

**BANCROFT MAZINAW AREA LAKE TROUT STRATEGY**

**AND**

**LAKE TROUT STATE OF THE RESOURCE REPORT**

**A summary of goals, objectives and strategies for management of native lake trout lakes,  
as well as lake trout data and information on the state of the lake trout populations within  
the Bancroft/Mazinaw Area**

**Bancroft/Mazinaw Area –Bancroft District Ministry of Natural Resources**

**Lake Trout (*Salvelinus namaycush*)**



**Bancroft District OMNR  
December 2008**



## BANCROFT/MAZINAW LAKE TROUT STRATEGY

### Introduction

Lake Trout are the only native sport fish species in Ontario adapted to infertile lakes with low levels of nutrients, high dissolved oxygen levels, and very cold deep water; characteristic of many lakes found on the Canadian Shield. Because lake trout live in cold and infertile environments, they tend to grow slowly, mature at a late age with a low reproductive potential, low replacement rate and long life expectancy, making them extremely vulnerable to stresses such as overexploitation and environmental changes. They are unable to adapt to significant changes in their environment. Because the lake trout is a sensitive species that is adapted to very specialized habitat conditions, it is an excellent indicator of the health of aquatic ecosystems. Lake trout are an important part of Ontario's biodiversity due to the unique character of the species and the unique genetic strains of inland stocks.

The lake trout is an important fishery resource in Ontario. It is a very valuable species and provides both economic and social benefits. There has been a general decline in both the quality of the fishery and in lake trout habitat in many lakes. Lakes with suitable habitat are limited and have been decreasing in number since early settlement times. The disappearance of native stocks began in the early 1900s and has continued to the present. Lake trout and their habitat are particularly vulnerable to the impacts of human activities, including exploitation (over-fishing), increased nutrient loading and siltation (enrichment from cottage septic systems, development and shoreline alteration), acidification, manipulation of water levels, direct disturbance/alteration of habitat, physical alterations (spawning sites, nursery areas and other critical habitat), decreased water quality, species introductions (including exotic as well as other native species such as northern pike, walleye and even hatchery-reared lake trout), and climate change.

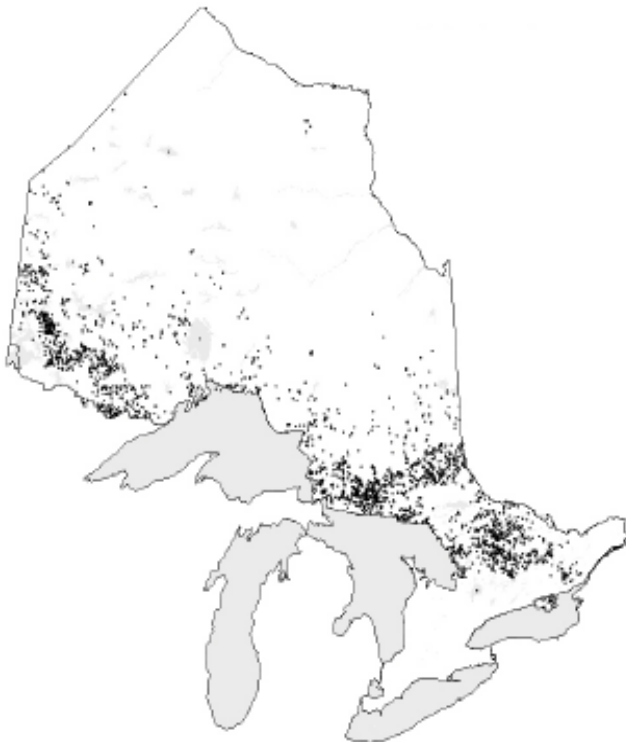


Figure 1. Distribution of lake trout lakes in Ontario (OMNR data).

Since lake trout have such specific habitat requirements, the lakes they inhabit are rare. Only about one percent of Ontario's lakes contain lake trout (approximately 2000 lakes supporting lake trout in Ontario-see Figure 1), but this represents 20-25% of all lake trout lakes in the world. Approximately 5% of the province's lake trout populations have already become extinct; 43% of the extinct populations were in south central and eastern Ontario. Although we have lost some local populations, the Bancroft area still supports some of the southernmost inland natural lake trout lakes in Canada. Bancroft and Mazinaw Areas support a total of 91 lake trout lakes, of which 67 are considered natural (including 7 lakes that are currently being stocked for rehabilitation purposes), and 24 Put Grow Take stocked lake trout lakes.

