TOOLKIT FOR PROTECTING YOUR LAKE FROM AQUATIC INVASIVE SPECIES

Invasive Species Awareness and Monitoring for Lakes Education Ontario: 2022 Results

IsampleON
Invasive Species Awareness and Monitoring Program for Lakes Education Ontario

Invasive Species Centre

FOCA
Federation of Ontario Cottagers' Associations

INTRODUCTION

Aquatic invasive species are a major threat to the economic and ecological integrity of our waters. Early detection is essential to protect our lakes and rivers from the negative impacts aquatic invaders have on these key ecosystems.

The Invasive Species Centre partnered with the Federation of Ontario Cottagers' Associations (FOCA) to help community members prevent, detect, and monitor aquatic invasive species in inland lakes.

In 2022, the Invasive Species Awareness and Monitoring Program for Lakes Education in Ontario (IsampleON) trained volunteers to collect water samples from 29 lakes in Ontario watersheds to test them for the presence of invasive mussels and spiny water flea.

IMPORTANCE OF COMMUNITY SCIENCE

The success of this project depended on the participation of our network of community scientists. This program was created to increase local awareness of aquatic invasive species and encourage public involvement in preventing their spread to inland lakes. Since it's inception, we have sampled 54 lakes in Ontario.

We would like to thank all volunteers for their participation and dedication to invasive species awareness and prevention through this program.

METHOD OF SAMPLING

FOCA connected with lake associations through their membership, sent 29 sampling kits and through training webinars and materials, 58 volunteers from 29 associations were trained prior to sampling. Materials sent included nets, gloves, pipettes, sampling jars and additional items. Volunteers collected three samples from their lake. It was recommended that samples be taken from public boat launches, or marinas (locations with high boat traffic), the deepest location in the lake and one from the windward size of lakes (veligers and spiny water flea are passive swimmers and can be detected on the windward side of lakes). Using the materials provided, volunteers used plankton haul nets and their boats to collect samples and ship them back to the Invasive Species Centre for analysis.

MEET THE INVADERS

ZEBRA & QUAGGA MUSSELS

Native to Eurasia and brought to the Great Lakes via ballast water. These mussels are typically found attached to objects, surfaces, or other mussels by threads extending from underneath the shells. The larvae are highly mobile as they are free-floating in water. This stage contributes to their rapid dispersal throughout the waterways subsequently leading to the colonization of water supply pipes of hydroelectric and nuclear power plants, public water supply plants, and industrial facilities. Zebra and quagga mussels primarily consume phytoplankton and zooplankton which may have effects on the food web and fish.

SPINY WATERFLEA

Spiny waterflea is also native to Eurasia and was introduced into the Great Lakes from ballast water from ships. Now, spiny waterflea is present in all five Great Lakes and in over 100 nearby inland lakes. They are best known for their barbed tail, used as a defense mechanism to deter predation by small fish. In total, spiny waterflea are just visible at approximately 1.5 cm in length. This invasive zooplankton outcompetes native species for food, which can have cascading impacts to the entire food web. Jelly-like masses of spiny waterfleas impact recreation and commercial fishing when they are caught in fishing equipment and commercial netting and trawling lines.

SUMMARY OF WATER SAMPLING RESULTS

Lake	Veligers Detected	Spiny Waterflea Detected
Round Lake	Positive	Negative
Canonto Lake	Negative	Negative
Bennett &Fagan Lakes	Positive	Negative
Fortescue Lake	Negative	Negative
Billings Lake	Negative	Negative
Canning Lake	Negative	Negative
Steenburg Lake	Negative	Negative
Salerno Lake	Negative	Negative
Chandos Lake	Negative	Negative
Crego Lake	Negative	Negative
Kashwakamak Lake	Negative	Positive
Glamor Lake	Negative	Negative
Horseshoe Crotch Lake	Negative	Negative
Temagami Lake	Negative	Negative
Big Gull Lake (West)	Negative	Negative
Farquhar Lake	Negative	Negative
Lake Mazinaw	Negative	Negative
Catchacoma Lake	Negative	Positive
Mary Lake	Negative	Positive
Lake Healey	Negative	Positive
Three Mile Lake	Negative	Positive
Rankin Lake	Negative	Positive
Trout Lake (Madawaska)	Negative	Positive
Lake Manitouwabing	Negative	Negative
Duck Lake	Negative	Negative
Trout Lake (Hoskin)	Positive	Positive
Menominee Lake	Negative	Negative
Lake Vernon	Negative	Positive
Growler Lake (Bat/Bear)	Negative	Negative

WHAT DO YOUR LAKE RESULTS MEAN?

Generally, when zebra mussel veligers are first detected in a lake, there is about a two-year period before adult mussels become noticeable. Thus, if veligers are discovered in your lake, it will give you a chance to heed the warning and prepare for the negative impacts of the zebra mussel. However, it cannot be overemphasized that a negative result is NOT a guarantee that zebra mussels, spiny waterflea and other invading species do not exist in your lake, proper precautions should always be taken in order to prevent the potential spread of invading aquatic species.

It is important to note the calcium levels in your lake as veligers require certain levels to build their shells and survive. Lakes with calcium over 25 mg/L are at high risk for mussel survival. Lakes under 25 mg/L are still at high risk, but other factors such as pH can play a role. Calcium levels below 20 mg/L are at a lower risk for survival.

