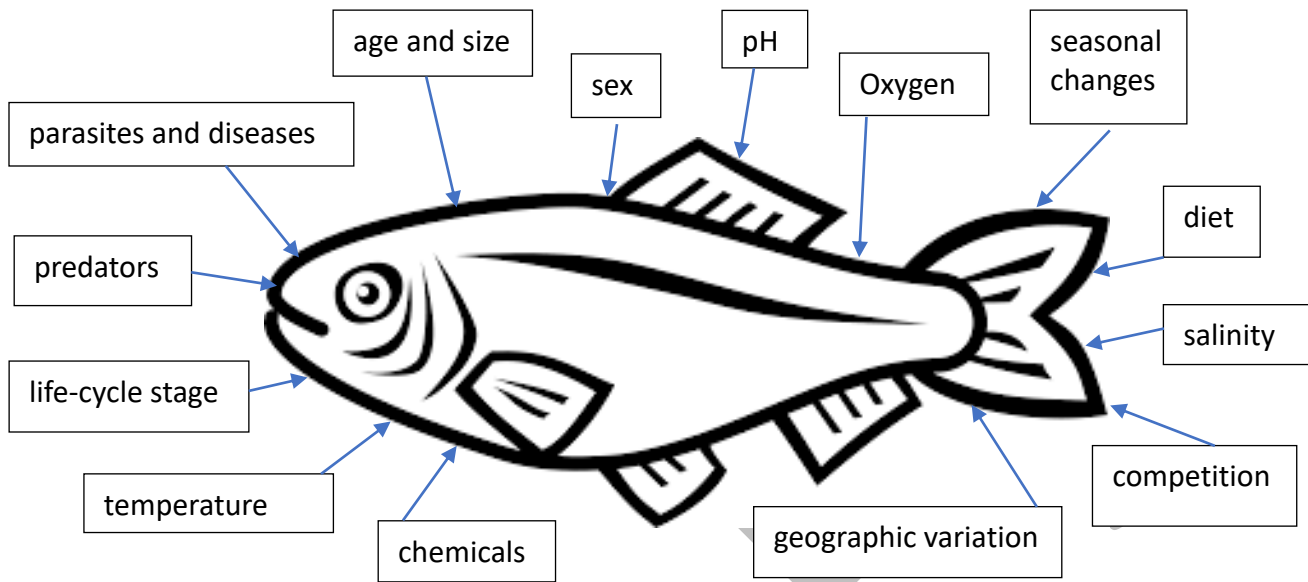


WATER AND FISH HEALTH STUDY



Some factors that influence the health of fish

UPRIVER CONTROL	FACILITY IMPACT	DOWNRIVER EFFECT
Tulit'a	Norman Wells	Fort Good Hope Tsiigehtchic

FISH SPECIES OF IMPORTANCE Common English or French name)	DENE NAME	FEEDING TYPE (surface, bottom, vegetarian, carnivorous)	SPAWNING TIME (Harvest fish before spawning)
Arctic Grayling Bluefish	Ꞗéchuwe		Spring after breakup of ice (mid-May to mid-June)
Coney Inconnu Sheefish	Sii or Sih Sih báh (small coney)		Mid-August to early October
Humpback Whitefish Broad Whitefish	Lugewá Dawq̄h (pointy mouth)		July to late summer
Loche Burbot	Nq̄hfə		December – January under ice
Jackfish	Ꞗq̄hda		Spring after breakup of ice

Northern Pike			
White Sucker Longnose Sucker	dehdeleh		Spring after breakup of ice
Arctic Cisco Herring	Lugeya		Mid-August to early October
Slimy Sculpin Spoonhead Sculpin			January - February
Flathead Chub Lake Chub	Sóra		Spring to early summer
Trout Perch			Spring

METHODOLOGY

Harvesters coordinated by the Renewable Resource Councils in each community will be paid to catch the fish and help determine best locations to catch the fish.

1. Fish must be harvested from each community at approximately the same time for meaningful comparisons.
2. Minimum 10 male and 10 female adults of reproductive age x 3 years of sampling effort.
3. Water samples are taken at same time as fish is collected to correlate fish health with water health.
4. Fish nets to be checked every 1 to 2 hours.
5. Fish to be humanely euthanized before visual assessment and dissection for sampling of tissue parts.
6. Fish to be evaluated within 1 to 2 hours of being euthanized.
7. Fish visual assessment will be by a group of men and women consisting of Elders, Harvesters, Youth and Aquatic Scientists.
8. After visual assessment fish will be dissected for fish for samples to analyze for age, food consumed, and contaminants including Mercury (Hg), metals including Lead (Pb), Zinc (Zn) and Copper (Cu) and for the presence of chlorinated hydrocarbons (PHC)
9. All samples will be immediately processed and placed on dry ice or as required.
10. Any excess fish will be distributed to community members so no waste.

PHYSICAL OR CHEMICAL CHANGES TO THE RIVER SINCE 1972

1. Siltation of spawning beds, rearing areas, or food supplies
2. Removal of spawning gravel
3. Blockage of fish migration
4. Reduction of dissolved oxygen levels
5. Chemical disruptions due to oil spill or produced water or heavy metals or pesticides.

