Lesser Slave 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. 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/net	Mature Pike/net	Risk to Sustainability
>29.0	>21.8	Very Low
20.3-29.0	15.3-21.8	Low
14.5-20.2	10.9-15.2	Moderate
5.8-14.4	4.4-10.8	High
<5.8	<4.4	Very High

Results of the 2020 FIN at Lesser Slave Lake

Lesser Slave Lake (119,267 ha) is located adjacent to the town of Slave Lake. From September 9 to 19, 2020 44 nets were fished. In the west basin, 20 nets captured 167 Lake Whitefish, 62 Northern Pike, 300 Walleyes and 34 Yellow Perch. In the east basin, 24 nets captured 109 Lake Whitefish, 48 Northern Pike, 727 Walleyes and 4 Yellow Perch.

Walleye

The mean catch rates from the west and east basins for mature Walleyes were 10.5/net-night and 15.9/net-night, respectively. The mean catch rates from the west and east basins for immature Walleyes were 4.4/net-night and 14.3/net-night, respectively. The overall mean catch rates for mature and immature Walleyes from both basins (i.e., overall lake) were 13.5/ net-night (Figure 1) and 9.3/ net-night. The corresponding FSI score for the overall density

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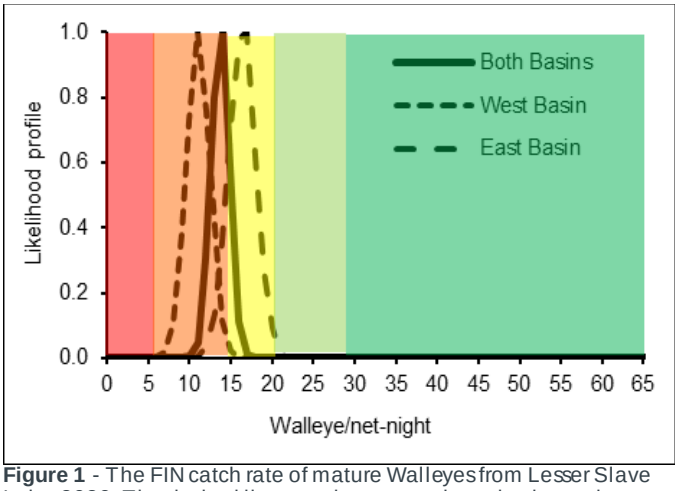

Figure 1 - The FIN catch rate of mature Walleyes from Lesser Slave Lake, 2020. The dashed lines are the west and east basin catch rates of mature Walleye (10.5/ net-night and 15.9/ net-night, respectively) and the solid line is overall catch rate from both basins (13.5/ net-night).

of mature Walleyes was assessed at high risk. The west basin and east basin catch rates and FSI scores were assessed at high and moderate risk, respectively.

The length distribution shows variable but overall strong recruitment, modest abundances of 300 mm to 480 mm Walleyes fish, and a healthy abundance of fish larger than 480 mm (Figure 2).

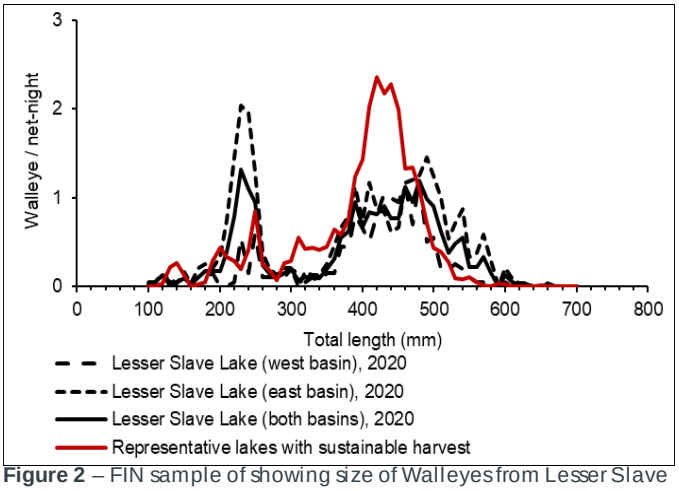

Figure 2 – FIN sample of showing size of Walleyes from Lesser Slave Lake, 2020. The red line indicates the average length distribution of Walleye from 5 Alberta lakes supporting long-term sustainable harvests of Walleye.

