

DE BEERS GROUP

# AQUATIC EFFECTS MONITORING IN THE NWT

## HOW TRADITIONAL KNOWLEDGE CAN BE INCORPORATED

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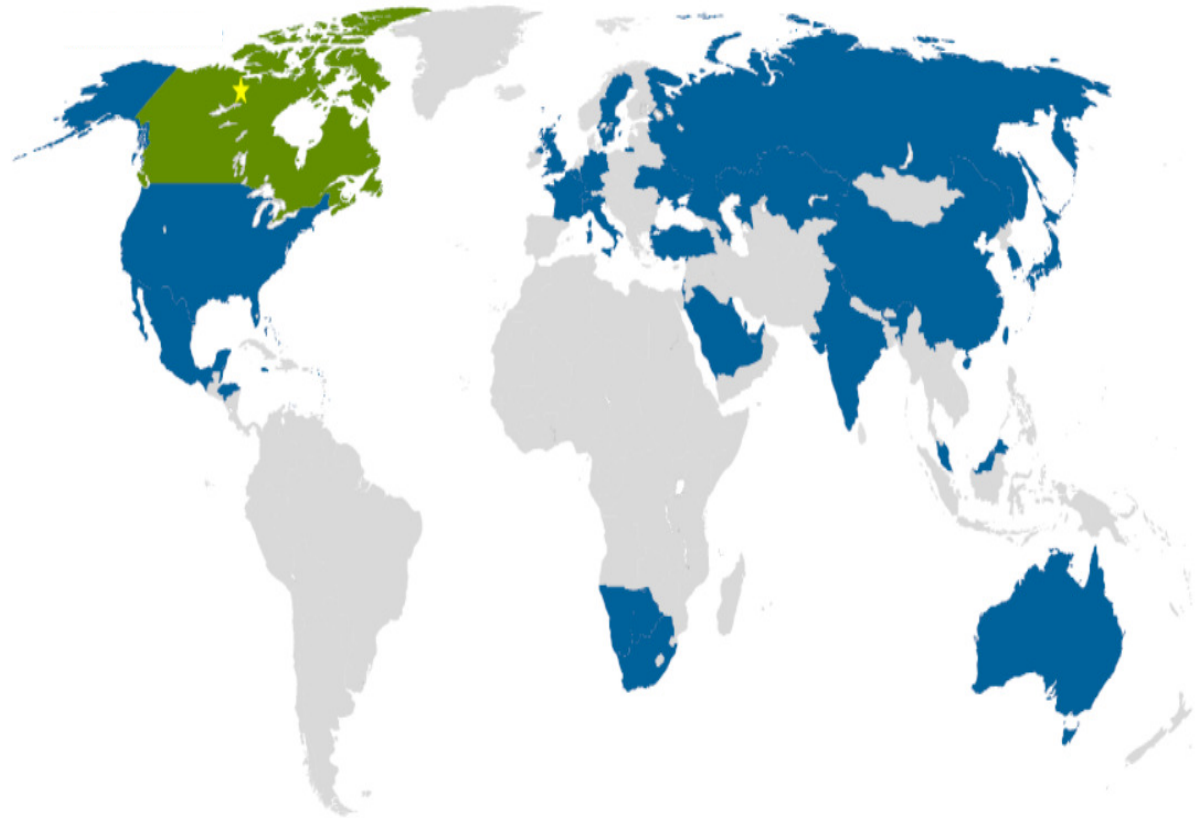
EXTERNAL

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## NORTHWEST TERRITORIES

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- Northwest Territories is one of two jurisdictions where aboriginal peoples are in the majority (50.3 %)
- Geographical resources include diamonds, gold, natural gas and petroleum
- Challenges have arisen in terms of land preservation and natural resource rights
- Communities have a strong connection to the land
- Regulatory regime is relatively new and is a direct result of comprehensive land claim agreements
- Based upon two principles:
  1. Integration and coordination; and
  2. Co-management of resources between governments and Aboriginal groups.



