

Sísqet? Sqyéytn et ǀ'u?sqáy^ws Suméx Scúws

Siska Salmon and Indigenous
Peoples' Life Work



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Sísqe? Sqyéytn et ǵ'u?sqáy^ws
Suméx Scúws (Siska Salmon and
Indigenous Peoples' Life Work)
was made possible by:

Siska Traditions Society

RloPelst (Blazing Stone) dipping
for sqyéytn (salmon) on the north
side of the Q^wu?m'ix (Thompson
River) east of N'kemcin (Spence's
Bridge)

**Cover Photos: 1913 James Teit,
The Canadian Museum
of Civilization**

Chief Fred Sampson dipping for
sqyéytn (salmon) at Susanna
Swartz's fishing area (previously
Ci?q^wok'pa- George Wish's area at
Sísqe?)

Cover Photos: Tina Edwards

Male and female Sockeye in the
spawning grounds
**Back Cover: Western Wilderness
Committee**



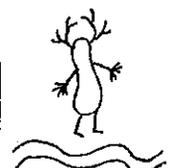


Ce?x^wmin
Dedication

Ce?x^wmíntm he ski?kiye?kt eł qəłqəłmíntk
Dedicated to our ancestors and elders,

tes cəcun'ékstm tis eł ɣəz'tes
for teaching us and preserving

tekm e zw'étmxs
all their expertise



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Ncwépes

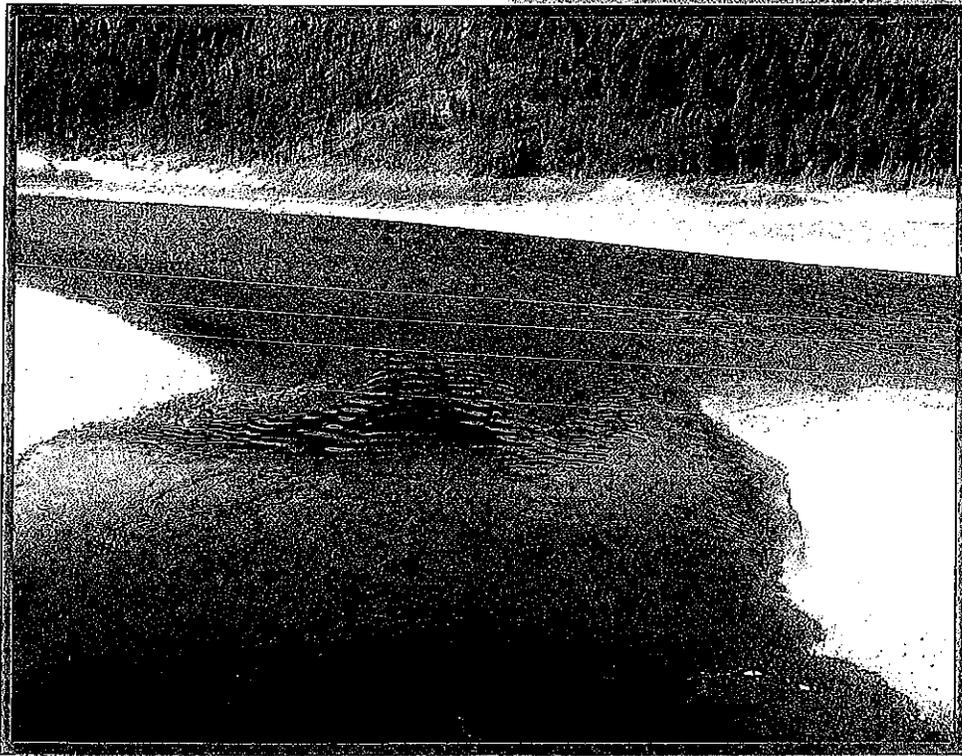
Start To Do Something (Introduction)

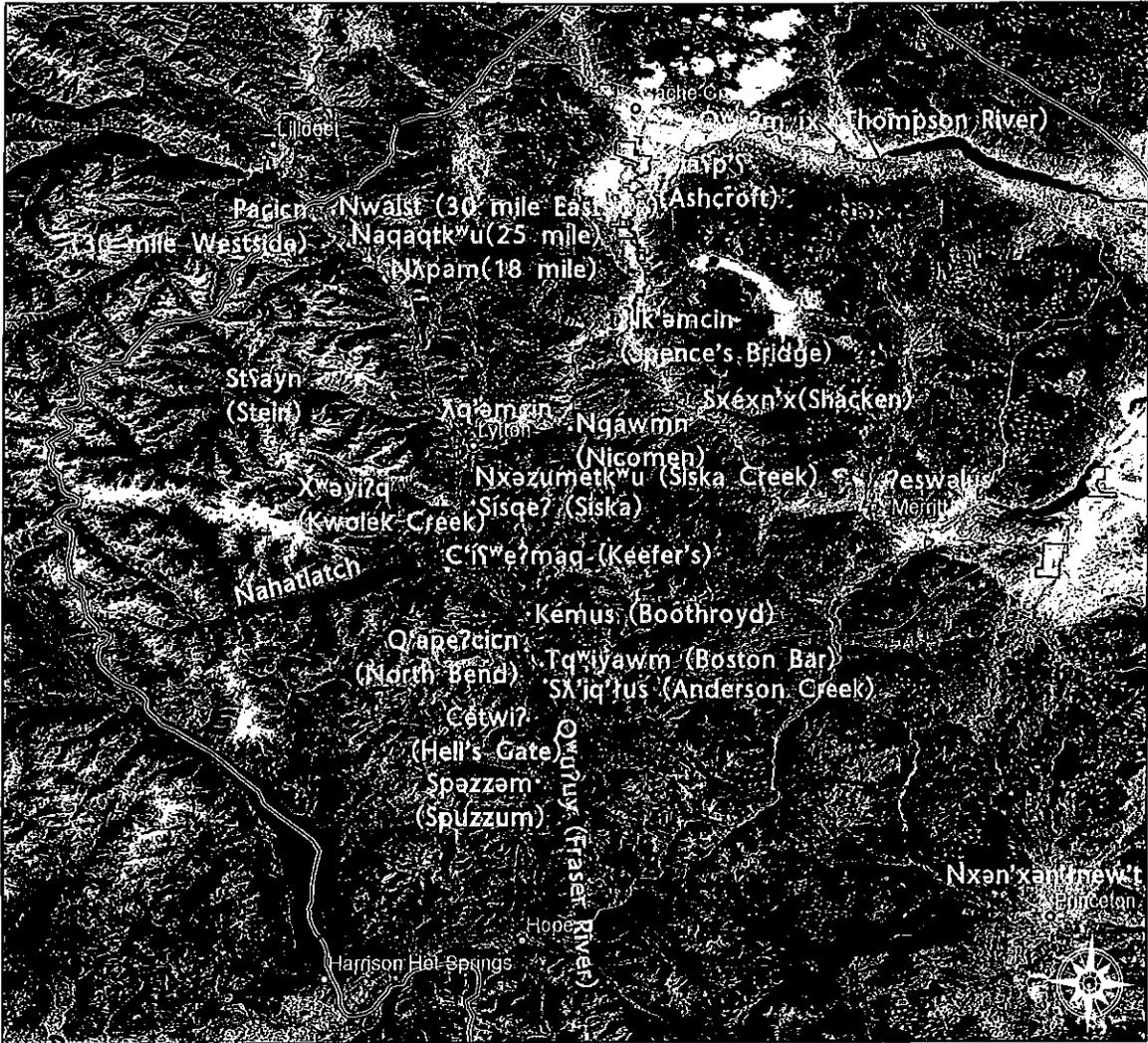
This report is about the health of the *sqyéytn* (salmon) from the Pacific Ocean to the headwaters of the *Qʷuʷuý* (Fraser River) and the *Qʷuʷm'ix* (Thompson River). In this international journey, the *Qʷuʷuý* river system extends through the First Nations of the Coast Salish, *Nt̓eʔkepmx*, *St'at'imc*, *Ts'ilhqot'in*, *Wet'suwet'en*, *Dakelh* and *Sekani* and the *Qʷuʷm'ix* river system extending through the *Nt̓eʔkepmx*, *Secwepemc* and *Sý'lix*.

As *Nt̓eʔkepmx*, this report focuses on our relationship with *Qʷuʷ* (Water) and with *sqyéytn*. We invite others to share in this celebration of *sqyéytn* and our responsibility to ensure their survival.



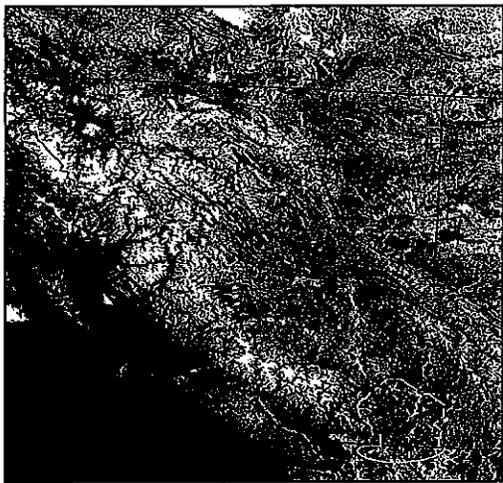
Qʷuʷuý (Fraser River) and
Qʷuʷm'ix (Thompson River)
Photo: Tina Edwards

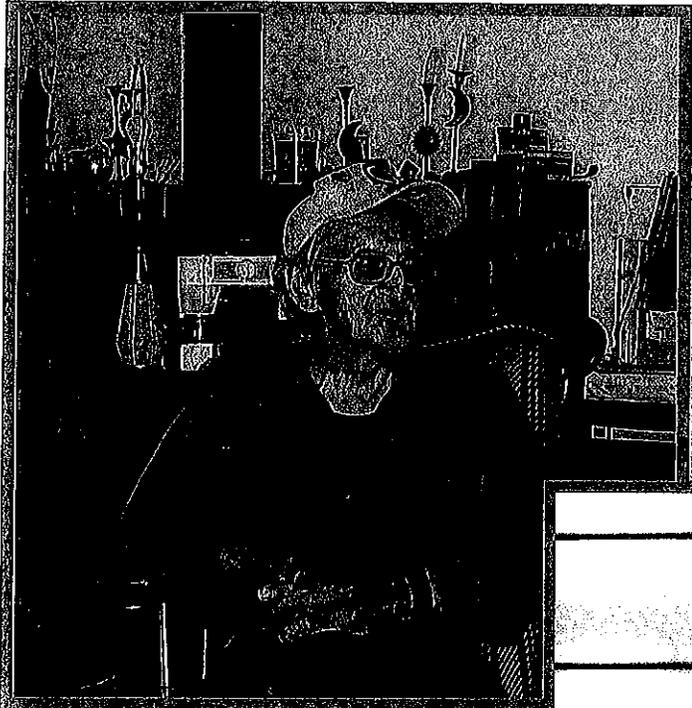




Legend

- ==== Nle?kepmx First Nation Territory
- Indian Reserves





Horace Michell



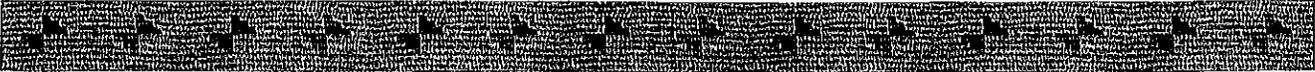
Glen Michell



Les Coutlee

Photos: Forrest Sampson





łix^wełwi?x ?ewikmkt

Changes Witnessed

The Nłé?kepmx have witnessed these changes. There is depletion in the sizes of the sqyéytn (salmon) runs.

“The elders have told us that there were more fish long ago as compared to today.”

– Les Coutlee

“There used to be so many fish in the river that you could see them on both sides of the river.”

– Horace Michell

The width and depth of the rivers has gotten smaller. The spring run-off happens too quickly because logging has left vast strips of un-forested land, and those that are replanted do not have the broad leaf (deciduous) trees that help to hold the water. The water temperature in all waterways has increased because of global warming. There is an increase in the amount of debris (both natural and unnatural), and much more pollution in the environment – including land, water, and air. The smell of the water has changed. The water used to be drinkable directly from the river 30 years ago, but no one interviewed would drink the water today.

The sqyéytn are smaller, and fewer return to the spawning grounds. Contamination happens from waste management, forest industry, mining and population increases. This is all reflected in changes to the size, shape, colour, taste and texture of our sqyéytn. There are also changes in the amount of animals seen around the river.

Other changes include the way séytknmx (First Nations People) fish today, not in large family groups as in the past. Séytknmx usage of fishing gear and techniques has also changed to adapt to the changes in the river.

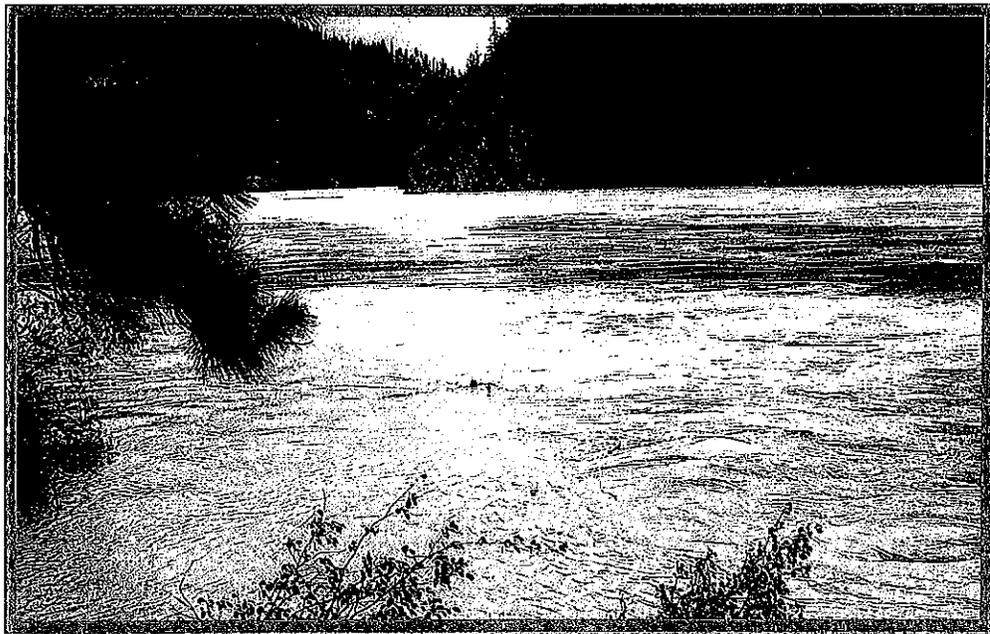




Highwater line mark
Photo: Forrest Sampson



Highwater line mark
Photo: Forrest Sampson



High water debris at Sisqe?
Photo: Mike Koester Sr.

Pi?ste Us He Seytknmx

Et C'ken'm Et Kenmus Es Exs Zéwm When People Began Fishing

How and Why They Fish

All séytknmx began fishing when they were old enough to walk without assistance from anybody, about six or seven years old, up and down the fishing trails.

"I used to go down to the river when I was really small with my mother carrying me on her back in a cradle. We went down by horse and she used to put me down on a blanket and tell me to wait there. We used fish to eat and some fish for trade to get us what we needed. When we eat fish it shows because it changes the face complexion, our hair texture, and our overall health."

– Mary Williams

The majority of those interviewed have learned from their family members and still continue to provide sqyéytn for their families.

"I fish because I like to eat fish and I'd rather eat fish than the store bought food"

– Les Coutlee

"I started fishing when my father let me fish, about twelve or thirteen years old, before that I could only pack fish. I fish for my family and for my relatives who can't make it to the river."

– Maurice Michell

The stuk^wcn (dip net), the nxézk^wutn (gill net), and the k'atnim'tn (rod and reel) are used by the Nle?kepmx to fish. This also depends on the way of the rivers, whether they are running high or low and the amount of debris coming down the river. Platforms were built and used for the sca?kn (big set net) and spear fishing that the séytknmx do not use as often today.

"I fish because it's the Native way and I like to eat fish."

– Virginia Bleakney





Holly Edwards dipping at Sísqə? with
Fred Sampson teaching how to dip
Photo: Tina Edwards

*"I fish for food. All séytknmx fish
using a variety of different meth-
ods depending on the type of fish
they would like to take home."*

– Peter Smith



Forrest Sampson holding salmon
Photo: Tina Edwards





ł'i?ksm

Fish Ceremony

Nłé?kepmx ceremonies were drastically affected by the Federal Government, the Anglican Church and their Residential School System. The Federal government also passed a law prohibiting potlatches and First Nations ceremonies enforced until 1951. The consequence for participating in potlatches, carrying a drum, or for drumming and singing was jail-time as this was the Canadian Government's law they enforced on our Indigenous Peoples.

"Our Mom and Dad told me in nineteen thirty nine that I had to go to the residential school or else they would put my parents in jail if I did not go."

– Horace Michell

Nłé?kepmx continue to recognize and give respect to the sqyéytn and the river for sharing their life so all séytknmx can survive. Nłé?kepmx still do prayers and offer tobacco to the river and to the sqyéytn, and either give their first sqyéytn away or share it in a feast with other séytknmx who live nearby.

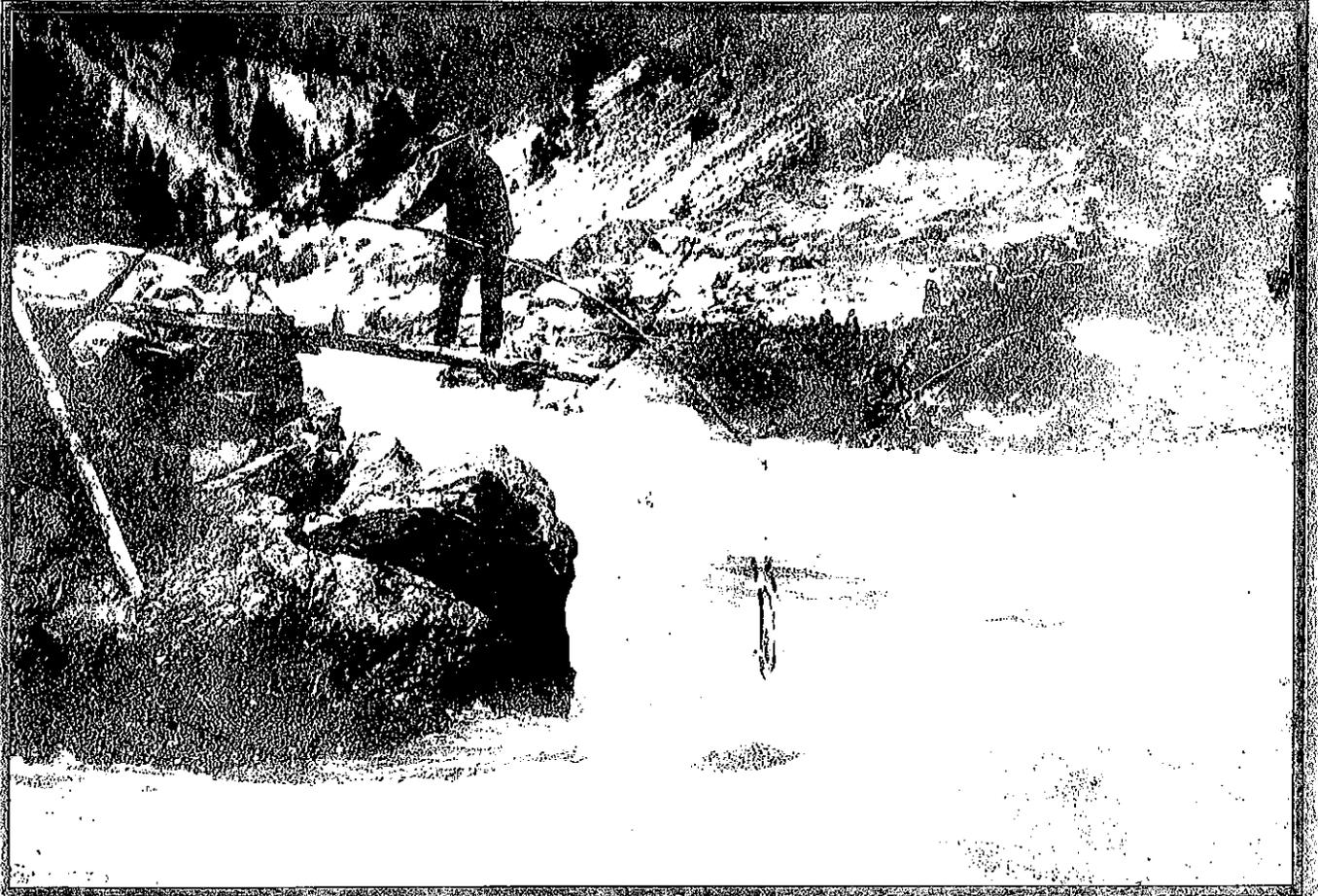
"At the beginning of the season when I first put my net out my mom always told me you have to throw the first one back in and make an offering to the river and the fish. I catch a live fish then I thank it for coming up the river, offer it some tobacco, and then return it to the river. I tell it go on your way, go to where you are going so that you can spawn and make more fish. My mom always told me you have to do that because it shows that you are honoring the fish and honoring the water. Then the next one you catch you do the "ł'i?ksm" (First Fish Ceremony). The first fish you catch you have to cook up and invite people to eat the fish. The bones are saved and put on a stick and put back into the river."

