

OUTSIDE OF WESTERN LAKE ERIE GRASS CARP CONTROL EFFORT SUMMARY & FUTURE DIRECTIONS

Grass Carp Advisory Committee

June 1, 2024

Overview

The [Grass Carp Advisory Committee](#) (GCAC) coordinates Grass Carp removal, surveillance, and research efforts across the Great Lakes. Although the focus of those efforts is on western [Lake Erie](#), the GCAC also coordinates efforts in other lakes as deemed necessary. During a meeting in August, 2023, the GCAC summarized past work outside of western Lake Erie and developed recommendations for future work across the Great Lakes. This document represents a summary of that information, with a page dedicated to each basin. Additional information on specific lakes can be provided by the GCAC and partners upon request.

Lake Superior

Past Efforts

- Grass Carp threat is lowest in Superior based on past risk assessments
- No historical captures in Lake Superior
- DFO sampling efforts as part of carp surveillance program 2013-2015
 - Methods used for sampling: Boat electrofishing, mini fyke nets, tied down gillnets, trap nets, trammel nets, hoop nets.
 - Key Locations: Kaministiquia River and Goulais River
 - 84 sites (6 e-fishing hours); no captures of Grass Carp
 - Dropped from surveillance efforts after 2015 to prioritize other basins

Future Directions

- Efforts in Superior remain a lower priority
- eDNA might be best focus due to the lack of captures

Lake Michigan

Past Efforts

- ~100 fish in the Nonindigenous Aquatic Species (NAS) Database from 1975-2022
 - The majority from the Milwaukee area and Lake Calumet
 - Many catches believed to be sourced from stocking events in basin
 - Northern part of Lake Michigan has had no detections, however detections in northern Huron
- Early detection monitoring led by USFWS AIS program
 - Multi-gear, multi-site data
 - Six fish detected from 2014-2021, with five from Burns Harbor, IN
- Formed a strike team for Lake Michigan in 2021 with focus on the St. Joe River, MI
 - Two monthly trips planned throughout field season (~May-Oct)
 - Sustained efforts with only e-fishing due to challenges with net sets in river
 - Additional surveillance efforts in Milwaukee, Burns Harbor, and Muskegon
 - 28 Grass Carp captured (22 St. Joe, 5 Burns Harbor, 1 Milwaukee)
- Egg collection efforts with help from UT
 - 39 tows from 2021-2023
 - Flows are low and limited on habitat that can be sampled
 - No eggs collected to date

Future Directions

- Expanding surveillance capacity across the lake is justified, likely by increasing partner participation
 - Discuss efforts at Lake Michigan Technical Committee Meetings
 - Provide annual updates and discuss next steps
 - Tribal partners have expressed an interest in being informed and engaged
 - Continue outreach to anglers and bow fishers
- Adult removals
 - Focus on electrofishing with a dedicated Grass Carp boat
 - Work in alternative gears (e.g. hoop nets) in places where current protocols may be less effective
- Continue egg collection efforts with focus on St. Joe River and areas not accessible by electrofishing boats on a monthly basis.
- Need better understanding where fish are coming from (otolith microchemistry in progress)
- Need better understanding of lake wide distribution, relative abundance, and spawning potential
- Committee supports increased survey efforts to address key uncertainties about Grass Carp in Lake Michigan
 - Maintain monthly St. Joseph R. visits
 - Start with high priority sites, then use remaining effort/time to sample others
 - Continue early life history (ELH) sampling
 - Continue analyzing otoliths to determine sources
 - Determine scope of work and capacity needs for Lake Michigan

Lake Huron (including Huron-Erie Corridor)

Past Efforts

- 14 Grass Carp reported in USGS NAS database from 1989-2018, primarily commercial captures in trap nets by Purdy Fisheries in southern Lake Huron
- DFO sampling efforts as part of carp surveillance program since 2020
 - Methods used for sampling: Boat electrofishing, mini fyke nets, tied down gillnets, trap nets, trammel nets, hoop nets.
 - Key Locations: Thames River, St. Clair River, lower Detroit River to Mississippi River to northern Lake Huron (410 sites, 120 e-fishing hours)
 - Zero captures of Grass Carp
- Increased efforts by MDNR following the capture of a diploid Grass Carp in the Tittabawassee River in 2020
 - Concentrated effort in five locations: Shiawassee R., Flint R., Cass R., Saginaw R., and Tittabawassee R.
 - ~100 hours of electrofishing and ~50 trammel nets led to no additional captures
- Egg sampling 2021-22 in Tittabawassee and Saginaw River
 - 39 tows resulted in no Grass Carp eggs
- No eDNA detections from priority sites (e.g., Thames and St. Clair R.)
- Two fish have been detected moving up into or through corridor via acoustic telemetry
 - One fish moved up and quickly back into Erie
 - One moved up through and into Huron and has not been detected since

