



DFO's Asian Carp Program

Great Lakes Panel Meeting
June 25, 2024



The four species



1

Bighead Carp



2

Silver Carp



3

Black Carp



4

Grass Carp

The Program Pillars

1



2



3



4





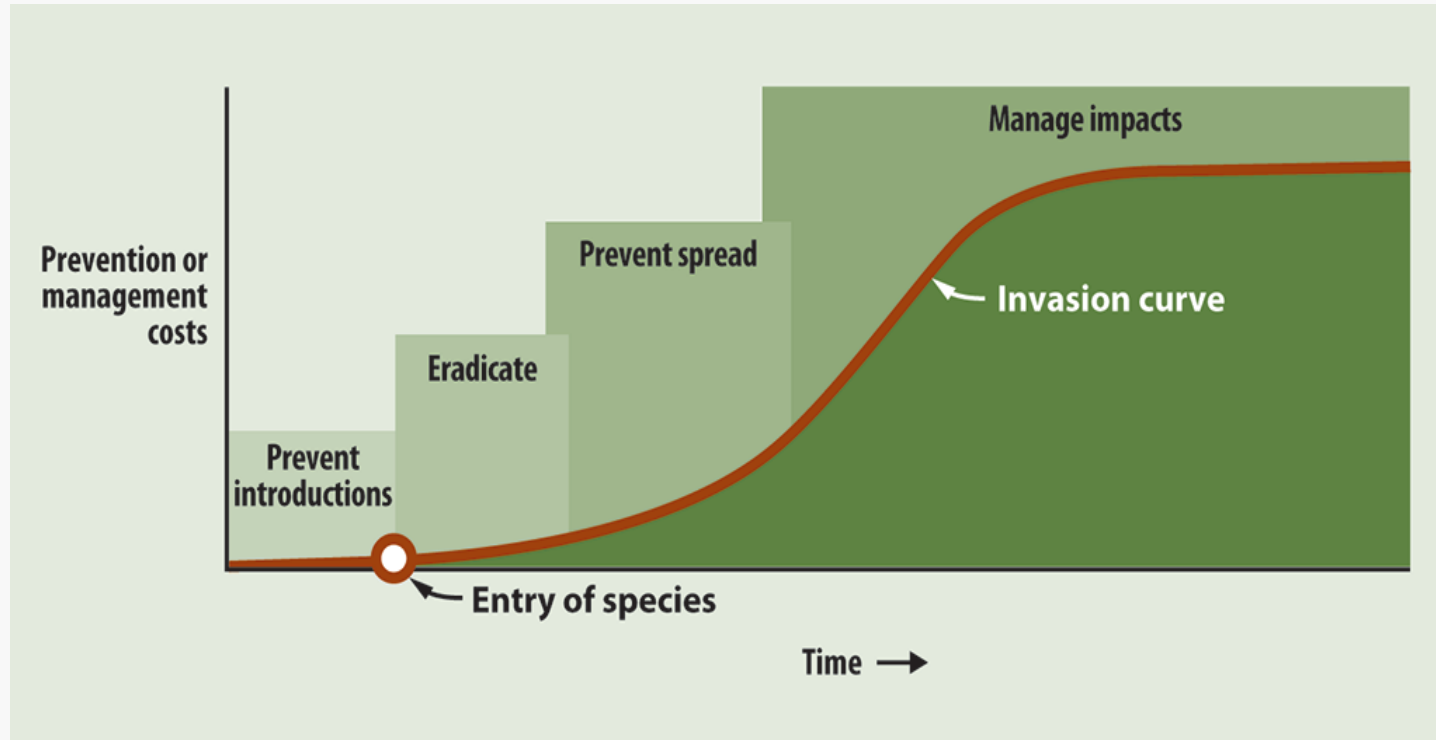
Prevention

Prevent the threat from entering Canadian waters through public **outreach, education, and awareness.**



The invasion curve

It costs far less to prevent the introduction of aquatic invasive species than to delay action and manage them once established