– Maurice Michell

Nłé?kepmx are taught to respect the sqyéytn (salmon), the Q^wu? (Water) and honour what it provides for all - "SUMÉX - LIFE".

To this day we, the Nłé?kepmx, continue to provide for our families, extended families, elders, traditional gatherings, funerals and for those unable to make it down to the fishing areas. The Nek'n'twáx^w (trade) system also continues to be utilized by Nłé?kepmx. Séytknmx trade their sqyéytn for fruit, vegetables, nets, medicines, and money to buy other items needed around the home.





Spear-fishing on platforms long ago
Photo: Royal BC Museum and Archives



Whén Us Ex Zéwm He Seytknmx

Where People Fish, Access

Over half the séytknmx (First Nations People) interviewed utilize fishing areas that are still used today by their nk'séytkn (family). The remainder came back home and approached community members on their willingness to share their fishing areas. Historically, fishing areas were shared amongst extended families and friends. Séytknmx would use different fishing areas up and down the river depending on the water levels, the weather and the salmon run. Mary Williams describes six fishing areas used:

"We had three different spots at thirteen mile, one at twelve mile, another down at the ferry on this side and another down on the south side of the ferry too. We went fishing where it was better for fishing depending on what part of the day it was; there was never any designated spot to go fishing for the séytknmx. We adjusted our net by the pole; like close to edge in the morning because the fish swam closer to shore, then midday the pole allowed us to move the net further to the middle of the river because it was cooler near the middle. We fished almost every day of the month for fish."

– Mary Williams

The catch is always shared and provided for those unable to do their own fishing. Sísqe? has held an Elders' Fishery at the place known as Frenchman's Bar for the past eight years. Frenchman's Bar is a historic X'wú7eÁ (sturgeon) fishing site. Nte?kepmx from the Coldwater, Lower Nicola, Cook's Ferry, Upper Nicola, Shackan, and Nooaitch are given opportunities to fish for their elders and/or bring their elders to the river. Many elders have not been to the river in so long that they are very grateful to be there to watch the younger séytknmx fish. This happens only if the fishing is open and if the salmon are returning in good quantity.

The access to fishing has changed in so many ways over the years. The allotment of reserves by Department of Indian Affairs was directly linked to prime fishing sites. Fishing areas are controlled and designated according to the "Band Reserves" by the Department of Fisheries and Oceans.

"There was not too many people fishing them days up and down the river. There used to be fish in the river all the time. Now the Commercial fishermen schedule us when we can go fishing."

– Mary Williams

Restrictions and fisheries closures by Department of Fisheries and Oceans are becoming more frequent because of dwindling sqyéytn stocks. The over-fishing of sqyéytn by commercial fisheries, the sport fisheries, the logging, global warming, and pollution play a role in the depletion of our sqyéytn resource. This represses the community economies of the séytknmx.

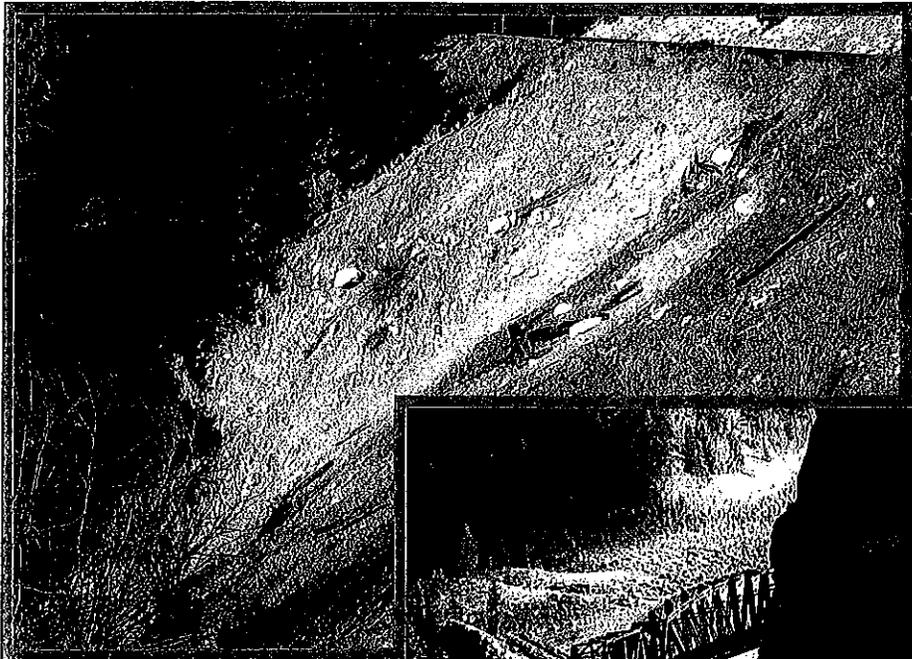
Access is also more difficult because the railways have covered or destroyed many fishing trails and fishing sites.

"My trails get wrecked from the railroad, because I have three trails to get here. We get told by the DFO when we can fish and when we can't."

– Peter Smith

Unstable water levels also make certain fishing areas unusable during parts of the fishing season. Some séytknmx do not share their fishing areas as was done in the past due to the dwindling resource of sqyéytn.





Sisqe? fishing trail
destroyed by train tracks
Photo: Forrest Sampson



Sisqe? Twin Bridges
Photo: Tina Edwards



Trail to Les Coutlee's fishing area
Photo: Forrest Sampson

"The trails have changed quite a bit because of the railroads. What they do on the railroad track it changes the trails every year."

- Les Coutlee



Nxézk^wutns

Fishing Gear

There are definite changes in the fishing gear and equipment used today compared to the past: The transition from "Homemade" to "Store" bought, the sizes and types of net, types of ropes, the net mesh material, floats, lead line, pack sacks/boards, knives, shoes, and the "where and how" sqyéytn is dried.

"We used to only use a sca?kn (set net) and a stuk^wcn (dip net). The nets were built at home, now we go to the store and buy the metal ones. The set nets and floats were made at home too, but now everyone buys them."

– Horace Michell

"We used the cow horns, certain kinds of wood but cedar wood was the best. My dad used to make his own lead line at home. We used straight cotton for our fish net making it easier to take the fish out- not like today's nets where they leave marks on the fish. Our needles were also hand made and little boards to make the different sizes of mesh for our net."

– Mary Williams

People have changed the way they use their gear due to availability, river access and the size of the sqyéytn returning. People are trying different methods to see what works in our ever-changing environment. Depending on the season the fishing gear is stored after it has had time to hang dry and has been repaired.

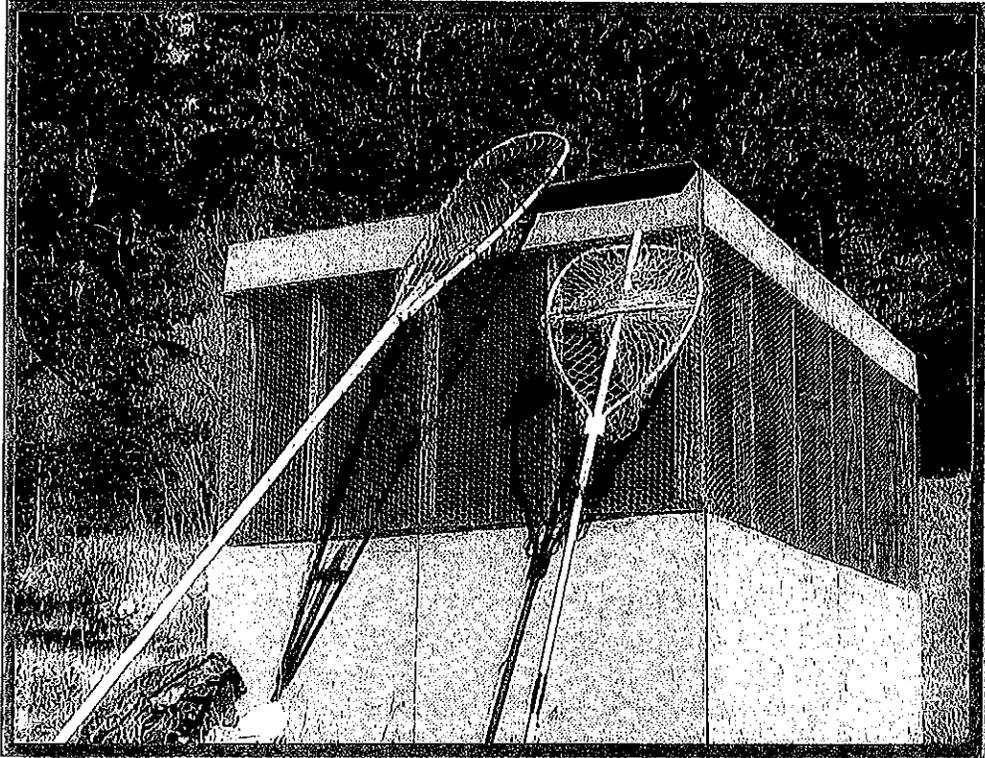
"We hang our net out for a couple of days so it can dry, be repaired, and then we bunch it up together, put it in a potato sack and store it in the cellar. The cellar stays cool and it keeps the bugs and rodents out so our net wouldn't get destroyed. We also repaired our net right away and did not leave it too long because that was the only net we had. We couldn't go and buy nets every time we needed one we just repaired the one we had."

– Mary Williams

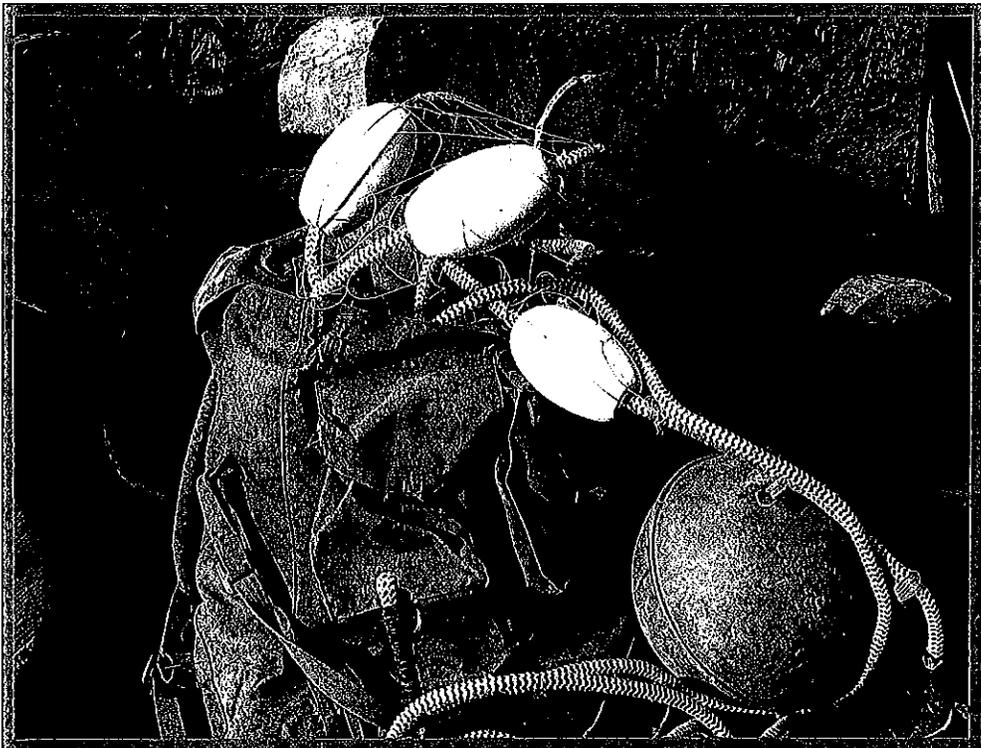
Some Nt'é?kepmx still store their gear in potato sacks while others use rubber totes. Nets are left at the river above the high water mark if the fishing is open to allow quick access. The nets are brought home if the fishing is closed, as nets are now being stolen and/or confiscated by DFO.

Long ago the Sca?kn (set net) and stuk^wcn (dip net) were hung in trees for other séytknmx to use and be put back in the same place for later use.

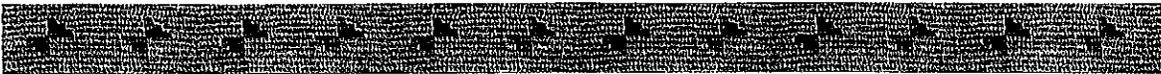




Stuk'cn (Dip Nets) hand made and store bought on a drying shed
Photo: Tina Edwards



Gill Net and ropes stored in packs after fishing season
Photo: Tina Edwards



C'iyt Hen Te Sqyéytn Ex ?úpitm

What Types of Fish are Eaten?

Séytknmx prefer to eat the Sxwá?es (Sockeye), K'wyí?e (Spring Salmon), and Swéw't (Trout). Few séytknmx (First Nations People) still eat Xwú?eá (Sturgeon) and Cós'wte? (Steelhead). In the past, the Sxáyqs (Coho) were caught and eaten but today we do not fish for this species because they are endangered and on the "NO" fishing list.

"The Cós'wte? (Steelhead) were fished in the winter by our people in the past because it was an important staple in our diet."

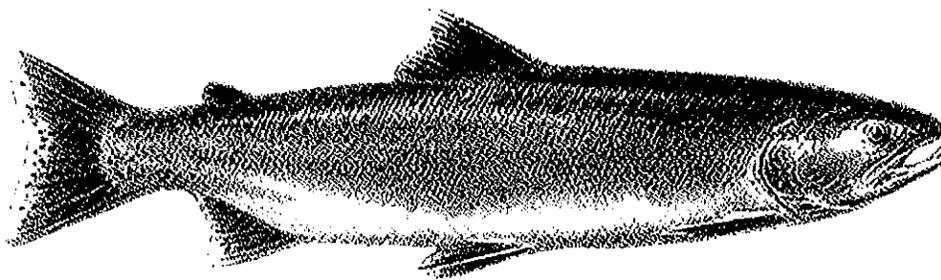
– Wesley Williams

"Ever since I can remember fish was our regular feed. Our grandfather had died in the slide at Jackass Mountain, so our grandmother only received a small pension of twenty-five dollars and that couldn't buy enough food to feed us all."

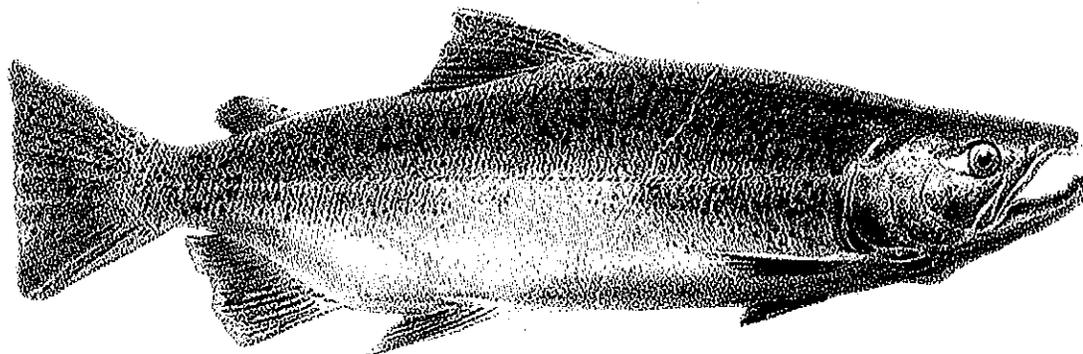
– Horace Michell

"My granny used to dry the Héni? but she had a hammer to crush it before she ate it."

– Maurice Michell



Cós'wte?
Steelhead

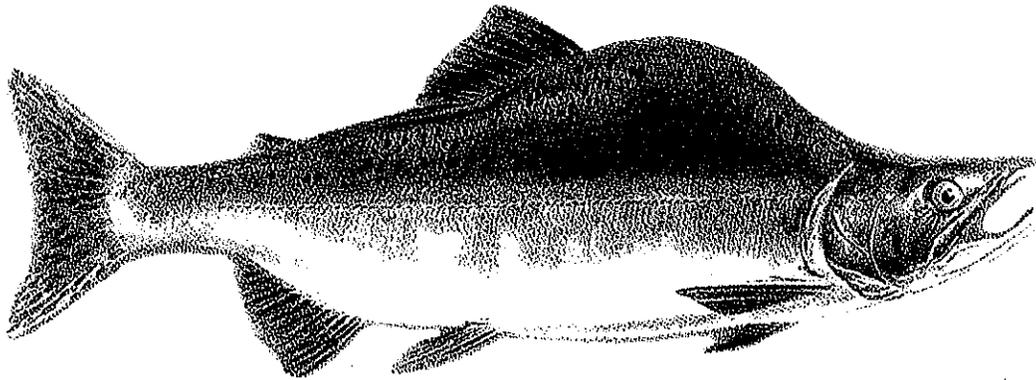


K'wyí?e
Spring Salmon

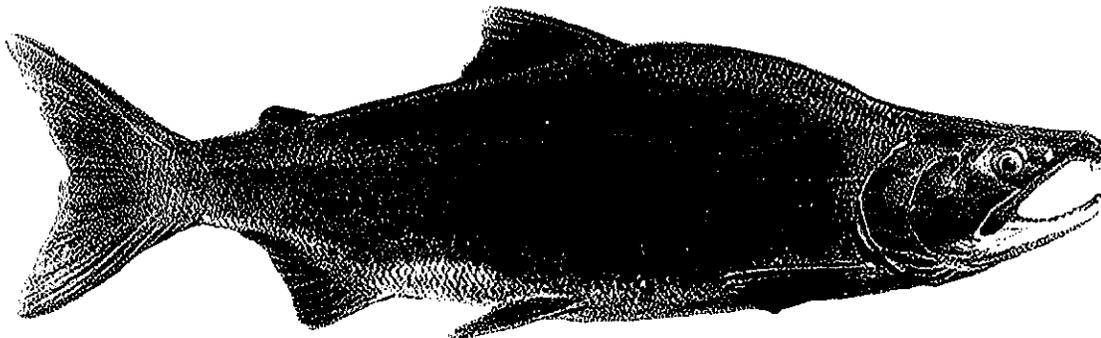


"I don't eat the dogfish and the Hení?, those usually only go up the Thompson River."

