocarbon Sheen

We've all seen that oily rainbow on water populated by boats or near roads. But sometimes, that sheen appears in water bodies in places no where near roads and where no motor-powered boat has gone on, so what's the deal? How did the oil make it all the way there? Did it travel down from some lake or river?

Well, you'd be surprised to learn that sometimes the oily sheen we see on water is naturally produced. It's called a hydrocarbon sheen.



Hydrocarbon sheen as seen in Buttertubs Marsh Park, Nanaimo, BC.

Picture taken from: <http://www.nanaimo.ca/blog/hints-of-spring-in-nanaimo>



Oil on water

Picture taken from: <http://www.firstnews.co.uk/news-in-pictures/quiz-6-science-questions-from-the-happy-scientist-192/oil-on-water-makes-lots-of-pretty-colours-but-what-does-it-tell-us-about-the-nature-of-light-p804>

Hydrocarbon sheens usually occur in marshy areas. It's caused by anaerobic bacteria, which is bacteria that doesn't need oxygen. They live in the mud of the wetlands where no oxygen is available and they release methane. The majority of the methane evaporates into the atmosphere, but a small bit of it is converted into hydrocarbons. Hydrocarbons are less likely to evaporate, and they are also lighter than water, so they float to the surface. This results in the oily sheen we see. This naturally produced oil and human produced oil are very similar compounds, so that's why they look the same, which makes them hard to tell apart just by eye.

# A Visit to Scully Creek

This fine month of June the grade 7 Uplands class joined us at Schulbuckhand Creek, also known as Scully Creek. The class learned about local fish that reside in the stream, how to identify the fish, what fish need to survive, and stream health.

While checking on the minnow traps set up in Scully Creek, we talked about what fish need to survive in a stream, like what kind of food they eat and how they prefer cold oxygenated water. Our minnow traps had a quite few fish in them, so we put them in the fish viewing tank to identify them. It was awesome for us to hear that a lot of the kids knew what fish they were looking at, such as Bullhead (Sculpin) and Cutthroat Trout!



Robin Millard-Martin talking about stream health.



Looking at fish in the seine net on the beach

We also did two seining sets in the lake with the help of the class. We caught a bunch of Sticklebacks! The class helped us put them in the bucket so we could take them up to the fish viewing tank and take a look.

Thank you to the Uplands Elementary School Grade 7 class for joining us, and thank you to Amy Warner for the pictures and bringing her class out to Scully Creek!

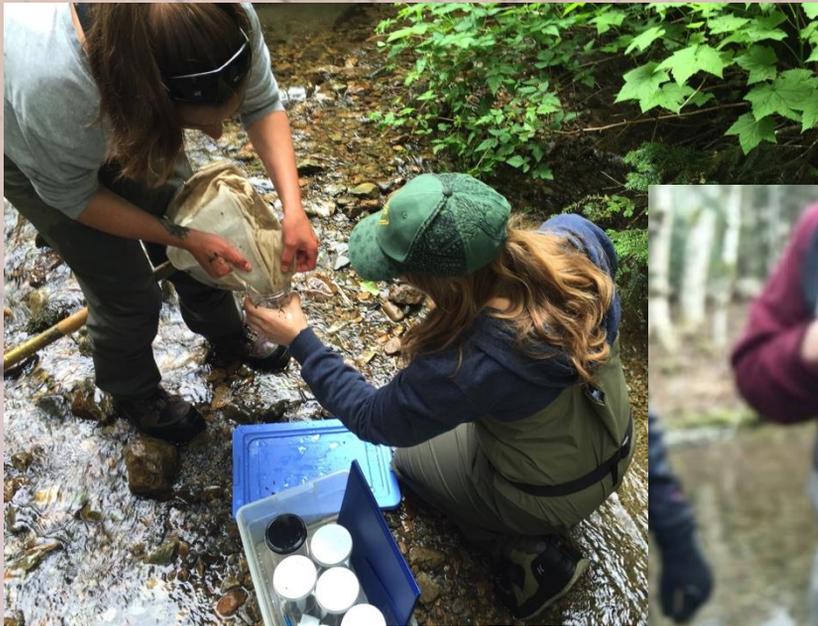
**“The Earth laughs in flowers.” – Ralph Waldo Emerson**

