



### NWT Cumulative Impact Monitoring Program (NWT CIMP)

A source of environmental monitoring and research in the NWT. The program coordinates, conducts and funds the collection, analysis and reporting of information related to environmental conditions in the NWT.

### NWT Environmental Research Bulletin (NERB)

A series of brief plain language summaries of various environmental research findings in the Northwest Territories. If you're conducting environmental research in the NWT, consider sharing your information with northern residents in a bulletin. These research summaries are also of use to northern resource decision-makers.

## Genetic Assessment of Inconnu in Great Slave Lake, NWT

Inconnu (coney or sheefish) populations are declining or no longer spawn in some rivers flowing into Great Slave Lake. By analyzing genetic samples from finclips, it was confirmed that Inconnu caught in the Great Slave Lake commercial fishery were from distinct populations from the Buffalo, Slave or Marian rivers. This information supports the risk assessment and development of fisheries management plans to ensure the sustainability of Inconnu stocks.

### Why is this research important?

It is thought that different Inconnu populations may spawn in different rivers flowing into Great Slave Lake. Using genetic samples, we can identify how related the Inconnu populations are, determine what rivers are used, and understand the harvest of the different populations in the commercial fishery. The results will contribute to sustainable management decisions for the fishery in Great Slave Lake, such as upcoming plans by Department of Fisheries and Oceans Canada to conduct a review of the Inconnu genetic information and stock composition.

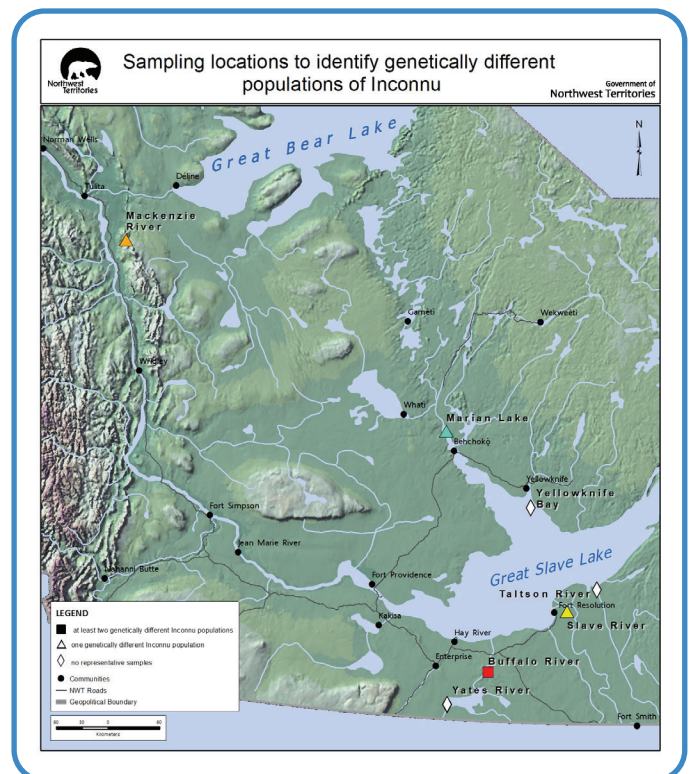


Figure 1: Sampling locations. Each colour represents a genetically different population of Inconnu sampled. Representative samples were not obtained from Yellowknife Bay or the Yates and Taltson Rivers.

## What did we do?

Information about Inconnu spawning locations, behavior, and movement in the Buffalo River were gathered by conducting interviews with elders and land-users from the K'at'l'odeeche First Nation. Samples were taken from locations in Yellowknife Bay and Buffalo, Yates, Slave, Taltson and Marian rivers, in consultation with the local communities, fishermen and information gathered from traditional studies. Genetic samples, including archived samples from the lower Mackenzie River, were collected and analyzed to see how genetically different Inconnu populations are within Great Slave Lake.

## What did we find?

- Inconnu sampled in the Marian, Slave and Mackenzie rivers were genetically distinct.
- The greatest genetic difference between populations was observed between Marian Lake and Slave River samples.
- There may be two or more Inconnu populations that use the mouth of the Buffalo River.

## What does this mean?

- There are different Inconnu populations in Great Slave Lake that use different rivers for spawning.
- Using genetic samples we can understand which populations contribute to the Great Slave Lake commercial fishery, and in what proportion.
- There is ongoing research to identify the proportion of Inconnu from each river that is caught in the Great Slave Lake commercial fishery. The identification of the genetic populations is the first step to informing fisheries management decisions.



Figure 2: Peter Sabourin (K'at'l'odeeche First Nation) and Lauren Wiens (Fisheries and Oceans Canada) sampling Inconnu at the mouth of Buffalo River (Photo credit: Darren Buggins; K'at'l'odeeche First Nation).

## What's next?

- Research will continue to better understand the genetic diversity of Inconnu within the Buffalo River system and Great Slave Lake.
- Sampling will be expanded to other river systems flowing into Great Slave Lake to identify additional populations and how they may contribute to the Great Slave Lake commercial fishery.

### Genetic populations

Genetic populations are populations of specific organisms that share an amount of unique genes. For example, Inconnu from the Marian or Slave rivers are examples of unique genetic populations.

### Recommended Reading

Day, A.C., VanGerwen-Toyne M., Tallman, R.F., 2013. A risk-based decision-making framework for Buffalo River Inconnu (*Stenodus leucichthys*) that incorporates the Precautionary Approach. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/070. iv + 13 p.

VanGerwen-Toyne, M., Day, C., Taptuna, F., Leonard, D., Frame, S., Tallman, R., 2013. Information in support of assessment of Buffalo River Inconnu, (*Stenodus leucichthys*), Great Slave Lake, Northwest Territories, 1945-2009. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/069. vii +81p.

Wiens, L. 2018. Population genetic assessment of Inconnu (*Stenodus leucichthys*) in the Northwest Territories. MSc Thesis, University of Manitoba, Winnipeg, MB. 119p. <https://mspace.lib.umanitoba.ca/xmlui/handle/1993/33680>

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