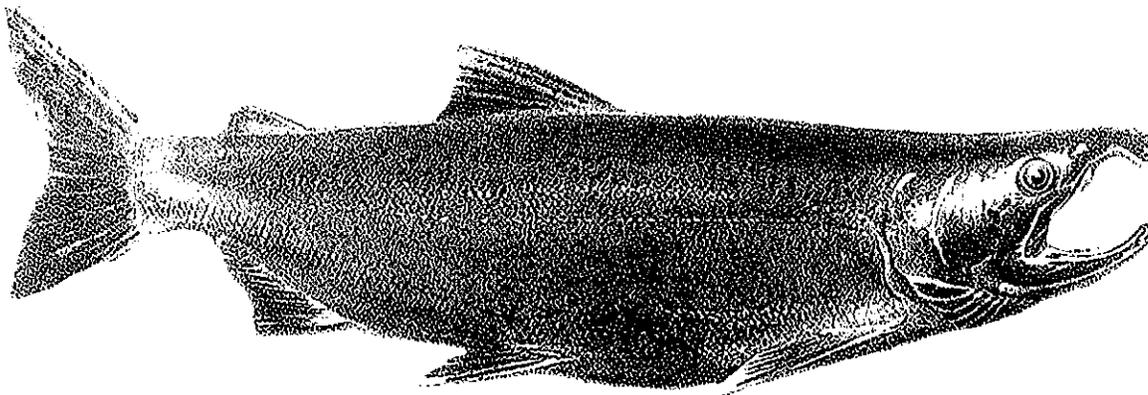
– Mary Williams



Héní?
Pink Salmon

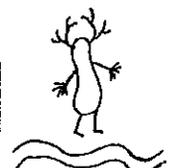


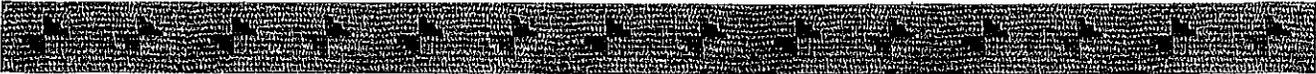
Sxwá?es
Sockeye



Sxáyqs
Coho

Spawning sqyéytn
Illustrations: Department of Fisheries and Oceans





Whén E C'axtis Us He Sqyéytn

Where They Clean Fish

Some séytknmx now clean their fish at the river and throw the sc'menk (guts) back in for the X^wú?eλ (Sturgeon).

"The séytknmx used to pack their fish from the river and bring them back home to clean, not like today."

– Mary Williams

The séytknmx use sc'menk for their gardens and to feed their dogs.

When we are finished fishing, our areas are cleaned before we go home so as not to attract animals or insects and to respect those who will be fishing after us.

– Tracy Sampson

Most séytknmx bleed their sqyéytn for ten minutes to four hours depending on the temperature and the fishing area. Bleeding the sqyéytn improves the quality. Depending on the processing method the sqyéytn are kept in or out of water until processed. Today séytknmx have to watch and inspect all sqyéytn before taking them home to eat. More and more sqyéytn show evidence of sea lice scars, cancer lesions, deformities such as missing a fin or a missing egg sac, and are just unappealing to the séytknmx.





Fred Sampson cleaning sockeye
at fishing area



Removes the sc'menk (guts)
and keeps the pne? (milt sac)
and ?ek'w'n (Eggs)
Photos: Tina Edwards



Ste? Tu^wx^w Sqyéytn Ex ?úpitm

What Parts Of The Salmon Are Eaten

Almost the whole *sqyéytn* continues to be utilized, depending on the type of processing. Some *séytknmx* (First Nations People) still compost the *sqyéytn sc'menk* (salmon guts). The *?ek'wn* (eggs), *pne?* (milt sac), *sx^wák^wuk^w* (heart), *nxcéc'mn* (liver), and the *sx^wámqe?* (fish head) are eaten.

"We used to eat the q^wune? (fermented salmon roe) and the áuy'sk^wy'e (fish oil). The sqyéytn that were caught in the morning were used for salting and those caught in the evening were used for drying."

– Horace Michell

The *sqyéytn á'eywn* (salmon skin) is eaten too depending on type of processing.

"Mom used to cut the sx^wámqe? (Fish head) almost in half, layer them in a cookie sheet type pan, put in the oven to bake until they were dry, so then they could be stored in the cellar for later use and would not spoil. This method keeps the oils in the sx^wámqe? (Fish head)."

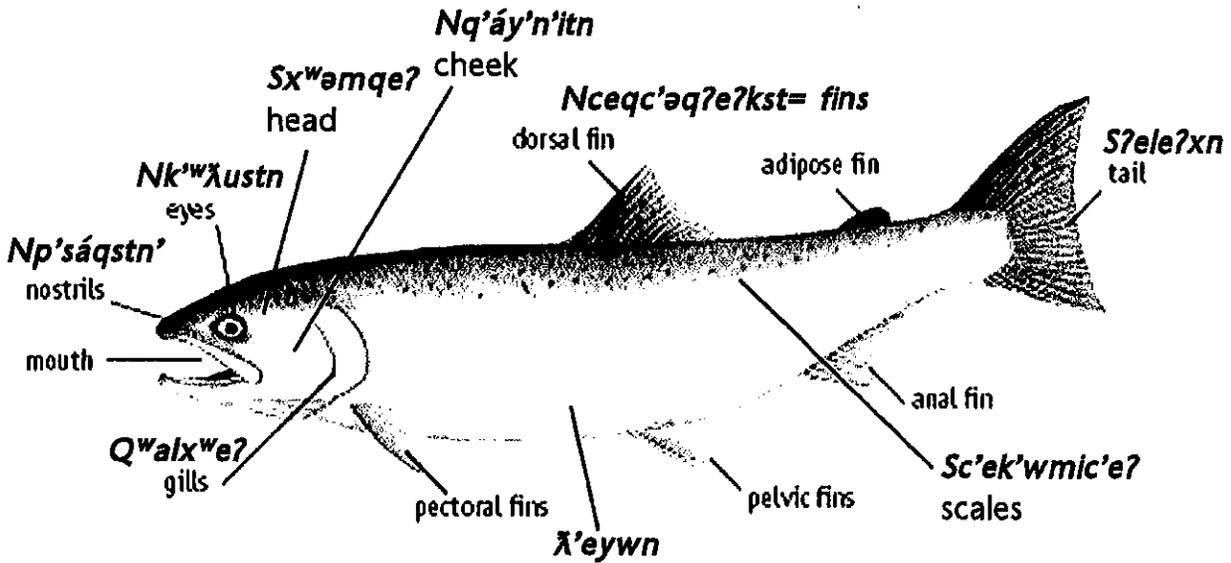
– Mary Williams

"Coho were used for canning because they are richer in fat and oil."

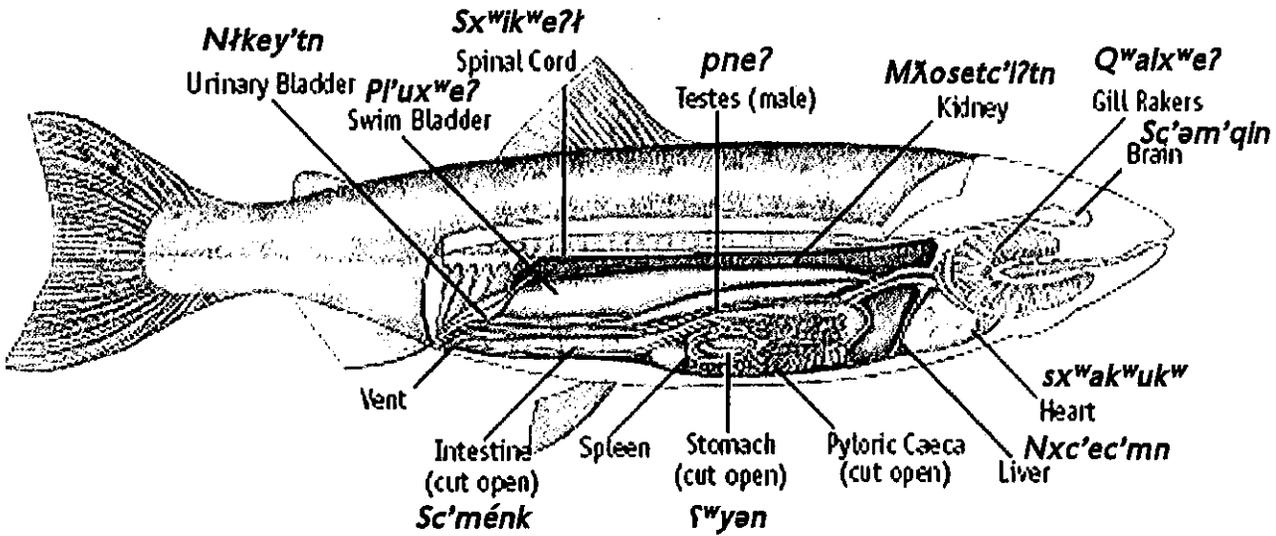
– Maurice Michell



Sqyéytn Anatomy



Sqyéytn Anatomy



C'əxʷʔuym̓s He Sq'éytn

Salmon Processing

The processing techniques have changed in these areas:

○ **Sc'uwén** (Dried Fish) - Weather has changed impacting the timing for xʷikm̓ (fish drying). When the sq'éytn are here, the weather is not right for drying outdoors.

Sq'éytn openings by DFO do not coincide when the sc'uwén (driers) are here.

Sq'éytn are cut differently, in the past with the bones in; and now they are filleted without the bones. In the past, c'əqʷʔiqʷ (saskatoon sticks) were used to hold open the sq'éytn. Cuts were made at an angle and the sq'éytn were hung by a hole made in the sʔéleʔxn̓ (tail). Cedar boughs were used for shade and controlling the temperature for the drying method.

In the past sq'éytn were dried next to river on t̓əmn̓f̓im̓n̓ (drying racks) now they are dried in a sc'uwén shack or in the home.

Different flavors are now used in the drying methods like cayenne, pepper or barbecue sauce.

Electric fans are now used to help dry fish, not just the wind.

"We used to only dry, can, smoke, or salt the sq'éytn because we had no freezer back in those days. The sq'éytn was always smoked separately because the fat content was different in every species"

- Maurice Michell

○ **C'altm** (salting) - Less people salt fish today Sq'éytn (Fish) was stored in crock pots/barrels with a heavy flat rock on top. Each barrel held maybe twenty-five fish in one crock in the cellar.

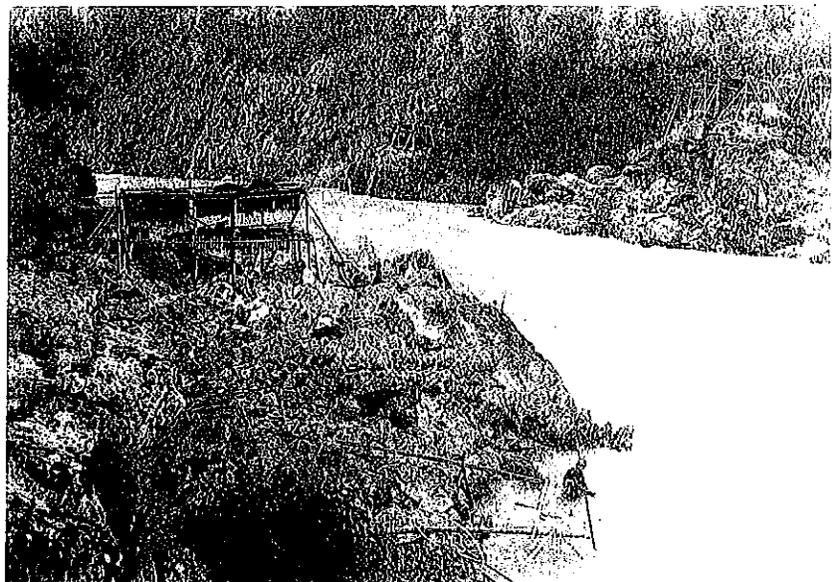
○ **Canm** (Canning) - Tins were used long ago now jars are used

○ **P'úmes** (Smoking) - People now use old fridges, store bought smokers and smokehouses are being built behind the home instead of down at the river.

○ **Pás'wes** (Freezing) - The vacuum-sealed fish lasts longer and freezers are more utilized today. In the past, freezer paper was used instead of a vacuum sealer.

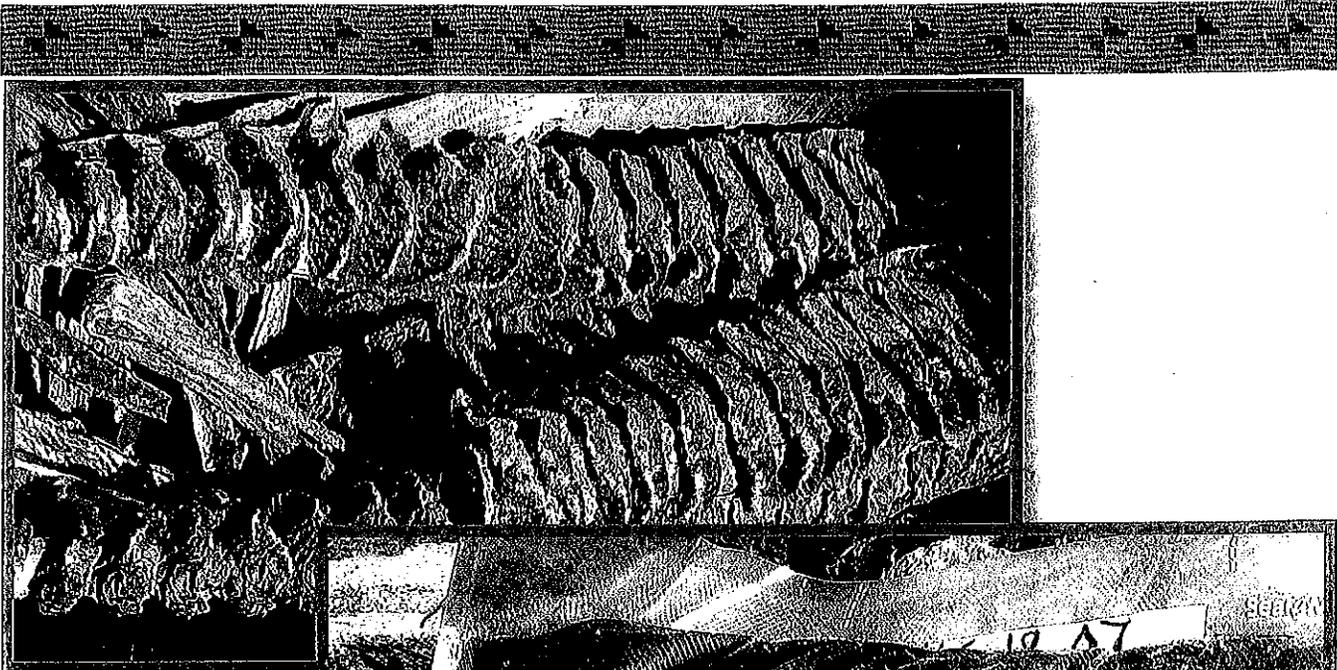
○ **Q'wúneʔ** (Fermented Salmon Roe) - Séytknm̓x use rotted out stumps lined with fir boughs to hold the q'wúneʔ throughout the winter time.

○ **Scécim̓** (Storing Methods) - have changed from the past because all the sq'éytn used to be stored in a cellar not like today's various storing methods - the freezer or in the basement.



t̓əmn̓f̓im̓n̓ (drying racks) near Slwash on the Q'wúy (Fraser River)
Photo: Royal BC Museum





**Páʻes (freezing) –
The vacuum-sealed
sqʻeytn lasts longer
Photo: Tina Edwards**



**For Canm (canning) tins were used long ago now jars are used
Photo: Tina Edwards**

Y'cín

Nutrition

Salmon is a mainstay in the Nte?kepmx diet. Where access was limited like the Coldwater and Merritt, fish are traded and families go fishing on the Qwu?uy (Fraser River) and Qwu?m'ix (Thompson River) to catch enough salmon for the year.

Elders remember eating salmon three times a day, and some youth remember eating salmon three times a day. However, in the past decade the ability to fish has declined drastically due to fish closures. Elders believe this is impacting the health of their communities:

"We kept our health, there was no one with diabetes at that time or cancer, you just died of real old age, now a days you don't see that, people dying because they are old, they are young and they die."

– Mary Williams

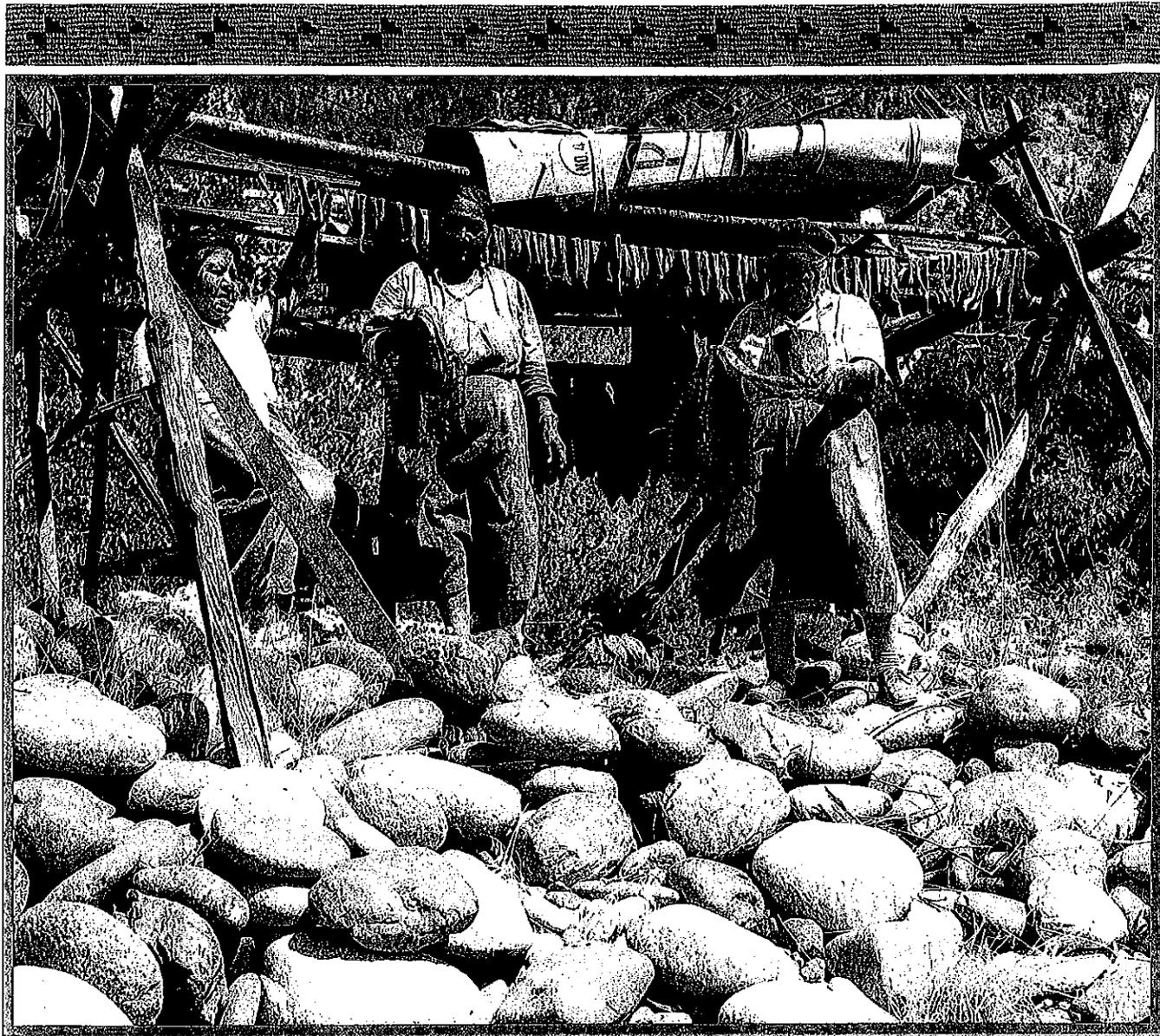
Eating sqyéytn with a balanced diet, including other traditional foods, help séytkm'x to be strong people. The oils in the salmon keep your skin healthy, from getting dry, from forming acne and make your hair strong and shiny. Salmon oils are mainly in skin and fattier parts of the fish and are mostly made-up of omega-3 oils. Scientists have shown by eating wild salmon one to two times a week the chances of heart disease are reduced by 25 percent. The omega-3 oils in salmon also help prevent and manage obesity, diabetes and inflammation.

