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## FACT SHEET: Lake Trout in Fisheries Management Zone 10

This fact sheet for lake trout in Fisheries Management Zone (FMZ) 10 is based on the findings of the report, *Status of Lake Trout Populations in Northeastern Ontario (2000-2005)*, (Selinger et al., 2006).

Water quality information and annual angler effort was collected and analyzed to characterize lake trout habitat and amount of angler effort on lake trout lakes.

Standard index netting data was used to estimate current lake trout abundance on a representative subset of 130 self-sustaining lake trout lakes, 89 lakes or (68.5%) from FMZ 10. Data analysis for FMZ 10 includes the additional 41 lakes (31.5%) just outside the zone to improve the robustness of analysis.

### FISHERIES MANAGEMENT ZONE 10

FMZ 10 lies north of Lake Huron and Georgian Bay. Its eastern border extends northwards from the mouth of the French River to Elk Lake and the western border follows the east shore of Lake Superior from Sault Ste. Marie north to Wawa. FMZ 10 includes the 'Specially Designated Waters' of the French River and Manitoulin Island.

This zone has the highest road and population density of all the Northeast zones. The landscape is characterized by the Ontario shield's shallow soils, ancient bedrock and boreal forests. This zone has the most lake trout and brook trout lakes of all the Northeast zones. Numerous streams flow into Lakes Superior and Huron and the inland lakes are generally small, deep and clear.

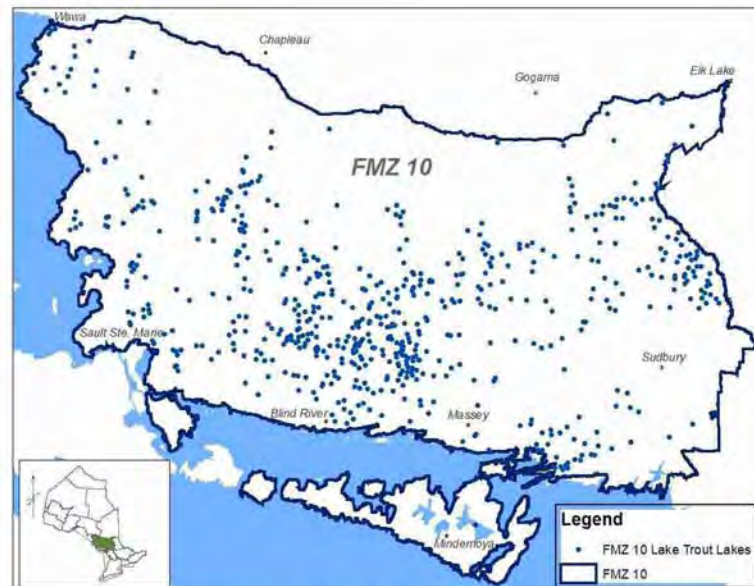


Figure 1: Map of lake trout distribution in FMZ 10

### LAKE TROUT BIOLOGY

Lake trout have strict habitat requirements of deep, cold, well-oxygenated lakes with clean, windswept rock rubble shorelines for spawning. Their specific habitat requirements make lake trout sensitive to habitat change.

Lake trout spawn in the fall when water temperatures drop from 10-14°C and disperse after spawning. They are slow growing fish, and reach maturity late in life. Lake trout life history traits limit how fast they can

*Acid damaged lake trout lakes have shown dramatic chemical recovery and efforts to restore lost lake trout populations are well underway; however, data suggests lake trout populations in the Northeast Region are in poor health overall.*



reproduce and ultimately how many young fish can be produced. These slower reproductive rates ultimately limit the number of fish that can be harvested sustainably from a population.



**Interesting Facts:**

In FMZ 10, approximately half of the female lake trout mature by age 7 and generally 40 cm. Almost all females are mature by age 11 and 54 cm. Male lake trout mature at similar ages, but are generally shorter in length.

The NER Lake Trout Project revealed that there are fewer old female lake trout (i.e. beyond age 10) than male lake trout in FMZ 10. It has been suggested that mature female lake trout are more vulnerable to angling from mid to late summer given energy requirements associated with egg production.

Biological Characteristics	Min	Avg	Max
Male age-at-maturity	2 years	6 years	11 years
Female age-at-maturity	3 years	7 years	11 years
Male weight-at-maturity	168 g	531 g	1346 g
Female weight-at-maturity	218 g	552 g	1276 g
Male length-at-maturity	28.6 cm	38.3 cm	51.4 cm
Female length-at-maturity	30.1 cm	40.2 cm	53.8 cm

