Elinor 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. At Elinor Lake in 2015, 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 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 / 1/2 net	Mature Pike / 1/2 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 2015 FIN at Elinor Lake

Elinor Lake (858 ha) is located approximately 25 km SE from the town of Lac La Biche. From September 21-24, 2015, twelve ½ length nets captured 11 Lake Whitefish, 42 Northern Pike, 145 Walleye, and 54 Yellow Perch.

Walleye

The mean catch rate of Walleye was 12.1/ ½ net-night. The catch rates of mature (Figure 1) and immature Walleye were 8.4/ ½ net-night and 3.7/ ½ net-night, respectively. The corresponding FSI score for the current mature density of Walleye was assessed at moderate risk**.**

The length distribution shows moderate recruitment, and a adequate density of larger fish, but with considerable truncation of fish over 500 mm (Figure 2), strongly indicating heavy fishng pressure.

The 2015 FIN sample represented approximately 1.3% of the estimated mature Walleye population size.

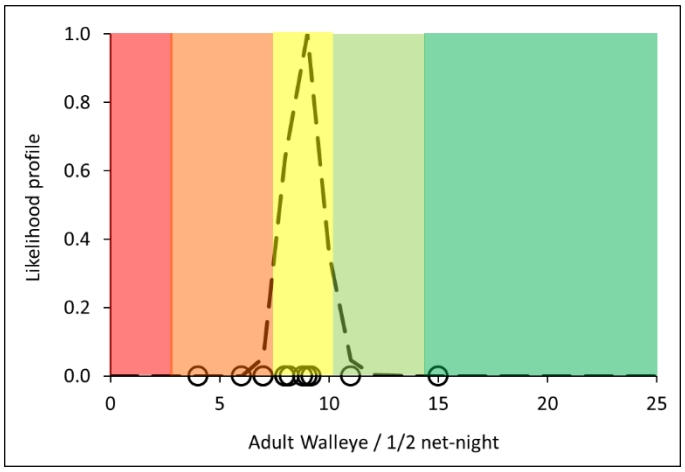

Figure 1 - The FIN catch rate of mature Walleyes from Elinor Lake, 2015. Dashed line is the mean likelihood catch rate (8.4 fish/ ½ net-night), with individual net data as hollow circles (n=12 nets).

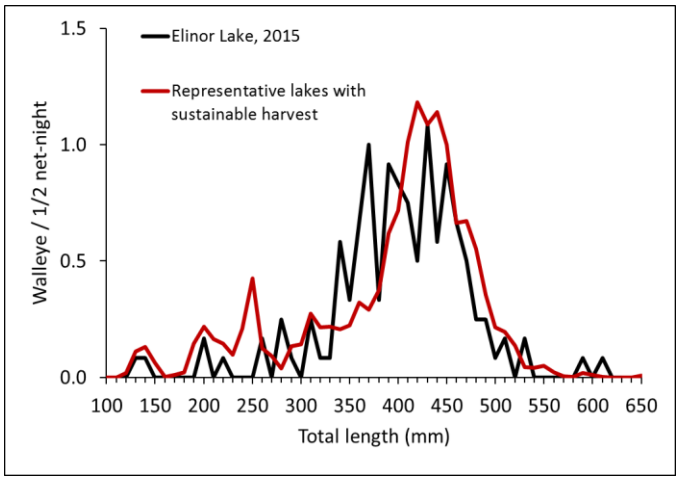

Figure 2 – FIN sample showing size of Walleyes from Elinor Lake, 2015. The red line indicates the average length distribution of Walleye from 5 Alberta lakes supporting long-term sustainable harvests of Walleye.

Northern Pike

The mean catch rate of mature Northern Pike was 3.3/ ½ net-night (Figure 3). The corresponding FSI score for the mature density of Northern Pike was assessed at high risk.

The length distribution shows weak and unstable recruitment of Northern Pike, carrying through to patchy adult densities (Figure 4). This poor-quality fishery appears to be supported by few year-classes.

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

Summary

The previous FIN assessments of Elinor Lake showed the status of Walleye decreasing from moderate risk to high risk.

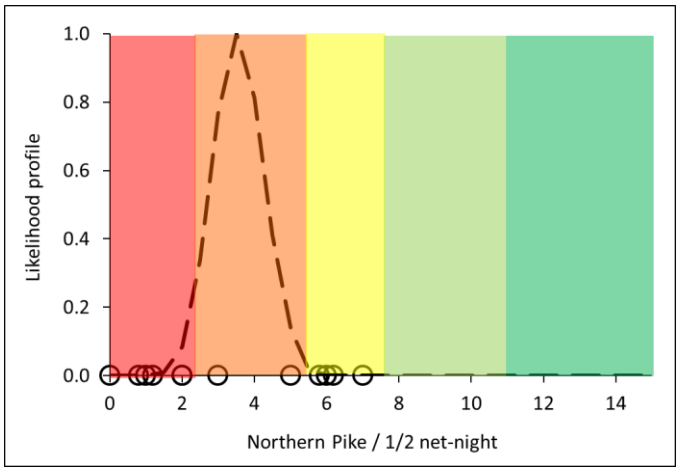

Figure 3 - The FIN catch rate of Northern Pike from Elinor Lake, 2015. Dashed line is the mean likelihood catch rate (3.5 fish/ ½ net-night), with individual net data as hollow circles (n=12 nets).

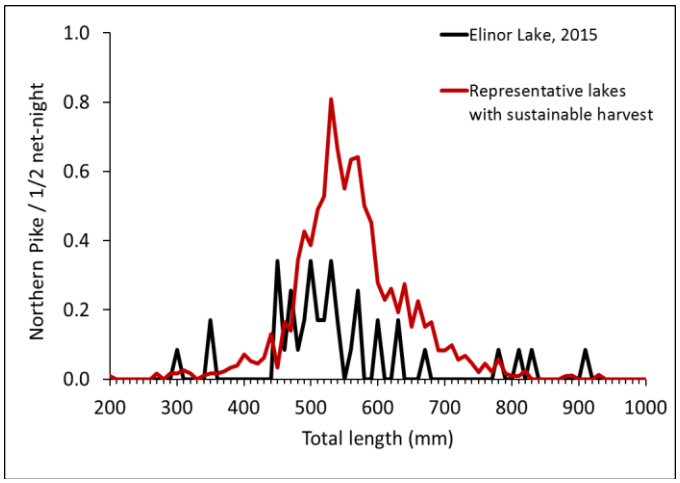

Figure 4 – FIN sample showing size of Northern Pike from Elinor Lake, 2015. The red line indicates the average length distribution of Pike from 6 Alberta lakes supporting long-term sustainable harvests of Pike.

The 2015 FIN, however, showed the status recovering to moderate risk. Long-term sustainable harvests are being achieved at this fishery with the careful use of special harvest licences.

The FIN assessments during the past decade have all showed the Pike fishery remaining at high risk. Improving the fishery to provide a long-term sustainable harvest will likely require conservation-focused management.

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.