● The salmon omega-3 oils also improve brain function. It is important for childbearing women and nursing mothers to eat fish once to twice a week before and after birth for the baby to have healthy brain development. At four years of age, children's social, visual and language abilities were greater if their mother's diet included high omega-3 oils during and after pregnancy.

● Salmon minerals give us energy and stamina, and maintain our immune system. These minerals found in salmon are in even higher concentrations in the ?ek'wn (eggs) and pne? (milt sac). One of these minerals is iron. Iron is also important for pregnant mothers so their babies can grow in good health, reducing the risk of downs syndrome or other illnesses.

● The bones of canned salmon benefit bone and teeth health because of the high calcium and phosphorus content. Salmon is very high in vitamin D, which is needed to absorb calcium. Calcium and vitamin D help to prevent cancer.

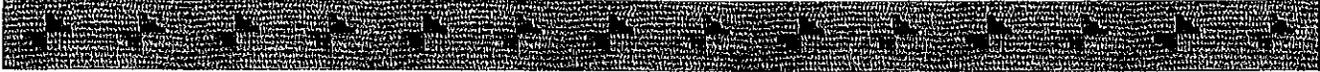




St'at'imc Women showing sc'uwén (dried fish) processing in the 1950s. This sc'uwén method cuts sqeytn along the backbone. The sides are kept open using c'aq'ʔiqʷ. This type of sc'uwén keeps the backbone and sx'amqəʔ (head) attached in the drying process. The backbone and sx'amqəʔ are stored for sc'uwén soup. This method stores more nutrients and is less wasteful than the modern sc'uwén method.

Photo: Royal BC Museum





Spzú? Eł Stuytúymx Nɔkustn

Plant And Animal Indicators

The animals and flowers of the plants and trees around our homes are indicators for when the sqyéytn (fish) are here.

"We used to sit outside, Mom and Dad would be telling a story then we would hear the bird go sp'iq'w - sp'iq'w, and dad would say the bird is telling us the fish are coming. We have to get our fishing gear ready. There was a little bird used to tell us when to go fishing. It would go up and down the river and it would go running around the edge of the river. Another indicator was when the berry turns pink it would be time for this fish to be coming up the river."

– Mary Williams

Salmon now come up the river periodically, varying from run to run. Sqyéytn indicators used by séytkmɔx to predict and sustain the runs include:

"When the Mock Orange blossomed my grandmother, Suzanna, would say 'Now is the time to go fishing for Spring Salmon. We have let some fish go through for the Up-River People for their food and some fish for the spawning grounds'."

– Chief Fred Sampson

"There was indicators for the sockeye, the spring, the humpbacks."

– Horace Michell

"My granny and mom told us that when we first start fishing in the spring time to watch out for the thimbleberries because soon as they flower and soon as the Hékwu? (Cow Parsnip) start growing the Kw'y'í?e (Spring Salmon) should be in the water. We watch out for the mock orange flower then the Sx'á?es (Sockeye) should be in the water. The bird called Sp'iq'w (Nighthawk) soon as they start diving to the ground they say the Sx'á?es (Sockeye) should be in the water too."

– Maurice Michell



"I used to count around eleven bears on the other side of the river but now I only see the odd one."

– Virginia Bleakney

The *sqyéytn* were more predictable some time ago than today.

Séytknmx have said, there are fewer animals, such as bears, seagulls, and eagles around the fishing areas that depend on salmon. There are less animals and insects around the fishing areas because of the decrease in numbers of fish coming up the river.

It depends on what time a person is fishing whether there are insects present. In the morning it is cooler and they usually come around when the sun reaches the water. In the evening there are more sand flies and more black (deer) flies because it is warmer. The heat in the summer also determines the amount of insects around the fishing areas.

Indicators

E nk'emuyqnmus e sp'iqwes λ?eks e sx^{wá}?es

When the nighthawk dives the salmon are here.

λ?eqas e sx^{wá}?es

Lots of Sockeye

E p'áq'muse e sləkm es λ?eks e sx^{wá}?es

When the thimbleberry flowers the Spring Salmon are here

E p'áq'muse e waxzəlp es λ?eks e sx^{wá}?es

When the Mock Orange flowers the Sockeye are here

E cmi?me?tus e móc'e x^{wi}? x^{wi}?it e sqyéytn

If the bees are small that means there is going to be lots of fish

E xzúmus e móce tetée x^{wiks} x^{wi}?ites e sqyéytn

If the bees are big there is not going to be much fish

E wikt xus e sləkt x^{wi} λ?ekt e q^{wu}?úy

When you see the ants with wings the Fraser is going to flood



?eszeyk'w Surrounding Environment

The environment has changed drastically due to human impacts. The railroads encroachment, logging and damming rivers in séytknmx territory marked the first environmental impacts threatening the sqyéytn since the late 1800s. In Nte?kepmx Territory, "The Hell's Gate Disaster of 1913" was a huge landslide caused by explosions detonated during railroad construction. The debris destroyed the only resting place for sqyéytn, making it impossible for sqyéytn to pass. The séytknmx packed the sqyéytn over the slide and built flumes for the sqyéytn so they could make it back to their spawning grounds. The ingenuity, courage, and perseverance of séytknmx

saved the Q'u?uy (Fraser River) sqyéytn.

Today expert fishers identified many more threats to the salmon including:

Industry- Factories, logging, farming, and illegal dumping of Hazardous/non-hazardous waste, oil spills from ships and vehicles, railways and derailments, hydro extracting power from the water sources, and building dams - changing the water temperature and flow.

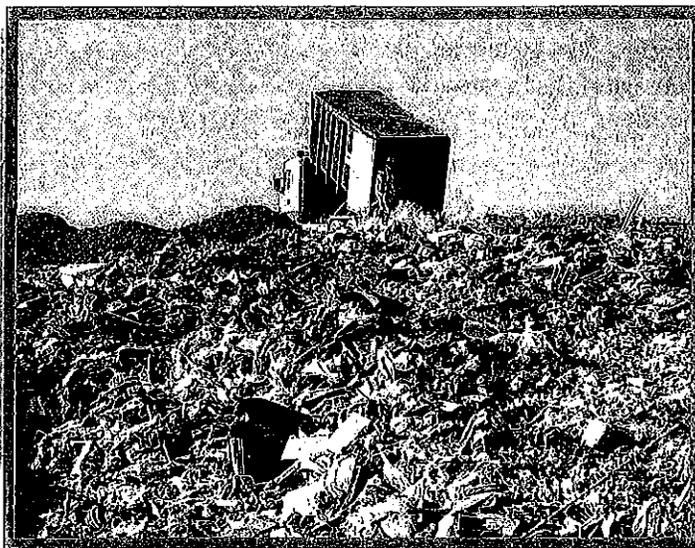
Development- Highways, bridges, roads, and culverts, sewage poorly treated and untreated, and dumps placed too close to water sources leaching toxins into creeks, streams,



Oil Spill Clean Up
Photo: Foggie Gee



Logging debris in Q'u?uy
Photo: Tom Ayres



Garbage truck dumping garbage into landfill
Photo: Mattias Olsson, Sweden



lakes, and rivers. Over use of water resource from farms and water bottling plants.

Fish Farms – Sea Lice Infestation to smolts migrating to the ocean, Escapement of Atlantic salmon into Wild Pacific Salmon Habitat

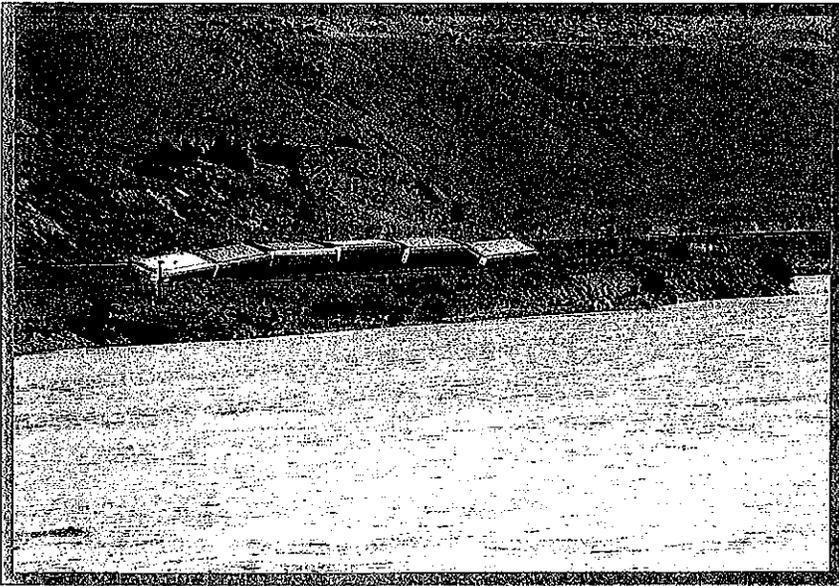
Exhaustion of Natural Resources- The Mountain Pine Beetle Infestation, Spruce Bud Worm Infestation.

Weather – Climate change, global warming, ozone depletion, snow levels lower than usual, water temperature, and water flow.

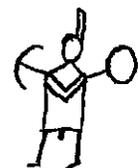
Séytknmx continue to protect and defend the survival of the sqyéytn.



Log booms in the Q'u?uy (Fraser River) near New Westminster
Photo: Dennis Sylvester Hurd



Train derailment on the Q'u?m'ix (Thompson River) September 2008
Photo: Tom Ayres



ʔe Sc'kenm Et Nɣk'wén'kn's He Sqyéytn Et He Qwu?

Quality and Quantity of Fish and River Health

There have been more drastic changes in the quality and quantity of the Qwu? and the sqyéytn in the last 30 years from human impacts. The sqyéytn population has been affected and continue to decline drastically. Many sqyéytn runs have become extinct because of the way the resource is being managed.

"We used to hang maybe two to three hundred dried fish."

– Mary Williams

"I remember when I was little and came fishing with my dad, we used to see the fish swimming by and we used to catch three hundred in a day really easy. My granny and my uncle used to sit at the drying rack all day and cut fish into sc'uwen while we caught and packed the fish to them."

– Maurice Michell

The river stability has changed drastically over the years. The snow melts too quickly early in the spring, affecting the water level, which also plays a factor in its width and depth. Then in the summer the water level is lower than usual.

"We used to get longer winters and we had more snow in the winter times long time ago."

– Horace Michell

"We can see the rocks around my fishing spot where we couldn't see them a few years back."

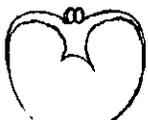
– Chief Fred Sampson



Lower Nɣezumétk'u (Sísqə? Creek)
Photo: Danielle Michell



Upper Nɣezumétk'u (Sísqə? Creek)
Photo: Tina Edwards





The river water was drinkable over thirty years ago but is definitely not today.

“The river was a whole lot cleaner when I was a teenager. The fish were shinier and bigger back then. They were firmer back then but today they are mushy, not bright red but a pale pink. The tummy is not as firm but sloppy today. The eggs used to be bigger, thicker, and more there.”

– Mary Williams

The river quality and water temperature has changed due to human impact.

“The temperature of the water used to be really cold now the water is warm.”

– Maurice Michell

Each stream and creek is important because the fish use them to clean their gills and cool their body temperature. The N \acute{x} ez \acute{u} metk w u is the strongest temperature bearing (coldest) creek in the Q w u?uy (Fraser River) System.

All Q w u? (Water) is sacred to the S \acute{e} ytknmx.

“All water is sacred and treated as such. Water is very important to us. Water is a part of our women’s names because of its importance.”

– Chief Fred Sampson

“The women are the backbone of our nation as they are the givers of life just as the river is the giver of life. Water has to be treated with respect as it is the giver of life but it can also be the taker of life. The river is the backbone and the creeks are its ribs. Grandmother told me never to go to the river to cleanse myself but to go to the creek because the water comes from the top of mountain and is more clean and fresh. Sundance Chief told him to pray to the water because without water we would not have fish. Without water we don’t have anything as the water helps the earth grow. Water is our blood-without water there is no life.”

– Glen Michell

“Water and cedar tree branches are best tools for a spiritual person to help an ill person get better.”

– Mary Williams





?e Sc'kenm He Sqyéytn

Salmon Quality

Sqyéytn quality has changed in their size, weight, colour, thickness and taste.

“The sqyéytn are less healthy now because of environmental factors, pollution from rafters, and who knows what is actually going into these rivers now.”

– Glen Michell

The sqyéytn are now smaller, scabbier, less firm and blotchy. Depending on the Q^wu? temperature their flesh can be mushy in texture. Some females are missing one of their egg sacs. Their eggs have changed in color from bright to a pale pink. The size of their egg sacs is smaller.

“The temperature has gotten warmer about five years ago and about four years ago the fish looked like they were cooked from the warm water, we didn't know if we should eat it or not, but we ate it.”

– Virginia Bleakney

Nhé?kepmx have noticed more Atlantic Salmon (farm fish), and other fish of different colors, sizes, width, and species that they could not identify.

“Back in 2004, the water was so warm I remember fishing and seeing some of the salmon going belly up down river, it was sad. One year I noticed that there were long white worms in one fish I caught.”

– Peter Smith





**Ustko and Glen Michell at age twelve with the first spring he caught himself at Nahamanak 1950s
Photo used with family permission**



ǻ'éyes He Zew'm

Fishing Closures

The fishing closures affect the fish supply.

"The closures affect the fish supply because the time allotted only allows for a limited time and we get a small catch or either the fish are not running at this time."

– Glen Michell

In the past there were no closures, no Department of Fisheries and Oceans, no jobs, no welfare, there were more sqyéytn runs and species to catch. Fish closures were unheard of in the past, not like today.

"In the late nineteen thirties there was no closures on fishing. Fishing was open year around them days."

– Horace Michell

Closures over the last year by Department of Fisheries and Oceans have the same actions of a child's toy Yo-Yo™: On one day, off the next, up, down, off, on etc. This makes it impossible for First Nations to know when fishing is open. Therefore many people missed the small window of opportunity to fish.

Announcements of Communal licenses should be at least seventy-two hours prior to the opening or closing of the fishery. Communal licenses today do not meet the requirements of the Indigenous Peoples' needs.

Today there are depleted stocks of fish and more environmental effects on the water of all streams, creeks, rivers, and oceans. Nǻ'é?kepmx fish less than in the past because of DFO closures and depleted stocks. The health of the river also affects the amount of time people fish.

Nǻ'é?kepmx fishing begins in the early morning, ranging from four until around noon (depending on weather conditions, water temperature, and the number of fish coming up the river), then in the evening from five until dark. Nǻ'é?kepmx used to catch more fish in less time, process more fish, and had more time for fishing than today. Nǻ'é?kepmx depend on the sqyéytn for sustenance and trade.

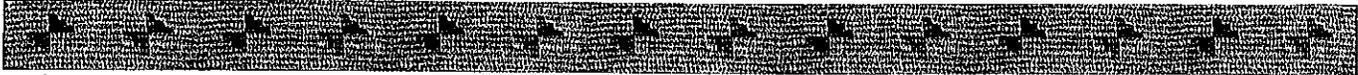
Department of Fisheries and Oceans and industry assume control over our fish resources. There were more fishing opportunities long ago for trade, Nǻ'é?kepmx Gatherings and ceremonies, and food. Now Nǻ'é?kepmx are allowed fishing very few days. Some Indinegous Peoples are not allowed to fish at all.

The Department Of Fisheries and Oceans have inaccurate forecast calculations to the point where the media wrongly informed the public of séytknmx overfishing and stealing fish. To this day media have not retracted their accusations or informed the public of their misinformation. Indigenous Peoples are forced to fish in other territories because of DFO mismanagement. In 2007, for example, the Northern Secwepemc First Nations came to fish at Nicomen because so little fish were returning to their fishing areas.

"I've gotten in trouble by DFO and spent four years in court for the lack of communication on the openings of fishing."

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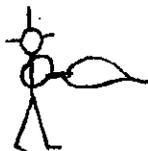
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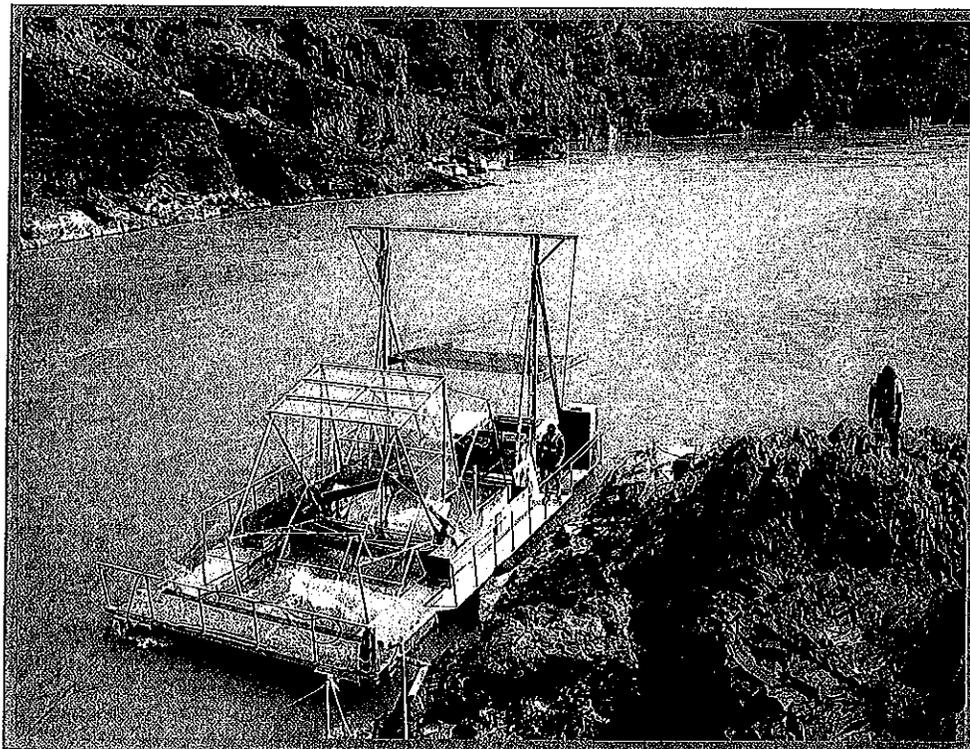
Zoq^wnełn

Salmon Poisons

With the changes the séytknmx are witnessing in the health of the sqyéytn, there is a growing concern about the quality of sqyéytn eaten.

Siska Traditions Society is concerned about exposure to contaminants by eating sqyéytn during the up-river migration of sqyéytn in the Q^wu?uý (Fraser River) and Q^wu?m íx (Thompson River) basins. The Sísqe? Sqyéytn eł ǎ'u?sqáy^ws Suméx Scúws (Siska Salmon and Indigenous Peoples' Life Work) research answers these concerns by measuring contaminants in Late-timed Spring Salmon (South Thompson), Late Summer Adam's River Sockeye and Weaver Creek Sockeye. Sísqe? measured contaminants at three points in up-river migration of each sqyéytn run- At the mouth of the Q^wu?uy (Fraser River), mid-river and at the spawning grounds. Sísqe? tested for heavy metals, PCBs (Polychlorinated biphenyls), dioxins and furans (PCDD/Fs- Polychloro-dibenzo-p-dioxins and furans) and pesticides in raw and cooked sqyéytn, and ʔek^wn (eggs).