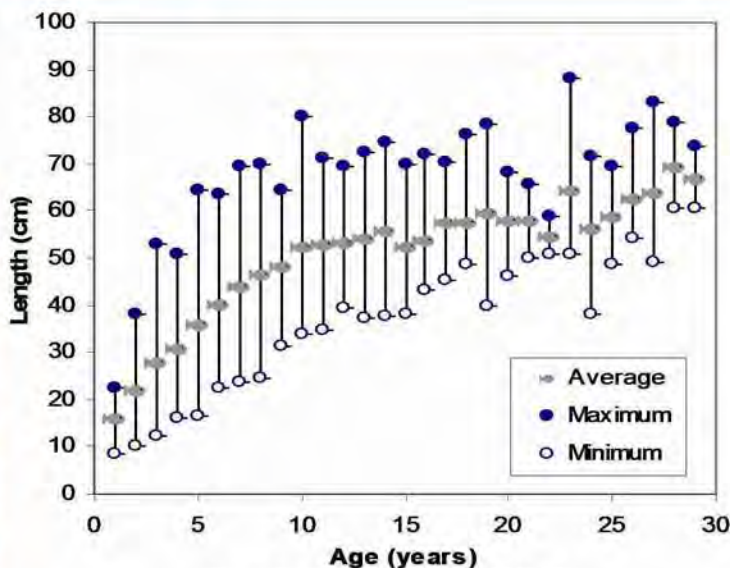


Figure 2: Lake trout growth in FMZ 10

**FACTORS INFLUENCING LAKE TROUT POPULATIONS**

Lake trout populations are subject to a range of stressors including, but not limited to: acidification, over-harvest, the impact of invasive species, water level manipulation and nutrient loading.

**ACCESSIBILITY:** The distribution of lake trout lakes experiencing high angler effort are those influenced by lake accessibility and the quality of the fishery. Higher fishing effort and unsustainable harvest are most commonly found on large, accessible and developed lakes during the open water season.

Large, accessible lakes seem to be most vulnerable to over-fishing at present, primarily due to increased open water effort. Small lakes with poor road access have higher effort during the winter from snowmobile use; however, for the majority of these lakes, observed levels of annual effort are considered sustainable.

**FISHING EFFORT:** Current levels of lake trout fishing pressure are of concern, 32% of the self-sustaining lakes surveyed are experiencing angling effort beyond sustainable levels. Fishing effort in the FMZ 10 is highest in the watersheds close to Sault Ste. Marie, Blind River, and Elliot Lake.

The high effort is a result of easy accessibility and numerous lake trout lakes. The watersheds close to Sudbury are fished less than watersheds closer to Sault Ste. Marie. This trend is thought to be related to poor resource status from historically high pollution in the Sudbury area.



The Sudbury area has the lowest quality lake trout lakes in FMZ 10. Only 20% have good or healthy lake trout abundance and 53% are classified as degraded. The unhealthy condition of Sudbury lakes is likely a result of combined impacts of acidification and historical over-harvest of lake trout. The healthiest lakes are found in Sault Ste. Marie area, where 44% have good or healthy lake trout abundance and 30% are degraded.

**ACIDIFICATION**

Acidification is the addition of acidic compounds into the environment from human produced emissions. The main compounds that cause acidification are sulphur dioxide, nitrogen oxides, and ammonia. Widespread regional acidification linked to industrial pollution negatively influenced approximately 100 lake trout lakes in the FMZ 10. Native lake trout populations survived acidification in 25 of the 100 lakes.

Fortunately, metal smelter emissions and surface drainage of mine tailings have been reduced over time (Figure 3). Lake trout populations have responded positively to the reduction in pollutants and improved water quality. Acid damaged lakes have shown dramatic chemical recovery and efforts to restore lost lake trout population are being implemented.

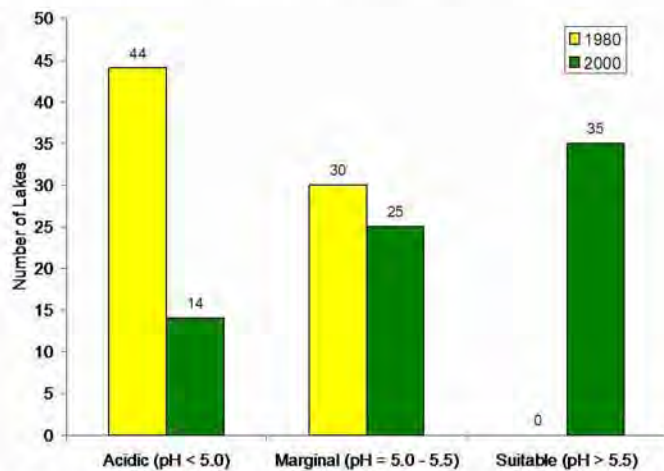


Figure 3: Chemical recovery of 74 acid damaged lake trout lakes in Sudbury.

**INTRODUCED SPECIES**

In FMZ 10, lake trout abundance was found to be lower where smallmouth bass were present (Figure 4). Smallmouth bass are aggressive predators that can significantly reduce the biomass of shore prey

fish and ultimately resources available to lake trout. It is estimated that either smallmouth bass, rockbass, or both have been introduced into approximately 25% of FMZ 10 lake trout lakes.

Lake trout abundance is also decreased in the presence of lake herring or whitefish. These fish not only serve as forage fish for lake trout but they compete with young lake trout. As large bodied lake trout are targeted by anglers and removed from the population, herring and whitefish populations increase and the remaining young lake trout fish struggle to compete.