Historically, lake trout have been reared in hatcheries and widespread stocking of Great Lakes hatchery-reared strains has occurred. Stocking of Great Lakes strains generally provides artificial, short-term fishing opportunities that are dependent on continual stocking. Recent science and assessments have shown that stocking over existing naturally reproducing populations may be detrimental for several reasons: stocking may alter or damage existing ecological communities; it often masks what is actually happening (fishing success increases so anglers believe everything is fine meanwhile natural stocks continue to decline); stocking increases fishing pressure by attracting anglers putting further pressure on natural stocks; stocked fish can displace native fish from spawning sites reducing recruitment of natural fish; stocking may have negative genetic impacts on natural fish (interbreeding and loss of genetic diversity). Unique genetic diversity is irreversibly lost when native fish populations are reduced or eliminated, which impedes rehabilitation efforts and increases ecological instability.

Science has shown that isolated populations of the same species possess certain characteristics which make them better adapted for survival in that area; therefore, locally adapted stocks are best suited for the specific habitat in which they have adapted and currently live. Unique genetic stocks have been identified in the Bancroft District; two strains (the Haliburton Silver and Haliburton Gold) were identified in several Haliburton area lakes and the “Platinum” or Jewel Lake Trout have been identified in several Mazinaw Area lakes. These strains exhibit the small-bodied, planktivorous traits typical of southern Ontario inland lakes, and genetic analysis suggest that, despite previous years of stocking, fish from these strains show little evidence of interbreeding with fish from the provincial hatchery program. The local strain of lake trout has unique genetic markers that indicate they have been isolated for a longer-than-normal period of time. Essentially, they represent the most genetically pure populations of lake trout yet to be identified in Ontario; remnants of the lake trout dispersed following the retreat of the glaciers. To date, samples have been collected from a number of local lakes and results of the genetic analysis will help to identify, map and conserve the special locally adapted strains of lake trout. The objectives of lake trout management in the Bancroft/Mazinaw Area will be aimed at ensuring these unique natural lake trout populations are sustained.

Given the high profile and socio-economic value of lake trout as a natural resource, as well the globally significant genetic strain, the consequence of losing these populations is irreversible. Management strategies need to be developed that allow adaptation to changing conditions, especially given the threat of global warming, ensuring we can prevent the loss of these genetically distinct populations of lake trout. The identification of genetically significant strains of lake trout from the southern portion of their range is vital to the management of the species and management actions must occur that protect this globally significant resource.

### **Lake Trout Management**

Observations of declines in the quality of angling in the 1970's and 80's, supported by fisheries monitoring and assessments, signified that lake trout fisheries required special management to ensure sustainability. In the late 1980's, MNR established provincial Lake Trout Synthesis working groups to compile and analyze fisheries data and make recommendations as outlined in the reports published in 1990 and 1991. Fisheries management is also guided by strategies outlined in the Strategic Plan for Ontario Fisheries II or SPOF II (1992). The importance of native biodiversity was identified in SPOF II: naturally reproducing fish



communities, based on native fish populations, provide predictable and sustainable benefits. In 1995, the Southcentral Lake Trout Committee was established to review the recommendations from the Lake Trout Synthesis and develop an integrated approach to the management of trout across the region. After extensive review and public consultation, the committee produced the Southcentral Ontario Lake Trout Strategy. Management recommendations were provided in a report entitled "Management Plan for Naturally Reproducing Populations of Brook Trout and Lake Trout in Southcentral Ontario" (1995).

The strategy was implemented in 1996 with the goal of implementing a mix of management options to conserve naturally reproducing lake trout and brook trout populations and maintain or increase outdoor recreation opportunities. Lake trout regulation changes in Southcentral Ontario included slot-size restrictions, one line while angling through the ice, season closures and/or sanctuaries. Supplemental stocking on top of naturally reproducing lake trout populations was also discontinued. In order to increase angling opportunities and divert pressure from the naturally reproducing lake trout lakes, year-round open seasons for various species stocked as put-grow and take.