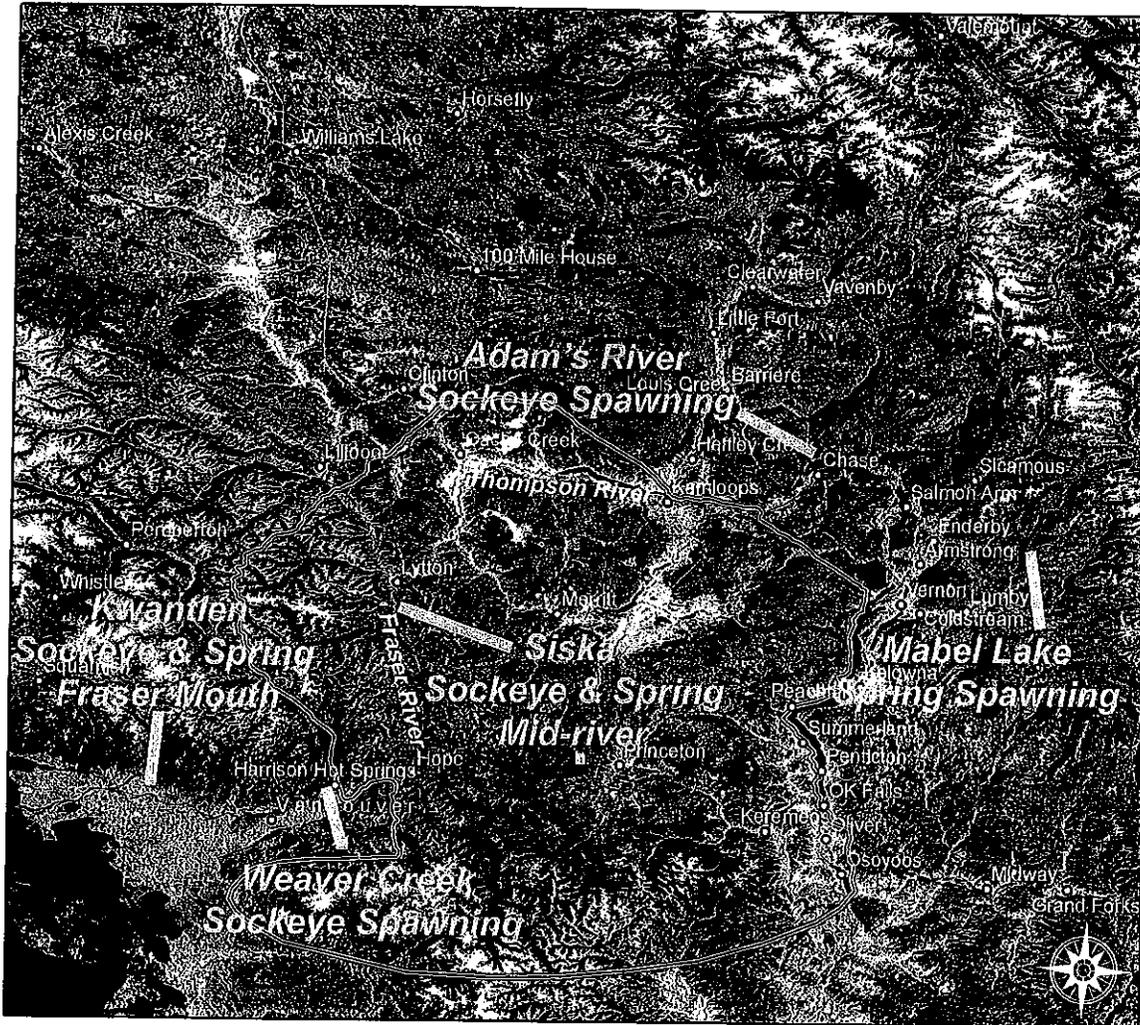
Nłe?kepmx expert fisher's testimonials combined with the ability to test the contaminants in sqyéytn gives us greater power to take action to limit the amount of contaminants entering our waterways and protect our health.



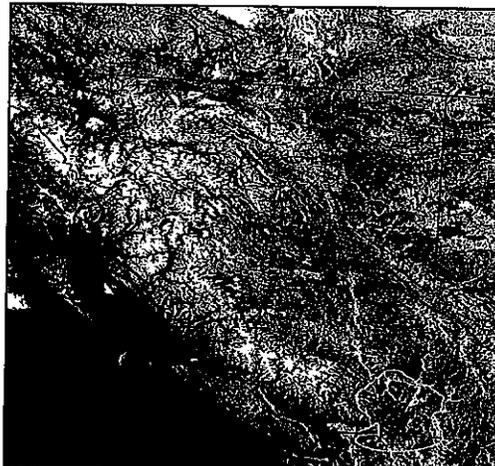
The Sísqe? Fishwheel is used to monitor salmon returns, the fish wheel was used to sample salmon for this project. The fish wheel is not used for food fishery because Sísqe? community members want to maintain Nłe?kepmx fishing methods and related cultural knowledge. Photo: Dave Patterson, Environmental Watch Team, DFO



Sisqé? Sqyéytn eł ǂ'u?sqáy^ws Suméx Scúws Sampling Sites



— Nle?kepmx First Nation Territory



Esh-kn-am
Cultural
Resources
Management
Services



Təx^wtox^wt Scúw

Honourable Work (Research)

To ensure honourable research the Siska Research Committee guided the research process.

- *In respect of neighboring First Nations territories-* Permission was requested to enter the Sto:lo and Secwepemc Territories to catch salmon for research.
- *In relevance to Siska community-* Youth and Siska community members worked throughout the project.
- *In responsibility to the sqyéytn-* Conservation and the food fisheries took priority before catching fish for research, all fish caught during this project were caught from existing fisheries.
- *In reciprocity to the river and the neighboring nations-* No salmon was wasted, a piece of the sqyéytn and the ʔek^wn (roe) were used for research, the sqyéytn flesh was given to elders, the bones and sc'menk (guts) were offered back to the river or made into fertilizer. All salmon caught in neighboring territories was given to that First Nations' Elders.



Sísqə? Research Committee Members:

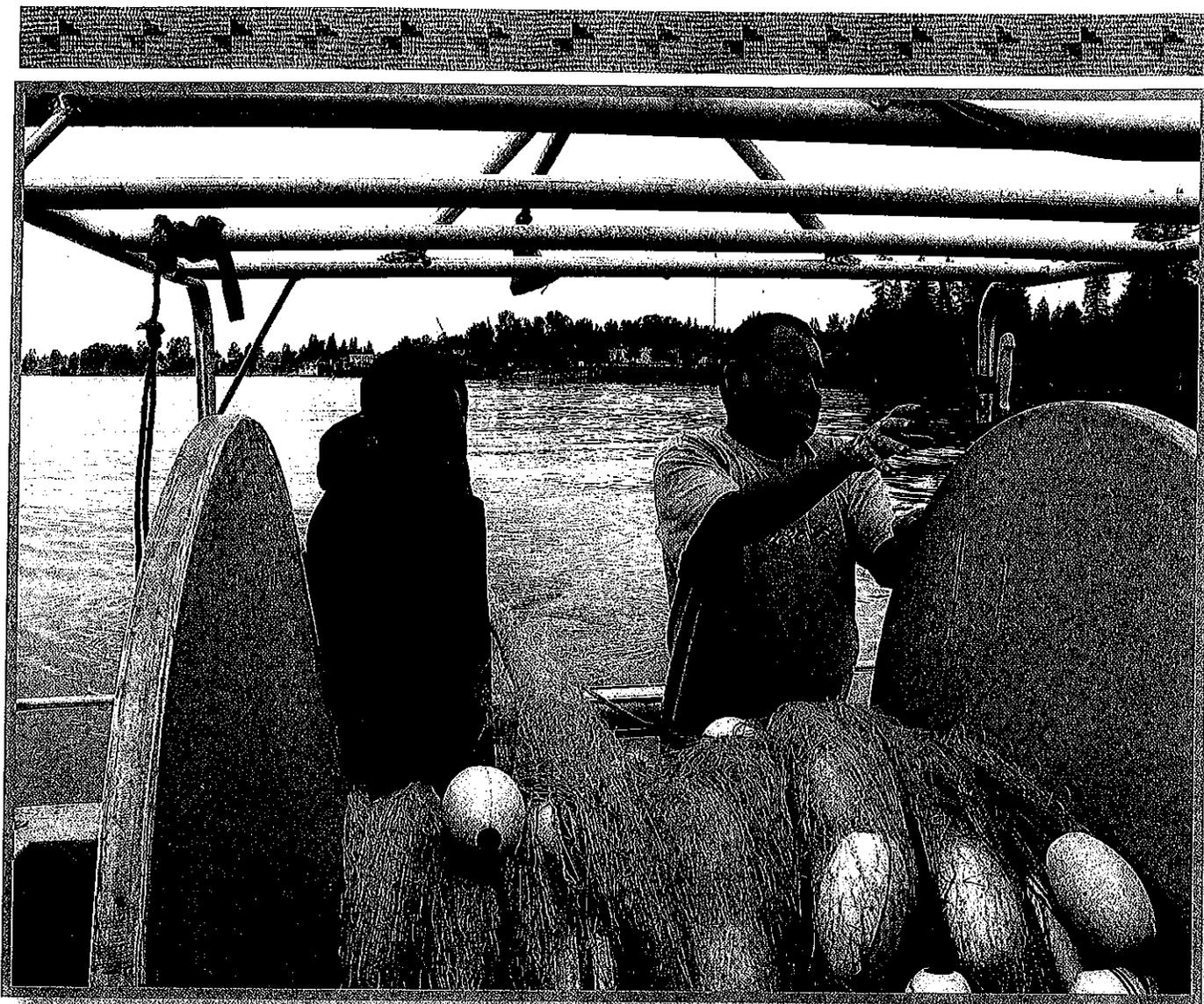
Horace Michell of Nahamanak-
Sísqə? elder and expert fisher

Mary Williams of Lytton- Elder,
retired Community Health Worker
and expert fisher

Betsy Munro of Sísqə?- Sísqə?
Band Councilor

Charlie Michell of Sísqə?- Youth
representative and
Sísqə? Fisheries Department
Photo: Nancy MacPherson





Sisqe? fished with Lekeyten and Brandon Gabriel (In photo) and Cheryl Gabriel at Kwantlen, Sto:lo First Nation. Les Antone helped organize fishing and gifting the salmon to community elders.
Photo: Nancy MacPherson





Mi?tés E Xəkstes

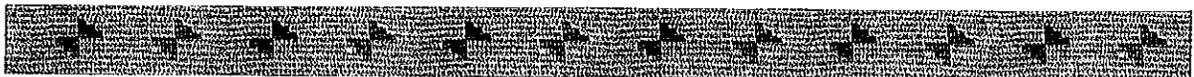
Knowledge Sharing

The exchange that took place when working with other First Nations was powerful. We have learned the different ways of the river and the variety of fishing technology that was perfected according to the river conditions from the mouth of the river to the spawning grounds. Coming together as expert fishers from Kwantlen of the Sto:lo First Nation, Spalts'in of the Secwepemc First Nation, and Sísqe? of the Nt̓e?kepmx First Nation raised awareness of the same struggles and of the same changes witnessed.

“It is just like the buffalo, they just keep taking, soon there won't be any left. There is so much overfishing, salmon farms, development, they want to allow oil tankers in prime salmon habitat and migration routes, and here in the lower mainland you have the Gateway Project. The spring salmon spend a year in the Fraser River between Sto:lo territory into Coast Salish Territory past Musqueam and Tsawwassen before going out to the ocean. These are tiny fry, they depend on each little slough, ditch, stream and creek. Paving and culverting streams will destroy that habitat, what impact and how much pollution will enter the waterways with that traffic right on top of the Fraser River. We know the impact the Gateway project, how can they go ahead with it?”

– Les Antone, Kwantlen First Nation of the Sto:lo Territory

Coming together at the grassroots level brought strength and enthusiasm to each person's own culture, ceremonies, and knowledge, as well as an opportunity to share expertise in fishing techniques. At Kwantlen, the Sísqe? research team worked with Elders and community members at the dock cleaning and gutting the salmon after the day of fishing. Kwantlen Elders honoured the research team by presenting a paddle, carved by Wes Antone, for working to protect the sqéytn.



Zoq^wneṭn

Poison- What is poisoning our environment?

An environmental contaminant is an impurity or a zoq^wneṭn (poison). We most often think of chemicals or materials from industry, agriculture, vehicles and sewage as contaminants. Contaminants also include species or actions that poisons the natural environment.

The Atlantic salmon as a species is a contaminant to the Pacific Ocean ecosystem and a threat to wild salmon stocks. Atlantic salmon fish farms contaminate the environment by producing toxic waste below pens, breeding disease, and breeding sea lice that kill migrating wild salmon smolts. Three sea lice can kill a smolt. In 2006, fish farms had an escapement of 90,000 Atlantic Salmon. Why is this a threat? Farmed fish will spawn in our systems and take over our pacific wild salmon species.



Pink Salmon smolt with sea lice attached, caught in the Broughton Archipelago
Photo: Alexandra Morton

The action of logging contaminates the environment. As the earth becomes unstable, erosion increases, and more silt and tree debris enters the waterways disturbing spawning ground and sqyéytn fry habitat. Silt filled waters make it difficult for sqyéytn, especially fry, to breath through their gills. Logging increases the water temperature and decreases water level stability in streams, creeks and rivers.

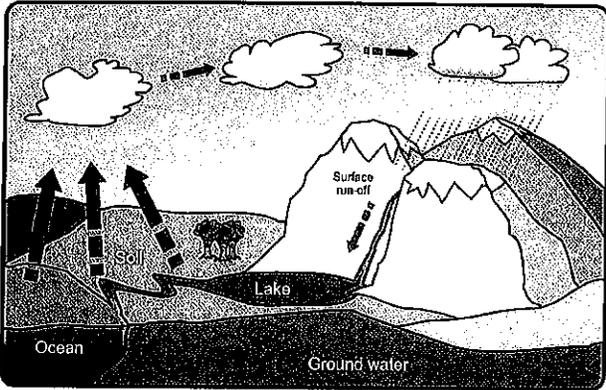


Sísqe? measured contaminants called persistent chemicals. Persistent chemicals do not break down in the sun, air, water or earth for hundreds or even thousands of years. Some examples of persistent chemicals are heavy metals, plastics and some pesticides. Chemicals released into the environment bioaccumulate (build up), moving up the food chain from the air, water and earth to the plants, insects, fish, birds and animals. The bigger the animal, and the longer their lifespan, the more contaminants build up in their bodies. Usually metals build up in mus-

Clearcut and slash pile
Photo: Mea Duva



cle and organs while organic chemicals like pesticides, PCBs and dioxins build up in fat. Even though contaminants are found in microscopic levels they can impact human health over the long term because we are at the top of the food chain.

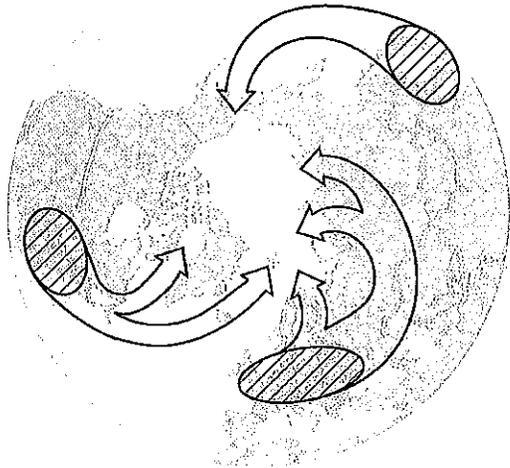


Water cycle
Graph: HMS Endurance Tracking Project-
<http://www.visitandlearn.co.uk/Portals/0/Water%20Cycle.jpg>

Many contaminants are released through gas or smoke and can be transported far distances by clouds and then fall as rain into all water systems. Contaminants can also evaporate from water systems, move up into the clouds and then fall in other areas. This transport tends to concentrate contaminants in northern and colder areas, where contaminants are trapped in the cold ground, snow or ice and no longer evaporate into the atmosphere. The Circumpolar Indigenous Peoples, of the far north, have some of the highest contaminant levels in their territories as a result.

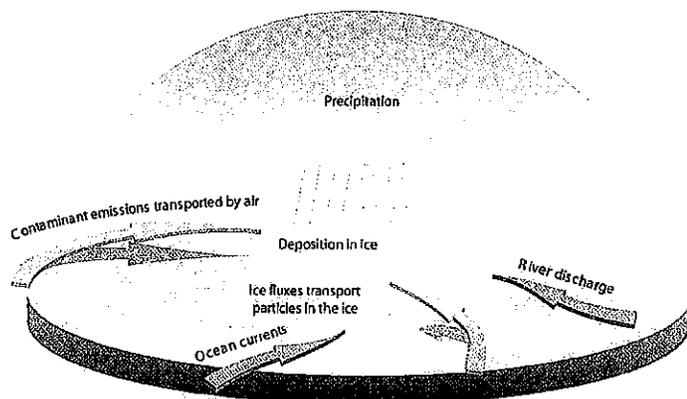
The contaminants are reported in parts per billion. One way to visualize one part per billion (ppb) is to think of one drop of water in one billion drops of water or about one drop of water in an olympic-sized swimming pool (50 m x 25 m x 2 m). One part per million (ppm) is about one cup of water in an olympic-sized swimming pool.
 1 ppb = 1 microgram in 1 kilogram (1ug/kg)
 1 ppb = 1000 parts per trillion (ppt)= 1 nanogram in 1 kilogram (1 ng/kg)
 1 micro gram (ug) = 0.00000001 kilogram (kg)
 1 kilogram= 2.2 pounds

Dominating air currents



Central industrial areas

Contamination pathways



Source: ANAP 2002, ACIA 2004

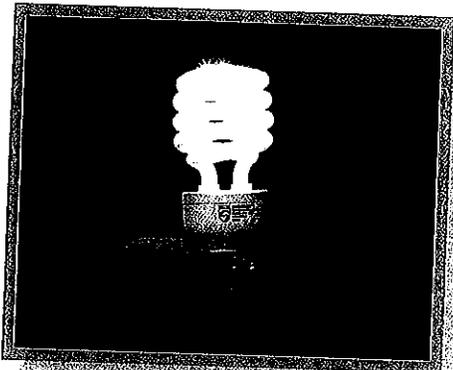
Arctic dominant air currents from major industrial areas
Graph: Philippe Rekacewicz, UNEP/GRID-Arendal
<http://maps.grida.no/go/graphic/long-range-transport-of-air-pollutants-to-the-arctic>

Pathways of contaminants to the Arctic
Graph: Hugo Ahlenius, UNEP/GRID-Arendal, Norway
http://maps.grida.no/go/graphic/pathways_of_contaminants_to_the_arctic



Zoq^wnefn Heavy Metal Poisons

All living beings have trace amounts of heavy metals in their bodies including iron, copper, cobalt, manganese and zinc. These metals are essential to life. However some metals such as mercury, lead, arsenic and cadmium are toxic to life.