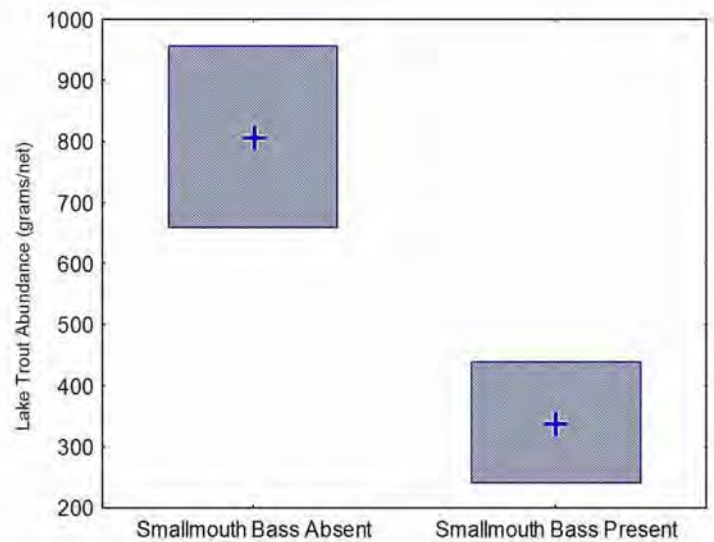


Figure 4: Lakes with smallmouth bass introduced.

**CURRENT STATUS OF LAKE TROUT IN FMZ 10**

During the Northeast Lake Trout Project, a sample of 130 lake trout lakes were used to evaluate fishing pressure and lake population abundance (the number of lake trout in a lake).

Of the 130 lake samples:

- 17% of the lake trout lakes have high population abundance and sustainable levels of fishing effort.
- 15% of the lake trout lakes are considered to have population numbers above the lake benchmarks and fishing effort above the benchmark; in these lakes abundance can be expected to decline.
- A further 27% of the lakes sampled are presently being over-fished and abundance has already declined.
- Finally, 41% of the lakes sampled were classified as degraded; both abundance and fishing pressure are low (Figure 5).





Figure 5: Status of NER lake trout populations

### WHAT IS MNR DOING TO MANAGE LAKE TROUT IN FMZ 10?

**Northeast Lake Trout Project (2000-2005):** the Northeast Lake Trout Project was launched to evaluate the present health of NER lake trout populations. The overall objectives of this 5 year collaborative project were to consolidate relevant historic data, to update available information regarding the status of acid damaged lake trout lakes, and to evaluate the overall health and sustainability of the regional resource.

**Lake Trout Database:** All existing background information on 1000+ lake trout lakes in NER was entered into a customized database. The database includes location, physical characteristics, surrounding land use designations (e.g. parks and protected areas), and stock status as well as more detailed information. The database will facilitate data retrieval and storage, ensuring all information is available for management decisions.

**Acid Lake Restoration:** Applied restoration strategies include lake trout stocking and a range of harvest control measures. Self-sustaining populations have been re-established in 10 additional lakes through hatchery stocking. Restoration efforts on another 34 lakes are underway. Unfortunately, 31 lakes remain void, the majority of which require additional chemical recovery.

**Fisheries Regulations:** Lake trout fisheries regulations, along with the lake trout information from the NER Lake Trout Project, was analysed and a range of regulatory options explored and implemented by MNR and the FMZ 10 Advisory Council.

### ECOLOGICAL FRAMEWORK FOR FISHERIES MANAGEMENT (EFFM)

Fisheries are now managed and monitored at a zone scale, not on an individual lake basis. The three components of the EFFM are regulation streamlining, pilot Fisheries Management Zone Councils and Broad Scale Monitoring.

### Fisheries Management Zone 10 Advisory Council

An important component of the EFFM is enhanced public involvement in fisheries management. The public, through the FMZ 10 Council, have enhanced involvement in determining fisheries objectives for the zone, and the management actions to support those objectives. Members of the FMZ 10 Advisory Council represent the stakeholders and the public who have an interest in fisheries and aquatic resource management within FMZ 10.

In March of 2007, the FMZ 10 Advisory Council was formed. Its membership includes the Bait Industry, Ontario Federation of Anglers and Hunters, Ontario Nature, Federation of Ontario Cottagers' Association, Tourism Industry, Nature and Outdoor Tourism Ontario, Angling Retail, First Nations, Anglers, Local Citizens Committees, Academia and representatives from the 'Specially Designated Waters' of the French River and Manitoulin Island. This community stakeholder group provides advice to MNR on various aspects of fisheries management.

The FMZ 10 Advisory Council and MNR decided to make its first focus for FMZ 10 on lake trout given the recent information from the Northeast Lake Trout Project (2000-2005). This has facilitated management decisions at a landscape scale.

### Broad Scale Fisheries Monitoring Program

The data collected during broad scale fisheries monitoring will allow for evaluation of fish population status and changes over time; distribution, extent and diversity of aquatic ecosystems; and connections between stressors and aquatic resources. This data will also support future State of the Resources Reporting.

For more information, visit the MNR website [www.ontario.ca/zonecouncils](http://www.ontario.ca/zonecouncils) or contact the FMZ 10 MNR Project Team at (705) 949-1231