Lake Nipissing Fisheries Management Plan Update

I wanted to share the information from attending a recent meeting of the lake Nipissing Advisory Council on the Fisheries Management Plan for Lake Nipissing recently.

We meet periodically, usually every two years to review the data and evaluate data and progress on the pan we implemented in 2014. The Fisheries management plan will continue for a number of years as we go forward, and we begin to see an effective balance protecting the fishery and creating a sustainable fishery.

I attended a roughly three-hour mtg, at the MNR offices in North Bay on June 26th, 2024. Our Advisory Council is made up of various representatives from: cottage associations, lodge owners, municipal offices, commercial interests and first nations.

The presenters included representatives from the Ministry of Natural Resources, Ministry of Northern Development and Ministry of Tourism Culture & Sport.

The Fisheries Management Plan was initially implemented in 2014.Date from 2009 and onwards had begun to show a troubling trend in the Walleye population. The data began to show troubling trends in the walleye population with declining fish stocks (particularly walleye) in the older year classes. This began to point towards a possible collapse in the walleye population on Lake Nipissing. Many older year classes (5 to 10 years old) that produced young walleye, were missing. The walleye biomass had dropped to approximately 126, 000 Kg. in Lake Nipissing from the mid 90's numbers that had biomass of closer to 400,000 kg.

Lake Nipissing has one of the most complete fishery data sets in Ontario with records that date back almost 50 years. The data is collected through a number of different means, including the fall walleye Index netting (FWIN) which happens in the fall with rotating locations around the lake, summer creel census, winter creel census, spring netting at walleye spawning areas such as Wasi Falls. Recently, MNR has begun to utilize new and additional data capture methods with many partners including Nipissing First Nations. These new techniques included voluntary shoreline surveys completed by anglers after leaving the ice during the ice fishing season as well as aerial reconnaissance over the lake on multiple occasions during the winter.

Manned aerial surveys covered all 17 ice sectors per flight, with a trained onboard observer recording the 'total activity' (counts of all active huts, both personal and commercially operated, as well as the number of anglers fishing on the ice) per sector.