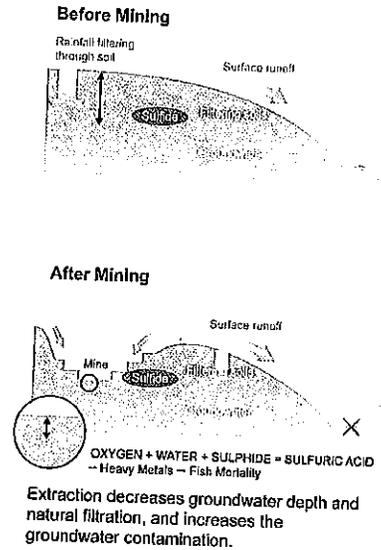
The mercury in one fluorescent bulb is 20 milligrams. If mixed with 20,000 liters (5,000 gallons) of water, the water would be contaminated beyond drinking water limits.
Photo: Erica Marshall of muddyboots.org

Heavy metals end up in the environment through mining or the disposal of mining products. We all enjoy the benefits from the mining industry; we drive cars, use stoves, computers, as well as electronics with metal components and we wear jewelry made of metals. We also have the responsibility to ensure that waste like batteries, fluorescent bulbs and electronics that contain mercury, lead, arsenic and cadmium are disposed of safely, so that they do not leak toxins into the ground and waterways.

The government also has the responsibility to make mining operations clean up their contaminant waste. British Columbia has 8,000 toxic waste sites, the most of any province in Canada. Many of these abandoned mines and toxic waste dumpsites are a high risk to the environment. BC taxpayers are often left to pay for the toxic waste clean up after the mine shuts down. While mining companies gain short-term economic benefit exploiting First Nations territories, it is the local communities that are left with the long-term impacts to waters, lands, animals, birds and fish. Mining in BC is skyrocketing since the BC government began allowing companies to stake mining claims through the internet in 2005.



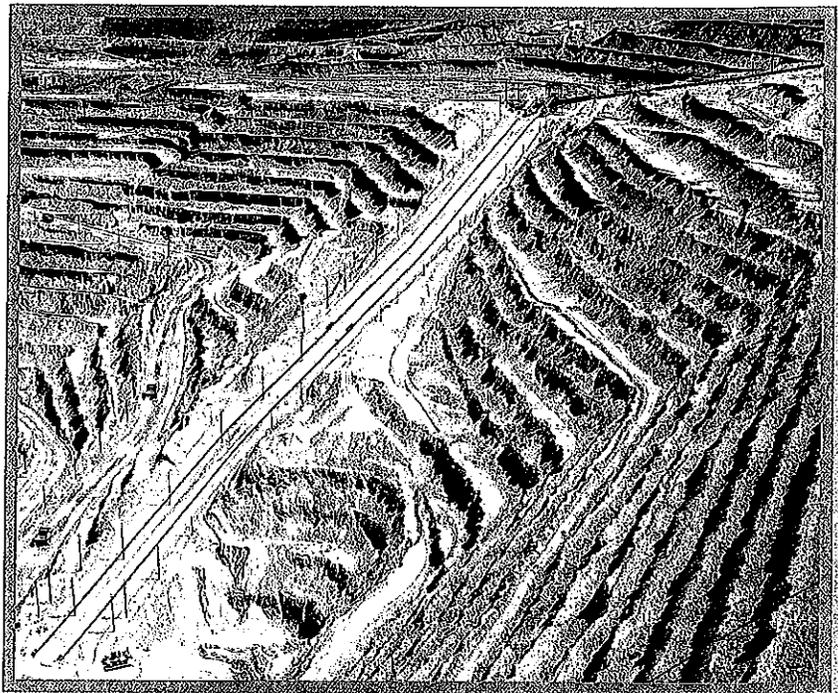
Batteries contain heavy metals, in a landfill they can leak toxins into the ground and water. We have the responsibility to make sure they are recycled or brought to a safe disposal depot.
Photo: Paul Watson



Mining effects on rainfall drainage. The Acid Mine Drainage (AMD) is the number one environmental problem facing the mining industry. AMD occurs when sulphide-bearing minerals in rock are exposed to air and water, changing the sulphide to sulphuric acid. It can kill fish, and once started, can continue for centuries (Roman mine sites in Great Britain continue to generate acid drainage 2000 years after mining ceased). Acid mine drainage can develop at several points in mining: in underground workings, open pit mine faces, waste rock dumps, tailings deposits, and ore stockpiles. (Reference: Miningwatch)
Graph: Philippe Rekacewicz, UNEP/GRID-Arendal, Norway
http://maps.grida.no/go/graphic/mining_effects_on_rainfall_drainage

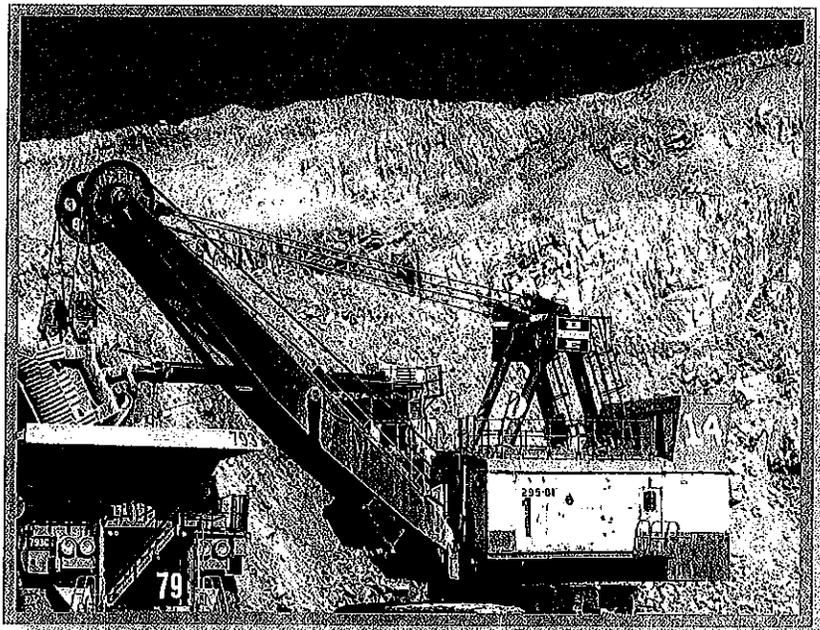


Imperial Metals, the company behind the Red Chris Mining Venture, is an example of disrespect for local environments and communities. Imperial Metals is proposing to turn fish-bearing lakes into toxic metals tailings impoundment (waste site). This is possible because DFO changed the Federal Fisheries Act in 2002 to allow lakes to be reclassified as "tailings impoundment areas" changing its longstanding policy against polluting fish habitat. The courts ruled that Natural Resources Canada and Department of Fisheries and Oceans acted illegally to exclude Tahltan elders, and public participation in the Red Chris Mining environmental assessment process. This example shows the problems with the current environmental assessment process in BC. The current closed-door process needs to be transformed into an independent public panel environmental assessment review. First Nations' knowledge of ecosystems' health is necessary to the environmental assessment process.



Open Pit mining leads to Acid Mine Drainage, this open pit mine is the Highland Valley Copper Pitwall- Logan Lake, Secwepemc Territory
Photo: Gord McKenna

In Nt̓eʔkepmx Territory, there is a proposed coal-bed methane mine for the Princeton area. The mine is opposed by Princeton Band, Nt̓eʔkepmx First Nation. Coal-bed methane mining contaminates a huge amount of groundwater and also creates acid mine drainage, and releases toxic arsenic into the waterways. Burning coal releases mercury, dioxins and many other contaminants into the air. The First Nations Summit is calling for a moratorium on all coal-bed methane mining in BC.



Highland Valley Copper Pitwall- Logan Lake, Secwepemc Territory
Photo: Gord McKenna

The Tahltan Peoples are successfully protecting the sacred headwaters of the Stikine, the Nass and the Skeena, the most productive salmon bearing rivers in Northern BC. Shell wanted to build a coal-bed methane mine in their sacred headwaters. Now after protesting



ten years, and many arrests, the Tahltan are joined by local and federal politicians, the Union of BC Municipalities and the First Nations Summit in opposition to the project. The watershed is still not protected, but there is a two year moratorium on coal-bed methane mining. This example teaches us how local, provincial and federal government can learn from, and work together with First Nations, sharing responsibility to protect the land for the benefit of all people.



Northwest BC residents gather outside the BC government building in Smithers to hear people from the Tahltan First Nation talk about Shell's coalbed methane development.

Photo: Pat Moss



The Sacred Headwaters of the Stikine, the Nass and the Skeena
Photo: Brian Huntington



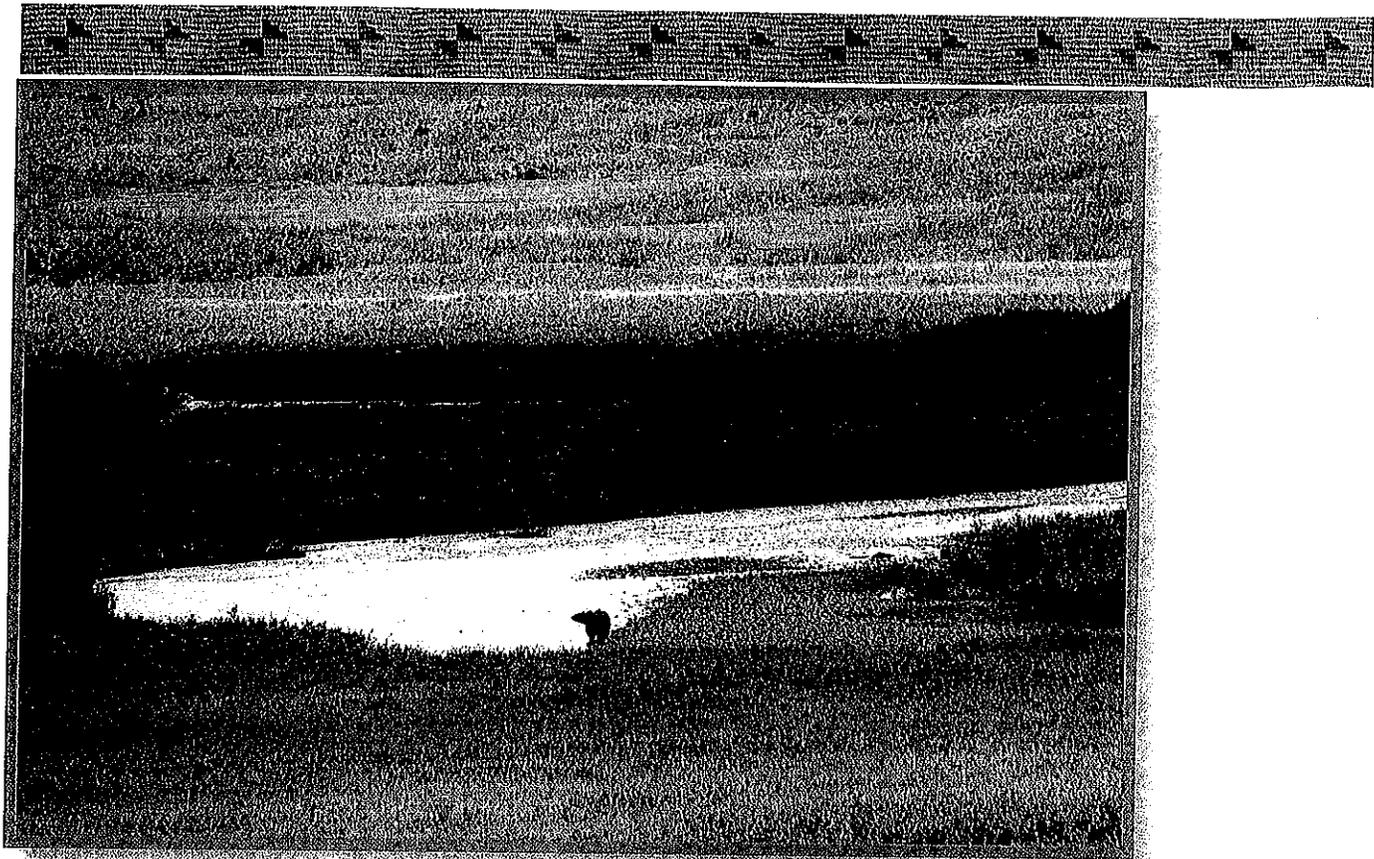


Photo: Brian Huntington



Photo: Brian Huntington

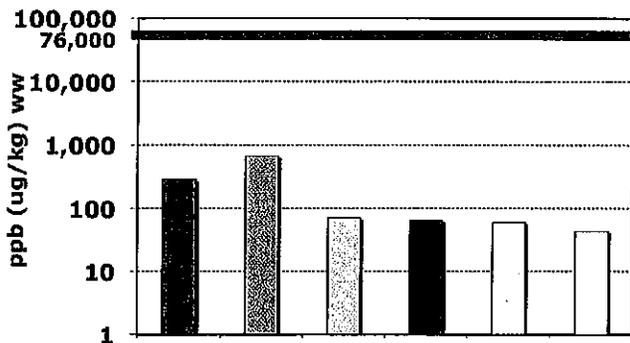


The *Sisqé? Sqyéytn eł ʔuʔsqáy*'s *Suméx Scúws* found that the salmon measured all had heavy metal levels well below the maximum limits for sale. For mercury and cadmium, fruits and vegetables had similar or higher metal levels than the wild salmon. Wild salmon had slightly higher arsenic and lead levels than beef, pork or chicken. In BC a major source of arsenic is creosote or wood preservatives. DFO reports that creosote use increased significantly in the 1990s, now making up 66 percent of all pesticides sold in BC. Creosote is applied almost all within the Fraser and Thompson Basins. Arsenic and lead impact *sqyéytn* health in changes to growth, behaviour and reproduction, and possibly death.

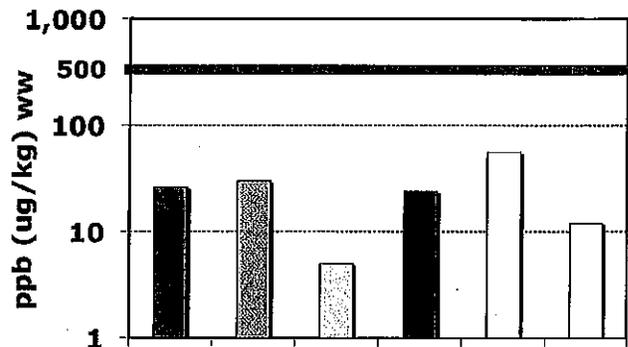
The graphs below compare the average total heavy metals ppb (ug/kg) in Fraser River *sqyéytn*, to store bought foods, to the maximum allowed limit for retail sale (represented by thick red line) and. Heavy metal levels measured are for mercury-26.1ppb (limit- 500 ppb); arsenic-280 ppb (limit- 76,000 ppb); lead-237 ppb (limit 1500 ppb); cadmium- 49 ppb (limit- 3000 ppb).

- Limit for fish sale
- Wild salmon
- ▨ Farmed salmon
- Chicken, pork and beef
- Fruit and vegetables
- Honey
- Eggs

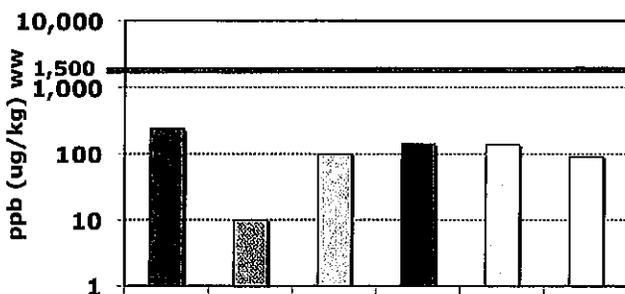
Arsenic



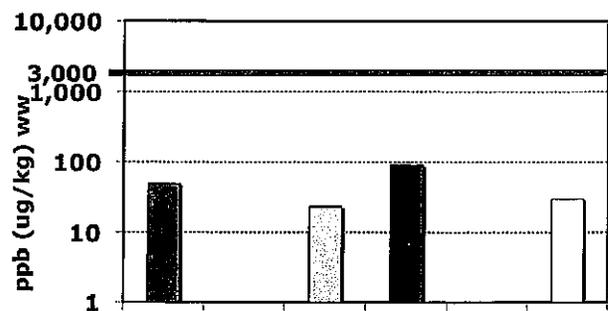
Mercury



Lead



Cadmium



Wild salmon
Farmed salmon
Chicken, pork and beef
Fruit and vegetables
Honey
Eggs

Wild salmon
Farmed salmon
Chicken, pork and beef
Fruit and vegetables
Honey
Eggs



Zoq^wnełn

PCB Poisons

PCBs (short for polychlorinated biphenyls) are a group of 209 different chemicals that are fire resistant, do not conduct electricity and do not break down for hundreds if not thousands of years. PCBs were mainly used by industry as a cooling fluid, fire retardant, and insulation for electrical equipment, as well as hydraulic and lubricating fluids, plastics, paints, and asphalts.

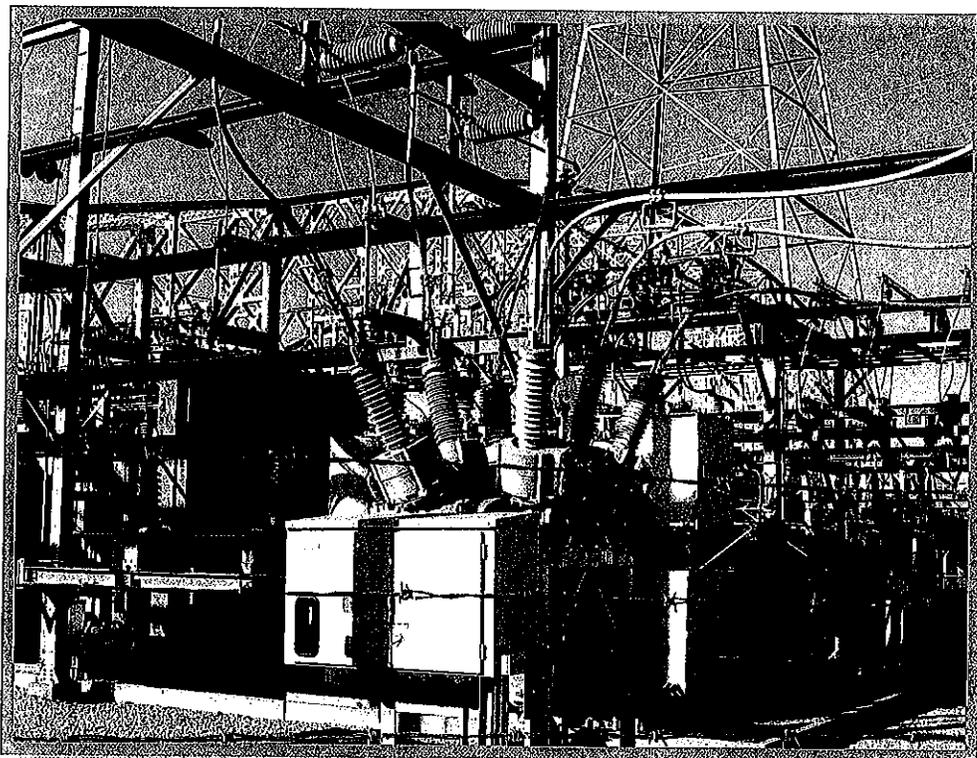
Health Canada reports over 24,000 tons of PCBs are still in use in Canada and 16 million tons have been released in the environment by disposal into landfills and waste sites.

The first impacts of PCBs on human health were experienced by workers manufacturing PCBs for the US company, Monsanto, in the 1930s. Health impacts included extreme acne, liver disease and cancer. Monsanto produced half of the PCBs in the world. Despite

dangers for workers and the environment, Monsanto and others continued producing PCBs into the 1980s when most industrialized governments banned their use.

In 2004, fifty countries worldwide signed and ratified the Stockholm Convention to ban PCBs and the so-called dirty dozen chemicals including the most toxic chemicals produced. Indigenous Peoples of Turtle Island played a significant leadership role in the creation of the Stockholm Convention.

The Sísqə? Sqyéytn eł ǎ'u?sqáy^ws Suméx Scúws found that levels of PCBs in wild salmon caught at the Fraser Mouth and in Spawning grounds of Secwepemc Territory were lower than most store bought foods.

