Lake of the Woods:
Walleye Management

Significance of Lake of the Woods

Lake of the Woods is one of the largest lakes in Ontario, after the Great Lakes and Lake Nipigon. It occupies parts of the provinces of Ontario and Manitoba and the U.S. state of Minnesota. Two-thirds of its surface area is within Ontario's provincial boundaries.

Lake of the Woods supports the most economically valuable inland recreational fishery in Ontario, with an estimated annual angler expenditure of $111.4 million. While this value includes recreational fishing for all species, studies show walleye is the species most sought by anglers on Lake of the Woods. Other common sport species in the lake include smallmouth bass, northern pike and muskellunge, yellow perch and black crappie.

The Ontario portion of Lake of the Woods is home to over 6,000 cottages and other seasonal properties as well as more than 60 tourism businesses, including outfitters, main base lodges, campgrounds and guiding businesses. The tourism industry employs roughly 38% of the workforce in the City of Kenora and represents a significant portion of the half a billion dollars spent by visitors in the Northwest annually.

In addition, both commercial and subsistence fishing play a significant role in the lives of Indigenous people on and near Lake of the Woods, contributing to the dietary, social, cultural and economic needs of numerous First Nations and Metis communities.

Fisheries Monitoring on Lake of the Woods

Monitoring data on Lake of the Woods is captured using index gillnetting and angler creel surveys. The gillnetting standard uses a multi-panel gillnet to capture biological information from different species. All nets are set in random locations and at various depths across the lake to ensure monitoring results reflect fish populations across the entire lake and not just areas of low or high fish density.

The same method is used as part of the Broad-scale Monitoring program in Fisheries Management Zones across Ontario and is a standard used across North America.

Walleye captured in index gillnets nets are measured for biological attributes that provide information on population health, such as:

Length | **Weight** | **Sex** | **Age** | **Contaminants**

These measures are used to describe several important characteristics of the walleye population, including biomass, fishing mortality rate, and population age structure.

Fishing Effort

To estimate angler effort and harvest on Lake of the Woods, the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) conducts summer and winter angler creel surveys. In these surveys, NDMNRF staff count and conduct interviews with anglers to understand their habits and preferences. This information helps fisheries managers make decisions about effective fishing regulations to support management objectives.

Assessing the Health of the Walleye Population

The ministry evaluates the status of fisheries in Ontario using biological reference points. Managers compare what is observed from monitoring data to what is expected given habitat and climate characteristics of a waterbody. The two main reference points used are mortality rate and biomass (how much fish weight is present in the lake). NDMNRF carefully considers these reference points in addition to socio-economic factors to make management decisions that support a sustainable fishery as well as long term economic benefits for Ontarians.

Current Status of the Walleye Population on Lake of the Woods

NDMNRF monitoring data on Lake of the Woods indicates that the walleye population is vulnerable to continued high levels of harvest to the point where the current harvest poses a risk to the quality of the walleye fishery. Specifically, there are **three ecological issues of concern**.

Taken together, these issues suggest the walleye fishery is at risk in the long-term. The ability of the walleye population to buffer itself against unforeseen pressures in the future, such as poor reproductive years, increased fishing pressure or severe climate events, is low.

At the same time, the ministry recognizes the importance of the walleye fishery to the social and economic wellbeing of the communities in the Lake of the Woods area and is committed to balancing conservation and socio-economic considerations.

Issue #1

Harvest rates are high and impact the population's ability to buffer against pressures such as invasive species, increased harvest and climate change (Figure 1).

Issue #2

Observed biomass of walleye is below the benchmark biomass (Figure 2).

Issue #3

Mortality rates are high and there are few old walleye in the population.

