Buffalo 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 Buffalo Lake

Buffalo Lake (8,990 ha) is located approximately 65 km northeast from the city of Red Deer. From October 3-5, 2017, ten gill nets captured 168 Northern Pike, 3 Burbot, and 65 White Suckers, from Buffalo Lake. No Walleyes are present in this lake.

Northern Pike

The mean catch rate of mature Northern Pike was 16.1/net-night (Figure 1). The corresponding FSI score for the mature density of Northern Pike was assessed at low risk.

The length distribution shows moderate and somewhat sporadic recruitment of pike smaller than 400 mm, moderate abundance of fish from 410-600 mm, a high abundance of pike between 610-730 mm, with few large pike (Figure 2).

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

Summary

Since the FIN assessment in 2009, the corresponding FSI status of mature Northern Pike has improved from high risk to low risk. Conservation-based management is necessary for

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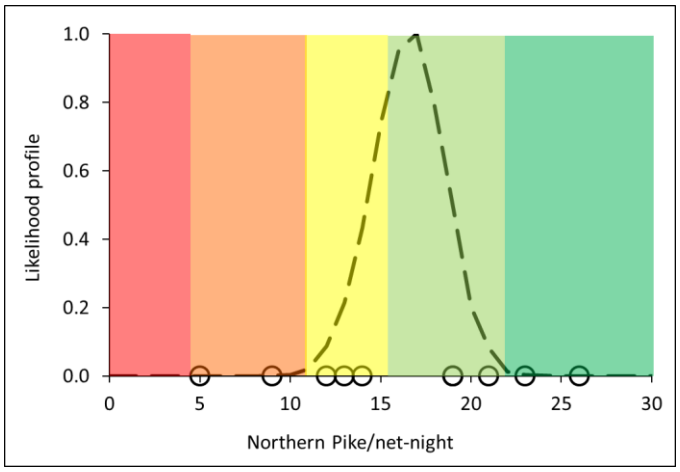

Figure 1 - The FIN catch rate of mature Northern Pike from Buffalo Lake, 2017. Dashed line is the mean likelihood catch rate (16.1 fish/net-night), with individual net data as hollow circles (n=10 nets).

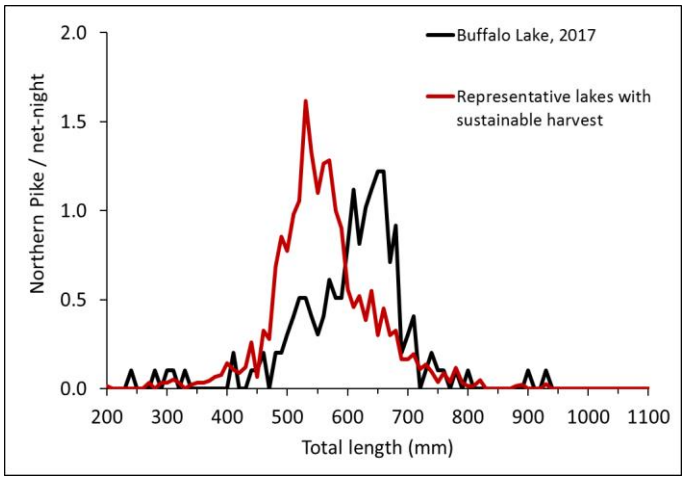

Figure 2 – FIN sample showing size of Northern Pike from Buffalo Lake, 2017. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

this fishery to reach the management objective and to maintain the long-term sustainability of this fishery.

Walleye were stocked into Buffalo Lake in 1926 and 1960 and these stockings were unsuccessful. There have been anecdotal reports of walleye being angled at the narrows though index netting assessments have not caught any walleye to validate these reports.

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.

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