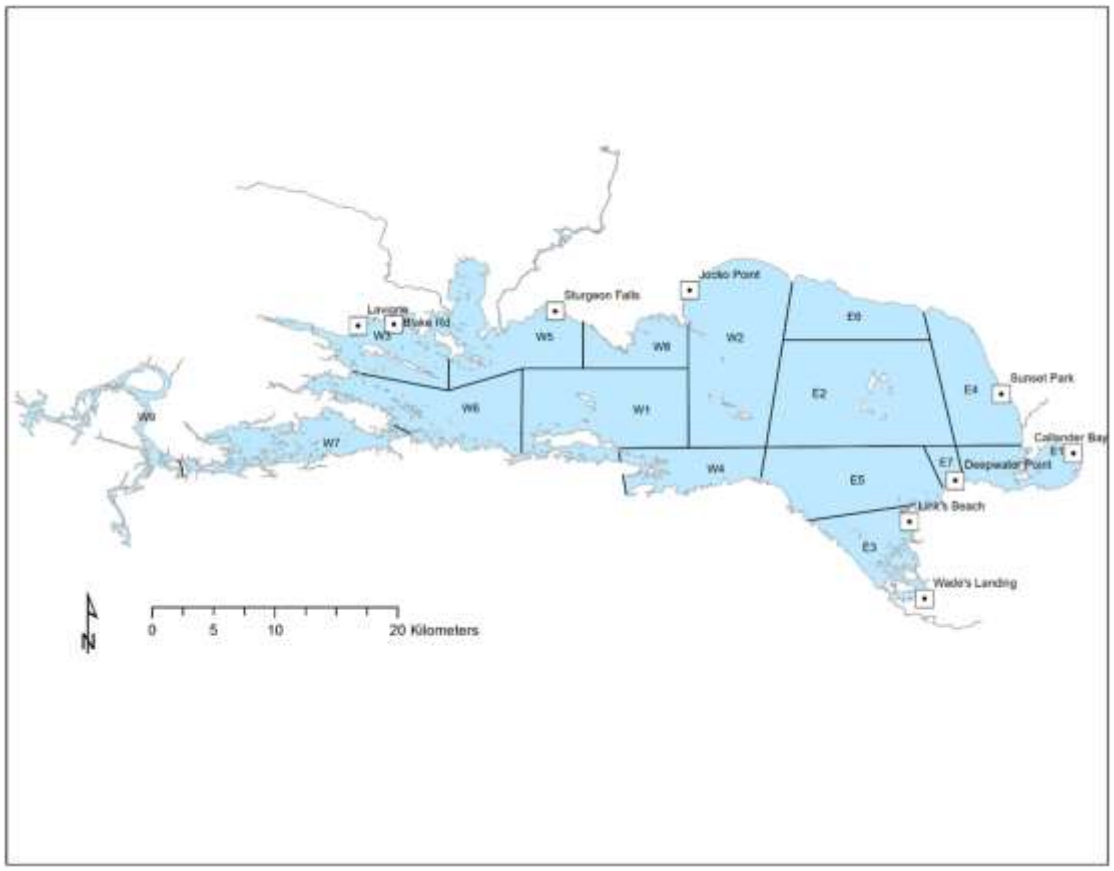

Figure 1

The timing of each sector-level count was recorded. Half of flights were scheduled for mornings (start times between 10:00 am – 12:00 am) and half for afternoons (start times between 1:00 pm – 3:00 pm). Flights were also varied between workdays and non-workdays. Active huts in both roving surveys and aerial counts were distinguished from empty huts based on the presence of snowmobiles, ATVS, or trucks/cars parked nearby; exhaust from gas or wood heating; and/or presence of individuals seen inside or outside.

Food Web Study

We also reviewed the finding from a 2021 Food Web Study of Lake Nipissing designed to better understand food sources including the effects of invasive species and their interrelationship .Recent declines in abundance of walleye, the primary fishery target in Lake Nipissing, have raised concerns that changes in the food web, such as the rise in abundances of spiny water flea (Bythotrephes cederstroemi) and double-crested cormorant (Phalacrocorax auritus), may be reducing walleye production.

Carbon and nitrogen stable isotope ratios (δ13C, δ15N) were analysed to characterize the current food web structure in Lake Nipissing, and to examine how food web structure has changed since the invasion of spiny water flea and compare feeding ecologies of double-crested cormorants and native piscivorous fishes. Analyses were based primarily on food web sampling from 2012 to 2017, supplemented with analyses of archived fish scale samples dating back to 1976 and data from food web research conducted in 2002–2003.

Forage fish food web positions diverged sharply from 2002 to 2015, when the abundance of spiny water flea presumably increased, suggesting a shift towards increased reliance on pelagic production and a lengthening of the food chain since the spiny water flea arrived.

Diets of walleye, northern pike and double-crested cormorant chicks were estimated using stable isotope mixing models. Predictions based on most model scenarios were that diets included high proportions of emerald shiner and/or logperch but only small proportions of yellow perch — the most common forage fish species in Lake Nipissing — and juvenile walleye. Model predictions also indicated that walleye diet composition shifted sharply in the early 2000s

These results have implications for management of the Lake Nipissing fishery. First, the observed lengthening of the food chain, possibly due to the addition of spiny water flea, may be reducing the production of apex predators such as walleye. Second, the high degree of similarity in apex predator diets suggests that double-crested cormorants could compete with native piscivores under food-limiting conditions, though it is not clear whether such conditions exist now. Finally, juvenile walleye appears to be a minor component of both cormorant and native piscivore diets, and cormorant predation on juveniles is probably not limiting walleye recruitment.