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### The Importance of Invertebrates



Invertebrates are organisms that lack a backbone and comprise about 95% of animal species. They can live in both aquatic and terrestrial environments and consist of a variety of animals, some of which include sponges, crabs, worms and insects. Invertebrates are an important source of food for a variety of different fish including Salmon, Trout and Char as well as a number of terrestrial animals including birds.

In order to further evaluate the health of streams within the Lakelse watershed and their ability to support fish populations, invertebrate samples were collected from the 15 streams currently included in the water sampling route. Samples were taken from an area of approximately one cubic foot with shallow water and a moderate flow. Rocks and soils were disturbed in the water by hand and a net was held downstream from our sample area to catch any invertebrates that flowed downstream. Following sampling, invertebrates were placed in an alcohol solution for preservation.

Once in the lab, samples were sorted and invertebrates were identified using a microscope. The main invertebrates identified in the lab included Stoneflies, Caddisflies, and Mayflies. These three classes of invertebrates are very sensitive to pollution and high levels of organic sediment input so can be useful in identifying changes to the surrounding environment. If present in a high quantities Stoneflies, Mayflies, and Caddisflies can also be useful indicators of a healthy system. Results from the samples analyzed in the lab can be found in Table 1.

Table 1: Sorted invertebrate samples collected on June 1, 2016

Creek	Mayflies	Stoneflies	Caddisflies
Clearwater Tributary	5	25	12
East Highway Clearwater	20	3	3
Eel Creek	64	11	37
Ena 1	1	4	1
Ena 2	35	38	15
Granite	22	1	29
Mountain Creek	0	3	8
Sockeye	27	10	22
Upper Herman	4	0	0
Westside	31	30	21
Williams Creek	7	12	0

As seen in Table 1, streams with the highest abundance of Mayflies, Stoneflies, and Caddisflies are highlighted in green. In particular Eel Creek, Ena 2, Sockeye and Westside Creek had a greater number of Stoneflies, Caddisflies, and Mayflies compared to the other streams sampled. Streams with the lowest number of Stoneflies, Caddisflies, and Mayflies were Ena 1, Mountain Creek, and Upper Herman. Invertebrate samples still need to be sorted for Upper Mink, Clearwater, Langley, and Scully Creek.



Any volunteers looking to get involved are welcome to participate and learn how to identify invertebrates!!

# Williams Creek Sockeye Seining 2016



Members of the Lakelse Watershed Stewards Society and other volunteers worked with the Department of Fisheries and Oceans to determine the amount of wild and hatchery Sockeye salmon returning to Williams Creek this year to spawn. Seining/marking occurred at the mouth of the creek and later gill-netting/marking upstream determined approximately how many Sockeye salmon spawned. In total **11,137** adult Sockeye salmon were estimated to have spawned in Williams Creek in 2016. Come out next year to experience the thrill of handling salmon and being able to sport the complimentary T-shirt given out to all volunteers!



Thank you to LWSS volunteers Cheryl Brown, Terry Brown, Ernie Kuehne, and Ted Wilson!!

# Scully Creek Camera



The underwater camera has been removed from Scully Creek following the end of the Sockeye salmon run. This year, improvements to the data collected were made through the installation of a fish fence in order to ensure accurate counts of fish moving upstream. Data from the camera will be reviewed in the upcoming months in order to estimate the total number of salmon that spawned in Scully Creek. Volunteers are encouraged to help review footage and count fish from the comfort of their own homes!



Pair of Spawning Sockeye!