Future Directions

- Lake St. Clair habitat seems favorable to Grass Carp, but no captures
 - eDNA program in St. Clair River; have gotten some incidental captures in other rivers. This methodology may not be effective here.
 - Follow-up eDNA study to refine methodology conducted in 2023; results available in 2024.
 - Unique hydraulics/flow pattern as well as boat traffic in the St. Clair system might affect behavior and movement of fish
 - Open sandy shoreline may be a deterrent?
 - Water quality may influence fish movement, similar to Illinois River?
- Shifting effort in Lake St. Clair to focus on researching the system's habitat, vegetation/diet, and hydraulics may be beneficial for future sampling efforts.
 - LSC model may be useful for predicting habitat type/use and probability of occurrence
- Modeling task group will think about priorities for Lake St. Clair
 - IBM model: could be extended to Lake St. Clair; look into probability of fish moving in its direction. E.g., time to travel from LSC to western basin, how many to get there, congregate and how long until they establish
- The Huron-Erie Coordinator, especially Lake St. Clair, has been somewhat under sampled and studied. The committee recommends allocating additional effort with existing capacity to conduct additional surveillance in Lake St. Clair and research into system's habitat, vegetation/diet, and hydraulics.

Eastern Lake Erie

Past Efforts

- 25 Grass Carp reported in USGS NAS database from 2006-2020 from various sources
- DFO sampling efforts as part of carp surveillance program since 2020
 - Methods used for sampling: Boat electrofishing, mini fyke nets, tied down gillnets, trap nets, trammel nets, hoop nets.
 - Key Locations: Long Point Bay, Nanticoke Creek, Grand River, Welland River (542 sites, 35 e-fishing hours)
 - Zero captures of Grass Carp
- Sampling efforts increased in 2022, led by USFWS and University of Buffalo
 - One crew completed 597 transects (177 EF hours)
 - Majority done in open water or marinas
 - Some challenges with setting nets due to water depths or flows
 - A total of 16 Grass Carp captured
 - 10 from Bell Slip; uncertain why this location is a “hot spot”, but may be because of vegetation
 - Ploidy: 3 diploids, 7 triploids, 5 undetermined, and 1 not tested
- Telemetry data, collected since 2014, indicates that fish tagged in western Lake Erie do travel to eastern Lake Erie and tributaries

Future Directions

- Continue surveillance and removal efforts across eastern Lake Erie
 - Developing a strategy to systematically target new habitats would be beneficial for eastern Lake Erie and other new habitats
- Try to figure out why Bell Slip is the eastern Lake Erie hotspot; potential relationship with elodea and/or curly leaf pondweed?
- eDNA may be useful for early detection and should prioritize its use in eastern Lake Erie where captures are low
- Public outreach focus in Canada (e.g., app to report Grass Carp captures)
- Overall, satisfied with current level of effort; priority is to continue surveillance where accessible to determine distribution and relative abundance of Grass Carp.

Lake Ontario

Past Efforts

- DFO sampling efforts as part of carp surveillance program since 2013
 - Methods used for sampling: Boat electrofishing, mini fyke nets, tied down gillnets, trap nets, trammel nets, hoop nets.
 - Key Locations: Jordan Harbor, Credit River, Humber River, Toronto Island, Rouge River, Frenchman's Bay, Duffin's Creek; pretty good coverage overall with help and other organizations
 - 1419 sites (81 e-fishing hours), two captures of Grass Carp in Jordan Harbor
- Increased efforts by USFWS
 - Focus on Oak Orchard Creek, Braddock Bay, and Genessee River
 - Nine sites (4.5 e-fishing hours); no captures or observations of Grass Carp

Future Directions

- Overall, satisfied with current level of effort; priority is to continue surveillance where accessible to determine distribution and relative abundance of Grass Carp in Lake Ontario basin.