A great deal of information was presented I have selected the attached chart to help illustrate the walleye fishery and its performance under the current Slot size and limit in the Fishery Management Plan for Lake Nipissing. The chart below shows the slot size at 400 mm to 450 mm. The interesting point to gain from the chart below is the number of walleye year classes that are represented in the slot size, approximately (5). I also thought that one particular data point illustrates the success of the program very effectively. At the beginning of the plan in 2014, walleye netted at Wasi Falls during the spring spawn numbered about 40 Walleye while the number of fish netted in 2024 was 700. It was estimated that at Wasi Falls in 2024, some 500,000 walleye eggs were present.

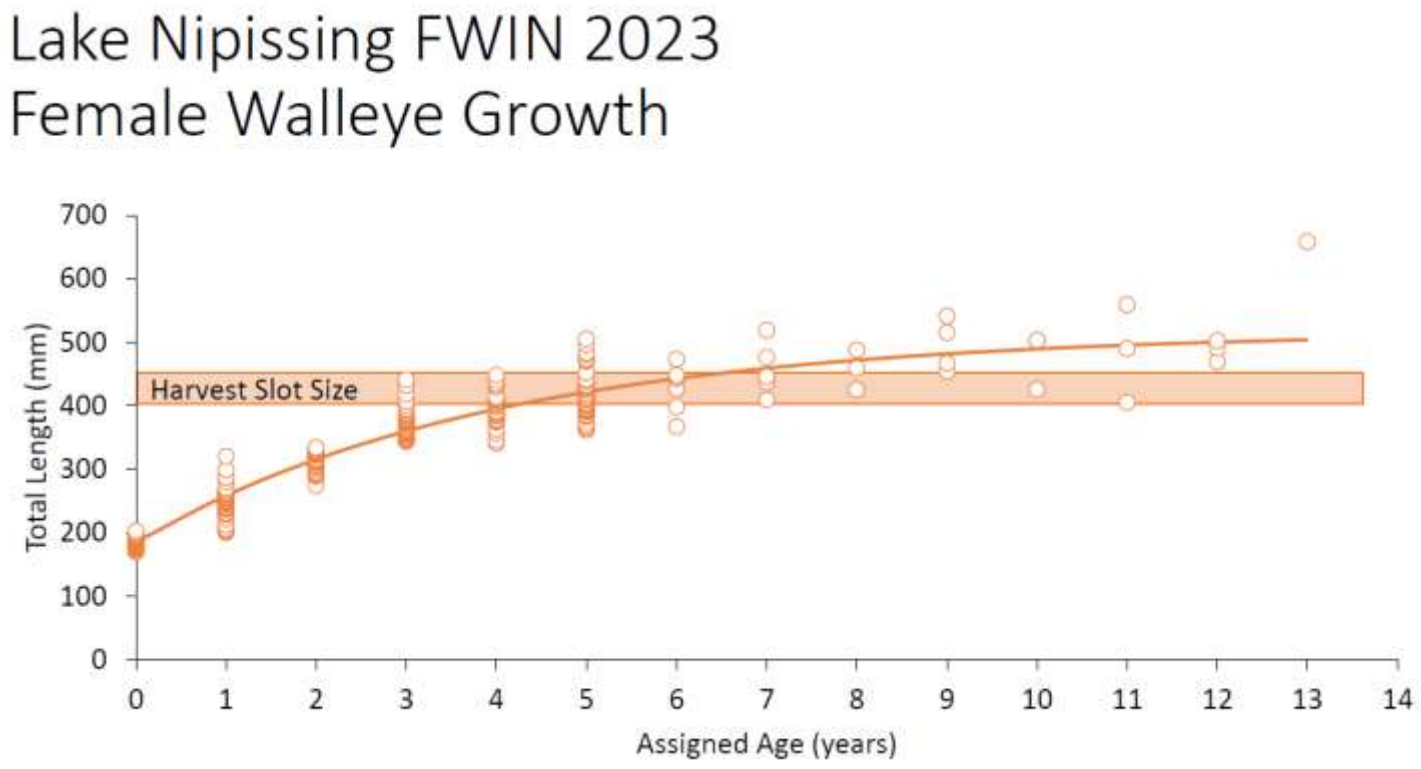

Figure 2

The following chart also offers us some interesting insight to how and why the walleye year classes year beginning to fill up from 5 to 10 years. Females pass trough the slot size might more quickly than males and as a result we are catching many more male walleyes in the existing slot size, allowing females to grow into the older year classes and produce greater spawn classes.