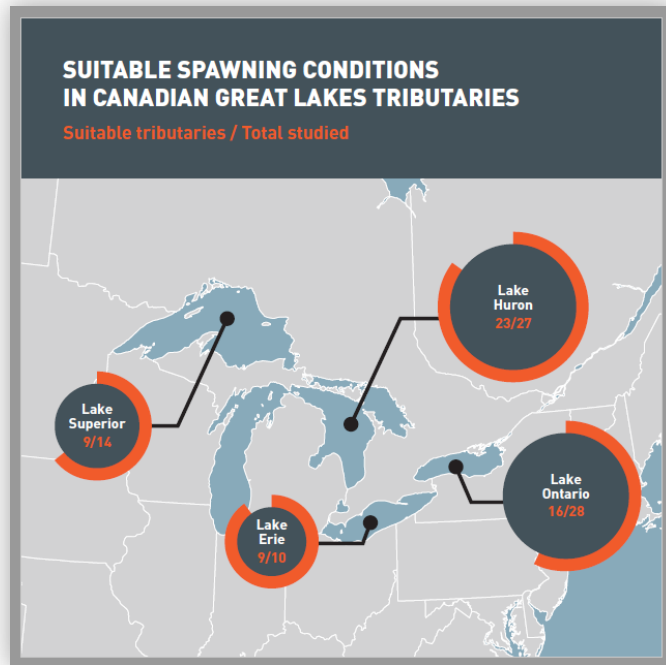




2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada
Report 1—Aquatic Invasive Species Source: Adapted from Invasive Plants and Animals Policy Framework, Department of Primary Industries (since changed to Department of Jobs, Precincts, and Regions), State of Victoria, Australia




Support Risk Assessments and Research

- DFO Science (GLLFAS)
- Risk Assessments




Fisheries and Oceans Canada / Pêches et Océans Canada


ECOLOGICAL RISK OF GRASS CARP



PROBABILITY OF INTRODUCTION
Likelihoods of

- Arrival
- Survival
- Establishment
- Spread

Overall Risk

MAGNITUDE OF CONSEQUENCES

Ecological

1. Arrival

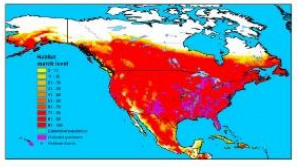
Based on the results of our 2011 ecological risk assessment on Grass Carp, both triploid (sterile) and diploid (fertile) Grass Carps have arrived from outside the Great Lakes Basin to Lake Michigan, Lake Erie, and Lake Ontario but the pathways of how they arrived are not clear. Arrival for a given lake was considered to be the repeated detection of at least one Grass Carp in at least one part of the lake basin within any continuous five-year period.

Three pathways of potential entry into the Great Lakes Basin were identified and assessed in the assessment: physical connections, human-mediated release, and lake ballast. The most likely pathway was considered to be physical connections, specifically the Chicago-Area Waterway System into Lake Michigan. In 2016-2017, 18 other natural and artificial hydrological connections between the two basins were identified. However, some may now have mitigation measures implemented that have altered their risk status.

There is evidence of Grass Carp successfully spawning in two U.S. rivers in the western basin of Lake Erie, the Sandusky and Maumee rivers in Ohio. Thus, the current most likely pathway for the spread of Grass Carp into other Great Lakes and their tributaries is from these two populations in the U.S.

2. Survival


Based on thermal tolerance, food availability, predation, pathogens, and diseases, adult and juvenile (both triploid and diploid) Grass Carp will survive in the Great Lakes; there are no known factors that would preclude their survival.



RED AREAS INDICATE A GREATER HABITAT MATCH LEVEL

3. Establishment

Suitable spawning conditions for Grass Carp exist in up to 57 Canadian rivers in the Great Lakes Basin. Ten adult females and 10 (or fewer) adult males are required for >90% chance of annual successful spawning. The likelihood of establishment by five years after a successful spawning is high for Lake Erie due to evidence of recruitment. For Lakes Michigan, Huron, Erie, and Ontario, the likelihood of establishment is very likely by 10 years. The likelihood of establishment in Lake Superior remains low at 50 years, given the low probability of overwinter survival and the inability to mature based on current climate conditions, which will limit establishment.



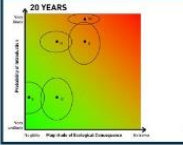
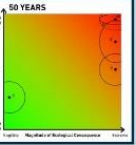
Suitable spawning tributaries / Total tributaries studied

4. Spread

No known impediments to spread exist among the lakes. Based on the arrival of Grass Carp in Lakes Erie and Michigan, their spread to the other Great Lakes in the basin within 10 years is a concern. Spread would be more rapid for Lakes Erie, Huron, Michigan, and Ontario; longer for Lake Superior.

