

Skeleton Lake FIN Summary

2020

Background

“How are the fish in my lake doing?” We need this answer to set appropriate fishing regulations, to understand and correct any problems with fish habitat, and to guard against invasive species. A healthy fish population and fish community means we can all enjoy the benefits of sustainable fisheries and healthy ecosystems. A standard method of assessing the status of fish populations is necessary to allow comparisons of fish sustainability across the years at a lake, and to compare to other lakes. In Alberta, we use an accepted standard of index netting for lake fisheries assessment. This method provides the necessary data on fish abundance, biological data (such as age and sex), and species diversity to assess sustainability.

Fall Index Netting (FIN)

Alberta Environment and Parks monitor Walleye and Northern Pike populations using standardized index netting (Morgan, 2002). 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 Skeleton Lake in 2020, a half-length variation of the standard index net was used, balancing 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, Alberta biologists provide the fish to local Indigenous peoples or to persons on approved subsistence lists. Typically, a tiny proportion of the lake’s fish population (usually 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 fish living to old age) or habitat (e.g., poor spawning success) 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. Achieving this goal uses the netting data and the FSI to determine the most appropriate sport fishing 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 FIN and FSI websites,

- <https://www.alberta.ca/fall-index-netting.aspx>
- <https://www.alberta.ca/fish-sustainability-index-overview.aspx>

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 of the 2020 FIN at Skeleton Lake

Skeleton Lake (875 ha) is located 50 km west of the town of Athabasca. From September 8 to 11, 2020, 14 ½-length nets captured 64 Lake Whitefish, 72 Northern Pike, 105 Walleyes, 15 White Suckers and 222 Yellow Perch.

Walleye

The mean catch rate of Walleyes was 7.5/½ net-night. The catch rates of mature (Figure 1) and immature Walleyes were 7.2/½ net-night and 0.3/½ net-night, respectively. The corresponding FSI score for the current mature density of Walleyes was assessed at **moderate** to **high** risk.

The length distribution shows very weak recruitment, low abundance of 350 mm to 480 mm Walleyes and abundant 490 mm to 630 mm fish (Figure 2).

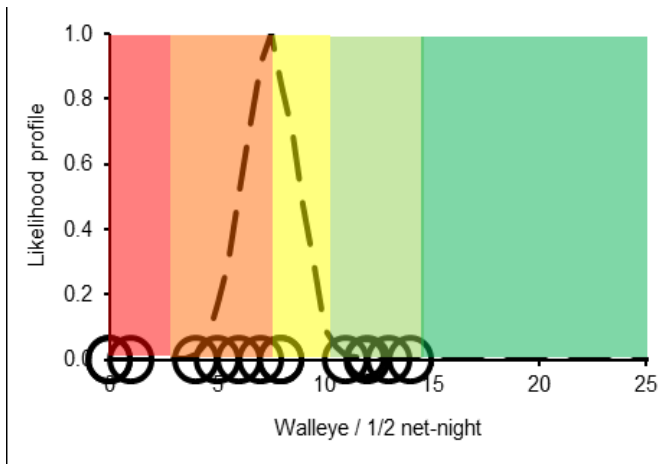


Figure 1 - The FIN catch rate of mature Walleyes from Skeleton Lake, 2020. Dashed line is the mean catch rate (7.2 fish/ ½ net-night), with individual net data as hollow circles (n=14 nets).

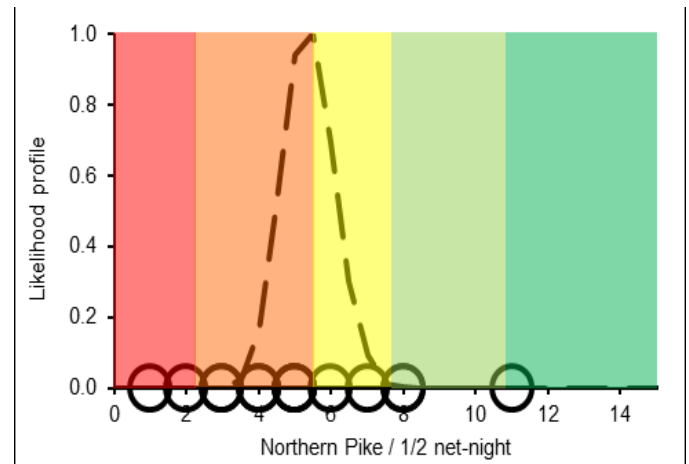


Figure 3 - The FIN catch rate of mature Northern Pike from Skeleton Lake, 2020. Dashed line is the mean catch rate (4.8 fish/ ½ net-night), with individual net data as hollow circles (n=14 nets).

