

**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 Berry Creek (Carolside) Reservoir**

Berry Creek Reservoir (496 ha), or locally known as Carolside Reservoir is located 160 km east from the city of Calgary. From September 28 to 30, 2015, eight gill nets captured 82 Northern Pike, 12 Spottail Shiners, and 81 White Suckers from Berry Creek Reservoir.

**Walleye**

No Walleye were captured during the 2015 FIN assessment of Berry Creek Reservoir. Walleye have not been stocked into Berry Creek Reservoir however there are unconfirmed anecdotes of Walleye being caught by anglers.

**Northern Pike**

The mean catch rate of mature Northern Pike was 9.6/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 Berry Creek Reservoir shows unstable yet strong recruitment, moderate densities of 490 to 650 mm Pike, and a handful of fish over 650 mm (Figure 2). The Northern Pike population is recovering from the near draining of the reservoir in the fall of 2012.

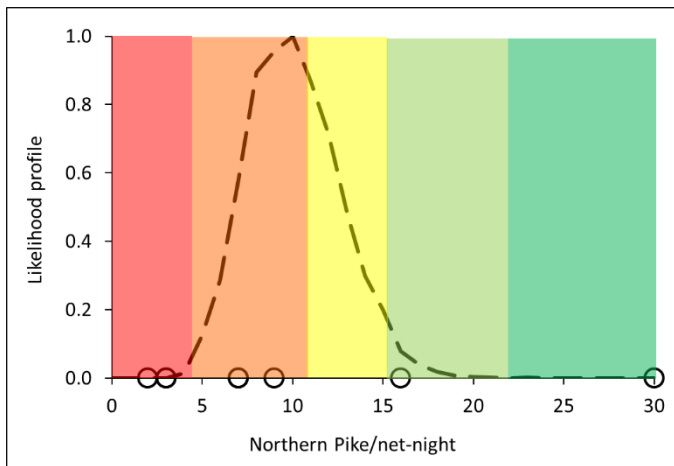


Figure 1 - The FIN catch rate of Northern Pike from Berry Creek Reservoir, 2015. Dashed line is the mean likelihood catch rate (9.6/net-night), with individual net data as hollow circles (n=8 nets).

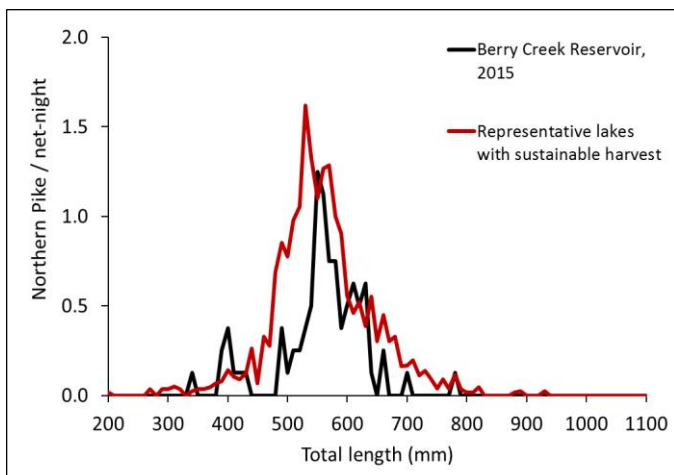


Figure 2 – FIN sample showing size of Northern Pike from Berry Creek Reservoir, 2015. The red line indicates the average length distribution of pike from 6 Alberta lakes supporting long-term sustainable harvests of pike.

The 2015 FIN sample represented approximately 0.7% of the estimated Northern Pike population size.

### Summary

No Walleye were captured during the 2015 assessment. Walleye have not been stocked into Berry Creek Reservoir and there are no historical records of Walleye being present.

The 2015 FIN assessment determined the corresponding FSI status of the density of mature Northern Pike to be **high risk**. However, high variation in net catches leads to uncertainty in the status designation. The length distribution is close to be representative of lakes with sustainable harvest, but currently only has moderate abundance of medium sized pike and few large fish. The Northern Pike population is composed of almost entirely of small individuals (<63 cm).

The presence of Northern Pike, White sucker, and Spottail shiners is evidence that fish were successful in repopulating the reservoir from either upstream refuge sites and/or surviving the low water conditions experienced over the 2012-13 winter season. The data suggests that the Northern Pike population in Berry Creek (Carolside) Reservoir is still recovering before supporting sustainable harvest opportunities. This reservoir will be reassessed in the next 3 to 5 years to determine if a change to the Fisheries Management Objective is required from recovery to providing a harvest opportunity.

### 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.