Winagami 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 Winagami Lake

Winagami Lake (4586 ha) is located 128 km west from the town of Lesser Slave Lake. Walleye were initially stocked in this lake-turned-resevoir during the 1990s. From September 9 to 11, 2015, ten gill nets captured 59 Lake Whitefish, 125 Northern Pike, 238 Walleye, 2 White Suckers, and 36 Yellow Perch from Winagami Lake.

Walleye

The mean catch rate of Walleyes was 23.9/net-night. The catch rates of mature (Figure 1) and immature Walleye were 20.5/net-night and 3.3/net-night, respectively. The corresponding FSI score for the current mature density of Walleye was assessed at low risk.

The length distribution shows unstable recruitment and low densities of small Walleye, but a very strong pulse of large fish (Figure 2). The fishery appears to be supported by only one or two size-classes. Irregular recruitment may be the result of oxygen limitations in this hypereutrophic waterbody.

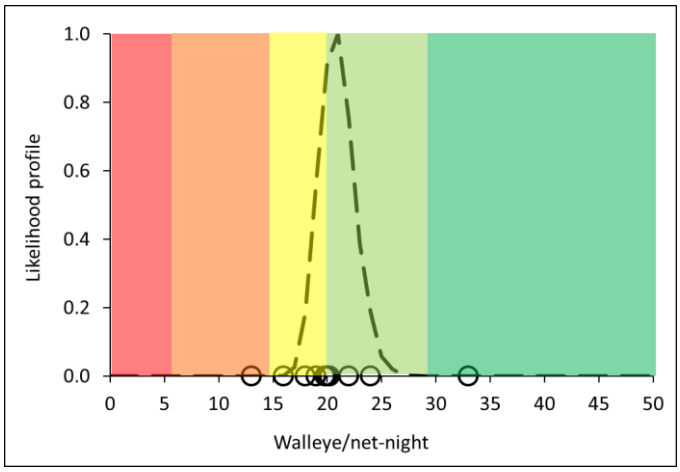

Figure 1 - The FIN catch rate of mature Walleyes from Winagami Lake, 2015. Dashed line is the mean likelihood catch rate (20.5 fish/net-night), with individual net data as hollow circles (n=10 nets).

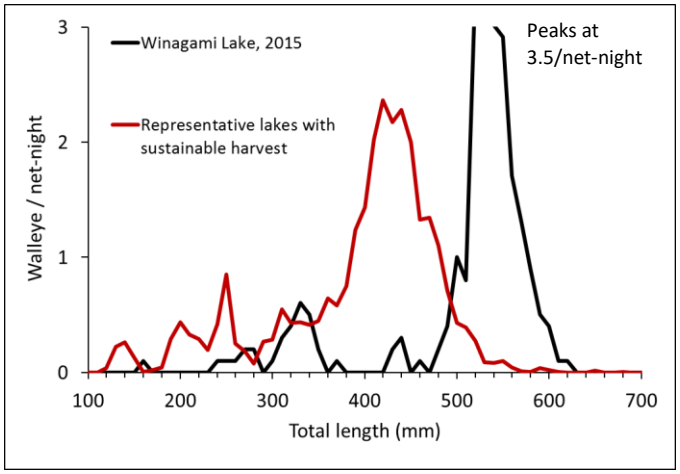

Figure 2 – FIN sample of showing size of Walleyes from Winagami Lake, 2015. The red line indicates the average length distribution of Walleye from 5 Alberta lakes supporting long-term sustainable harvests of Walleye.

The 2015 FIN sample represented approximately <0.4% of the estimated Walleye population size.

Northern Pike

The mean catch rate of mature Northern Pike was 12.3/net-night (Figure 3). The corresponding FSI score for the mature density of Northern Pike was assessed at moderate risk.

The length distribution of Northern Pike shows moderate recruitment, and adequate densities of adult Pike, but with heavy truncation of fish larger than 620 mm (Figure 4).

The 2015 FIN sample represented approximately <0.1% of the estimated Northern Pike population size.

Summary

The previous FIN surveys at Winagami Lake (2006, 2010)

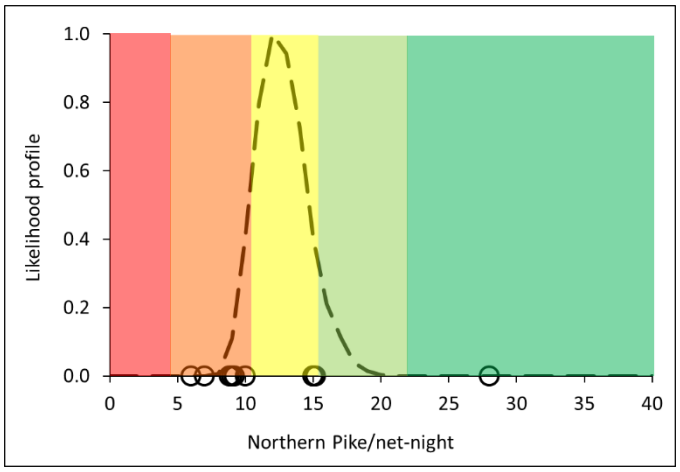

Figure 3 - The FIN catch rate of mature Northern Pike from Winagami Lake, 2015. Dashed line is the mean likelihood catch rate (12.3/net-night), with individual net data as hollow circles (n=10 nets).

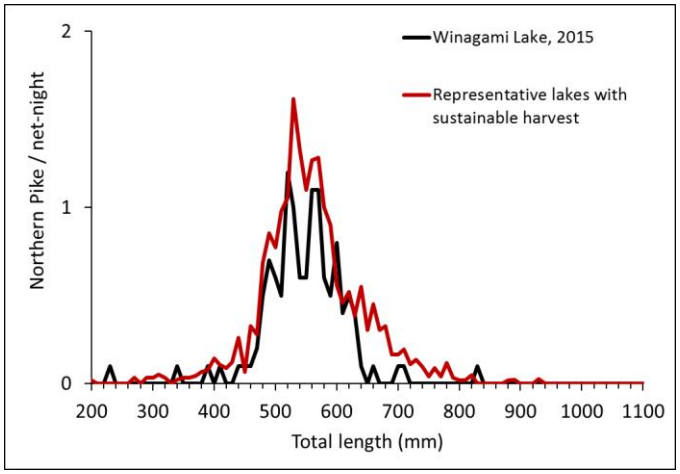

Figure 4 – FIN sample showing size of Northern Pike from Winagami Lake, 2015. The red line indicates the average length distribution of Pike from 6 Alberta lakes supporting long-term sustainable harvests of Pike.

indicated the density of mature Walleye has been increasing to the current low risk. However, this is apparently the result of a strong size-class of Walleye. Careful management of the harvest of adult Walleye is necessary for long-term sustainability.

The 2006, 2010, and 2015 FIN surveys at Winagami Lake show an improvement in density of mature Northern Pike to moderate risk. Long-term sustainability appears reasonable and therefore additional opportunities exist for management objectives such as high-quality fisheries.

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.