

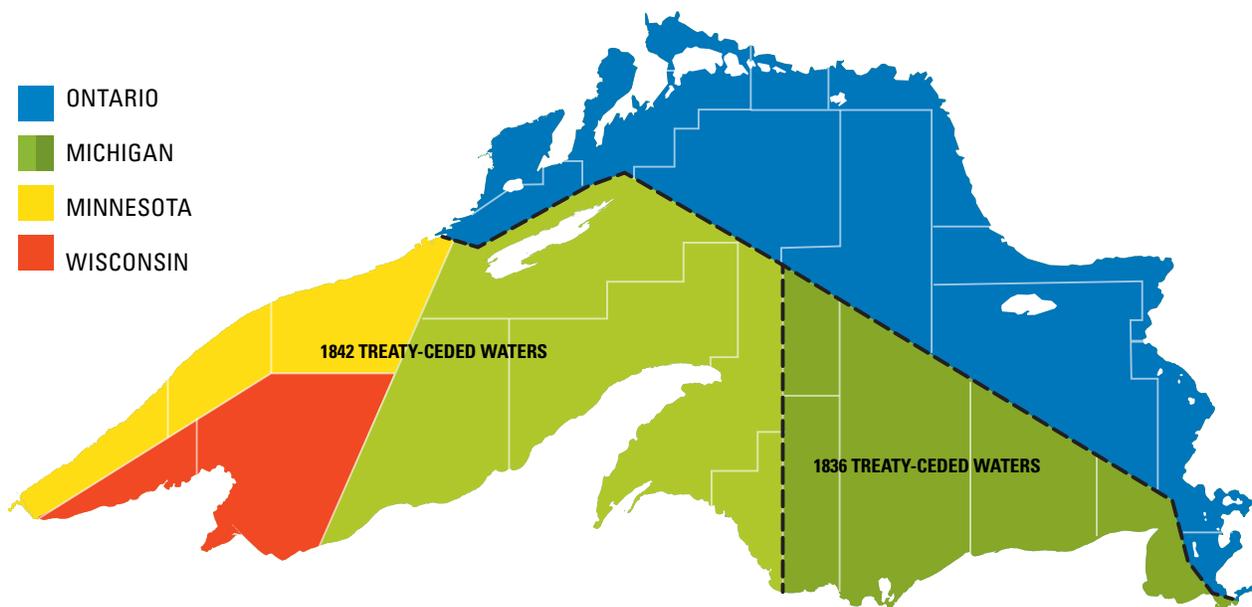


UNIVERSITY OF WISCONSIN SEA GRANT

# Overview: Lake Superior Commercial Fisheries

## LAKE WHITEFISH | CISCO | LAKE TROUT

The goal this overview is to help staff at fisheries-rating and ranking organizations, government agencies and businesses draw conclusions about Lake Superior's cooperative fisheries management and the sustainability of the lake's commercial lake whitefish, cisco and lake trout fisheries. The overview includes links to related fisheries management agencies, plans and data.



**Map of Lake Superior fisheries management units.** *Note: The State of Michigan has separate units for managing lake whitefish and lake trout. The Michigan units shown here are for lake whitefish.*

Lake Superior is the largest freshwater lake in the world by surface area. Of its 80 fish species (67 native),<sup>1</sup> lake whitefish (*Coregonus clupeaformis*) and cisco (*C. artedii*) make up roughly 89% of the annual commercial harvest.<sup>2</sup> Together, lean and siscowet lake trout (*Salvelinus namaycush*) account for another 10% and other species are about 1% of the harvest. The annual Lake Superior harvest of all species by commercial fishers is about 3,870,500 kg (8,533,000 pounds).

Lake Superior fisheries can be considered artisanal, or small-scale.<sup>3</sup> Some of the family-owned businesses have operated for six generations and many fishing tugs are piloted and crewed by Anishinaabe members whose ties to fishing the Great Lakes predate written history.