In the recent past, management actions have been guided by strategic documents such as Our Sustainable Future (2004), Ontario's Biodiversity Strategy (2005) and the New Ecological Framework for Recreational Fisheries Management in Ontario (2005). Central themes throughout such documents emphasize the importance of integrated ecosystem management, adaptive management and the conservation of native biodiversity. The ministry is committed to the conservation of biodiversity to ensure healthy ecosystems, protect our native species and sustain genetic diversity. A further component of recent strategic documents has been the prominence of stewardship, partnership and community involvement in natural resource management and the introduction of state of the resource reporting. MNR will involve interested parties and Ontarians in its initiatives through the provision of opportunities to participate in resource management decisions, and by providing information on the state of our resources to ensure transparency and accountability (OMNR 2005). In fisheries management, there has been a move away from reactive management of individual lakes towards an adaptive ecosystem management of a broad range of lakes to provide an assessment of the state of the resource. State of the resource reporting is a new initiative in the early stages of development.

Recovery of local native populations following implementation of the SCR lake trout strategy was expected to take up to twenty years (due to the slow growth and low recruitment of lake trout). The strategy has now been implemented for ten years. Throughout this ten year period, additional stresses on lake trout and their habitat have continued. Concerns from local anglers about the continued decline in fishing quality have been heard and fisheries assessments have shown a general continued decline in lake trout populations. In light of the discovery of the unique genetic strains of lake trout in our area, it is felt that pro-active management actions are required to prevent the total loss of any unique genetic population. As a result, a document outlining goals, objectives and strategies is required. This document is a work in progress and will require public input, involvement and support in both its preparation and implementation.

In the initial stages of implementation of the strategy, we will be looking at a small number of lakes in detail, working from a prioritized list of native lake trout lakes, understanding that there are a large number of lake trout lakes within the area. Efforts will be focused on a few high priority lakes and will expand to include other lakes as projects are completed.



## Bancroft/Mazinaw Lake Trout Management Goals, Objectives and Strategies

**Goal:** To manage natural lake trout fisheries in an ecologically sustainable manner to ensure they are available for the enjoyment and use of present and future generations.

### Objectives:

- Conserve native biodiversity of lake trout populations and protect unique genetic stocks
- Rehabilitate and restore natural populations where possible
- Ensure sustainable harvest
- Provide and enhance angling opportunities, improve angler satisfaction
- To contribute to the social and economic benefits of the local community
- To educate the public about the characteristics of lake trout fisheries, sustainable harvest levels, key stressors on lake trout fisheries, the various management tools and their effectiveness and how they can get involved.



### Strategies:

- Lake assessment program-selected lakes to be identified. Lakes chosen for netting will be prioritized based on local knowledge, anecdotal evidence and suspicions of struggling lake trout fisheries.
  - Fisheries; population, genetics and stressors
    - Continue assessing local lake trout populations using provincial standards
    - Develop a program of genetic tissue sample collection and analysis
    - Investigate and identify stressors and potential causes of decline of local populations (including monitoring the effects of global warming)
  - Dissolved oxygen/temperature and suitable habitat analysis
  - Habitat (spawning shoals and spawning activity monitoring)
- Volunteer data collection program-selected lakes to be identified
  - Angler diaries
    - Revive angler voluntary creel program to aid in collection of much needed creel data, particularly in lakes selected for rehabilitation
  - Water quality parameters
    - Develop a data collection program to target specific lakes of interest
  - Involvement in lake assessment, monitoring and rehabilitation
    - Consult with public and stakeholders to develop objectives for the local fishery
    - Involve community groups in fisheries management decisions, assessments, monitoring and data collection programs
    - Coordinate and develop the Bancroft Area Stewardship Council fisheries assessment project (complete lake trout assessments, collect genetic samples)



- Data analysis and reporting
  - Genetic analysis
    - Collect, analyze and map locally adapted genetic strains
  - State of the resource reporting:
    - Review and compile all relevant lake trout data and develop a local state of the resource report.
    - Document existing information, identify information gaps, set priorities for information collection and identify how the information will be collected to assess, manage and monitor the lake trout fisheries in the Bancroft/Mazinaw Area
  