# Bitumen Refinery Proposed 8 km South of Lakelse Properties

## Location

The development of a new bitumen refinery is proposed between Terrace and Kitimat in an area known as Dubose Flats, near the Onion Lake Cross Country Ski Trails. The total project area would encompass approximately 15,714 hectares and contain multiple processing/ancillary facilities, some of which include: a bitumen refinery, rail yard, 50m wide x 40km long road, electrical power infrastructure, tie-in to natural gas pipeline, water intake pipe from Kitimat River, wastewater facility, and discharge pipeline to Douglas Channel.

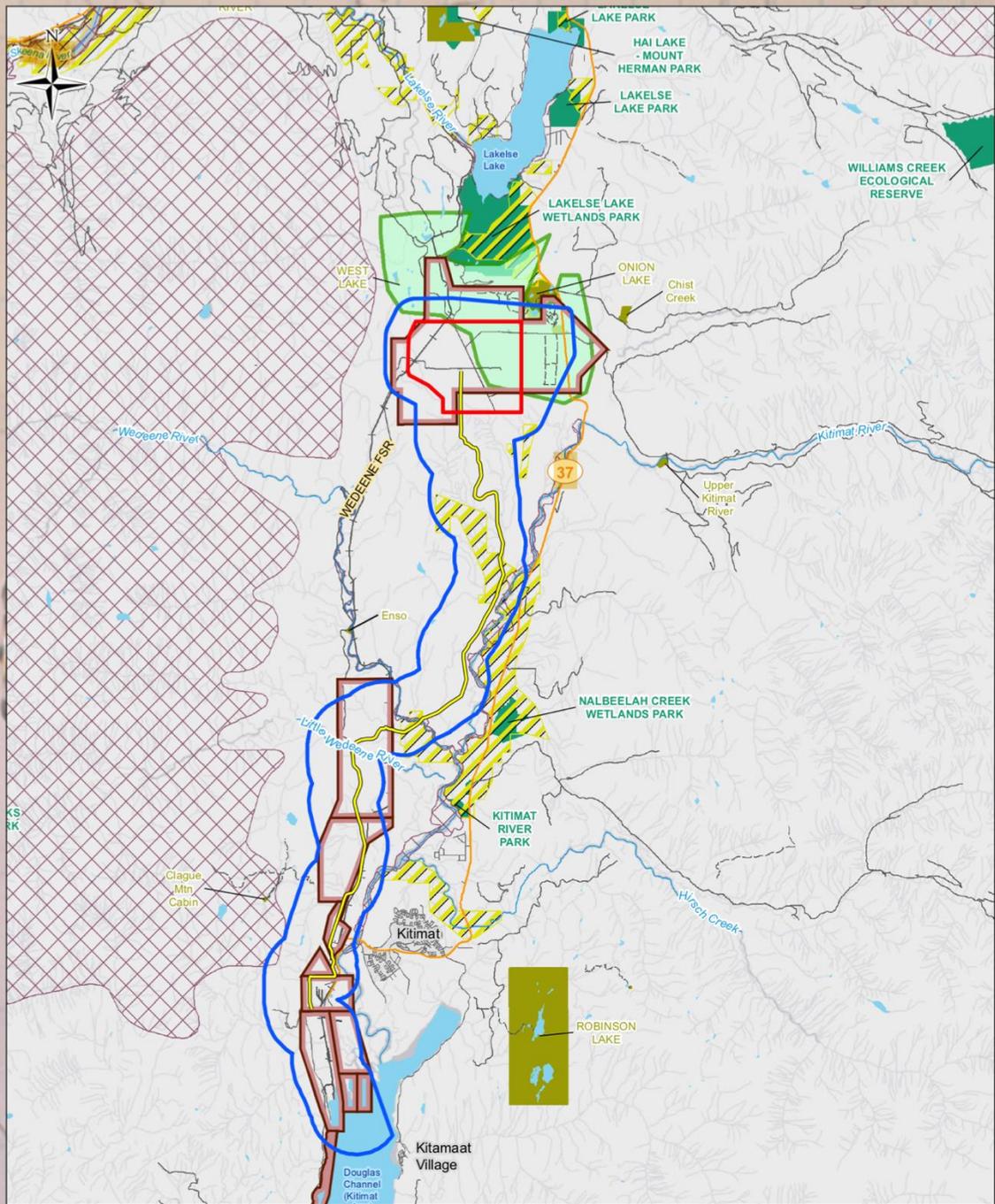
## Proponents

The Pacific Future Energy Refinery Project, formed in 2015, has submitted a formal 'Project Description' to the public, federal, and provincial governments for review. Following this filing, the BC Environmental Assessment Office will commence a provincial environmental review and the Canadian Environmental Assessment Agency will begin a federal environmental assessment. Should all environmental reviews be passed, the anticipated construction start date of the refinery would be in the summer of 2018.



Sample of bitumen. Credit: Syncrude Canada.

# Map of Proposed Footprint of Bitumen Refinery Submitted by: PFECC and SNC Lavalin.



**Legend**

Refinery Location	Recreation Areas
Project Area	Parks and Protected Areas
Potential Module Access Road	Highways
Terrace Community Forest	Other Roads
Commercial Recreation Sites	Forestry Roads
Proposed Industrial Development Areas	Recreation Trails
Agricultural Land Reserve	Rail Tracks
	Watercourses
	Water Bodies

**Notes:**

1. Intended for illustration purposes only.
2. Original in colour.
3. Site location is approximate.

**References:**

1. Data downloaded from GeoBC in September and October of 2015.
2. Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community ©2016

<p>PACIFIC FUTURE ENERGY Building Our Future, Protecting Our Coast</p>	<p>SNC-LAVALIN</p>			
		<p><b>Pacific Future Energy Refinery Land and Resource Use</b></p>		