1. Leach, J.H. Non-indigenous species in the Great Lakes: Were colonization and damage to ecosystem health predictable? *Journal of Aquatic Ecosystem Health* **4**, 117–128 (1995). [doi.org/10.1007/BF00044795](https://doi.org/10.1007/BF00044795)

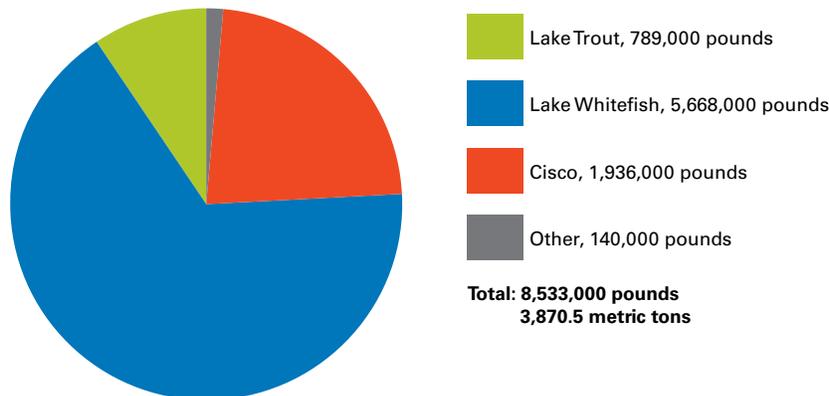
2. Great Lakes Fishery Commission fisheries database: [glfc.org/great-lakes-databases.php](https://glfc.org/great-lakes-databases.php)

3. Food and Agricultural Association of the United Nations. [fao.org/family-farming/detail/en/c/335263/](https://fao.org/family-farming/detail/en/c/335263/) [accessed — November 2021].

Understanding and adapting to ecosystem changes remains essential to sustainable fisheries management across the Great Lakes. State, provincial and tribal agencies cooperate to manage Lake Superior's fisheries, with support from the federal governments of the U.S. and Canada. Fisheries managers with a focus on Lake Superior cooperate to control invasive sea lamprey populations, monitor fish populations for health, recruitment and size, and mitigate the effects of climate change.

They work to balance commercial, recreational, assessment and subsistence fishing with the intent of producing sustainable, resilient fisheries supported by a robust ecosystem.

### Average Lake Superior Annual Harvest.



Based on [GLFC data from 2000-2015](#).

To ensure cross-border collaboration, the eight states that border the Great Lakes, the province of Ontario, three U.S. intertribal agencies and several federal agencies are signatory to [A Joint Strategic Plan for Management of Great Lakes Fisheries](#), a non-binding agreement through which fishery agencies commit to cooperation, consensus, strategic planning and ecosystem-based management.

