North Buck Lake FIN Summary, 2015

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 Fisheries Management Objective for most Alberta fisheries is **long-term sustainability**, shown by the red lines on the graphs below. Achieving this objective 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 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 2015 FIN at North Buck Lake

North Buck Lake (1994 ha) is located 38 km southwest from the town of Lac La Biche. From September 14 to 17, 2015, twelve gill nets captured 82 Lake Whitefish, 74 Northern Pike, and 57 Yellow Perch from North Buck Lake.

Walleye

No Walleye were captured during the 2015 FIN assessment of North Buck Lake. This lake once had native walleye, and was stocked 4 times in the 1980s. The Walleye, however, appear to be **extirpated**. Stocking has failed to restore the population.

Northern Pike

The mean catch rate of mature Northern pike was 5.4/net-night (Figure 1). The corresponding FSI score for the mature density of Northern Pike was assessed at high risk.

The length distribution of Northern Pike in North Buck Lake shows moderate recruitment, but low densities of large Northern Pike (Figure 2). Historically known as an excellent pike fishery, the truncation of sizes suggests high mortality on Pike.

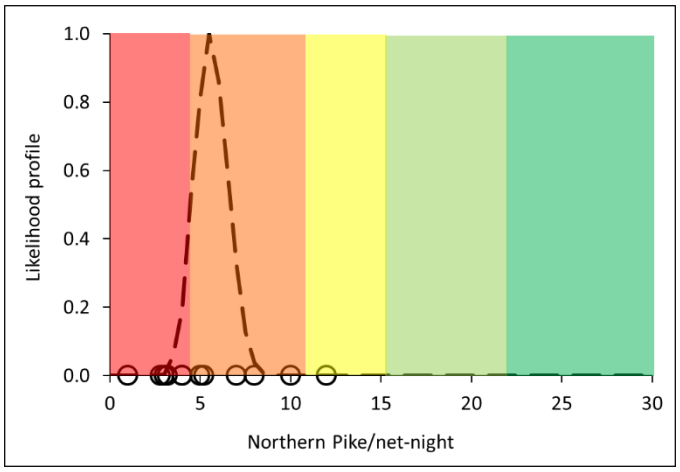

Figure 1 - The FIN catch rate of Northern Pike from North Buck Lake, 2015. Dashed line is the mean likelihood catch rate (5.4/net-night), with individual net data as hollow circles (n=12 nets).

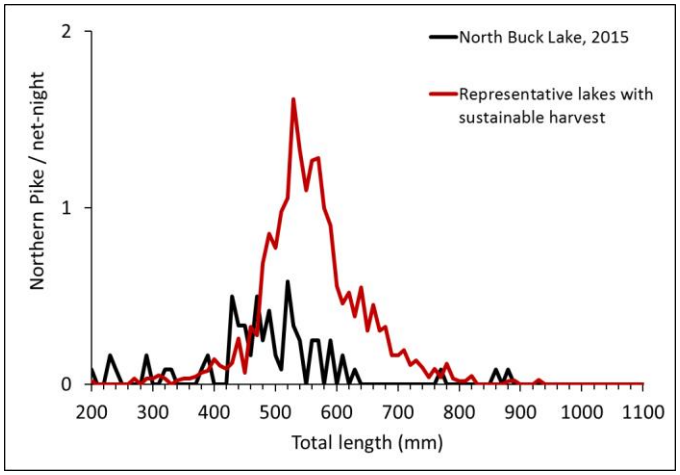

Figure 2 – FIN sample showing size of Northern Pike from North Buck Lake, 2015. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

The 2015 FIN sample represented approximately 0.3% of the estimated Northern Pike population size.

Summary

No Walleye were captured during either the 2009 or 2015 FIN assessments. At present, the Walleye population is extirpated.

The 2009 FIN assessment determined the corresponding FSI status of the density of mature Northern Pike to be low risk, but the 2015 assessment showed a serious decline to high risk. The size limit (1 Pike <63 cm or >100 cm) has resulted in the decline of the Pike fishery and the management objective of long-term sustainability is not being achieved.

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.