

Frog Lake Fall Index Netting Summary, 2022

Background

A healthy fish population and fish community means we can all enjoy the benefits of sustainable fisheries and healthy ecosystems. A common question biologists receive is “how are the fish in my lake doing?” This is an important question to answer to set appropriate fishing regulations, understand and correct any problems with fish habitat, and guard against invasive species.

Fall Index Netting (FIN)

Environment and Protected Areas (EPA) uses an accepted standard of index netting for assessing walleye and Northern pike in lake fisheries (Morgan, 2002). This method provides the necessary data on fish abundance, biological data, and species diversity to assess the sustainability of these fish and fisheries. It also allows for comparisons at a lake over time and to other lakes.

Fall index netting occurs during late summer and fall when water temperatures are 10-15 °C. Standardized multi-mesh gill nets are set at random locations between two and 15 metres deep, set for 21-27 hours (i.e., a net-night), and then reset in new random locations. At Frog Lake, in 2022, a half-length variation of the standard index net was used to balance precision of the catch rates with reduced sampling effort.

Information from yellow perch, lake whitefish, burbot, minnow, and sucker species are also collected. The information collected from each fish includes length, weight, age, gender, and maturity. After sampling, if fish are appropriate for human consumption, AEP provides the fish to local Indigenous peoples or to persons on approved subsistence lists. Typically, a very small proportion of the lake’s fish population (less than 1 or 2%) are killed in this sampling.

How is this information used?

Catch rates (i.e., number of fish captured per net-night) of walleye and Northern pike are an index of the populations’ abundance, with higher catch rates meaning there are more fish in the lake. The abundance of adult fish is compared to the standardized thresholds for 5 broad categories of risk to the long-term sustainability of the fish population, with higher densities of fish having lower risk (Table 1). The sizes and age of fish also tell us if problems with overharvest (e.g., too few large and old fish) or habitat (e.g., poor spawning success results in too few small and young fish) are a concern. Biologists use this information, as well as a variety

of data on water quality, access, development, and habitat threats as part of Alberta’s Fish Sustainability Index (FSI).

The management goal for most Alberta fisheries is long-term sustainability, shown by the red lines on the graphs below. In support of achieving this goal netting data is collected to determine the FSI, which helps determine the most appropriate regulations for a lake. This landscape-level assessment allows for consistent, broad temporal comparisons of fish sustainability and status. For more information, please see [Alberta’s Fall Index Netting website](#) and [Fish Sustainability Index website](#).

Table 1 - Alberta’s Fish Sustainability Index risk thresholds for walleye and Northern pike using the standardized Fall Index Net (FIN) method. Note: Thresholds align with species management frameworks.

| Mature Walleyes/ ½ net | Mature Pike/ ½ net | Risk to Sustainability |
|------------------------|--------------------|------------------------|
| >14.5 | >10.9 | Very Low |
| 10.2-14.5 | 7.7-10.9 | Low |
| 7.3-10.1 | 5.5-7.6 | Moderate |
| 2.9-7.2 | 2.2-5.4 | High |
| <2.9 | <2.2 | Very High |

Results

Frog Lake (5832 ha) is located 200 km east of the city of Edmonton. From October 4 to 5, 2022, 13 half-length nets captured 101 lake whitefish, 25 longnose suckers, 28 Northern pike, 79 yellow perch.

Walleye

Frog Lake historically had walleye. No walleye were caught during this FIN assessment and the status is **functionally extirpated**. Extirpation was due to high commercial and recreational fishing, and low water levels likely reduced spawning habitats and contributed to the extirpation.

Northern Pike

The mean catch rate of mature Northern pike was 2.2 Northern pike/ half net-night (Figure 1). The corresponding FSI score for the mature density of Northern Pike was assessed at **high-very high risk**.

The length distribution of Northern pike shows no evidence of recent recruitment, very low abundance of 520 to 740 mm fish, and a few Northern pike larger than 720 mm (Figure 2).

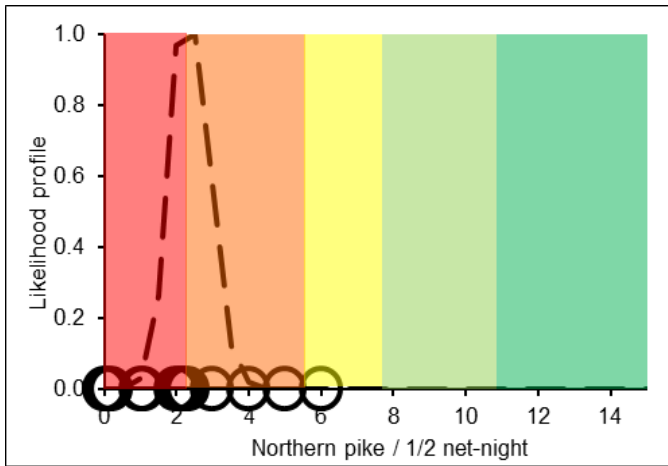


Figure 1 - The FIN catch rate of mature Northern pike from Frog Lake, 2022. Dashed line is the mean catch rate (2.2 fish/ half net-night), with individual net data as hollow circles (n=13 nets).

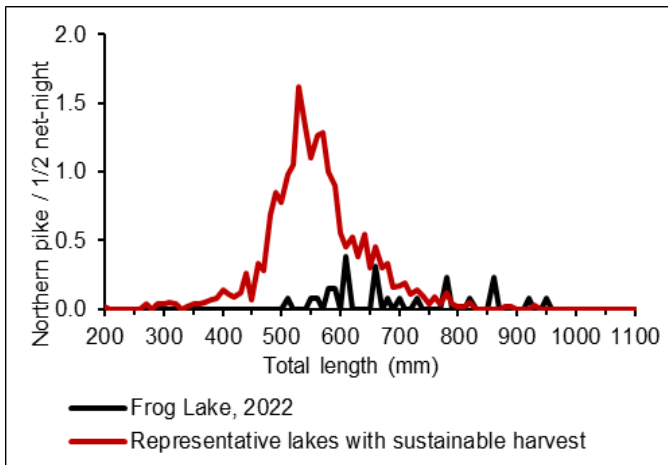


Figure 2 – FIN sample showing size of Northern pike from Frog Lake, 2022. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

The 2022 FIN sample represented approximately 0.1% of the estimated Northern pike population size.

Summary

The status of walleyes in Frog Lake has remained at **functionally extirpated** since the previous assessment in 2016 and 2021.

Between the 2016 and the 2021 FIN assessments, the status of mature Northern pike remained at very high risk. During the 2022 assessment, the status of pike improved slightly to **high-very high risk**. Conservation-based management remains the focus for this pike population and fishery.

Literature

Morgan, G.E. 2002. Manual of Instructions-Fall Walleye Index Netting. Percid Community Synthesis, Diagnostics and Sampling Standards Working Group. Laurentian University, Sudbury Ontario.