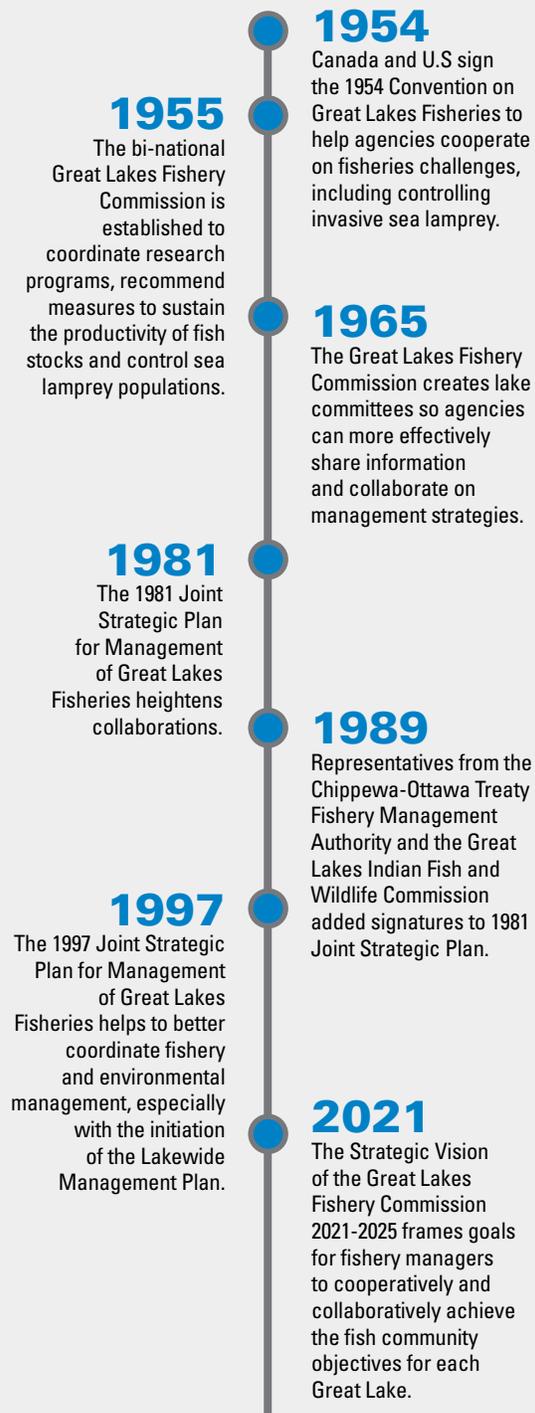
The agencies create and implement their own management plans within their jurisdiction but work together through the **Great Lakes Fishery Commission** and its **Lake Superior Committee**<sup>4</sup> to support the resilience and sustainability of the shared resources. Such multi-jurisdictional cooperation has spanned almost 70 years.

The **Lake Superior Committee** is composed of a senior staff member from each of seven agencies:

- Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF)
- Minnesota Department of Natural Resources
- Wisconsin Department of Natural Resources
- Michigan Department of Natural Resources
- 1854 Treaty Authority
- Great Lakes Indian Fish and Wildlife Commission
- Chippewa Ottawa Resource Authority

4. Great Lakes Fishery Commission website. [glfc.org/lake-superior-committee.php](http://glfc.org/lake-superior-committee.php)

## TIMELINE OF COOPERATION: Canada, the U.S. and Tribes Work Together to Manage the Great Lakes



With support from a technical committee of fishery biologists, the Lake Committee sets **Fish Community Objectives**<sup>5</sup> designed to maintain productive and sustainable fish communities through ecosystem-based management strategies. They recommend harvest levels for fish species of common interest, stocking goals and habitat improvement goals. They seek a cooperative management framework that reflects each agencies' interests, which include balancing charter, recreational, subsistence and commercial fishing. Fish populations are unevenly distributed throughout the lake reflecting food availability, habitat preferences and other behavioral characteristics. This uneven distribution influences fishing regulations and harvest rates in different management units of Lake Superior.

The committee compiles a state of the lake report every five years to summarize trends in fish populations and progress toward the Fish Community Objectives. **The latest report was published in 2021 and indicated the Lake Superior fish community remained diverse, was dominated by indigenous species and was able to support sustainable fisheries (2012-2016).**<sup>6</sup>

## LAKE SUPERIOR COMMERCIAL FISHING METHODS

Two types of nets are commonly used by Lake Superior's commercial fishers: trap nets and gill nets. An advantage of trap nets is that non-target species can be returned to the lake alive. However, trap nets require a larger capital investment and require a greater level of expertise to operate.