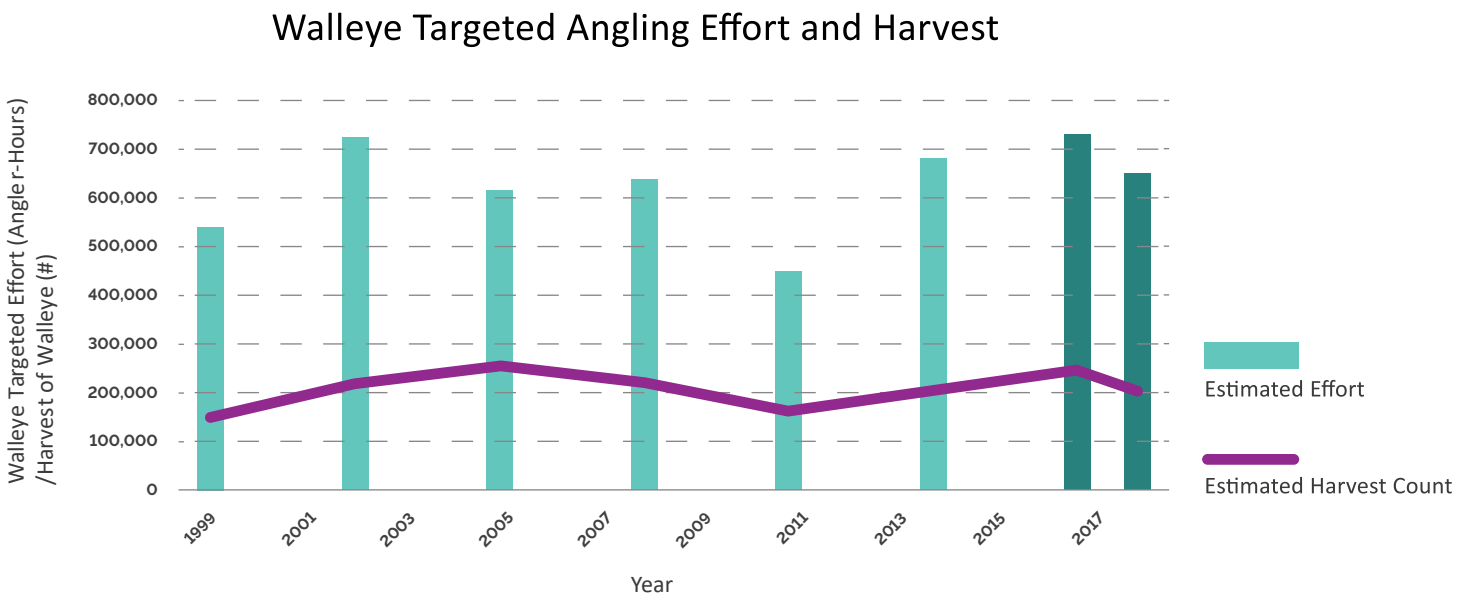

Figure 1:
Walleye is the most targeted species by recreational anglers. Angling effort for walleye has been consistently high over the years depicted in the chart above for the open water creel. Estimated walleye targeted angling effort ranges from 542,713 (1999) to a high of 724,821 (2017) angler hours per hectare. Estimated walleye harvest has ranged from 154,808 (1999) to 244,581 (2005).

Walleye Mortality

Mortality is a measure of how quickly fish are removed from a population and occurs both naturally (e.g. disease, natural predation) and by human activities including angling. Natural mortality and fishing mortality combine to give total mortality (Z). A total mortality of two times natural mortality is the benchmark for safe levels of fishing. Lake of the Woods mortality exceeds the benchmark, resulting in a population that may be unable to buffer additional pressures such as climate change, increased harvest or invasive species

Walleye Biomass

There are two key reference lines in Figure 2 which help fisheries managers evaluate the status of a fishery. The carrying capacity is considered the maximum amount of biomass a lake could produce if no harvest was occurring. Fully fished (Bmsy) is the amount of biomass a lake has available when it is exploited (i.e., fished) to an optimal level, known as maximum sustainable yield (MSY). The fully fished (Bmsy) reference line is the benchmark for a healthy fishery. Fisheries managers can then compare what is measured (observed biomass) from monitoring programs, to what is expected to be available in a healthy fishery.

The most recent netting surveys in Lake of the Woods, conducted in 2018 and 2019, estimate an observed biomass (Bobs) of walleye greater than 350 mm (13.75 inches) of 590,000 kg or 47% of the benchmark biomass (Bmsy) of 1,250,000 kg for a healthy fishery. As biomass levels approach the benchmark for a healthy fishery, the population will be better able to buffer against future unforeseen pressures.