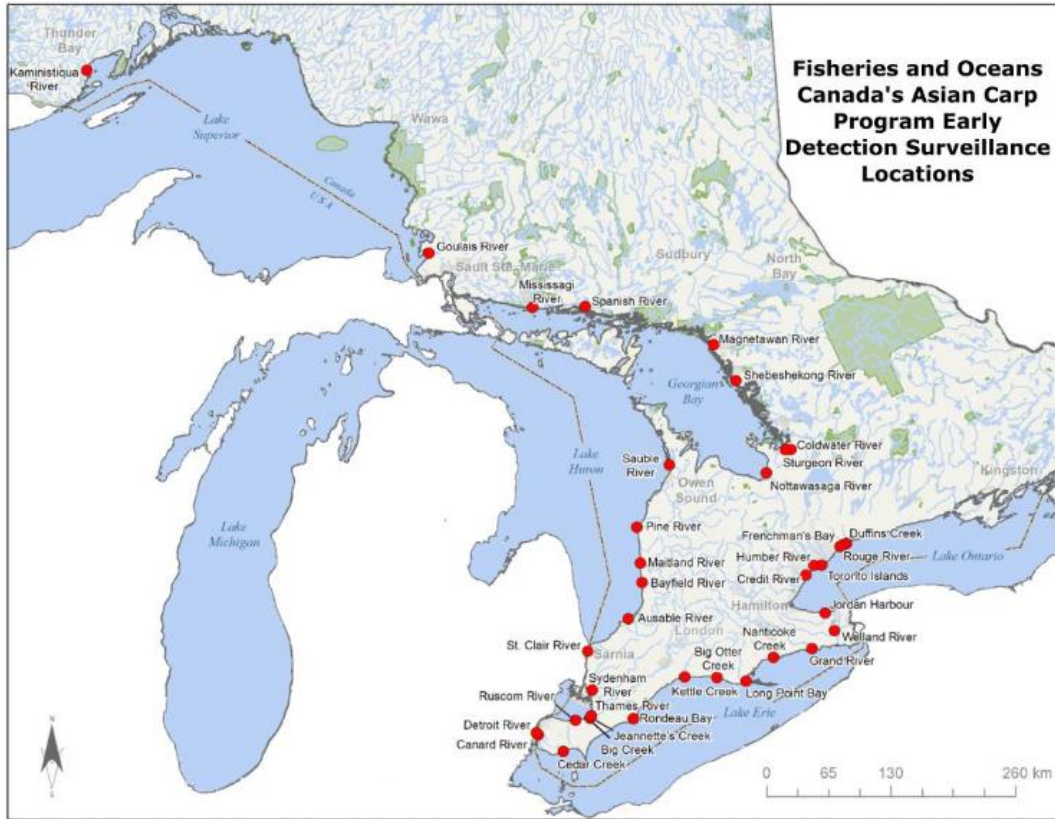


Figure 1. Map of Department of Fisheries and Oceans (DFO) early detection surveillance sites.

