

Frog Lake FIN Summary, 2021

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 in order to set appropriate fishing regulations, understand and correct any problems with fish habitat, and guard against invasive species.

Fall Index Netting (FIN)

Alberta Environment and Parks (AEP) 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 2 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 2021, 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 (5,832 ha) is located 200 kilometres east of the city of Edmonton. From September 27 to 30, 2021, 12 half-length nets captured 1 burbot, 19 Northern pike, 2 spottail shiners, 135 lake whitefish, 48 white suckers, and 111 yellow perch.

Walleye

The mean catch rate of walleyes was 0/ half-length net-night. The corresponding FSI score for the current mature density of walleyes was assessed at **functionally extirpated**.

Frog Lake historically had walleye. Extirpation was due to high commercial and recreational fishing, and low water levels may have reduced spawning habitats contributing to the extirpation.

Northern Pike

The mean catch rate of mature Northern pike was 1.4/ half-length net-night (Figure 1). The corresponding FSI score for the current mature density of Northern pike was assessed at **very high risk**.

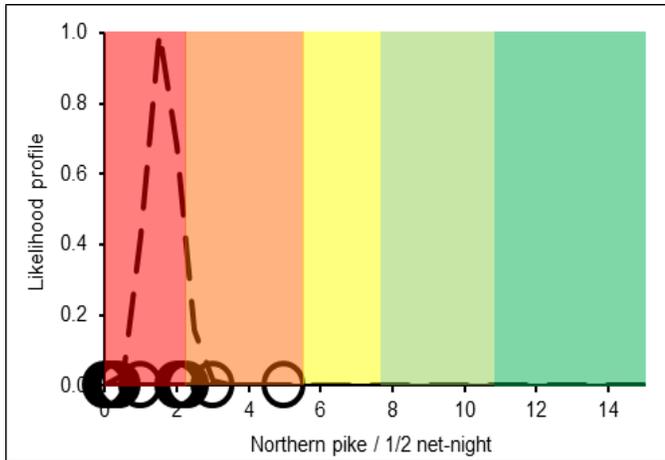


FIGURE 1 - The FIN catch rate of mature Northern pike from Frog Lake, 2021. Dashed line is the mean catch rate (1.4 fish/ half-length net-night), with individual net data as hollow circles (n=12 nets).

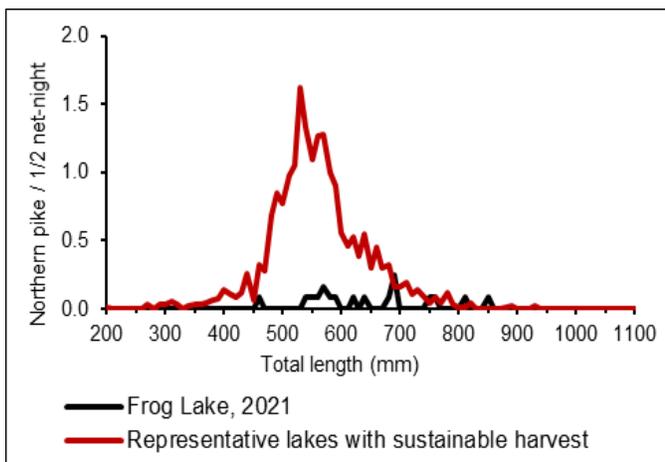


FIGURE 2 - FIN sample showing size of Northern pike from Frog Lake, 2021. The red line indicates the average length distribution of Northern pike from 6 Alberta lakes supporting long-term sustainable harvests of Northern pike.

The length distribution shows no recent recruitment, very weak abundances of 460 to 680 mm fish, and a few pike larger than 700 mm (Figure 2).

The 2021 FIN sample represented approximately 0.1% of the estimated mature Northern pike population size.

Summary

The status of walleyes in Frog Lake has remained at **functionally extirpated**.

Since the 2016 FIN assessment, the status of mature Northern pike has remained at **very high risk**.

Conservation-based management will remain 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.