Overall Risk

If no additional actions are taken, the overall ecological risk of Grass Carp to the Great Lakes Basin is high, especially to the central lakes, with the impacts of Grass Carp increasing over time. The probability of introduction and magnitude of the ecological consequences for fertile Grass Carp in lakes Superior, Ontario, Huron, Erie and Michigan over 20 and 50 years are shown in the figures below.

PREVENTING ESTABLISHMENT IS CRITICAL

https://www50.ec.gc.ca/colac-invasif/publications/Recherche/Docs/Doc/Bu/2016/014_118-eng.html
https://www.dfo-mpo.gc.ca/colac-invasif/publications/Recherche/2011/2011_114-eng.html



Why Collaborate?

- Shared goals
- Non-government voices
- Efficient resource use, no overlap, consistent messaging
- Leverage strengths – well placed, established audience
- Engage the public (more eyes on the water)
- Allow for easy reporting – many tools, all feed together
- Faster notification to government to respond



Collaborators

- Federation of Ontario Cottagers' Associations
- Invasive Species Centre
- Magnetawan First Nation
- Mississauga First Nation
- Metis Nation of Ontario
- Ontario Federation of Anglers and Hunters
- Ontario Ministry of Natural Resources and Forestry
- Quebec Natural Resources and Forests
- Royal Ontario Museum
- Toronto and Region Conservation Authority
- Toronto Zoo



Invasive
Species
Centre





Ontario Federation of Anglers and Hunters

- AC billboards and signs
- Classroom Education: in-person/virtual
- Boater education/CDD, Trade Shows
- How to ID Grass Carp fact sheet
- Radio PSAs, magazines
- Social media campaigns
- **Invading Species Hotline + EDDMaps**



INVASIVE GRASS CARP OR A LOOK-ALIKE?

Grass Carp is an invasive fish that has been found in the Great Lakes in small numbers, but are not established in Canada. If you think you have caught a Grass Carp, follow these steps:

1. Report it to the Invading Species Hotline: 1-800-563-7711, or email info@invadingspecies.com, or report via EDDMaps.org/Ontario;
2. Work through this ID sheet;
3. If your fish matches ALL of the features of Grass Carp, go to step 4. Otherwise, if the fish cannot be lawfully kept, release it immediately to the waters where it was caught, in a manner that causes the least harm to the fish. OR, if the fish can be lawfully kept, you can either practice catch and release or keep it;
4. Take photographs of the fish from multiple angles with adequate lighting and note your geographic location (e.g. latitude and longitude);
5. If you were unable to reach someone directly in step #1, avoid unintentionally killing native fishes by being certain

of your identification before killing a suspected Grass Carp. Ensure you are abiding by all of the laws highlighted in the Ontario Recreational Fishing Regulations Summary; and

6. IMPORTANT: Do NOT release the Grass Carp alive. Kill the fish without damaging the head or eyes. Gut the fish and keep it in a cooler, with its head above the ice. Fisheries and Oceans Canada will collect it! They learn a lot about the fish by conducting analyses on the head and eyes, such as whether or not the fish is fertile or sterile and where it came from.

A Grass Carp's eyes sit in line with its mouth

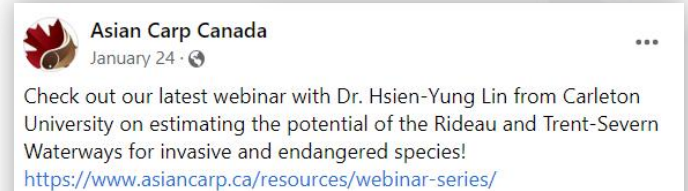
Grass Carp have a **JAWED** mouth and do **NOT** have a **SUCKER** mouth

Grass Carp have **LARGE SCALES** with dark borders giving a cross-hatched appearance



Invasive Species Centre

- www.AsianCarp.ca
- Coordinated social media campaigns
- Working with influencers
- Podcasts (Fish'n Canada)
- Webinars
- Public Information Sessions





Magnetawan First Nation

- Assisting with early detection surveillance of Grass Carp using environmental DNA (eDNA)
- Asian carp identification training
- Conducting Grass Carp outreach within the community



Magnetawan First Nation - Lands, Resources and Environment

December 24, 2023 · 🌐

Call out to all MFN Community Members!

The Lands Department has acquired funding (2022-2025) through partnership with the Department of Fisheries and Oceans to monitor the Magnetawan River annually for the presence of Invasive Asian **Carp**s. The monitoring is accomplished through the use of environmental DNA (eDNA). This non-invasive monitoring technique is an early detection tool for aquatic invasive species (Asian **Carp**s) to detect early warnings of changes in population distribution. (i.e. invading populations).

