

Wabamun Lake FIN Summary

2020

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,

- <https://www.alberta.ca/fall-index-netting.aspx>
- <https://www.alberta.ca/fish-sustainability-index-overview.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 2020 FIN at Wabamun Lake

Wabamun Lake (8031 ha) is located 70 km west from the city of Edmonton. From September 13th to 15th, 2020, 5 gill nets captured 69 Lake Whitefish, 4 Northern Pike, 127 Walleyes, 10 White Suckers, and 7 Yellow Perch from Wabamun Lake.

Walleye

The mean catch rate of Walleyes was 25.4 fish/net-night. The catch rates of mature (Figure 1) and immature Walleyes were 20.4 fish/net-night and 5.0 fish/net-night, respectively. The corresponding FSI score for the current mature density of Walleyes was assessed at **low** risk.

The length distribution reflects a sporadic pattern of recruitment, a high abundance of fish between 320 mm to 440 mm and no fish reaching lengths greater than 500 mm (Figure 2).

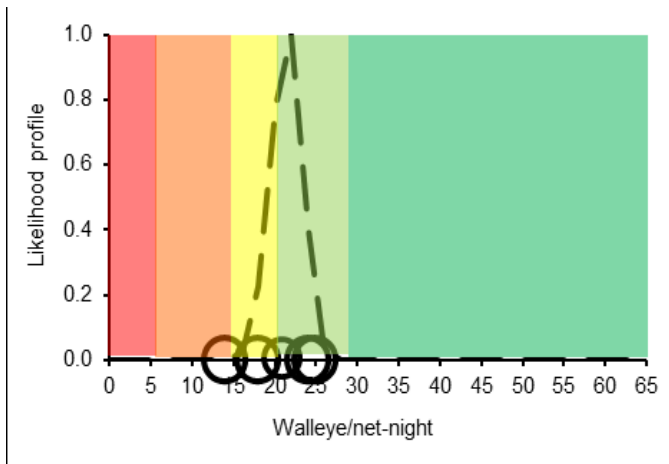


Figure 1 - The FIN catch rate of mature Walleyes from Wabamun Lake, 2020. Dashed line is the mean catch rate (20.4 fish/net-night), with individual net data as hollow circles (n = 5 nets).

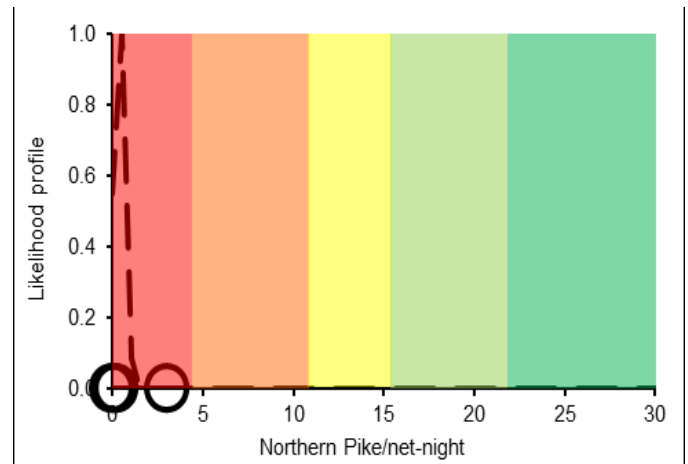


Figure 3 - The FIN catch rate of mature Northern Pike from Wabamun Lake, 2020. Dashed line is the mean catch rate (0.6 fish/net-night), with individual net data as hollow circles (n = 5 nets).

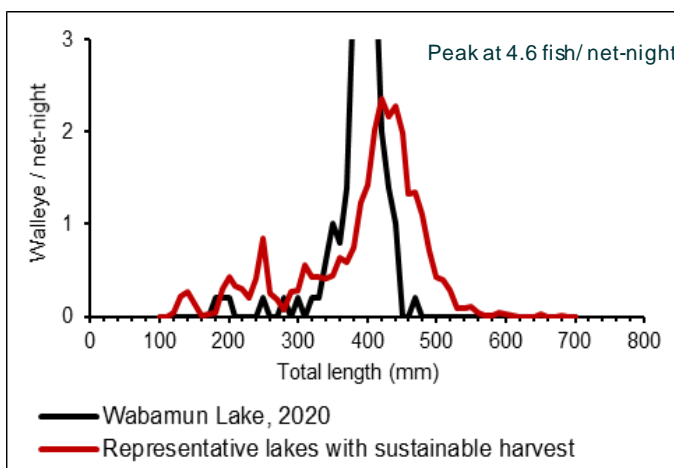


Figure 2 – FIN sample showing size of Walleyes from Wabamun Lake, 2020. The red line indicates the average length distribution of Walleye from 5 Alberta lakes supporting long-term sustainable harvests of Walleye.

The 2020 FIN sample represented approximately 0.1% of the estimated mature Walleye population size.

Northern Pike

Though 4 pike were caught, the mean catch rate of Northern Pike was 0.8 fish/net-night. The catch rates of mature (Figure 3) 0.6 fish/net-night. The corresponding FSI score for the mature density of Northern Pike was assessed at **very high** risk.

The pike length distribution (from 4 fish) in Wabamun Lake shows very little evidence of recruitment, a completely absent mid-size class range (i.e., 250 mm to 710 mm) and a few larger fish greater than 720 mm (Figure 4).

The 2020 FIN sample represented approximately 0.02% of the estimated Northern Pike population size.

Summary

The Walleye in Wabamun Lake were reestablished

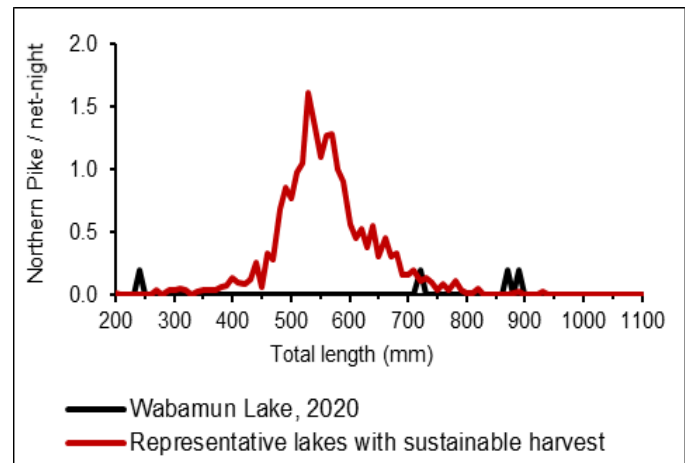


Figure 4 – FIN sample showing size of Northern Pike from Wabamun Lake, 2020. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

between 2010 and 2014 by transferring adults and stocking fry from Lac Ste. Anne. Recovery of this fishery is evident as the FSI status has improved considerably from being **very high** risk in 2015 to a **low** risk in 2020. To continue long-term recovery efforts, recruitment of young Walleyes will be necessary.

Between 2015 and 2020, the FSI status of mature Northern Pike has degraded from **high** risk to **very high** risk, respectively. Strict conservation-based management is necessary, dependent on the management objective, for long-term sustainability of 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.