

Hutshi Lake Whitefish Population Health Investigation – Draft for Discussion

Summary and Project Need

The Alsek RRC recently reached out to EDI to determine how an investigation into the health of the lake whitefish population could be completed at Hutshi Lake. Local knowledge has indicated that lake whitefish in the lake have become smaller in recent years and the ARRC is interested to, along with CAFN, undertake a population health assessment.

The information contained in the document is based upon an initial discussion between EDI and the ARRC which took place on November 18, 2022. This is intended to be a starting point for the assessment only as there are a number of details that need to be addressed with the potential project.

When discussing fish population health, this can be interpreted in two general forms and it is understood that both of these forms may be of interest at Hutshi Lake:

1. Overall population health such as year-class strength and evidence of regular recruitment (i.e., successful spawning and juvenile survival). This can also involve measures of total abundance or similar estimates.
2. The health of individual fish such as condition factor (weight for length, skinny/thick) and parasites. Can also include other more detailed information such as contaminants in muscle/organ tissue, and overall health as indicated by blood analysis.

Potential Project Outline

As discussed with the ARRC, a potential means of collecting this data would be to have EDI personnel travel to Hutshi Lake by snowmobile with CAFN and ARRC personnel to catch a number of whitefish by gillnetting under the ice. This would ideally be completed during March when weather conditions are more suitable and the days longer. This would also provide an opportunity to get youth from the community involved in a hands on research/monitoring project while also learning practical learning of on the land skills. Additional Information on a potential project approach is outlined below.

Gillnetting and Fish Capture

In order to capture all but the smallest juvenile whitefish, it is proposed that a research grade (multi-mesh size) gillnet be used. The use of this sampling gear ensures that fish of all sizes can be captured and differs from most subsistence gillnetting which only uses a single mesh size. EDI has such gillnets that could be provided to the project at no cost and the nets are constructed of 7 panels each 22.9 m (75 ft) long, 2.4 m (8 ft) deep and constructed of 38 mm (1.5 inch) to 127 mm (5.0 inch) size stretch mesh. For the Hutshi Lake gillnetting, we would propose dropping the 38 mm (1.5 inch) mesh size given the potential for the capture of high numbers of small juveniles. These same nets have been used by EDI for Yukon Energy on Aishihik and Canyon lakes (and also other Yukon lakes) which would provide a means of comparing the Hutshi Lake data to other lakes.

The number of fish to be killed/sampled is a point that requires discussion to balance the need for data analysis with acceptable levels of mortality by CAFN and the ARRC. To gain a robust indicator of population status, it is typically to get at least 10 fish per year class and lake whitefish between 6 and 25 would be expected to be captured resulting the need of at least 190 fish. It is fully realized that this may be above acceptable mortality limits and as such, this could be reduced to as low as 50% of this number while still providing useful information.

It is fully expected that after sampling, all fish would be cleaned and saved for distribution in the community.

Data Collection

All fish captured would be expected to be killed and sampled (large lake trout may be able to be released if they are present in the lake) with the following information collected from each fish:

- Length and weight
- Collection of ageing structures (otoliths)
- Rapid assessment of fish condition for abnormalities
- Determination of sex and maturity

A subset of the fish captured would also be assessed for the following more detailed metrics:

- Collection of muscle and liver tissue for contaminants. This is costly analysis so likely 10 lake whitefish to be sampled, could also sample pike and lake trout if caught.
- Detailed assessment of fish condition and parasites using a method developed for use on Aishihik Lake by EDI for Yukon Energy. This includes the collection and onsite analysis of blood parameters for an in-depth look into fish health.

Field Logistics

EDI will provide the gillnets and all fish sampling supplies at now cost. CAFN and the ARRC would be required to pay for and provide the following equipment:

- Snowmobiles for access to Hutshi Lake (EDI could also rent in Whitehorse and charge to the project if needed)
- A place to stay at Hutshi Lake
- Wall tent to set up on the ice/shoreline and serve as a warm place to complete the fish sampling.
- Camp supplies and food.