Why does monitoring for Asian **Carp**s matter? The introduction of an invasive species to an aquatic ecosystem changes the relationships between the native species, creating an unbalanced food web, generally posing negatively pressure native fish species. This loss of biodiversity is a recipe for an unhealthy river.





Toronto and Region Conservation Authority

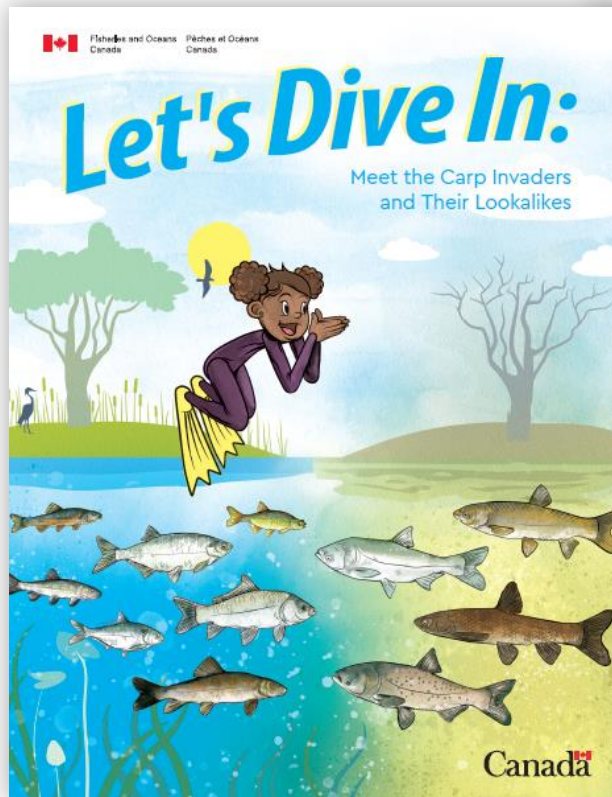
- Surveillance for Asian carps across the Toronto Region (e.g., Humber, Rouge, and Toronto Islands)
- Hosted virtual engagement workshops with DFO for other Conservation Authorities
- Nature in your classroom: live virtual engagement
- Social Media campaigns





Some of our recent projects

- Colouring Books / Ripley's Exhibit / ID Cards



Don't confuse Grass and Black carps with...

Golden Shiner deepset body with distinctive hump reddish fins anal fin wide with a curved edge	Goldfish single stout dorsal spine long, broadly attached dorsal fin deep body	Common Carp eye above mouth long, broadly attached dorsal fin barbels (whiskers) deep body
Fallfish back-set eye above mouth short, blunt dorsal fin broad head	White Sucker eye at top of head sucker mouth that protrudes downwards straight scale pattern along the midline	Creek Chub dark spot at the front of dorsal fin blackish stripe along side

Compare to the following key identification features of Grass and Black carps:

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LEARN TO IDENTIFY GRASS AND BLACK CARPS

Grass Carp eye level with mouth short dorsal fin no barbels (whiskers) large, dark crosshatched scale pattern	Black Carp eye level with mouth short dorsal fin no barbels (whiskers) large, dark crosshatched scale pattern
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- Slender, oblong shaped body with a rounded belly
- Wide, scaleless head with a toothless mouth
- "Terminal" to subterminal mouth with a very short snout
- Terminal mouths are located in the middle of the head and point forward