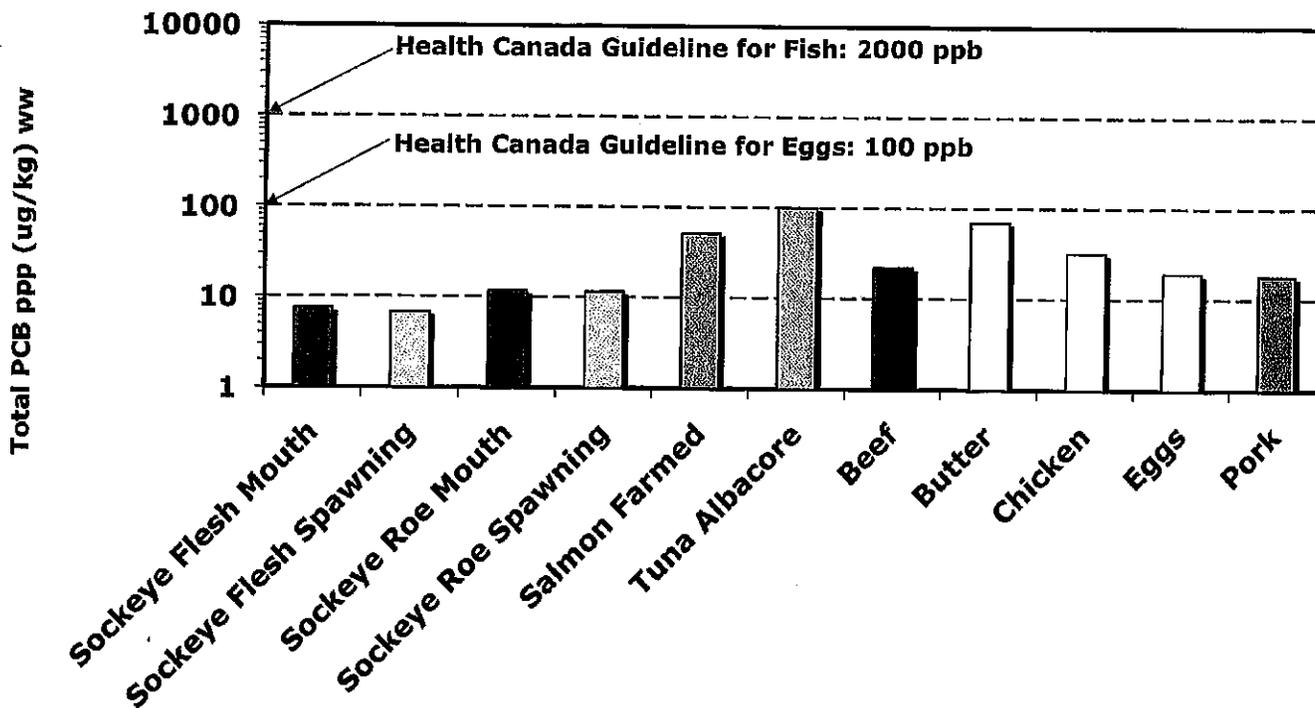


Electric Transforms used to be made with PCBs as a coolant. Many transforms still have PCBs in there parts. 24,000 tons of PCBs are still in use in Canada.

Photo: The Joy Of The Mundane Blog



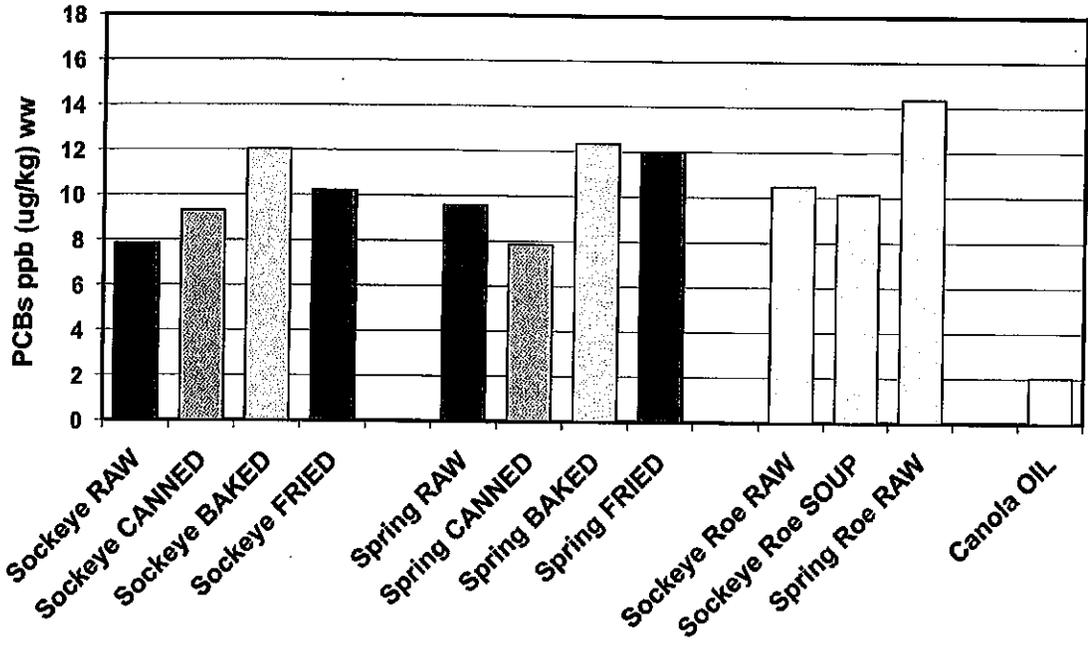
Average Total PCB ppb of Fraser River Sockeye Salmon 2007 Compared to Store Bought Foods



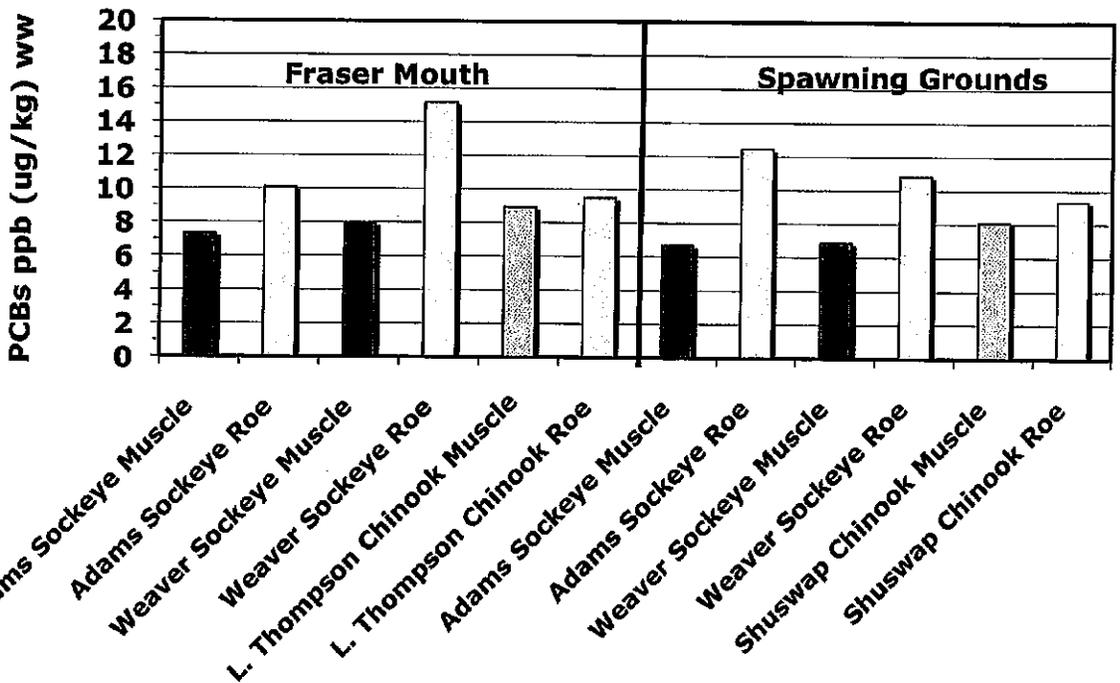
The sockeye shown in this graph are the average of the Adam's River and Weaver Creek sockeye. The PCB measurements for store bought foods are from an article published in the Journal of American Medical Association by Mozzafarian and others in 2006.



**Average Total PCBs ppb (ww) for Siska (Mid-Fraser River)
Raw and Cooked Sockeye and Spring Flesh and Roe Samples**



**Average Total PCBs ww Comparison in Wild Sockeye and
Spring Salmon from Fraser River 2007**



Both at Siska and the spawning grounds there was a higher concentration of PCBs in the roe than in the flesh of sockeye and spring salmon. When the salmon migrate up the river they are transferring energy and fat reserves into the roe, so the PCBs and dioxins stored in fat are also transferred into the roe. This impacts the survival rate of salmon eggs.



Zoq^wnefn

Dioxin and Furan Poisons

Dioxins and furans are common names for the toxic chemicals polychlorinated di-benzo-dioxins and furans. The 210 different dioxins and furans are related to PCBs (polychlorinated biphenyls). Dioxins are one of the most toxic chemicals known to humans and was one of the Agent Orange chemicals used in the Vietnam War. Health effects related to high levels of dioxins and furans include skin disorders, liver and immune system problems, hormone and reproductive functions, nervous system and some types of cancers.

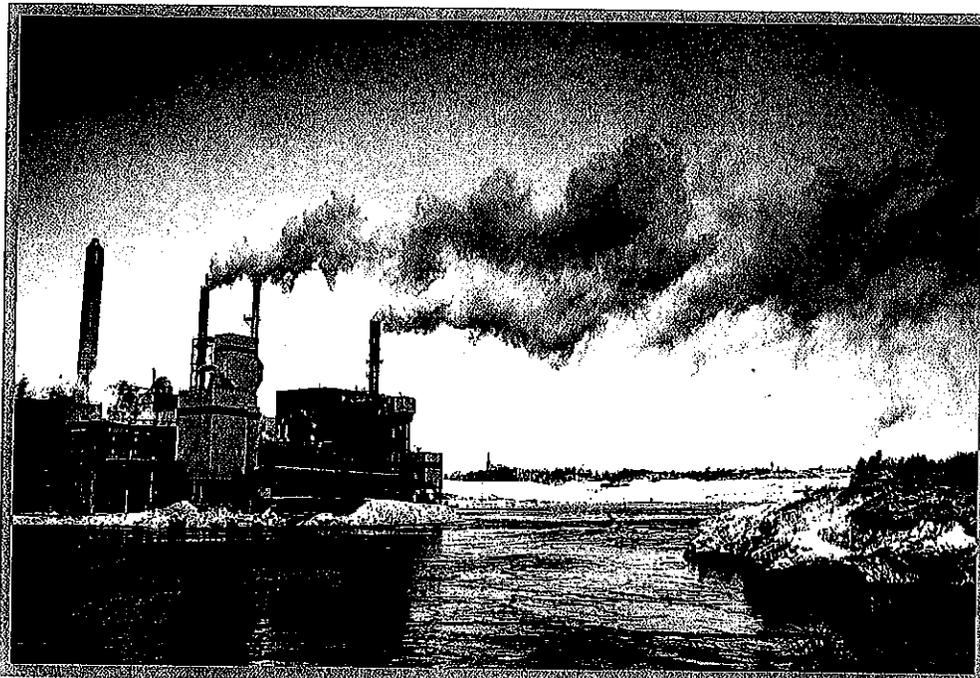
Most dioxins and furans are released by industrial activities such as waste incinerators, coal-fired power plants, pulp and paper mills, and production of iron and steel. Forest fires and volcano eruptions release some dioxins and furans into the environment. Our household activities also contribute, including backyard burning of household waste, especially plastics (plastics, styrofoam, piping, and computers all contain PVC- polyvinyl chloride that turns into harmful dioxins

when burned), gas fuel, diesel fuel, wood burning and even cigarette smoking.

The burning of salt laden wood in British Columbia's coastal pulp and paper boilers is one of the largest sources of dioxin and furans in Canada. In the early nineties it was found that the dioxins and furans released at pulp mills, from the bleaching process, were killing the sqyéytn smolts. Large public campaigns pressuring the government for more strict regulation has resulted in eliminating 90 percent of the dioxins and furans being released into the waterways.

Continued action includes the key role Indigenous Peoples play in The Stockholm Convention- An international treaty signed between 122 countries, to phase out the group of poisons that includes dioxins and furans. Canada has decreased dioxin and furan release by 60 percent since 1990.

Ninety percent of our exposure to dioxins and furans is through diet. Meat, dairy and egg have higher levels of dioxins and furans than wild salmon. The dioxin levels in wild salmon were lower compared to store bought foods shown in the graph following.

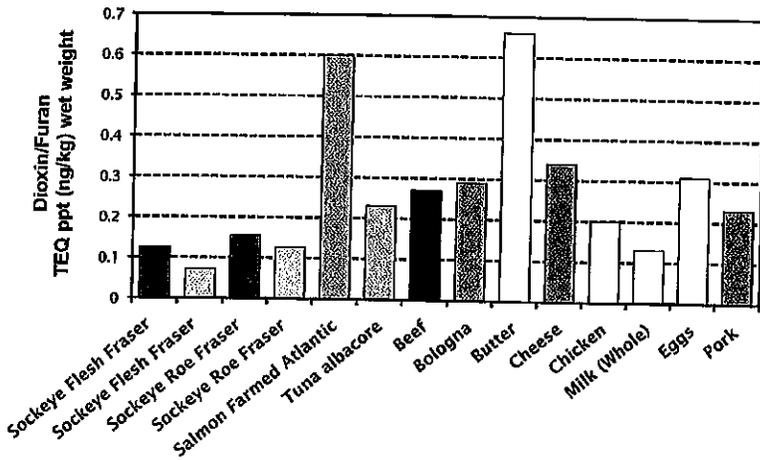


Incinerators, pulp and paper mills, coal plants, cars and other burning activities release dioxins and furans into the air.

Photo: Sean McGrath



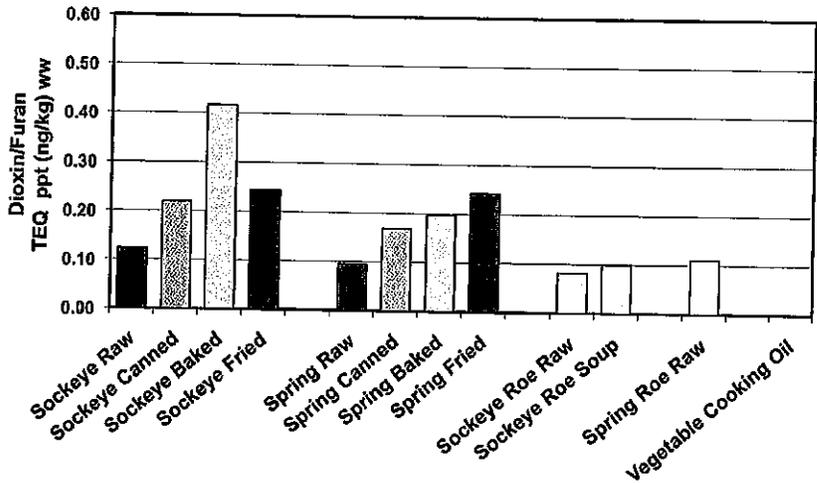
Average Total Dioxin/Furan TEQ (ppt) ww of Fraser River Sockeye Salmon 2007 Compared to Store Bought Foods



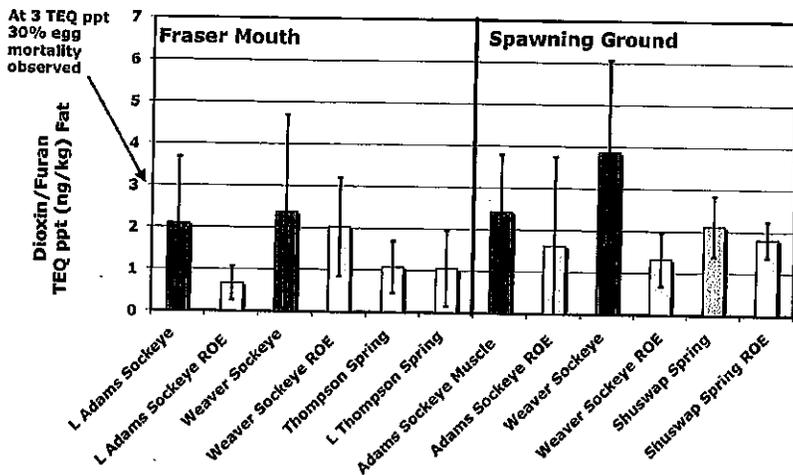
Dioxin and Furans are measured in TEQ- or Toxic Equivalent Factors. The Toxic Equivalent Factor is calculated by adding the toxicity of each of the 209 dioxins and furans. The TEQ is measured in parts per trillion (ppt), this is 1000 times smaller than parts per billion (ppb).

The increased concentrations of dioxins/furans for baked and fried sqyéytn is from water evaporation. The cooking oil (canola oil) had very low dioxins.

Average Total Dioxin/Furan TEQ ppt (ww) for Siska (Mid-Fraser) Raw and Cooked Sockeye and Spring Flesh and Roe Samples

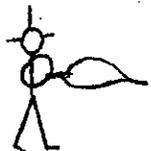


Average Total Dioxin/Furan TEQ ppt Fat (Lipid) Comparison Between Wild Spring and Sockeye from Fraser River 2007



Dioxin levels in sqyéytn are considered low for human health standards, but there is concern for sqyéytn health. Dioxin levels are high enough to kill sqyéytn ?ek'wn (salmon eggs). The average dioxin/furan level we measured in roe is below the 30 percent mortality range- 3 TEQ ppt Fat. However the thin black bars, representing the range of individual samples, show some individual sqyéytn ?ek'wn samples were above the 30 percent mortality range.

Currently the Department of Fisheries and Oceans does not consider these impacts when making predictions of returning salmon populations.



Zoq^wnefn

Pesticide Poisons

Chemical pesticide use began 60 years ago, following World War II, when chemical companies were searching for another use of chemical weapons. Originally the biggest concern by health professionals was higher cancer rates around agricultural areas. Today we know pesticides also disrupt hormones that can have serious impacts on reproductive health for seytknmx and sqyéytn.

The *Sísqe? Sqyéytn et á'u?sqáy^ws Suméx Scúws* measured levels of Organo-Chlorine pesticides in salmon to determine the long-term impact of some of the worst pesticides known. They include aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene as well as hexachlorobenzene (HCB). Most of these pesticides were banned in the 1970's in North America because they were threatening the survival of bald eagles, river otters, minks and entire ecosystems. These pesticides do not break down in the ecosystems, still impacting predator species today. For example 70 percent organo-chlorine pesticides found in grizzly bear's are from their salmon diet.

Because Organo-chlorine pesticides were so toxic a new family of pesticides that are more easily broken down in the environment gained popularity. The Nazis invented the new phosphate pesticides for use as a nerve gas. After the war, US chemical companies gained access to the nerve gas information and began mass production for use as pesticides.

Phosphate pesticides break down more quickly in the soil and air but before they are broken down they are more toxic. Organo-phosphate pesticides drastically affect salmon smolts brain function and their sense of smell. These effects impact a smolt's ability to sense predators and migratory paths.

The use of pesticides in the Fraser Basin is increasing even though little is known about the impacts of pesticides on specific salmon runs. For example, Triclorpyr (ReleaseTM), known to be toxic to salmon species, is widely used by the forest industry to kill broadleaf trees. Killing broad leaf trees has serious impacts, not only because of pesticide use, but the important role broad leaf trees play in stabilizing the water tables, providing shade to streams, creeks, and other ecosystem interconnections.

Realizing pesticide dangers, more people are taking action. Many cities across Canada have made bylaws against the "cosmetic use" of pesticides. We can also pressure the forest industry to stop using herbicides in their management practices.