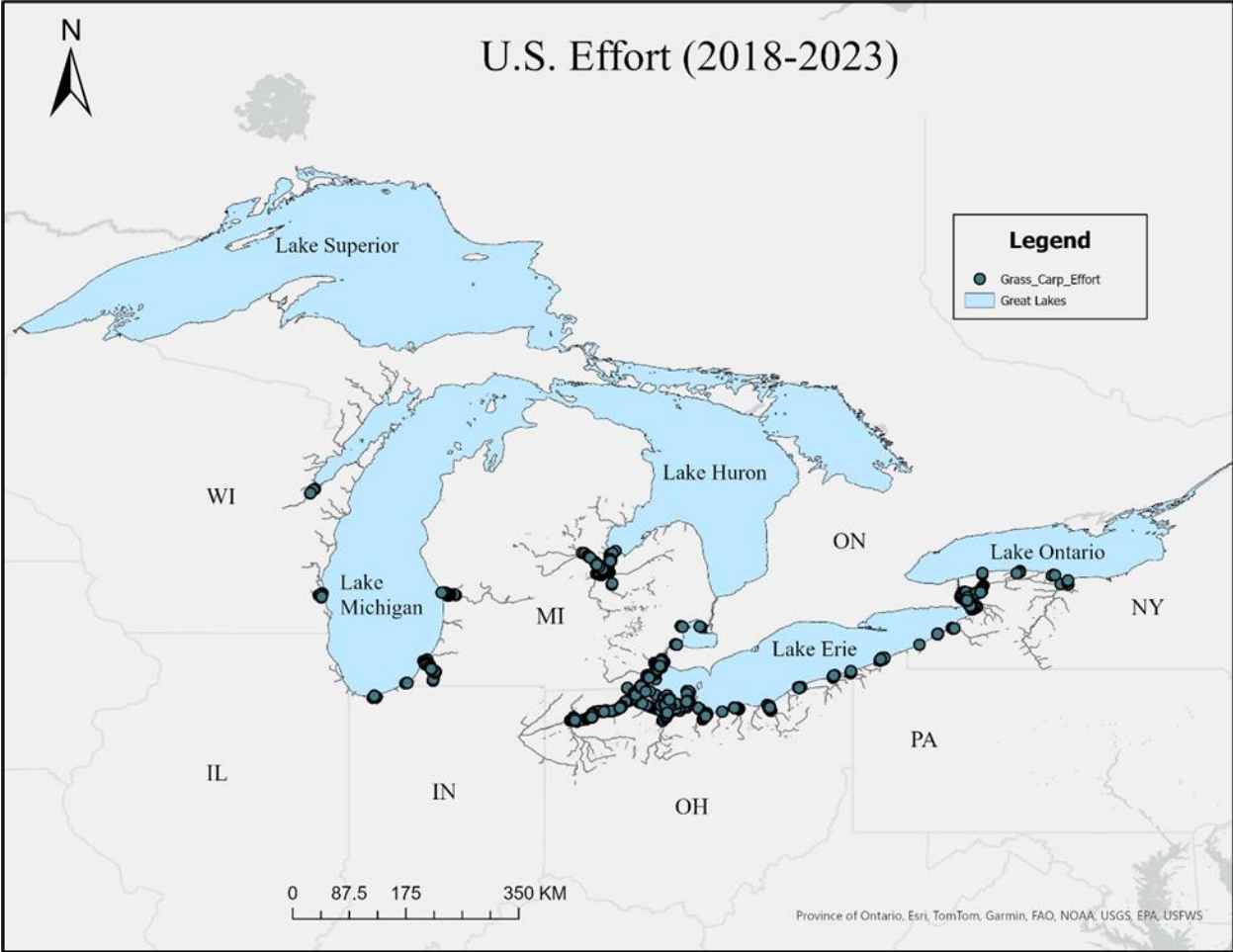


Figure 2. Map of Grass Carp removal efforts across U.S. waters of Great Lakes.

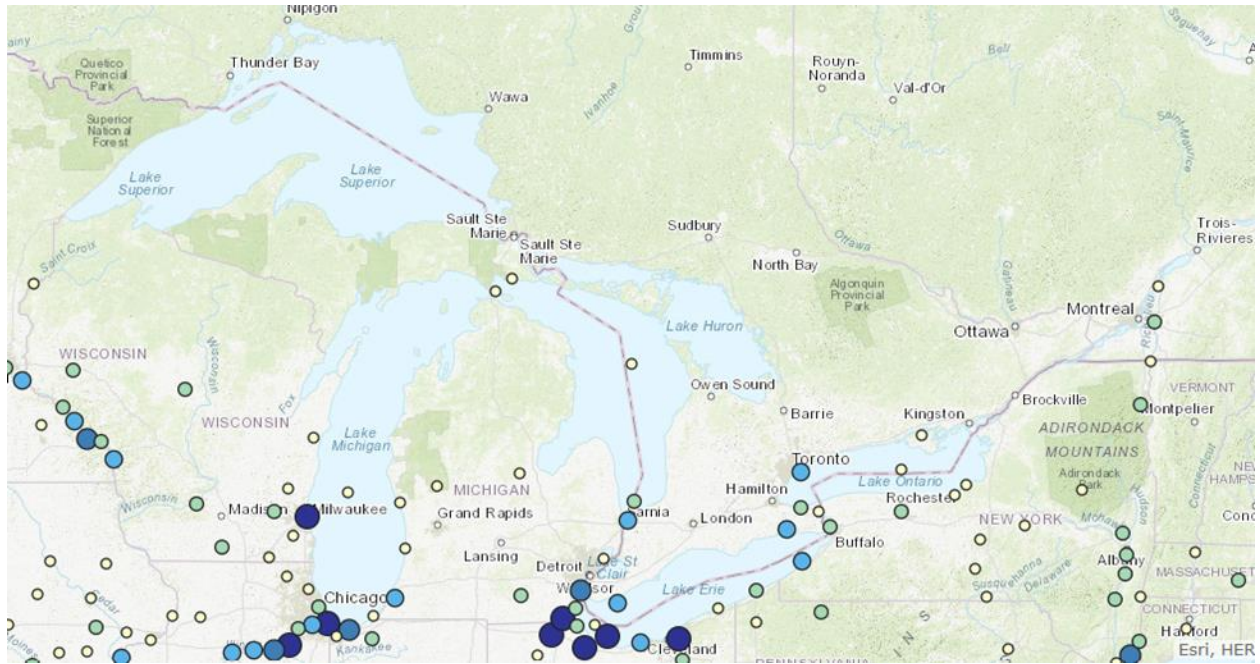


Figure 3. Map of Grass Carp reports in the United States Geological Survey's Nonindigenous Aquatic Species database as of April 2, 2024.