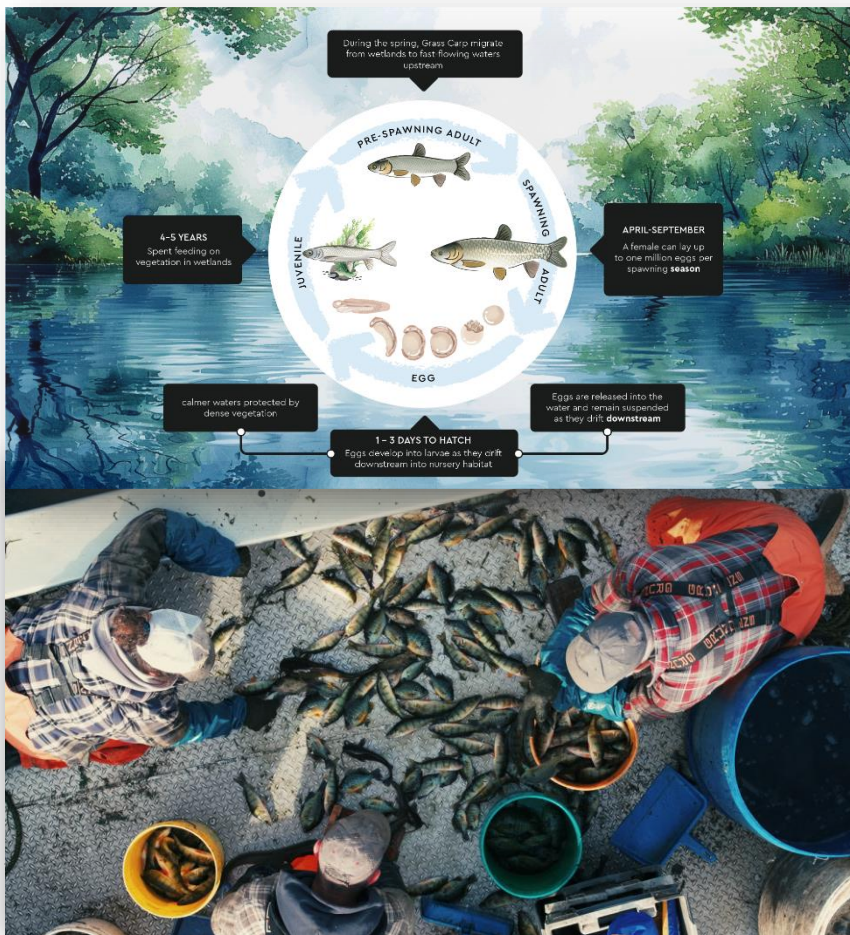
Juvenile

If found, RETAIN specimen in a cooler, double-bagged, with its head above the ice. DOCUMENT the sighting and REPORT to the Invading Species Hotline: 1-800-563-7711 or EDDMap5.org/Ontario or info@invadingspecies.com



Some of our recent projects (cont.)