Commercial fishers are required to have licenses (state, provincial or tribal) and follow jurisdictional fishing regulations. Fishing regulations include fishing zones, gear type, depth

5. Great Lakes Fishery Commission website, Fish Community Objectives. [glfc.org/pubs/SpecialPubs/Sp03\\_1.pdf](https://glfc.org/pubs/SpecialPubs/Sp03_1.pdf)

6. Ebener, M.P. and T.C. Pratt [EDS]. 2021. The state of Lake Superior in 2017 [online]. Available from [glfc.org/pubs/SpecialPubs/Sp21\\_02.pdf](https://glfc.org/pubs/SpecialPubs/Sp21_02.pdf) [accessed 22 Sept. 2021]



**Lake whitefish:** Since 2000, lake whitefish stocks in Lake Superior have been stable and annual harvests have been similar to those in the early 1900s.<sup>9</sup>



- Ontario: ITQs are developed for management units. ITQs in units that are actively fished are evaluated annually and adjusted by no more than 20% based on the status of the population.
- Minnesota: No viable commercial fishery due to inadequate habitat and low population numbers.
- Wisconsin: The commercial fishery and the adjacent 1842 Treaty-ceded waters of Michigan are limited by quotas for lake trout, observed CPUE of lake trout, seasonal closures and limited entry. Fishers may only operate 10 total trap nets at a time. The amount of large-mesh gill net footage fishers are allowed to set annually is determined by lake trout catch rates.
- Michigan: Harvest quotas are established using statistical catch-at-age models and state-licensed commercial fishers are only permitted for trap nets.
- 1842 Treaty-ceded waters: The tribes cooperate with the states to coordinate fishing regulations.
- 1836 Treaty-ceded waters: See the 2000 Consent Decree (2020 Consent Decree is in negotiation).

**Cisco:** Cisco abundance appears to rely on strong year classes which occur infrequently. The population declined to low levels by the 1960s, rebounded in the 1980s with three strong year classes and have fluctuated since showing an overall gradual decline in abundance.<sup>10</sup>



- Ontario: ITQs are developed for management units. In units that are actively fished, ITQs are evaluated annually and adjusted by no more than 10% based on the status of the population.
- Minnesota: TAC is no more than 10% of the spawning-stock biomass as estimated by annual hydroacoustic surveys.
- Wisconsin: Limited with a TAC and ITQ. The TAC is determined using hydroacoustic survey estimates of spawning-stock biomass. Harvest of no more than 15% of the spawning-stock biomass.
- Michigan: Cisco are not commercially targeted by state-licensed fishers. Limited to bycatch allowances in the other fisheries.
- 1842 Treaty-ceded waters: The tribes cooperate with the states to coordinate fishing regulations.
- 1836 Treaty-ceded waters: See the 2000 Consent Decree (2020 Consent Decree is in negotiation). Cisco can be targeted.

9. Seider, M. 2018. Status of Lake Whitefish in Lake Superior. Presentation slides. [glfc.org/pubs/clc/whitefish/2018%20Whitefish%20Wkshp%20Lake%20Superior%20Status%20and%20Trends.pdf](https://glfc.org/pubs/clc/whitefish/2018%20Whitefish%20Wkshp%20Lake%20Superior%20Status%20and%20Trends.pdf)

10. Stockwell, J.D., M.P. Ebener, J.A. Black, O.T. Gorman, T.R. Hrabik, R.E. Kinnunen, W.P. Mattes, J.K. Oyadomari, S.T. Schram, D.R. Schreiner, M.J. Seider, S.P. Sitar and D.L. Yule (2009) A Synthesis of Cisco Recovery in Lake Superior: Implications for Native Fish Rehabilitation in the Laurentian Great Lakes, North American Journal of Fisheries Management, 29:3, 626-652, DOI: 10.1577/M08-002.1

**Lake trout:** “Lake trout recovery in Lake Superior is an extraordinary example of agency cooperation toward a common goal for managing recovery of an ecologically important shared resource.<sup>11</sup>” The current fishery relies on the active management of invasive sea lamprey.



