

Temporal Trends of Mercury Levels in Food Fish Species in Lakes Used by Dehcho Community Members.

Project Leaders: George Low, AAROM Coordinator, Marlene Evans, Environment Canada Scientist and Mike Low, AAROM Technical advisor

Study Objective: To determine the levels of mercury in fish, especially predatory species, from several “fishing lakes” in the Dehcho region and determine if these levels have changed from levels measured 10 to 15 years ago.

Background:

Media reports on increasing mercury levels in predatory fish in some lakes in the Dehcho and Sahtu regions have caused concern for harvesters in the Dehcho communities. The Dehcho Aboriginal Aquatic Resources and Oceans Management (AAROM) program therefore applied for and received funding to reassess the fish from Dehcho lakes which are most used by the communities. Most of these lakes were previously assessed through the NCP program and DFO in the 1990’s and early 2000’s. Some new lakes in the Wrigley area are being included in the reassessment.

Ironically the AAROM program is working towards increasing the use of the fish resources of the Dehcho, however it is important for harvesters to know the levels of methyl mercury in fish from lakes used by the communities for food. We also included whitefish and sucker samples in our data to illustrate that these species usually have low or moderate mercury levels. We want to be able to reassure people in cases where risks are low but also have GNWT Health warn people through well thought out advisories if there are health risks.

Methods:

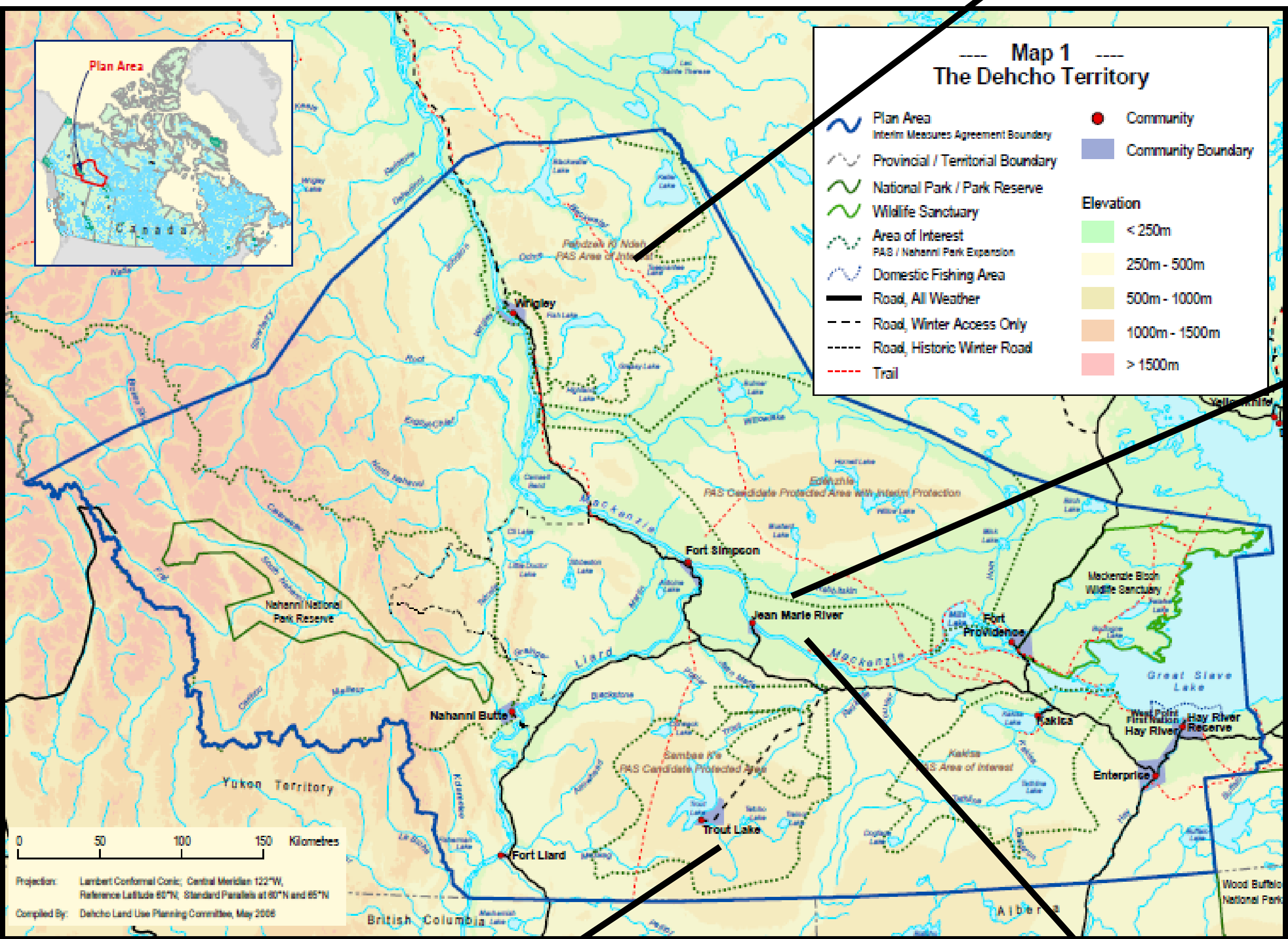
After consulting local communities to determine which lakes should be sampled, two monitors were hired from each community to assist the technician in collecting and sampling fish. If possible the study was conducted in the winter, to reduce the cost of travel and make storing samples easier. Ekali lake was the only lake sampled in the summer, due to its highway access.