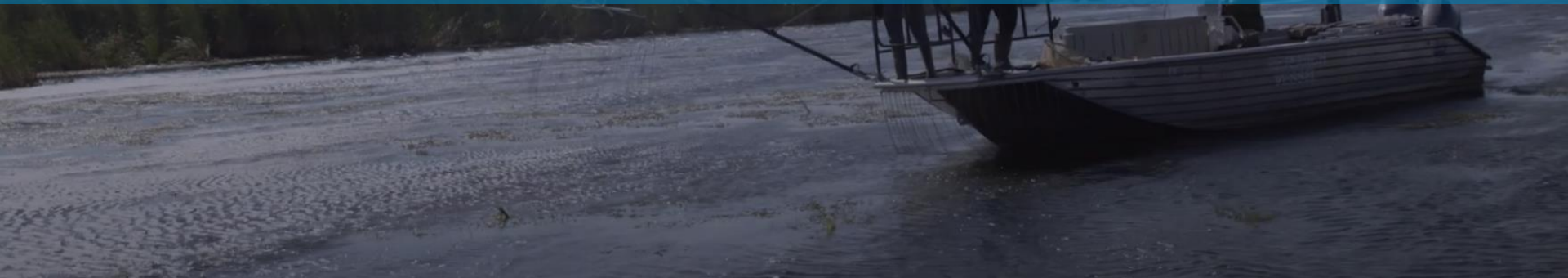
- Videos / Animated Graphics

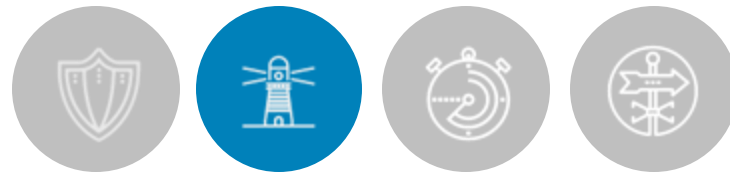




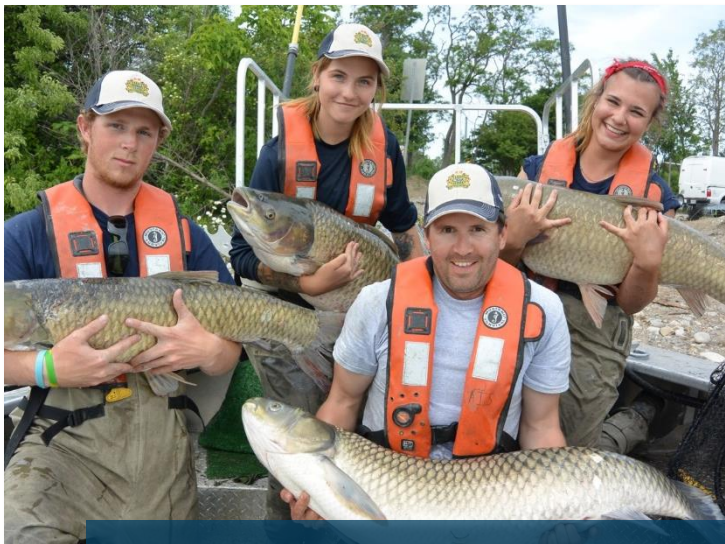
Early Warning

Detect the threat early through **surveillance** alongside partners and the efforts of key organizations.





