Sandy Lake FIN Summary, 2017

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:

- http://aep.alberta.ca/fish-wildlife/fisheries-management/fall-index-netting/default.aspx
- http://aep.alberta.ca/fish-wildlife/fisheries-management/fish-sustainability-index/default.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 2017 FIN at Sandy Lake

Sandy Lake (2793 ha) is located approximately 104 km northeast from the town of Slave Lake. From September 18-19, 2017, eight gill nets captured 220 Cisco, 1 Lake Whitefish, 93 Northern Pike, 24 Walleyes, and 71 Yellow Perch, from Sandy Lake.

Walleye

The mean catch rate of Walleyes was 3.0/net-night. The catch rates of mature (Figure 1) and immature Walleyes were 1.1/net-night and 1.9/net-night, respectively. The corresponding FSI score for the current mature density of Walleyes was assessed at **very high risk**.

The length distribution shows no recruitment and a low abundance of 420-570 mm Walleyes (Figure 2).

The 2017 FIN sample represented approximately 0.5% of the estimated mature Walleye population size.

Northern Pike

The mean catch rate of mature Northern Pike was 11.5/net-night (Figure 3). The corresponding FSI score for the mature density of Northern Pike was assessed at moderate risk.

The length distribution indicates a lack of recruitment, low densities of 530-660 mm Northern Pike, and abundant fish larger than 690 mm (Figure 4).

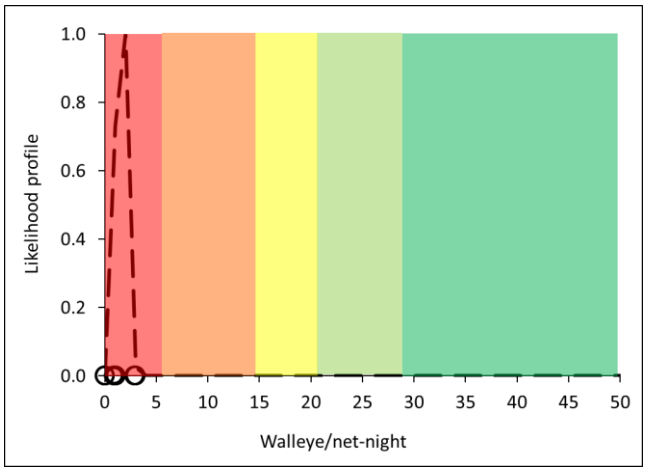

Figure 1 - The FIN catch rate of mature Walleyes from Sandy Lake, 2017. Dashed line is the mean likelihood catch rate (1.1/fish/net-night), with net individual data as hollow circles (n=8 nets).

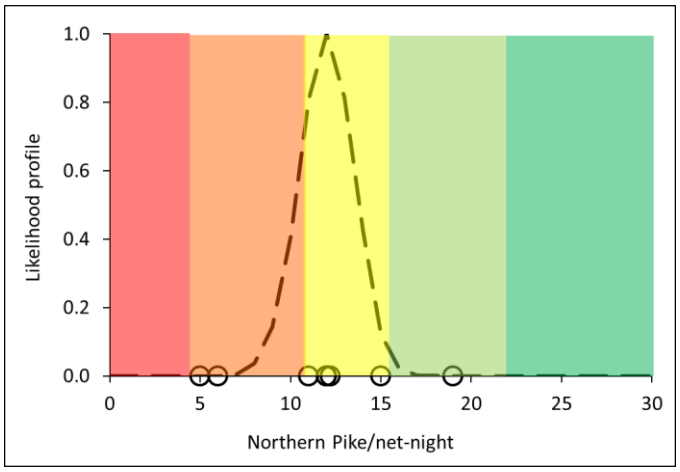

Figure 3 - The FIN catch rate of mature Northern Pike from Sandy Lake, 2017. Dashed line is the mean likelihood catch rate (11.5 fish/net-night), with individual net data as hollow circles (n=8 nets).

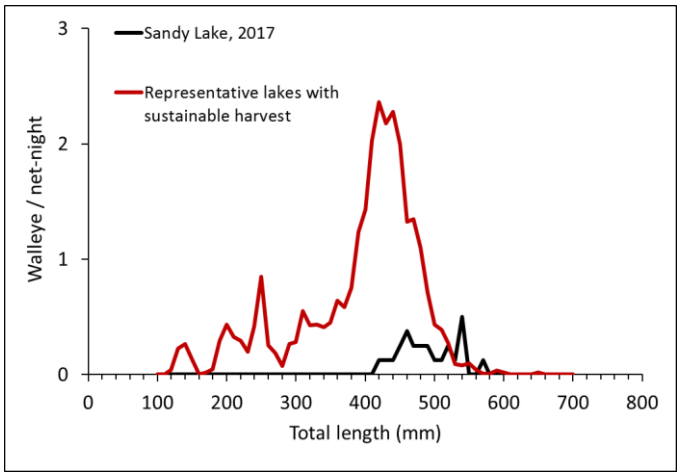

Figure 2 – FIN sample of showing size of Walleyes from Sandy Lake, 2017. The red line indicates the average length distribution of Walleye from 5 Alberta lakes supporting long-term sustainable harvests of Walleye.

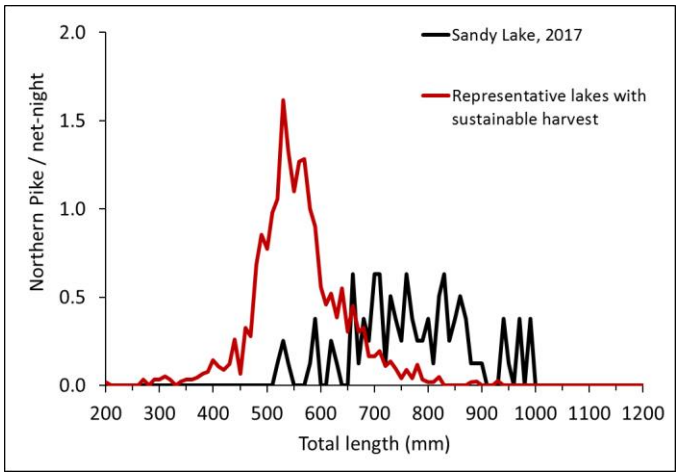

Figure 4 – FIN sample showing size of Northern Pike from Sandy Lake, 2017. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

The 2017 FIN sample represented approximately 0.1% of the estimated Northern Pike population size.

Summary

Since the FIN assessment in 2013, the abundance of mature Walleyes and the corresponding FSI status has remained at **very high risk**. Given the extremely low abundance of Walleyes and lack of recruitment, continued recovery actions and conservation-based management are necessary to recover and sustain this population.

Since the 2013 FIN assessment, the abundance of mature pike and the corresponding FSI status has increased from high risk to moderate risk. The lack of consistenct recruitment and moderate density of adults suggests a growth overfished stock. Continued monitoring and active management are necessary to maintain a sustainable harvest objective for this 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.