By: SS	Date: 2016/05/09	Scale: 1:250,000	Figure Number: 9	Rev.: 2
Chk'd: SM	Coord. Sys.: NAD 1983 UTM Zone 9N	Reference No.: 631180-101-005		



MXD Path: \\S2126\home\l\ORIEAM\BC\Current Projects\Pacific Future Energy\631180 Dabase Files - PFECC Refinery\4.5 GIS and Drawings\GIS\Mapa\MXD\Report Figures\631180-101-005-R2 Land And Resource Use.mxd

Sohay Spinning

## Logistics

The intent of the refinery is to bring in NEATBIT, a diluted form of bitumen, by rail car from Athabasca and Cold Lake regions in order to process it into usable products such as gasoline, diesel, and jet fuel. The proposed project would be bringing in approximately 4 unit trains (with 120 cars each), per day, on the CN line from Terrace. After processing, where emissions such as methane, carbon monoxide/dioxide, nitrous oxide, fugitive hydrocarbons,  $SO_x$ , and  $NO_x$  will be released, the refined product will then make its way to Asian markets. Exporting of the refined products will then be the responsibility of purchasers who must retain all required licenses and separate Environmental Assessments for the transportation of the product from the Refinery. Purchasers, along with Pacific Future Energy (PFEC) support, have entertained the construction of a marine export terminal to be built along Portland Inlet in order to aid with the transport of the refined products to global markets.



Tankers used to transport bitumen by rail. Credit: Ben Brooksbank.

## Public Participation

As a way to take part in the public review process, members of the LWSS have applied for funding to hire environmental professionals familiar with the project area to review the 'Project Description' submitted by PFEC. Upon review and consideration the appointed environmental professionals will take a seat on the public review panel in order to identify environmental areas of concern related to the construction of a bitumen refinery in the area.

For the full 'Project Description' submitted by PFEC please follow the link below:

[Pacific Future Energy Project Summary](#)