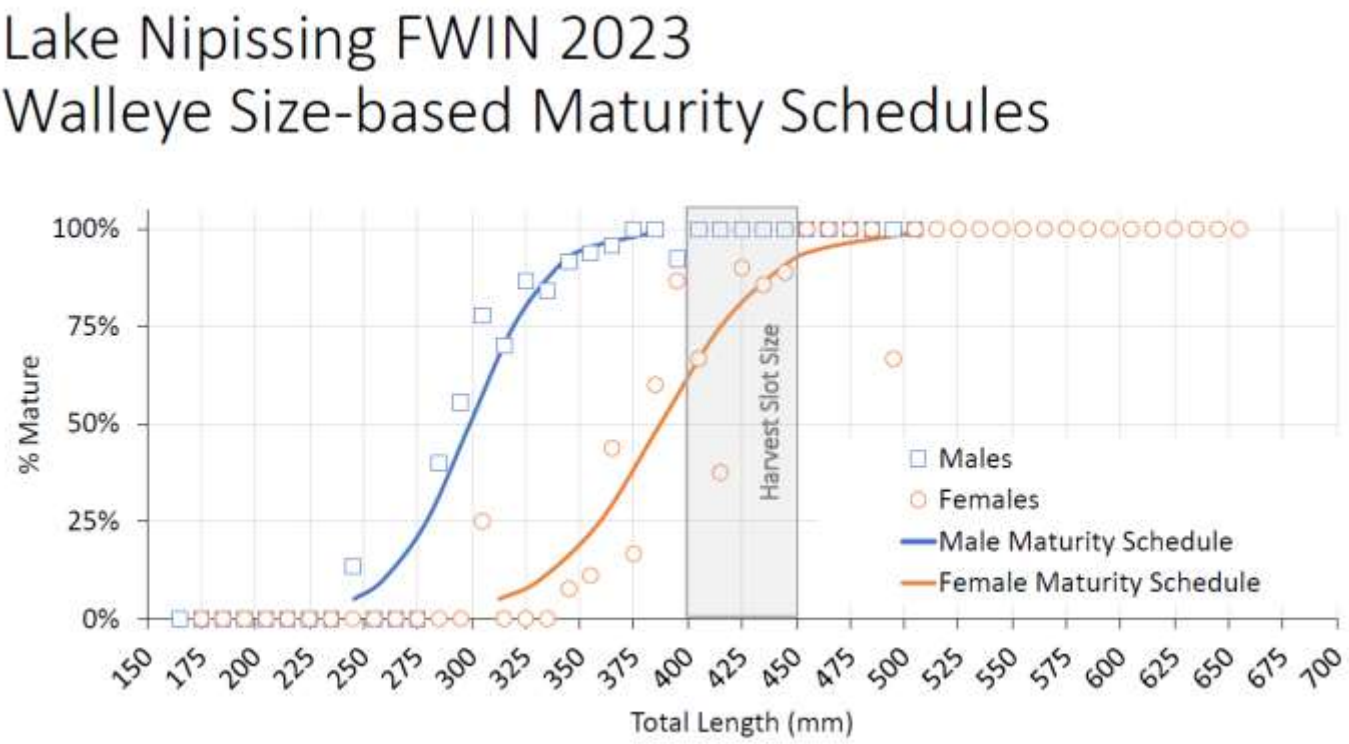

Figure 3

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