- Ontario: ITQs are managed for each management unit which covers incidentally caught lake trout. The ITQs are evaluated annually and adjusted based on the status of the population.
- Minnesota: State statute describes a limited commercial assessment program with a 5,000 lake trout per year quota in zones MN-2 and MN-3. A limited commercial fishery quota of 500 lake trout per year was instituted in MN-1 in 2017.
- Wisconsin: A TAC is set in the two management units. Each commercial fisher receives a specific number of jaw tags. When fishers run out of jaw tags or allowable gill net footage, they are basically done fishing for the remainder of the season.
- Michigan: Lake trout are not commercially targeted by state-licensed fishers.
- 1842 Treaty-ceded waters: The tribes cooperate with the states to coordinate fishing regulations.
- 1836 Treaty-ceded waters: See the 2000 Consent Decree (2020 Consent Decree is in negotiation). Some harvest allowed by commercial fishers with tribal licenses.

## FISHERIES MANAGEMENT PLANS AND HARVEST REPORTS

### Ontario Ministry of Natural Resources

- Contact: Ken Lacroix, lake manager, [ken.lacroix@ontario.ca](mailto:ken.lacroix@ontario.ca)
- Management plan: [Management of Fish in Ontario Fisheries Policy Section, Policy Division, Ontario Ministry of Natural Resources 1/10/2014 Background Report Supporting Ontario’s Provincial Fish Strategy Draft – January 2014](#). Also see: [Strategic policy for commercial fisheries \(2011\)](#).
- Most recent commercial fishing report: 2020, [ocfa.ca/downloads/2020-superior-stats.pdf](https://ocfa.ca/downloads/2020-superior-stats.pdf).
- Active commercial fishing licenses: 48 in 2020 (several were not fished). Managed using ITQs.

### Minnesota Department of Natural Resources

- Contact: Cory Goldsworthy, Lake Superior fisheries supervisor, [cory.goldsworthy@state.mn.us](mailto:cory.goldsworthy@state.mn.us)
- Management plan: [Fisheries Management Plan for the Minnesota Waters of Lake Superior 2016-2025. \(2017\)](#)
- Most recent commercial fishing report: 2018, [Completion Report for the Minnesota Waters of Lake Superior](#)
- Active commercial fishing licenses: ~20 (25 issued)

11. Hansen, M.J. and C.R. Bronte. 2019. Restoration of Lake Trout in Lake Superior through interagency cooperative management. Pages 385-409 in *From Catastrophe to Recovery: Stories of Fish Management Success*. American Fisheries Society. [pubs.er.usgs.gov/publication/70195571](https://pubs.er.usgs.gov/publication/70195571)

### Wisconsin Department of Natural Resources

- Contact: Brad Ray, Lake Superior fisheries team supervisor, [Bradley.Ray@wisconsin.gov](mailto:Bradley.Ray@wisconsin.gov)
- Management plan: [Lake Superior Fisheries Management Plan 2020-2029](#). Wisconsin Department of Natural Resources. Administrative Report No. 93. Lake Superior Fisheries Team.
- Most recent commercial fishing report: 2020, [Lake Superior Commercial Fishing Report 2020](#).
- Active commercial fishing licenses: 10 (10 issued, all are fished). Managed using ITQs.

### Michigan Department of Natural Resources

- Contact: Patrick Hanchin, Lake Superior basin coordinator, [hanchinp@michigan.gov](mailto:hanchinp@michigan.gov)
- Management Plan: Lake Superior Management Plan 2021-2031, in development.
- Most recent commercial fishing report: 2018, [michigan.gov/documents/dnr/2018-SL-Commercial-FishingData\\_664809\\_7.pdf](https://michigan.gov/documents/dnr/2018-SL-Commercial-FishingData_664809_7.pdf)
- Active commercial fishing licenses: 6 (all are fished by 3 enterprises).

### 1854 Treaty Authority

This inter-tribal natural resource management agency oversees territories ceded in the Treaty of 1854.

*Tribe exercising commercial fishing rights:* [Grand Portage Band of Lake Superior Chippewa](#)

- Contact: Seth Moore, director of biology and environment at Grand Portage Band of Chippewa, [samoore@boreal.org](mailto:samoore@boreal.org)
- Management: The band coordinates with the Minnesota Department of Natural Resources.