The 2020 FIN sample represented approximately 0.02% of the estimated mature Walleye population size.

Northern Pike

The mean catch rates from the west and east basins for mature Northern Pike were 2.3/net-night and 2.1/net-night, respectively. The overall mean catch rate for mature Northern Pike (i.e., overall lake) was 2.2/ net-night (Figure 3). The corresponding FSI score for the overall mature density of Northern Pike was assessed at **very high** risk. The FSI scores for the west and east basins were also **very high** risk.

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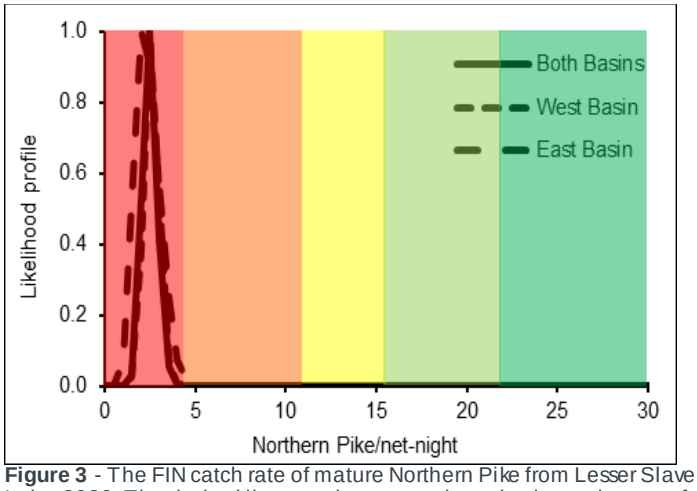

Figure 3 - The FIN catch rate of mature Northern Pike from Lesser Slave Lake, 2020. The dashed lines are the west and east basin catch rates of mature Northern Pike (2.3/ net-night and 2.1 / net-night, respectively) and the solid line is overall catch rate from both basins (2.2/ net-night).

The length distribution shows steady but weak recruitment, low abundances of Northern Pike across all size-classes and a few fish larger than 750 mm (Figure 4).

The 2020 FIN sample represented approximately 0.01% of the estimated mature Northern Pike population size.

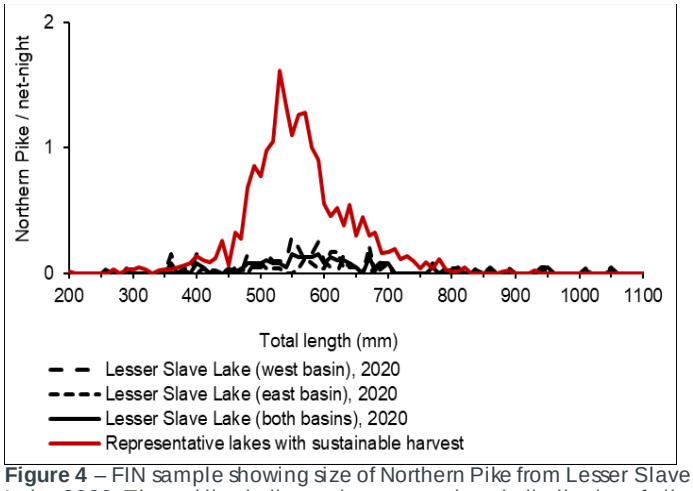

Figure 4 – FIN sample showing size of Northern Pike from Lesser Slave Lake, 2020. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

Summary

Since the status assessments of Walleye from 2010, 2014 and 2020, the density of Walleye has remained at a high risk status. Likely due to substantial harvest pressure and exploitation, the status of the Walleye population has been steady and based on the management objective, conservation-based management remains necessary.

Since the assessments of 2010 and 2014 and confirmed in 2020, the status of Northern Pike has remained at a **very high** risk. Based on the management objective, strict conservation-based management is required to recover this population and fishery.