- Rehabilitation: Where deemed appropriate, engage in lake trout rehabilitation projects, including habitat rehabilitation as well as population rehabilitation.
  - Rehabilitation Stocking
    - Examine the potential of a locally adapted genetic strain for rehabilitation and test whether stocking of local strains will reproduce and become established
    - Identify potential donor lakes and candidates for rehabilitation/restoration and develop rehabilitation plans for such lakes
    - A standardized method of identifying donor and recipient lakes based on population density estimations will be developed for the Bancroft District. The criteria recommended included ranking CUEs as low (0-0.5), moderate/average (0.5-1.0) and high (>1.0) for small bodied and low (0-<1), moderate/average (1-<2) and high (>2) for large bodied populations, although additional factors need to be considered before rehabilitation could occur. An unbiased system of prioritizing lakes for rehabilitation should include the relative CUE ranking versus the carrying capacity of the lake, available lake trout habitat, fish community complexity and forage base, social pressure, and community interest and involvement in long-term monitoring of rehabilitative efforts. This would ensure a consistent approach that would maximize egg collection capabilities and ensure the best use of hatchery fish.
    - Develop rehabilitation plans for any lakes identified as candidates for rehab stocking, including clear objectives, methods, timelines and monitoring.
    - Work with community to raise locally adapted strains for rehabilitation of degraded populations where appropriate
    - continue to stock put-grow-and take lakes to provide immediate angling opportunities; as a locally adapted native strain becomes more available for rehab stocking, some PGT lakes could be switched to native strain stocking in order to re-establish a naturally reproducing population in them as well.
  - Spawning shoals and other habitat
    - Identify lake trout spawning shoals in need of rehabilitation
    - Continue to educate and promote awareness on the importance of protecting lake trout water quality
    - Continue education and promote awareness on the effect of fish community interactions and the impacts of illegal introductions
  - Potential regulation changes
    - Implement regulation changes where necessary to protect unique populations; restrictive regulation changes are recommended in rehabilitation lakes
  
- Monitoring program
  - Continue to assess and monitor natural lake trout populations
  - Develop and implement a monitoring program on lakes selected for rehabilitation



## References

- Brook Trout/Lake Trout Management Committee. 1995. Management Plan for Naturally Reproducing Populations of Brook Trout and Lake Trout in South Central Ontario. (Commonly referred to as SCR Trout Strategy). Ontario Ministry of Natural Resources. 32 pp + supporting information.
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## BANCROFT MAZINAW AREA LAKE TROUT STATE OF THE RESOURCE

State of the resource reporting (SORR) is a new initiative and commitment from the Ministry of Natural Resources (Our Sustainable Future 2005) in which information will be provided to the public and stakeholder groups identifying the current status of particular resources of interest. This reporting system is in its very initial stages; a formal process has not yet been identified. The following information is a brief summary of the state of lake trout populations within the Bancroft Mazinaw Area and will be updated and developed into a SOR report. This report will be continually updated as new information is gathered.

Bancroft and Mazinaw Areas support a total of 91 lake trout lakes, of which 67 are considered natural (including 7 lakes that are currently being stocked for rehabilitation purposes), and 24 are PGT lake trout lakes. In addition, there are 13 lakes not currently being managed as natural lake trout lakes but having reports of remnant lake trout existing in them, including some of the lakes being stocked as put, grow and take. As of December 2008, assessments have been completed on 44 of the 67 native lake trout lakes within the last 15 years (after implementation of the SCR lake trout strategy). The remaining 23 of the 67 natural lake trout lakes have been identified as needing assessments for a variety of reasons (see Appendix 1). Assessments are also required to identify or verify the status (whether there is a viable natural population of lake trout or not) of an additional 13 lakes, some of which are PGT lakes. It is also recommended to conduct updated assessments from the 1990s as they provide valuable trend through time information and an evaluation of regulation changes.

### State of the Resource Facts and Figures

-  67 native lake trout lakes identified
-  24 put-grow and take lake trout lakes
-  13 lakes suspected of having remnant lake trout populations
-  44 native lake trout lakes have been assessed using standards methods from 1995 to 2008 (a few lakes have had multiple assessments for trends over time)
-  A unique genetic strain has been identified in the area representing some of the most unique, genetically distinct inland lake trout populations yet identified. They have been referred to as a globally significant resource.
-  The average catch per unit effort (CUE) of native lake trout lakes is 0.3 fish/hour. The average CUE includes both SPIN and SLIN assessments; therefore an average catch per HOUR was used for comparison to calibrate between the two protocols. The average includes native lakes only (no PGT) and also excludes Crystal Lake, which has an exceptionally high CUE.
-  A CUE of 0.3 lake trout per HOUR is used as a “benchmark” in Bancroft/Mazinaw Area; a CUE <0.3 is below average, while a CUE of >0.3 is above average.
-  From the 44 lakes assessed to date, 19 lakes would be considered “at or above average” using the 0.3 fish/hour criteria (18 in Figure 1 plus Crystal which is not shown), while 25 would be considered below average abundance.