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## AQUATIC EFFECTS MONITORING PROGRAM PURPOSE

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- The Aquatic Effects Monitoring Program (AEMP) is designed to study Snap Lake for Mine-related effects, to verify and update environmental assessment report predictions and to support management decisions.
- The main AEMP studies done every year are:
  - water quality,
  - plankton
  - sediment quality
  - Fish tasting
- Other studies are conducted every three years
  - Fish Health
  - Fish Community



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## SNAP LAKE MINE

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- Canada's first Underground Diamond Mine
- Located 220 km from Yellowknife, NT
- Regulatory approvals were granted in 2004 and the mine commenced operations in 2007
- 2012 new water license granted for 8 years; amended in 2013
- The mine entered Extended Care and Maintenance in December 2015



# SNAP LAKE ECOSYSTEM

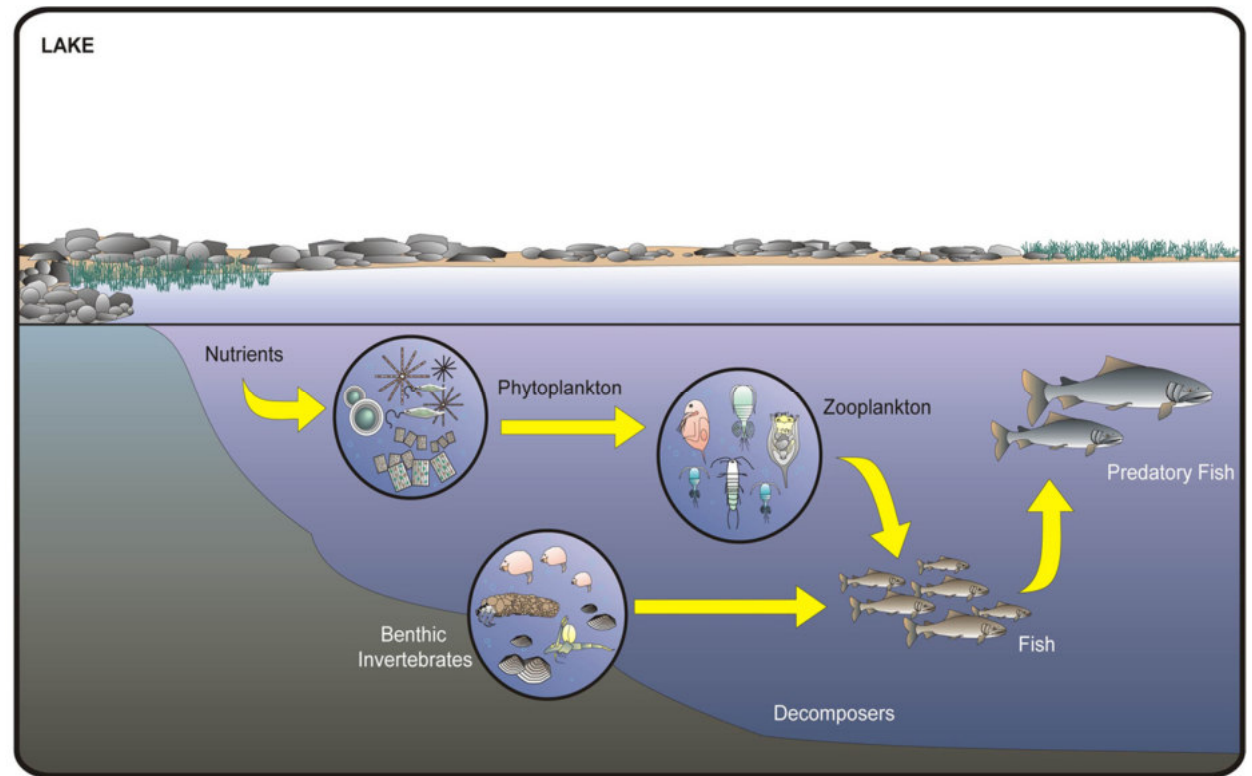
- Fish are the top of the food chain
- Fish are the main valued ecosystem component
- Top priority – fish to eat, water to drink

