

**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 2013 FIN at Wabamun Lake**

Wabamun Lake (8031 ha) is located approximately 70 km west from the city of Edmonton. From September 30-October 2, 2013, ten gill nets captured 151 Lake Whitefish, 130 Northern Pike, 109 Walleyes, 41 White Suckers, and 131 Yellow Perch, from Wabamun Lake.

**Walleye**

The mean catch rate of Walleyes at this stocked fishery was 10.9/net-night. The catch rates of mature (Figure 1) and immature Walleyes were 0.8/net-night and 9.8/net-night, respectively. The corresponding FSI score for the current mature density of Walleye was assessed at **very high risk** and is entirely composed of stocked fish, but Walleye smaller than 300mm are naturally produced.

The length distribution shows intermittent but strong recruitment from the stocked adults and fry. This population appears to be showing promising signs of restoration (Figure 2).

The 2013 FIN sample represented approximately 0.2% of the estimated Walleye population size.

**Northern Pike**

The mean catch rate of mature Northern pike was 13.0/net-night (Figure 3). The corresponding FSI score for the mature

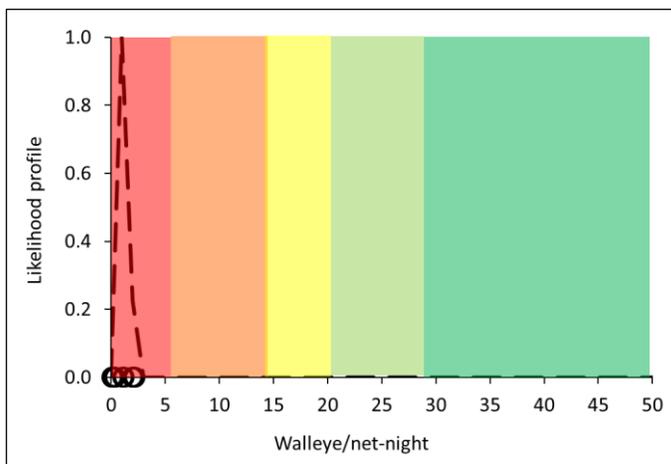


Figure 1 - The FIN catch rate of mature Walleyes from Wabamun Lake, 2013. Dashed line is the mean likelihood catch rate (0.8/fish/net-night), with net individual data as hollow circles (n=10 nets).

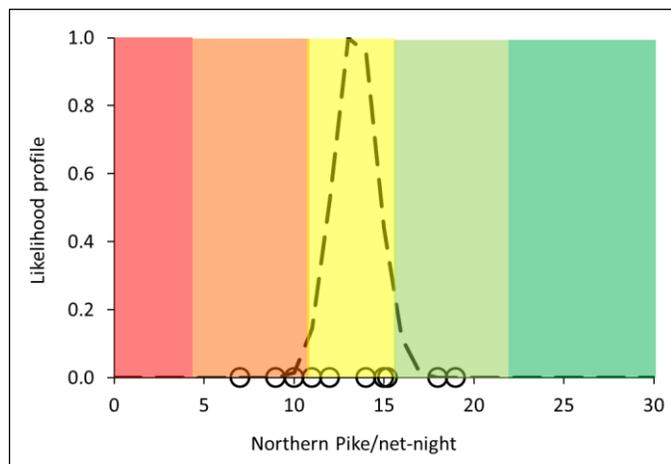


Figure 3 - The FIN catch rate of Northern Pike from Wabamun Lake, 2013. Dashed line is the mean likelihood catch rate (13.0 fish/net-night), with individual net data as hollow circles (n=10 nets).

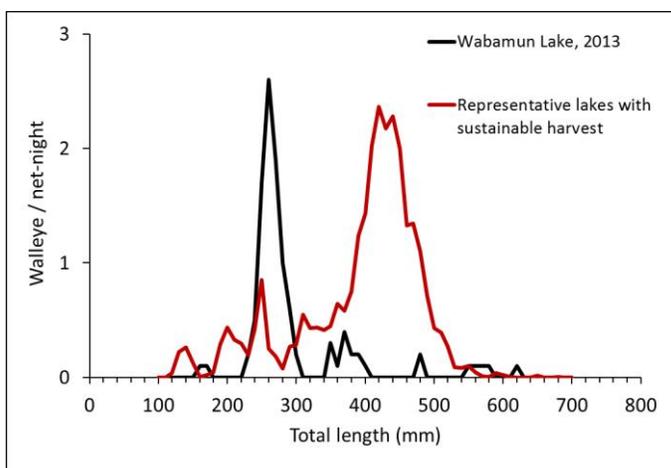


Figure 2 – FIN sample of showing size of Walleyes from Wabamun Lake, 2013. The red line indicates the average length distribution of Walleye from 5 Alberta lakes supporting long-term sustainable harvests of Walleye.

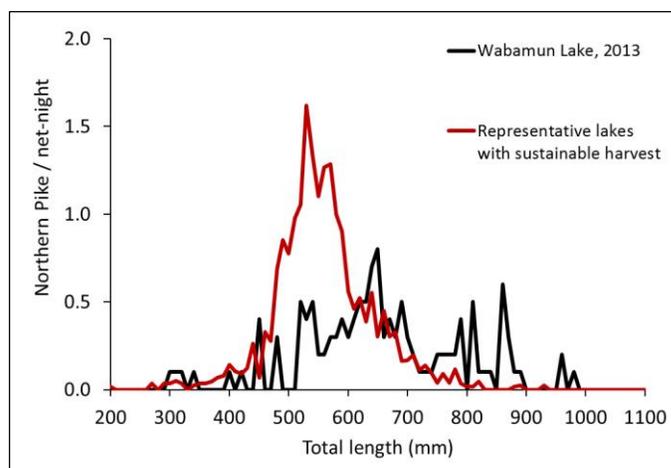


Figure 4 – FIN sample showing size of Northern Pike from Wabamun Lake, 2013. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

density of Northern Pike was assessed at **moderate risk**.

The length distribution shows unstable recruitment, moderately abundant 460-710 mm Pike, and abundant large fish (>700 mm; Figure 4).

The 2013 FIN sample represented approximately 0.05% of the estimated Northern Pike population size.

### Summary

The Walleye in Wabamun Lake were reestablished between 2010 and 2013 by transferring adults from Lac Ste. Anne and Lac la Nonne, and by stocking fry sourced from Lac Ste. Anne, with plans for continued efforts in 2014. The re-introduction of Walleye appears to be promising, with strong representation from the fry stockings, and confirmed natural reproduction by the transferred adults. Recovery of this

fishery is dependent on consistent recruitment of young Walleye, and although initial results look promising, several more years of natural recruitment will be necessary for recovery, therefore the FSI status is **very high risk**.

Since the 2007 and 2010 FIN surveys, the density of mature Northern Pike has increased from a FSI status of **high risk** to **moderate risk**. The irregular recruitment is a concern and careful management remains necessary. However, Wabamun Lake provides a unique opportunity to catch a broad-size range of Northern Pike.

### 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.