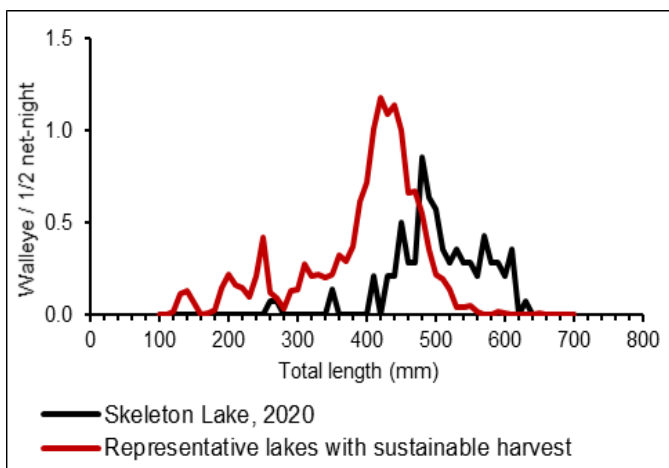


Figure 2 – FIN sample of showing size of Walleyes from Skeleton Lake, 2020. The red line indicates the average length distribution of Walleye from 5 Alberta lakes supporting long-term sustainable harvests of Walleye.

The 2020 FIN sample represented approximately 1.5% of the estimated mature Walleye population size.

Northern Pike

The mean catch rate of mature Northern Pike was 4.8/ ½ net-night (Figure 3). The corresponding FSI score for the current mature density of Northern Pike was assessed at **moderate** to **high** risk

The length distribution shows strong recruitment, moderate abundances of 420 mm to 630 mm pike, and the truncation and absence of fish larger than 630 mm (Figure 4).

The 2020 FIN sample represented approximately 0.3% of the estimated mature Northern Pike population size.

Summary

The FIN assessments (2004, 2010 and 2020) indicated weak recruitment and pulses of larger Walleyes. The status of Walleyes was **moderate** to **high** risk.

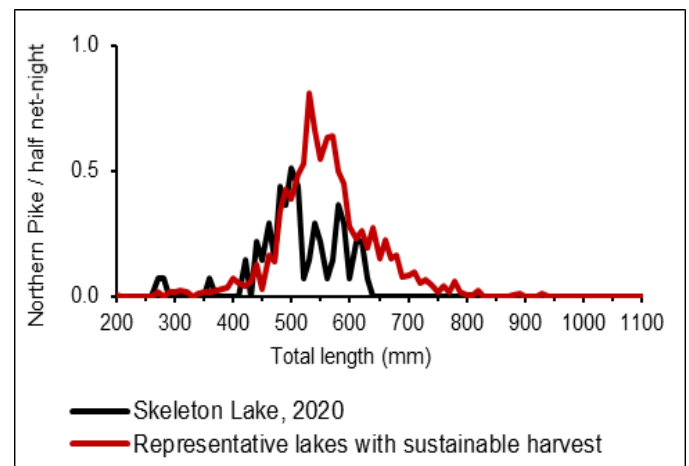


Figure 4 – FIN sample showing size of Northern Pike from Skeleton Lake, 2020. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

Conservation-based management is necessary to support the sustainability of this population and fishery, based on the management objective.

A slot harvest regulation is being evaluated for Walleyes at Skeleton Lake. Alberta Fish and Wildlife will report on its performance as survey results are available.

Since the 2004 and 2010 assessments, the status of the pike population has declined from **low-moderate** risk to **moderate-high** risk in 2020. The decline in status and the size truncation suggests high harvest pressure. Based on the management objective, conservation-based management is required to enhance the sustainability of this population and fishery.

A slot harvest regulation is being evaluated for Northern Pike at Skeleton Lake. Alberta Fish and Wildlife will report on its performance as survey results are available.