Early Detection Field Program



**Early detection of
Grass Carp**

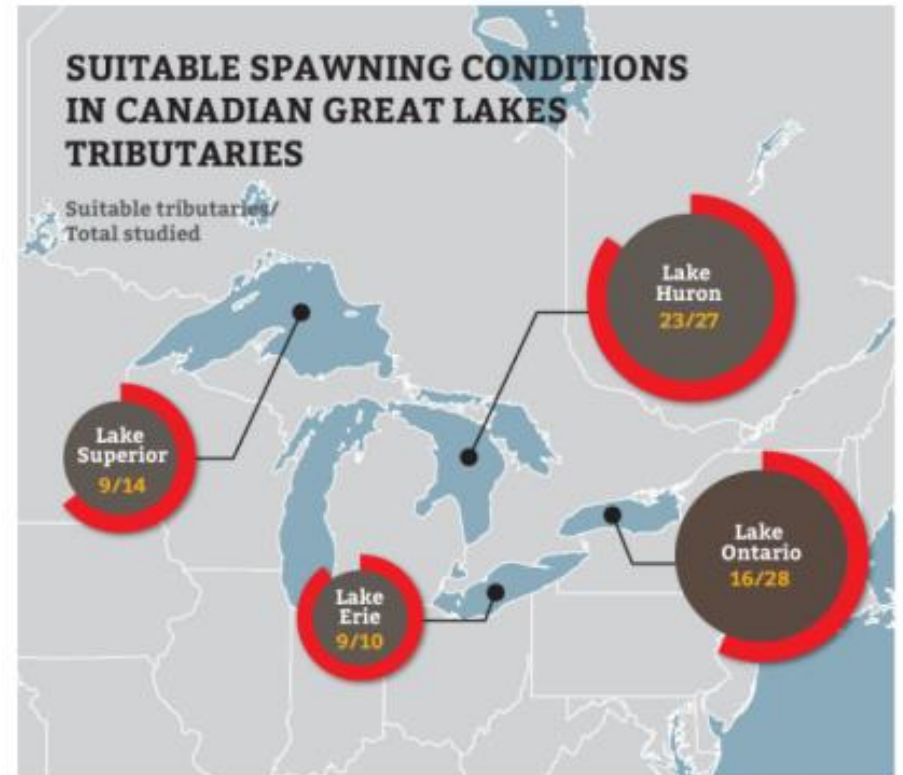


**Pre-impact baseline
fish community**

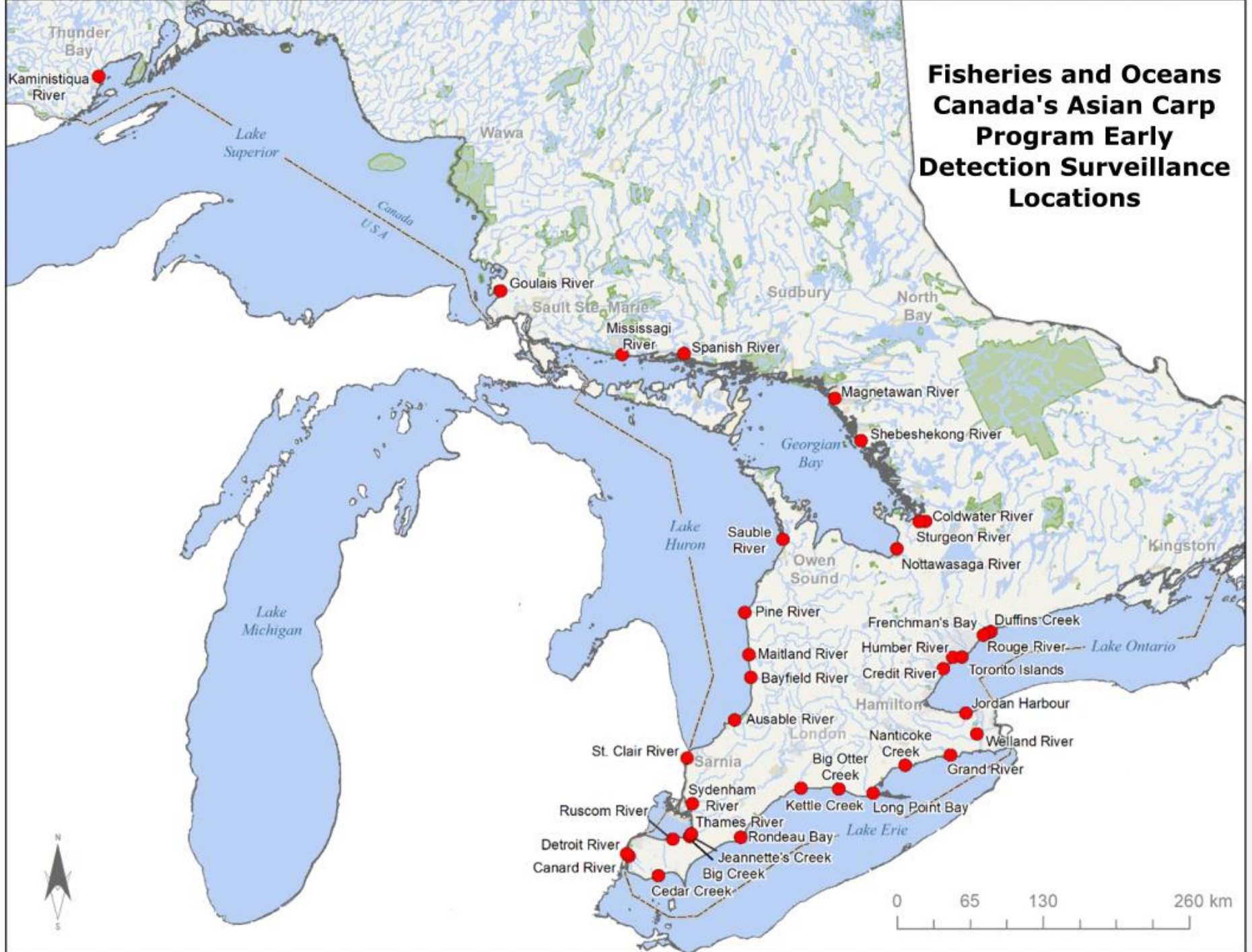


Surveillance Site Selection

- Started in 2013
- May to November
- 37 locations in lakes Superior, Huron, Erie, Ontario
- Sites selected based on modelling of suitable spawning habitat
- Large wetlands included in monitoring

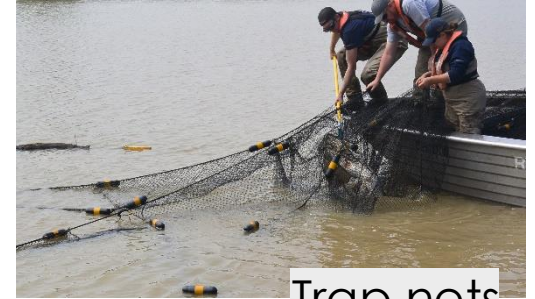


Fisheries and Oceans Canada's Asian Carp Program Early Detection Surveillance Locations