TABLE FOR VISUAL ASSESSMENT OF EACH FISH SAMPLED

Fish ID #				
VISUAL ASSESSMENT	ELDERS	YOUTH	HARVESTERS	AQUATIC SCIENTISTS
Whole Fish				
Fish Species (Luge)				
sex				
Length (mm)				
Weight (grams)				
eyes				
Fins – Luget'álé				
gills				
Eggs - Lugek'ó				
Overall health score				
Dissect Fish for samples				
Liver (Hg, Pb, Zn, Cu, chlorinated hydrocarbons)				
Muscle (Hg, Pb, Zn, Cu, chlorinated hydrocarbons)				
Stomach (fat lining)				
Stomach contents (food) numerical & volumetric				
Gonads (sex)				
Otoliths (ear bones) age				
Scales (age)				

“Healthy Water, Healthy Fish”

Attendees:

Florence Barnaby – Chair of Elders Committee
Bonnie Bergsma, Sahtu Land and Water Board (SLWB,) invited guest
Vicki Orlias
Joe Orlias
George Voudrach
Celine Proctor
Monique Cotchilly
Colin Pierrot
Benjamin Roy, SLWB, notes
Alex Tassioulas, Sahtu Land Use Planning Board (SLUPBO, notes

Additional comments relevant to this topic made by Sahtu Land and Water Board members were included in this summary.

There was no set agenda for the meeting, except for Bonnie to introduce the topic of large fish and explain the need for elder’s input into the design and execution of a large fish study to be led by Imperial consultants to answer two questions.

1. Is the water safe to drink?
2. Is the fish safe to eat?

Topics of discussion covered:

1. **Naming of Group** – The name of the group most supported was “Healthy Water, Healthy Fish”. Translation to Dene kədə forthcoming.
Water = Tu
Fish = Luge
Good Living and Health = gonezə godze keneh
Healthy = Befəta gonezə
Study Something = Lu’ke T’sunazon Lugela Sunazon
2. **Fish Camp Naming/Mapping** – Elders would like to see a map produced that shows the locations up and down the river of 10 or more traditional fish camps used by people from FGH. These camp names only have a traditional Dene Kede name.
3. **Common Fish Names** – It will be important to the study that all fish traditionally harvested be identified by their Dene kədə name as well as common English or French name. Pictures of each fish would also be helpful to ensure proper identification.
4. **Important Fish Species and changes observed over time** – Elders were asked which species were the most important to their diet?
 1. Jackfish (Vicky)

2. Coney
3. Whitefish
4. Herring
5. Loche.

Herring – This fish is gone.

- Herring size is typically 10“to 12” or smaller in length.
- Herring “likes clean water” and nets are set within eddies in the river. But the traditional locations of these eddies have been moving over time as the river changes (as noted by Wilfred Jackson and Michel Lafferty).
- Big Eddy = ᓇᓇᓇᓇ
- An effort to harvest herring last year resulted in a catch of 3 or 4 fish over 3 days.

Loche - have seen biggest change in their livers becoming darker and more shrunken.

- Of 10 fish harvested, only 3 were considered “good” to eat.
- Elders commented “We don’t eat dark fish livers in our culture”.
- Violet Dolittle (SLWB meeting June 6, 2023) recounted that they used to catch Loche at Bluefish Creek and at the Imperial dock at Norman Wells but the water is now too shallow because of the sandbars.

Trout, Graying, and sometimes Salmon - are caught in Great Bear Lake. Fish travel up the Bear River from the Mackenzie River (Violet Dolittle, SLWB meeting June 6, 2023).

Grayling – not too many of these are caught at FGH (George Barnaby, SLWB meeting June 6, 2023).

Coney – in late June and July they are in good shape and then change by August (George Barnaby, SLWB meeting June 6, 2023).

Whitefish – they come in good shape in July and then they change and get skinny. This is natural.

Fish - were impacted after the expansion. People knew it right away. There were changes in where and when fish started to spawn. Traditional Knowledge is important to know how the fish changed (George Barnaby, SLWB meeting June 6, 2023).

Water Level in Mackenzie River - Elders commented that the river has been low for three years now. The water gets warmer, the barges can’t travel through the rapids at the Ramparts, in July the Coney and Whitefish are low when they should be more abundant, the access to Fossil Lake is not open.

Other observations of changes to wildlife included:

- There was an abundance of cliff swallow nesting in the limestone cliffs of the Ramparts. Now, “Bets’q̄hda (cliff swallows) are not seen as often”.

- “Fish birds like Wagedéwé (osprey) are disappearing” and “Túhdai (bald eagles) have recently returned”.
 - The Gah (rabbit) cycle has crashed.
 - No Yehfe (fox) have been seen this year only found dead foxes.
 - Last year there were 7 Sah dezene (black bear) killed in the town and this year there is nothing.
5. **“Invasive” Salmon** – Elders spoke of their recollections of seeing fish out of their normal range. Salmon were spotted on the Tsín’tsu River and at Sans Sault in 1974. These salmon were harvested and consumed when caught. The Dene and Metis concept of invasive may not mean the same as defined by western science.

Violet Dolittle (SLWB meeting June 6, 2023) recounted Lisa MacDonald catching a Coney in Norman Wells that had a tag from B.C.

6. **Water Column Investigations** – there was discussion and grouping of fish according to where they feed.
7. **Concerns over Herring** – There was discussion around the question of when and why did the herring disappear?
 Consensus was the herring were pretty much gone 15 years ago and were plentiful prior to the replacement of dog teams with snowmobiles. Herring was harvested at the Ramparts to support sled dogs’ diet in the winter. Elders commented:
- “We’d dry every part of it”.
 - “We used to catch many... buckets” of fish.
 - “We ate everything on the fish, guts too”.
 - “We sold bales of herring for \$10.00 per bale in the 1970s”.
- Elders spoke of the relationship between Fire -> Herring -> Humans and Dogs.
 The rapids at Rádłłh Sele (Sans Sault) and Rádłłh Koe (Ramparts) were dynamited in the 1950s to facilitate barge transportation along the Mackenzie River.