### Great Lakes Indian Fish and Wildlife Commission

Treaties of 1837, 1842 and 1854. *Tribes exercising commercial fishing rights:* [Red Cliff Band of Lake Superior Chippewa](#), [Bad River Band of Lake Superior Chippewa](#), [Keweenaw Bay Indian Community](#)

- Contact: Bill Mattes, Great Lakes section lead, biological services, [bmattes@glifwc.org](mailto:bmattes@glifwc.org)
- Management: Great Lakes Indian Fishing Committee coordinates with Wisconsin and Michigan DNRs.

### Chippewa Ottawa Resource Authority (CORA) Great Lakes Resource Committee

This inter-tribal natural resource management agency oversees territories ceded in the Treaty of 1836.

*Tribes exercising commercial fishing rights:* [Bay Mills Indian Community](#), [Sault Ste. Marie Tribe of Chippewa Indians](#)

- Contact: Tom Gorenflo, biological services director, [tgorenflo@chippewaottawa.org](mailto:tgorenflo@chippewaottawa.org)
- Management: 2000 Consent Decree (2020 Consent Decree is in negotiation).

## ADDITIONAL RESOURCES

Ebener, M., R. Kinnunen, P. Schneeberger, L. Mohr, J. Hoyle and P. Peeters. 2008. Management of commercial fisheries for Lake Whitefish in the Laurentian Great Lakes of North America. Chapter 4 of International governance of fisheries ecosystems: Learning from the past, finding solutions for the future. 62. American Fisheries Society.

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Great Lakes Fishery Commission (Editor). 2007. A joint strategic plan for management of Great Lakes fisheries (adopted in 1997 and supersedes 1981 original). Great Lakes Fish. Comm. Misc. Publ. 2007-01. Available at [glfc.org/fishmgmt/jsp97.pdf](http://glfc.org/fishmgmt/jsp97.pdf) [accessed — August 2021].

Great Lakes Fishery Commission website, History. [glfc.org/history.php](http://glfc.org/history.php) [accessed — August 2021].

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Management of Fish in Ontario Fisheries Policy Section, Policy Division, Ontario Ministry of Natural Resources 1/10/2014 Background Report Supporting Ontario's Provincial Fish Strategy Draft — January 2014. [ncd.fisheries.org/wp-content/uploads/2016/01/Ontario-2014-Management.pdf](http://ncd.fisheries.org/wp-content/uploads/2016/01/Ontario-2014-Management.pdf).

Rook, B.J., M.J. Hansen, C.A. Goldsworthy, B.A. Ray, O.T. Gorman, D.L. Yule and C.R. Bronte (2021), Was historical cisco *Coregonus artedii* yield consistent with contemporary recruitment and abundance in Lake Superior? Fish Manag Ecol, 28: 195-210. <https://doi.org/10.1111/fme.12474>.

Sierszen, M., T. Corry, M. Pawlowski, J. Scharold and M. Vinson. Status of Lake Superior's lower trophic levels. Lake Superior Technical Committee, Ashland, Wis., January 10, 2018.

## DATABASES

USGS Great Lakes Science Center, Great Lakes Commercial Fishing Catch 1929-2014: U.S. Geological Survey data release, [dx.doi.org/10.5066/F74B2ZD1](https://dx.doi.org/10.5066/F74B2ZD1). [sciencebase.gov/catalog/item/57769db6e4b07dd077c8763c](https://sciencebase.gov/catalog/item/57769db6e4b07dd077c8763c)

Great Lakes Fishery Commission: [glfc.org/great-lakes-databases.php](http://glfc.org/great-lakes-databases.php)

NOAA Fisheries: [fisheries.noaa.gov/national/sustainable-fisheries/commercial-fisheries-landings](https://fisheries.noaa.gov/national/sustainable-fisheries/commercial-fisheries-landings)

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