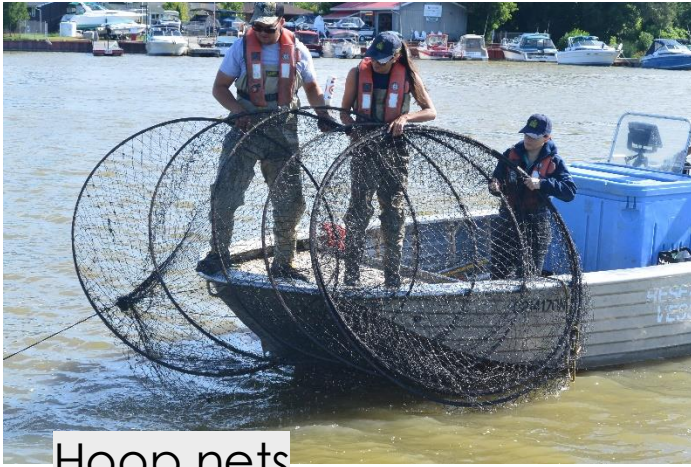




Bag Seines



Trap nets



Hoop nets



Fyke nets



Boat electrofishing



Gill and trammel nets





Light traps



Bongo nets



Early Detection Surveillance Summary



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of Sites	743	1056	1333	1211	1145	1197	984	699	1014	1167
Number of Waterbodies	37	36	40	34	36	36	30	28	33	38
Total Number of Fish	47,188	61,765	79,834	67,862	64,169	57,027	61,247	46,044	62,839	45,561
Number of Species	93	98	100	89	90	86	84	77	86	84
Number of Buffalo	346	762	1157	887	914	864	434	117	443	481
Number of Common Carp	1774	3200	2661	2024	2576	1876	995	915	1082	1230
Number of Grass Carp (Captured by Asian Carp Program)	0	1	0	0	0	0	1	0	0	1

ALL GRASS CARP DETECTED BY
TRAMMEL/GILL NETS

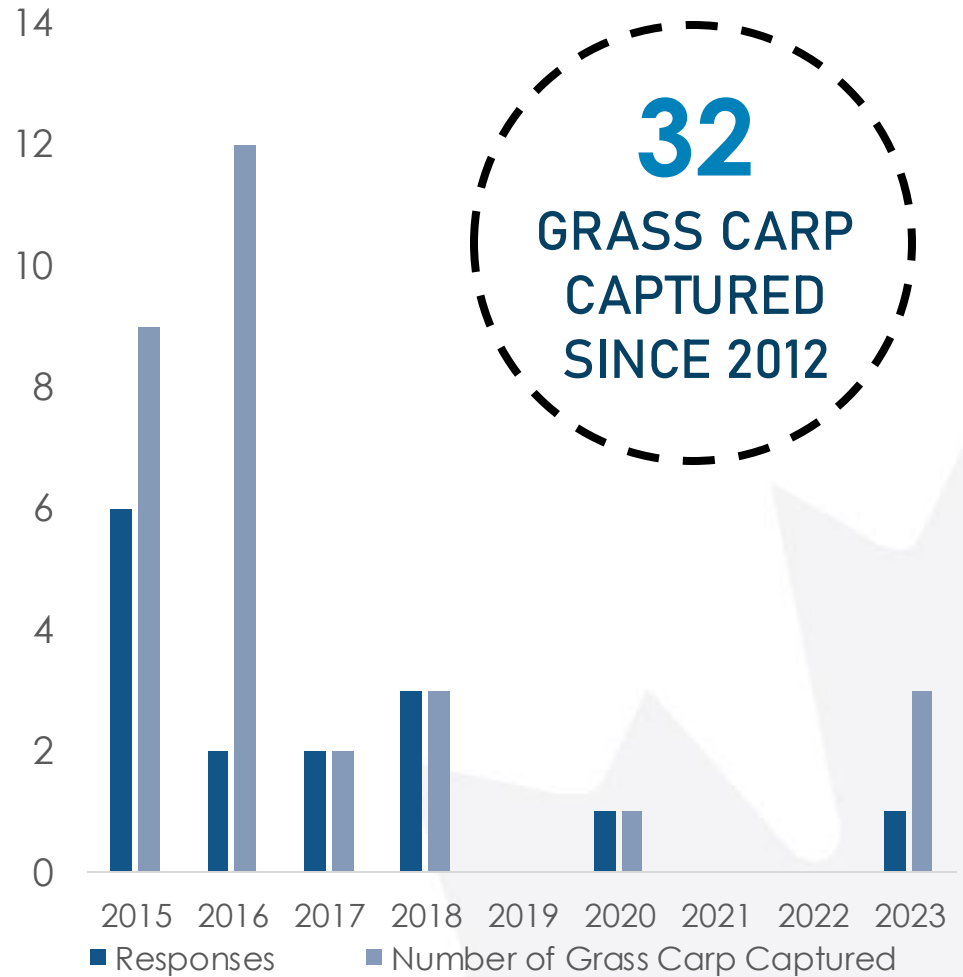


Response

Ensure a **unified** and **coordinated team** can respond to incidents.



Grass Carp Captures





Response video



Thank you!