Many Canadian towns and cities are banning cosmetic use of pesticides and herbicides.
Photo: Peter Organisciak

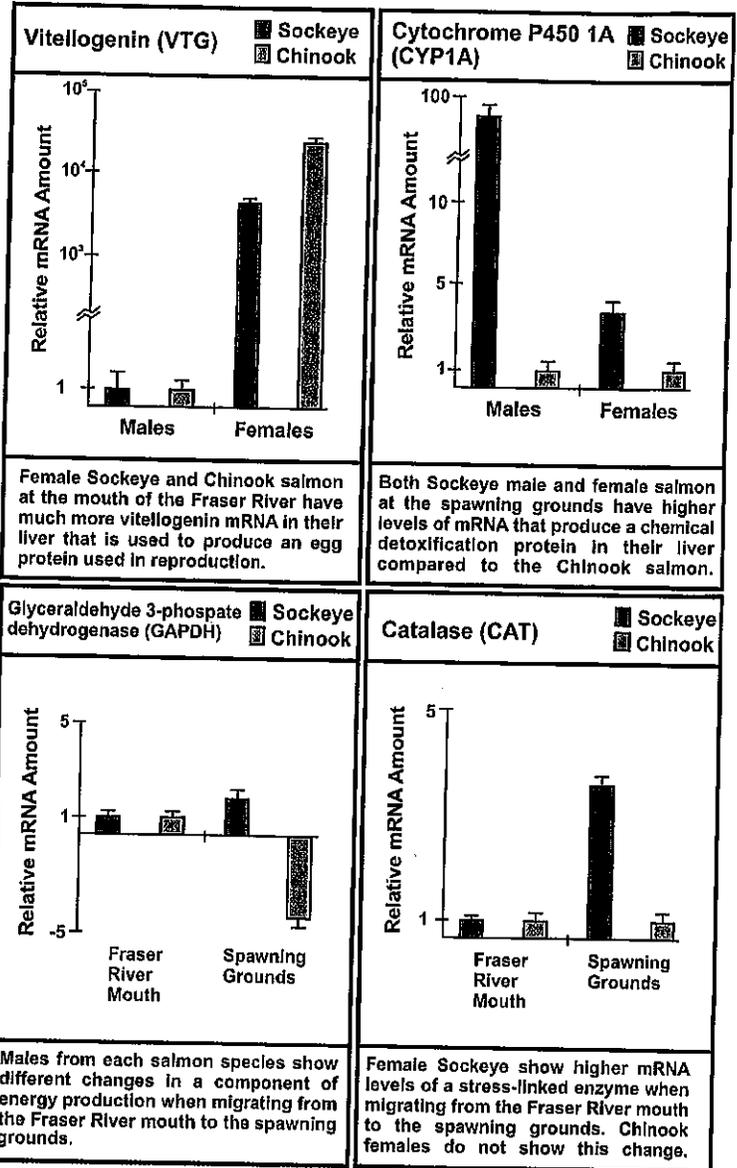


Zoq^wnełn

Poisons That Impact Hormones and Genetic Make-up

Pesticides and other chemicals entering our waterways through sewage also affect the reproductive system of salmon on the genetic level. DNA (deoxyribonucleic acid), the blueprint of life, maps out the genetic make up of all plants and animals. Each individual has unique DNA passed down from parents by the egg and sperm. Plant or animal DNA can be altered by chemicals and can change animal behaviour, appearance and impact health. Pesticides, birth control pills, hormone replacement therapy, other drugs and chemicals mimic female hormones. For example, by mimicking female hormones, chemicals can actually change the appearance of a genetically male salmon to female. The *Sísqe? Sqyéytn et ǻ'u?sqáy^ws Suméx Scúws* compared the DNA and genetic make up to the physical appearance of 80 sockeye and 80 spring salmon. One *sqyéytn* tested was genetically male, but physically looked like a female salmon and had fully developed *ʔek^wn* (roe). We also found several genetic markers that showed stress, possibly from pollution in the migration from mouth of the *Q^wuʔuy* (Fraser River) to the spawning grounds.

Development in the BC interior and Fraser Basin is happening at an alarming rate. The 2010 Olympics has spurred many ski/gulf resorts in pristine *séytknmx* food harvest areas and important salmon habitat. The sewage and water depletion from these developments can have serious impacts for aquatic life and the surrounding ecosystems. The current British Columbia Environmental Assessment Process does very little to address these impacts; it must reform to involve and reflect First Nations science and values equally with western science.



Comparing the difference between sockeye and spring (chinook) salmon genetic markers that showed stress, possibly from pollution in the migration from mouth of the Fraser to the spawning grounds

Graph: Nik Veldhoen, Caren Helbing, University of Victoria





Jayne Hill, Environmental Watch Team-DFO, taking blood sample from sqyéytn (salmon)
Photo: Dave Patterson, Environmental Watch Team, DFO



Taking a sample of the sqyéytn kidney to test sqyéytn health and stress caused by contaminants
Photo: Dave Patterson, Environmental Watch Team, DFO



Samples were sent to Michael Ikononou at Institute of Ocean Science, DFO and Caren Helbing at University of Victoria to test for contaminants and sqyéytn gene expression.
Photo: Cory Dubetz, Institute of Ocean Science, DFO



Testing for contaminants at Institute of Ocean Science
Photo: Cory Dubetz, Institute of Ocean Science, DFO



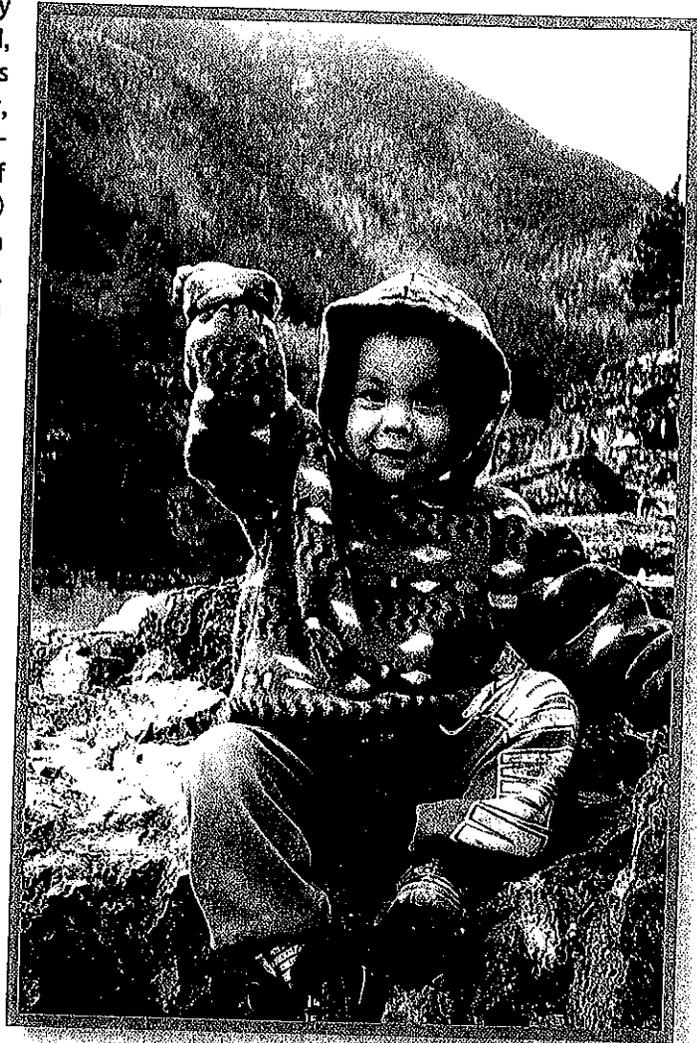
Nx^watpep et cuns

Conclusion and Recommendations

Currently commercial fisheries are given first priority over stock depletion and Indigenous Peoples food, social and ceremonial purposes. In attending meetings with Indigenous peoples from the Coast, the Interior, and up into the spawning grounds, the same concerns are repetitively spoken to the Department of Fisheries and Oceans. Séytknmx (Indigenous Peoples) have spoken on the sqyéytn quality and the sqyéytn quantity their communities are allocated per season. Séytknmx are concerned about the amount of fish that are actually returning to the spawning grounds. Indigenous people have relied on the fish resource for countless generations for their sustenance, trade, and overall well-being.

With the knowledge and expertise of the rivers and the sqyéytn the Séytknmx (Indigenous Peoples) must be a part of the planning and also have equal input in the stewardship and management of the sqyéytn resource. Canadian law, dictated by the Sparrow Supreme Court Decision, clearly states that salmon conservation is the first priority, followed by the First Nations fisheries and then if there is enough salmon, the commercial and sports fishery can be given a quota.

The Sports Fisherman should be more closely monitored on their catch and release permits. Studies by DFO show catch and release cause an average 19 percent mortality if the hook is in the mouth and 43 percent mortality if the hook is swallowed. This study was done under optimal conditions, whereas in reality the actual mortality is higher. Funds would be better utilized if allocated to funding on the ground First Nations and Sport Fisheries monitors rather than having aerial monitoring by helicopter. The monies made from sport fishery licenses *must* be used to enhance and rebuild local salmon habitat. The fines and taxes collected for polluting the waters *must* be used for enhancing and rehabilitating the natural spawning grounds and salmon habitat. Fish hatcheries do not replace natural habitat.



Forrest Sampson at his families fishing area
Photo: Tina Edwards

DFO, Industry, and Recreational Users must watch the documentary called "The Red Run" directed by Murray Jurak, produced by the National Film Board of Canada. Filmed at Sísqé?, it tells about the river damage that occurred in 1913 Hell's Gate disaster. This film will give a better understanding about the importance of the sqyéytn to Séytknmx. "The Red Run" shows the knowledge and relationship, which Séytknmx have with sqyéytn that is necessary for ensuring the survival of sqyéytn for generation to come.





Jaycee Isaac and Samantha Gush cleaning trout
Photo: Gloria Phillips

In 2007, the year of this research, the returning Fraser River sockeye population was predicted at 6.2 million by DFO using 50 percent probability (50 percent chance of being correct). Using this estimate DFO planned on 2.5 million fish being caught. After commercial fishing began DFO realized the returning population was about 1.5 million. The media reported a complete salmon collapse. This collapse had significant impacts on First Nations ability to fish. Across the province Indigenous Peoples had no or very few sqyéytn to put away for food for the coming year, severely affecting Séytknmx wellbeing and nutrition. DFO using the low 50 percent probability, the same probability as tossing a coin, causes these overestimates. At least 75 percent probability *must* be used in estimating returning populations to ensure that the Canadian Law dictated in the Sparrow Decision is enforced. To address current conservation concerns ocean base commercial fisheries must be closed so that all salmon populations can have time to regenerate. In-season salmon forecasts should be moved in-river, to allow for more accurate population predictions and monitoring of endangered salmon runs before fishing begins.

The health of the sqyéytn and the waters from the Pacific Ocean to the headwaters of Qʷuʷyúy (Fraser River) and Qʷuʷm'ix (Thompson River) are a continuous concern to all séytknmx (First Nations People) of the interior. The séytknmx rely on the sustenance that the sqyéytn provide for their main food source and trade.

Nteʔkepmx expert fisher interviews clearly demonstrate the deteriorating ecosystem and the impacts of low salmon returns on the many indicators. The Wild Salmon Policy must recognize and implement expert knowledge of First Nations in observing changes in salmon health indicators equally with western approaches. Western science is limited in terms of time frame and examines only parts of a system. First Nations science methods, passed down from generation to generation, include a long time frame and is systems-based, necessary for understanding ecosystem health.

There has been a continual decline in the Fraser River sqyéytn population up to the early nineties, then sqyéytn increased for a short period. Public pressured government to lower the amount of dioxins the pulp and paper mills were dumping in the rivers that were killing salmon fry. Sísqeʔ's research shows that dioxins are still causing mortality in sqyéytn ʔekʷn (salmon eggs) with rates as high as 30 percent. In the same time period, as of 1988, DFO made a deal with the BC to regulate salmon farms and lifting the moratorium on new salmon farm development. Research into the impact of salmon farms show devastating impacts on wild salmon populations. The Miramichi is the only river in Atlantic Canada that still has a significant wild salmon population. The Miramichi is also the only river in Atlantic Canada without salmon farms in its approaches. Salmon aquaculture in Atlantic Canada is about twenty years ahead of BC. If we want to protect our pacific wild salmon for the future we have to act now.



Climate change adds to these pressures of sqyéytn survival and is having a devastating impact, as described by Sísqe? expert fishers. We need to take responsibility for all human impacts we can decrease so that the salmon can survive. If we work together globally to enhance and provide more habitat for sqyéytn, they will be able to adapt to climate change. We *must* minimize the threats within our control by passing legislation enforcing enclosed fish farms, a moratorium on all development in spawning grounds, limited recreational and commercial fisheries, and becoming a world leader in reducing waste and pollution entering the air and waterways.

The United Nations Declaration on the Rights of Indigenous Peoples clearly states in Article 29:

Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programs for indigenous peoples for such conservation and protection, without discrimination.

We know from Nfé?kepmx science and Western science what is killing the sqyéytn and why the sqyéytn continue return in smaller numbers. Séytknmx (Indigenous Peoples) have repeatedly expressed their concerns for generations and generations that disregard for Suméx (life) is impacting the sqyéytn.

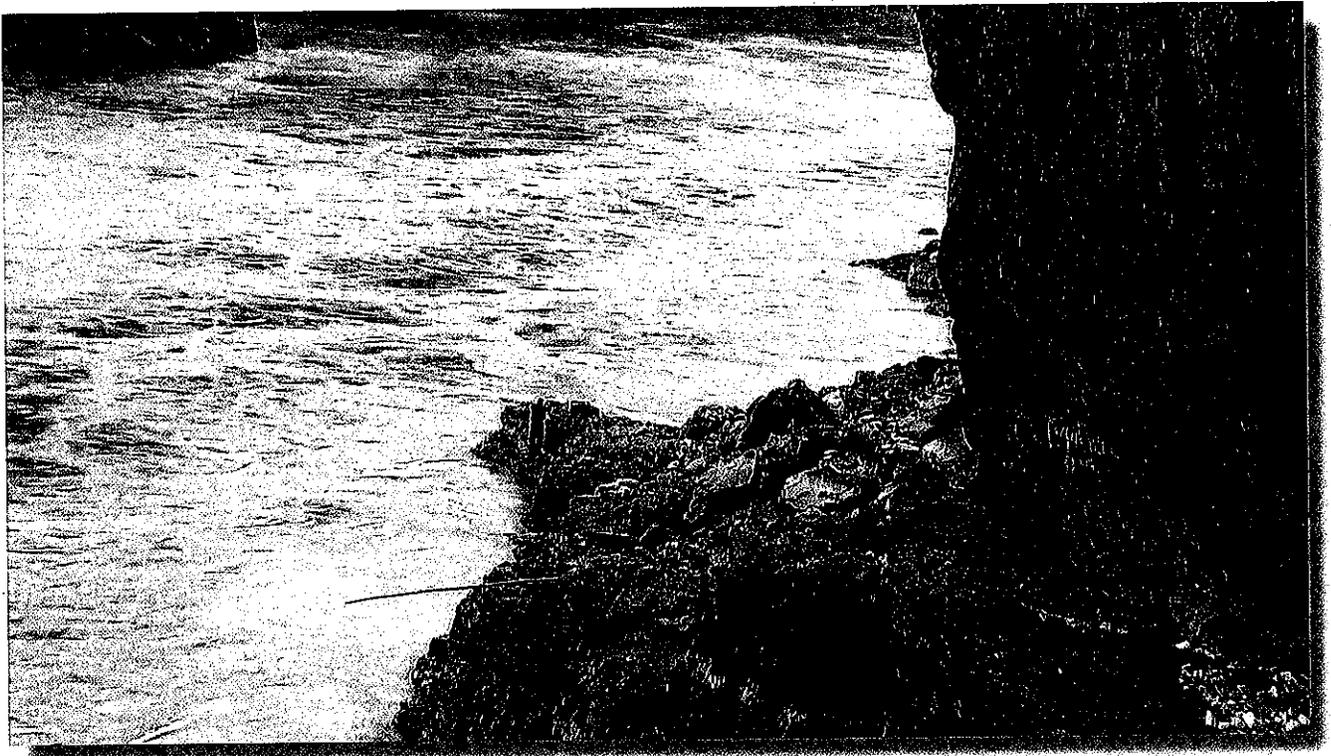
The sqyéytn are to the Nfé?kepmx and other Sqyéytn Nations of the Pacific North West Coast as the buffalo were to the Plains Nations. To continue to ignore this overwhelming knowledge of what is leading to sqyéytn extinction would be the same as hunting the buffalo to extinction.

All governments are urged to honourable action, joining together with Séytknmx (Indigenous Peoples) to work for the survival of the sqyéytn and all the Suméx (life) sqyéytn provides. Nfé?kepmx are the guardians of the Nfé?kepmx Territory. The Nfé?kepmx history tells of the coming of the sqyéytn. Sqyéytn is one of the founding principles of Nfé?kepmx culture. In this work we have gathered knowledge from our ancestors through our elders to ensure sqyéytn thrive, so that our children and grandchildren can continue our cherished relation with sqyéytn.



Timmy Pierre cleaning trout
Photo: Gloria Phillips





Trail to Les Coutlee's Fishing Area at Sisque?
Photo: Forrest Sampson





Elder and expert fisher, Mary Williams, during an interview with her ?imc, Holly Edwards and great ?imc, Rhiannon
Photo: Forrest Sampson



Ntɛʔkepɱx Americanist Alphabet Pronunciation

- ʔ glottal stop
- c like ch in church
- c' like ts in it's
- ə like vowels in luck, sun
- i like i in machine
- k' glottal k
- k^w like qu in quit, with a glottal catch
- ʔ like a voiceless hl sound
- ʔ like tl with a glottal catch
- n like n in neck, can, with a glottal catch
- o like in German gott
- p like p in puppy
- p' like p but with a glottal catch
- q^w like q with rounded lips, further back in the mouth
- s like sh in shirt, wish
- u like oo in boot, shoot
- x like ch in german ich
- x^w like x, with rounded lips
- x' like x but far back in throat, with friction
- y like y but with a glottal catch
- z like z in zone, ooze
- z' like z but with a glottal catch
- ʕ with the back of the tongue raised slightly toward the sound g



Nłe?kepmxcin Terms

Sísqe?	Uncle	Suméx	Life
Sqyéytn	Salmon	Q ^w u?	Water
Séytknmx	Indigenous Peoples	Q ^w u?úy	Fraser River
ǻ'u?sqáy ^w s	Indigenous Peoples	Q ^w u?m'ix	Thompson River
ǻe?ksm	Fish Ceremony	Nxəzumétk ^w u	Siska Creek
Nxézk ^w utns	Fishing Gear	ǻəmnǻimn	Drying rack
Stuk ^w cn	Dip Net	Sca?kn	Big Set Net
Nxézk ^w utn	Gill Net	K'ətním'tn	Rod reel
Sx ^w á?es	Sockeye	K' ^w y'í?e	Spring Salmon
Swew'ǻ	Trout	Cóŋ ^w le?	Steelhead
X ^w ú?eǻ	Sturgeon	Sxáyqs	Coho
Héni?	Pink Salmon	C'əq' ^w mús	Suckerfish
Sx ^w ák ^w uk ^w	Heart	Nxéc'əmn	Liver
Sx ^w ámqe?	Fish Head	Q ^w une?	Fermented Salmon Roe
Sc'menk	Guts	Pne?	Milt Sac
?ek ^w n	Eggs		
scecínm	Storing Method	Sc'uwen	Dry Fish
ǻuy'sk ^w y'e	Fish Oil	X ^w ikm	Drying fish (verb)
C'altm	Salting Process	P'úmes	Smoking Process
Páŋ ^w es	Freezing Process		
Héku	cow parsnip	Sp'iq ^w	Nighthawk