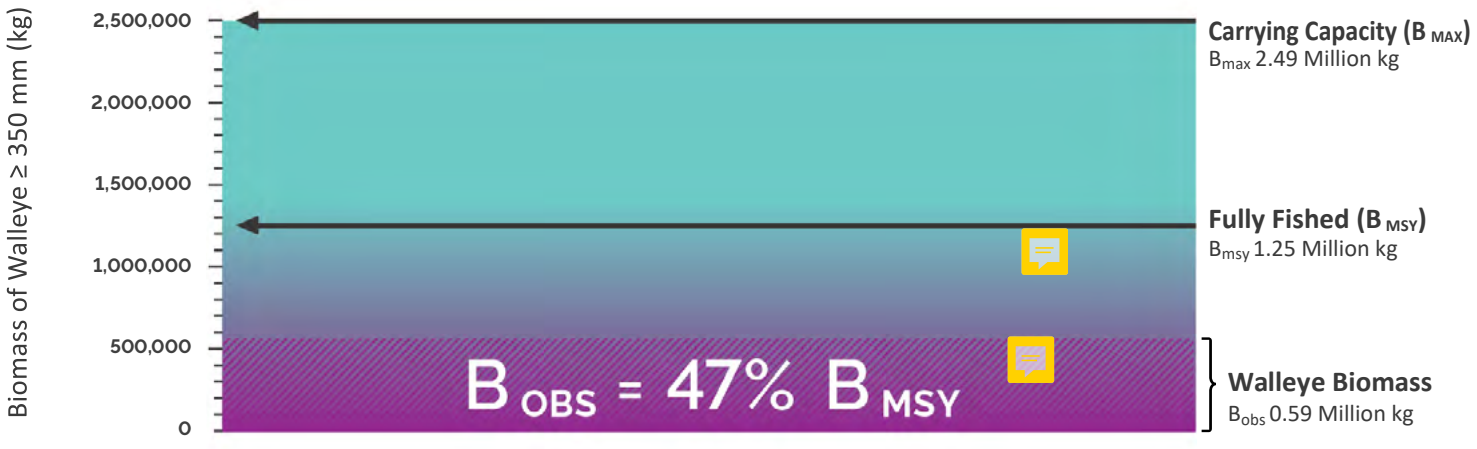

Figure 2:
Lake of the Woods biomass and benchmarks.

Walleye Management Planning on Lake of the Woods

NDMNRF has partnered with several local Indigenous communities, tourism operators, municipal governments and recreational users to form the Lake of the Woods Fisheries Advisory Council. Since January 2021, this group has been meeting to develop a recreational walleye management plan to improve the status of the walleye population while recognizing the social and economic importance of the fishery.

No changes to angling regulations have been decided upon at this time.

Once drafted, the Lake of the Woods Recreational Walleye Management Plan will be available for review and comment on the Environmental Registry of Ontario (https://ero.ontario.ca).

What Can I do to Help?

1. **Practice catch and release:** Anglers who voluntarily choose to release their walleye help to maintain sustainable fish populations. The ministry has recently published catch-and-release guidelines for anglers: https://files.ontario.ca/mnrf-catch-release-fishing-guidelines-anglers-en-2021-03-22.pdf.

2. **Harvest alternate species:** Smallmouth bass, northern pike, black crappie and yellow perch are all plentiful in Lake of the Woods and provide excellent fishing and harvest opportunities.

3. **Follow the rules:** Remember, the daily catch limit for walleye harvested by residents of Canada is currently four for holders of a Sport Fishing License, and two for holders of a Conservation Fishing License. The catch limit is the number of fish a person can catch and keep in one day and includes all fish that are not immediately released. **Fish eaten during a shore lunch count towards your daily catch limit, even after they have been consumed.**

   Recreational fishing regulations for Lake of the Woods can be found at: https://www.ontario.ca/document/ontario-fishing-regulations-summary/fisheries-management-zone-5

4. **Do not disturb monitoring nets:** It is important for your safety and the integrity of our data that these nets are not disturbed. All NDMNRF nets are clearly marked with orange buoys bearing the Ontario logo. If you see NDMNRF buoys, please do not lift the nets or buoys and avoid recreational activities or anchoring between and around the buoys. Nets are checked and moved to a new location every day. Notices will be posted at various locations including the public boat launch and retail stores located on the lake during the netting operations.

For more information on the walleye status in the Ontario waters of Lake of the Woods, the Lake of the Woods Fisheries Advisory Council, or the Lake of the Woods Recreational Walleye Management Plan, please contact Steve Bobrowicz at Steve.Bobrowicz@Ontario.ca.