Multi mesh gangs of 3 ½ , 4 ½ and 5 ½ inch panels that were 50 yards long and 6 feet deep were set at locations indicated by local traditional knowledge. Generally two or three gangs would be set in one lake at different locations, being checked every 24 hours. As the fish were removed from the nets, they were placed into labelled sacs and taken back to the camp to be sampled.

Sampling generally occurs inside the cabins in absence of any contamination. For this project focus was on predatory fish but other species such as whitefish and suckers were sampled as well. Each fish was sampled for total length, fork length, round weight, sex, maturity and ageing structures. Some species also had liver and gonad weights taken. One Hundred gram pieces of muscle was taken just posterior to the head of each fish for mercury analysis. In the case of lake trout the liver and stomach was also collected for analyses.

Number of fish species caught and analyzed per lake, with adjusted mercury

Lake/species	Year	Number Collected	Number analyzed	Adjusted Hg (µg/g)
Deep				
northern pike	Jan 2011	4	4	1.15
walleye	Jan 2011	9	5	1.36
whitefish	Jan 2011	1		N/A
burbot	Jan 2011	3		N/A
McGill				
northern pike	Dec2011	19	11	0.69
walleye	Dec2011	33	20	1.28
whitefish	Dec2011	3		N/A
white sucker	Dec2011	12		N/A
Fish				
northern pike	Mar2011	20	19	
walleye	Mar2011	5	5	
lake trout	Mar2011	7	6	
whitefish	Mar2011	25		
burbot	Mar2011	7		
Ekali				
northern pike	Aug2011	16		
walleye	Aug2011	18		
whitefish	Aug2011	35		



DEH CHO DRUM, Thursday, September 1, 2011

High mercury levels found in fish

Consumption limits recommended for Northern pike, walleye and trout from McGill, Deep and Fish lakes

by Roxanna Thompson
Northern News Services
Deh Cho

People should limit the quantity of fish they eat from three lakes in the Deh Cho, recommended a public health notice released last month.

Mercury is present in McGill Lake and Deep Lake near Jean Marie River and Fish Lake near Wrigley. As a result, it's recommended that people eat smaller fish and fish that are lower in the food chain, such as whitefish or grayling, from the lakes while consuming fewer fish higher in the food chain, such as walleye,

Northern pike and lake trout.

"We know that fish is a good source of nutrition high in protein as well as vitamin B and omega fatty acids and we always want to make sure we balance out the risks and benefits of eating the fish," said Dr. Lorne Clearsky, the territory's chief public health officer.

Mercury is a neurotoxin that interferes with the brain and nervous system. The effects of long term exposure include tremors, numbness in the fingers and toes and vision and memory loss. Mercury is a natural element that occurs everywhere in very low concentrations, said Clearsky.

It can also be created by human activities such as burning fossil fuels. This process emits mercury into the air and it is later deposited in different locations, he said.

Mercury levels are normally higher in older fish and fish that are higher in the food chain, said Clearsky. Health Canada has established guidelines for consumption of fish with mercury levels beginning at .5 parts per million (ppm).

Pike at McGill and Deep lakes have an average of .83 and 1.15 ppm respectively compared to 1.25 and 1.21 ppm for walleye. At McGill Lake, pike larger than 74 cm and walleye larger than 38 cm should not be consumed. Fish under 43 and 22 cm respectively for the two species can be eaten without restriction.

For fish between the two lengths, there are recommendations for portion size and frequency of consumption for adults, pregnant and breast-feeding mothers, and children of various ages. The advisory also includes recommendations for the other two lakes.

Clearsky visited both Jean Marie River and Wrigley in late August to present the find-

Collaboration:

Partners in this study were INAC, Northern Contaminant Program, Environment Canada, GNWT Health and Social Services, The Dehcho First Nations AAROM program, Fisheries and Oceans Canada, the following First Nations; Pehdzeh Ki, Jean Marie River (JMR) and Samba Ke.

We are grateful for the advise and cooperation of the First Nations Chiefs and Councils. Community monitors involved were; Angus Sanguiez, Earnest Hardisty and Rufus Sanguiez of JRR; Freddie Punch and David Jumbo of Samba Ki; and Jesse Cliili, Charlie Tali and David Horrisey of Pehdzek Ki. We also thank Shawn Buckley of Hay River who was the technician at Deep Lake during a 40 below spell last winter.

We would like to thank Lorna Skinner for guiding us through the process, Dr. Marlene Evans for processing the samples and analysing the results and Dr. Lorne Clearsky, the NWT Chief Public Health Officer.