There are a number of stresses on lake trout populations that affect their abundance and survival. Lake trout and their habitat are particularly vulnerable to the impacts of human activities, including exploitation (over-fishing), nutrient loading and siltation (enrichment from cottage septic systems, development and shoreline alteration), acidification, manipulation of water levels, disturbance and alteration of habitat, physical alterations (spawning sites, nursery areas and other critical habitat), decreased water quality, species introductions (including exotic as well as other native species such as northern pike, walleye and even hatchery-reared lake trout), and climate change.

### State of genetic testing, results and sampling

Genetic samples will be collected from lakes as they are assessed and used to produce a genetic map of the unique locally adapted strain. Analyses are being conducted by Dr. Chris Wilson in the Wildlife Research Section of MNR and results are dependent upon funding and laboratory availability. The following chart (Table 1) shows the samples analysed to date and will be revised as additional samples are submitted and analysed (some samples have not yet been sent or analysed because the sample size is too low).








Table 1. Status of genetic analyses of lake trout populations in Bancroft Mazinaw Area.

<i>Pure Native Strain</i>	<i>Probably Native</i>	<i>Introduced/Mixed Ancestry</i>	<i>Unresolved</i>	<i>Samples Submitted / Awaiting Analysis</i>	<i>Have samples-need to increase sample size</i>
Ashby Lake	Palmerston Lake	Mazinaw Lake	L'Amable Lake	Brule Lake	Mosque
Barnard Lake			Leatherroot Lake	Lucky Lake	Wollaston
Barker Lake				Buckshot Lake	Aylen
Crystal Lake				Bay Lake	Mazinaw
Effingham Lake				Faraday Lake	Kaminiskeg
Joe Perry Lake				Papineau Lake	Limerick
Weslemkoon Lake				Lobster Lake	Jack
				Lake St Peter	Big Mink
				Paudash Lake	Lower Hay
				Dickey Lake	
				Deer Lake	Holland
				McKenzie Lake	Shabomeka
				Eels Lake	Mayo
				Jeffrey Lake	Hudson
					Long

### Additional Facts on Local Lake Trout Populations

- 🦉 Locally, at least 18 native lake trout lakes are extinct; they are now managed for different species (mostly splake, some Put Grow and Take brook trout and rainbow trout)
- 🦉 There are also a number of “unknown lakes” where we receive periodic reports of lake trout being caught in lakes where they have not been documented in many years (ie lakes that have been stocked with rainbows or splake *may* contain remnant lake trout populations)
- 🦉 As part of the SCR lake trout strategy in 1994, a decision was made on all lake trout lakes to categorize them as either natural, PGT or unknown. In order to be classified as natural, the criteria used was a minimum of 13% native fish but most decisions were based on a 20% level (all available data was looked at, including creels, spawning assessments, netting surveys, anecdotal information, etc, and the number of clipped versus unclipped fish was calculated to make this determination). In a number of cases, there was insufficient information to make this call and lakes were classified as unknown status and supplemental hatchery stocking continued or stocking was switched to other species. In some of these lakes, we are receiving reports of remnant native lake trout being caught. If the status of any of the unknown lakes is still questionable, they should be revisited to investigate the possibility of supporting native populations of lake trout. In addition, if no

viable lake trout population exists and the habitat is no longer adequate to support lake trout, some lakes may be changed to put-grow and take stocking.

-  Current assessments indicate a trend towards continued declines in lake trout populations following implementation of the South Central Lake Trout Strategy in 1995.
-  The slot limits and associated regulations should be revisited. It is likely that the body size of lake trout is related to population density, as well as food availability, and may be “plastic” or capable of changing based on influencing factors. In a number of cases, the original body size designation and slot size may not have been protecting the native population but the stocked component of the population, further contributing to the decline of the native fish. This should be a point of discussion for the FMZ councils once they are established.
-  Many anglers report catching previously undocumented species in lake trout lakes (reports of splake, walleye, northern pike, rock bass, crappie, smallmouth, etc). This poses a problem for rehabilitation of lake trout as in many cases lake trout are unable to compete in a complex fish community. One top predator will generally “win out”. The illegal spread of fish species needs to be addressed, as does stocking practices where the stocked fish may be migrating into other waterbodies.
-  The Bancroft Mazinaw Area Lake Trout Strategy has been developed to update management goals, objectives and strategies to manage, conserve and restore local populations where feasible.
-  Additional threats on lake trout populations have been identified and are being monitored. Research on climate change is required in order to better understand the impacts on local lake trout populations.
-  Where possible, native populations should be rehabilitated and afforded a high degree of protection.
-  Continued assessment and monitoring of local populations is also required in order to ensure the persistence of this globally unique and important resource.