Threshold 1: no change to fish community composition

Threshold 2: fish must be edible

Threshold 3: water must be good to drink

Threshold 4: effluent cannot be toxic to fish





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## FISH STUDIES

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- Fish species in Snap Lake include:
  - Round Whitefish,
  - Arctic grayling,
  - Burbot,
  - Lake Chub,
  - Longnose Sucker,
  - Lake Trout and
  - Slimy Sculpin
- Fish Community Monitoring completed every 5 years
  - Focus on Lake Trout and Round whitefish



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## SHARING TRADITIONAL KNOWLEDGE

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- Occurs annually since 2005
- Elders gather at Snap Lake Mine to share their lifetime of experience and knowledge during an annual Fish Tasting.
- commitment made during the Environmental Assessment
- Discussed in the Environmental agreement which states:

*“To respect and protect the environment, air, land, water, aquatic resources, wildlife, archeological and cultural resources, and the land-based practices that are essential to the way of life and well-being of the Aboriginal Parties.”*

- *Focus is that fish are safe to eat and water safe to drink*





## FISHING: DAY BEFORE



Two Elders from different groups are selected to help De Beers Canada Environment department staff catch the Lake Trout needed for tasting, using a net and/or fishing rods.





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## EXAMINING THE FISH

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- Fish are examined by the Elders and then cleaned, with Elders examining the internal organs to make sure they look normal and healthy.
- All observations are documented
- If a concern is identified then samples are collected for lab analysis



## DOCUMENTATION OF OBSERVATIONS AND COMMENTS



Elders' comments are documented in a final report generated by Environment attendees. This report is added into the Annual Aquatic Effects Monitoring Program Report and submitted to regulators and stakeholders.

Fish Health Observations

Fish Health Observations												
Date: September 7, 2017						Time: 13:00						
Quantitative								Qualitative				
Fish ID #	Species	Weight (grams)	Total Length (cm)	Sex (M/F)	Presence of Parasite or Disease (Y/N)	Stomach Contents	Flesh Lab Sample (Y/N)	Skin Texture *	Skin Colour *	Body, Head and Tail Shape	Colour of Meat*	Additional Comments
1	LKTR	2260	64	F	N	Empty	N	VG	G	Normal	G	Good Condition
2	LKTR	1250	58.8	M	Y	Empty	Y	G	G	Skinny	NG	Yellow flesh, cysts, yellow liver. Fish discarded, not edible
3	LKTR	2540	67.9	M	Y	Empty	N	VG	VG	Healthy	G	Liver discoloured
4	LKTR	2050	62.4	F	Y	Empty	N	VG	VG	Healthy	G	Ripe
5	LKTR	2110	63.6	M	Y	Insect	Y	G	NG	Skinny	G	Liver discoloured, cysts, Fish discarded, not edible.
6	LKTR	3360	74.2	M	N	Empty	N	G	G	Old	G	Pale flesh, stomach and liver
7	LKTR	1600	57									N/A: Not Sampled
8	LKTR	2140	63	M	Y	Empty	N	G	G	Normal	G	Cysts
9	LKTR	1160	54	M	Y	Empty	N	G	G	Normal	G	Discoloured, worms/cysts
10	LKTR	1900	59.8	M	Y	Fish	N	VG	VG	Normal	G	Discoloured, worms/cysts
11	LKTR	1600	62.6									N/A: Not Sampled
12	LKTR	1570	57									N/A: Not Sampled
13	LKTR	1160	49.1	F	Y	Fish	N	G	G	Normal	G	Yellow liver, cysts in stomach

\*Parameters are graded by the following descriptions: Very Good (VG), Good (G), Not Good (NG).



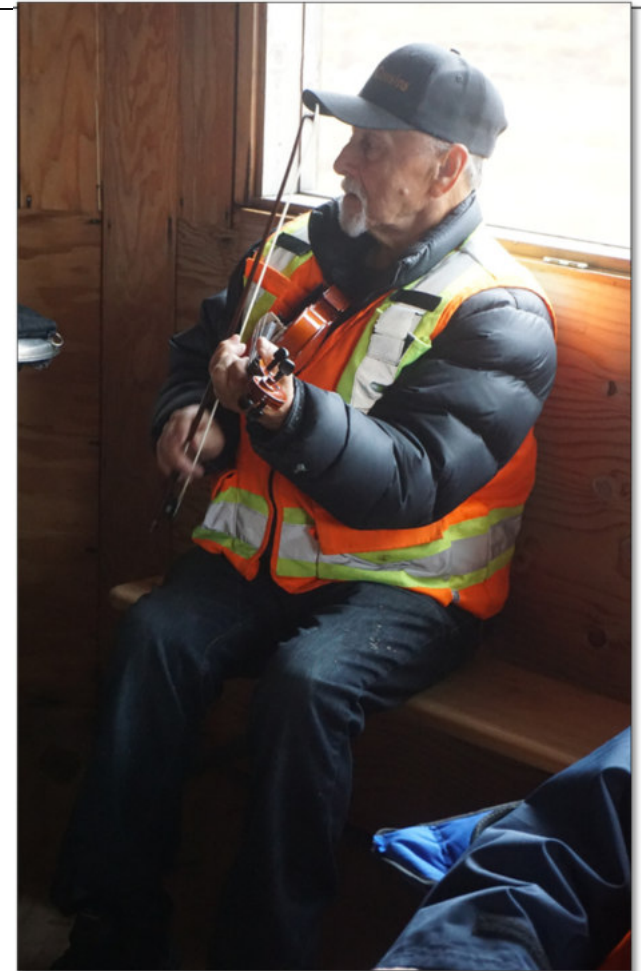
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## TASTING

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- Fish are then filleted and prepared for cooking over a campfire.
- For the tasting, fillets are boiled then eaten without salt, pepper, oil or butter
- Fish palatability, taste and texture is discussed and recorded
- Elders often sing, dance and play music during the event



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## HARVESTING BERRIES AND BANNOCK

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- Elders also pick seasonal berries to assess dust and ensure that they are still suitable for wildlife
- They enjoy steeped tea, make bannock and homemade jam while telling stories about the land with each other





# COMMENT FORM AND FEED BACK

Name of Attendee: Kathy Arden, North Slave Métis Alliance, N'Dilo		
APPEARANCE		
Very Good	Fish appears to be above average	
Good	Fish appears to be average health	
Not Good	Fish is below average health	X
TEXTURE		
Very Good	Texture is firm; fish is above average quality	
Good	Texture is of average firmness, fish is average quality	X
Not Good	Texture is below average firmness; fish is below average quality	
TASTE		
Very Good	Fish taste appears to be above average	
Good	Fish taste appears to be average	X
Not Good	Fish taste is below average	
Comment: "For those that we tasted, they had a beautiful color and tasted good"		



Ernest Boucher (Lutsel K'e Dene First Nation)

Photo

Appearance		
Very good	Fish appears to be above average in health	<input type="checkbox"/>
Good	Fish appears to be average health	
Not Good	Fish is below average health	
Comments: -When filleting the fish Ernest looks to the liver to determine the general fish health, if they are a nice bright pink colour then the fish are in good health. -Ernest informed me (?) while he was filleting a fish the livers had "nice colour" but he pointed out that "the livers get damaged from the nets, (causing) blood spots". -Ernest also pointed out that the fish were "spawning right now, and you can't eat their caviar when they are spawning."		
Texture		
Very good	Texture is firm; fish is above average quality	<input type="checkbox"/>
Good	Texture is of average firmness, fish is average quality	
Not Good	Texture is below average firmness; fish is below average quality	
Comments: -"When spawning they (the fish) are soft but these are good for this time of year."		
Taste		
Very good	Fish taste appears to be above average	<input type="checkbox"/>
Good	Fish taste appears to be average	<input type="checkbox"/>
Not Good	Fish taste is below average	
Comments: -"On the fire they are excellent." -"Boiled they are just good."		

## SUMMARY

- Traditional knowledge is an important component of aquatics monitoring
- Social license to operate
  - Assurance for community
  - Water is safe to drink, fish safe to eat
- Programs should evolve through community feedback
  - Dialogue and shared understanding most important