Lake	Veligers Detected	Spiny Waterflea Detected	Calcium
Round Lake	Positive	Negative	33.7 (2021)
Canonto Lake	Negative	Negative	Not Available
Bennett &Fagan Lakes	Positive	Negative	28.1 (2012)
Fortescue Lake	Negative	Negative	28.1 (2021)
Billings Lake	Negative	Negative	Not Available
Canning Lake	Negative	Negative	23.5 (2012)
Steenburg Lake	Negative	Negative	25.1 (2021)
Salerno Lake	Negative	Negative	22.7 (2021)
Chandos Lake	Negative	Negative	21.6 (2021)
Crego Lake	Negative	Negative	19.2 (2021)
Kashwakamak Lake	Negative	Positive	14.2 (2021)
Glamor Lake	Negative	Negative	14.1 (2021)
Horseshoe Crotch Lake	Negative	Negative	13.9 (2021)
Temagami Lake	Negative	Negative	5.3 (2021)
Big Gull Lake (West)	Negative	Negative	10.8 (2021)
Farquhar Lake	Negative	Negative	10.2 (2021)
Lake Mazinaw	Negative	Negative	8.9 (2021)
Catchacoma Lake	Negative	Positive	5.8 (2021)
Mary Lake	Negative	Positive	2.8 (2021)
Lake Healey	Negative	Positive	2.2 (2021)
Three Mile Lake	Negative	Positive	5.0 (2021)
Rankin Lake	Negative	Positive	4.8 (2021)
Trout Lake (Madawaska)	Negative	Positive	5.0 (2020)
Lake Manitouwabing	Negative	Negative	4.1 (2021)
Duck Lake	Negative	Negative	3.0 (2019)
Trout Lake (Hoskin)	Positive	Positive	30.1 (2021)
Menominee Lake	Negative	Negative	Not Available
Lake Vernon	Negative	Positive	2.3 (2021)
Growler Lake (Bat/Bear)	Negative	Negative	1.7 (2021)

Calcium Data Source: Lake Partner Program – Sampling Results & Assistance | FOCA

POSITIVE: NOW WHAT?

Now that you know invasive mussels are present, the most important actions are to prevent the spread of invasive mussels to neighboring lakes. Make other cottagers on the lake and visitors to the lake aware of the invasion. Add signage at public boat launches that state the presence of invasive mussels and the importance of cleaning, draining and drying your boat and equipment. Consider setting up equipment for boat washing at your public boat launches. Knowledge is key.

The presence of invasive mussels in your lake may also mean some extra work on your part. Invasive mussels can attach to many hard surfaces which can cause clogging of water intake pipes and mechanical issues with boat motors. The good news is there are some tools and strategies you can use to help mitigate some of these consequences.

- Intake lines and foot valve maintenance: Draining and drying water intake lines and foot valves can help reduce the risk of blockages. Freezing lines and foot valves after draining is even more effective than simply drying.

- Water intake pipe filter: Consider a filter for your intake pipes that feed your cottage water supply to prevent mussels from attaching to the inside of the pipe. This works well for year-round cottage use and with planned maintenance.

- Lift motor or boat out of water: After each use, lift your boat motor, propellers and all, up out of the water to decrease the chances of invasive mussels attaching themselves to the motor. Or better yet, consider investing in a boat lift or ramp to completely remove your boat from the water.

- Flush boat motor regularly: Microscopic veligers can be drawn up through the water inlet of the motor and settle inside, causing blockages as it matures. Frequently using a motor flusher or motor muffs can decrease the risk of this occurring.

- Wear water shoes: Mussels can have very sharp shells that hurt to step on, especially for children. Invasive mussels can grow in such abundance they become difficult to avoid. Consider wearing protection on your feet such as water shoes to avoid injury.

Although there are no recommended management options available in Ontario at this time, there is some research and pilot projects being done, in particular in the United States. Check out the Invasive Mussel Collaborative to learn about some of the projects that are underway and some of the hope for management options in the future.

WHAT CAN YOU DO?

Understand the pathways of introduction

One characteristic of invasive species is how easily they can spread and establish, especially in aquatic environments. Invasive mussels for example, can attach themselves to boats, trailers or fishing equipment, and microscopic villagers can go undetected in the bilge water and live wells. Aquatic invasive plants often reproduce asexually through fragmentation, it only takes a small plant piece attached to a boat prop or trailer and moved to a new area to start to grow and root. For these reasons, it is important to understand that recreational boating can be a vector or pathway for spreading aquatic invasive species.

On January 1st. 2022, the Ontario Government made amendments to the *Invasive Species Act, 2015.* These changes target the boating pathway as a vector of spread for invasive species. Watercraft such as motorboats, rowboats, canoes, punts, sailboats, rafts, or other related equipment may only be transported if drain plugs and other devices used to control drainage of water have been opened or removed. You can find more information and learn more about the regulations surrounding boating as a pathway here.

Clean, Drain, Dry

Clean any plants, mud, mussels and debris from your boat and equipment. **Drain** all standing water from your bilge, motor and live well. **Dry** your boat and fishing equipment for 2-7 days and/or disinfect with hot, pressurized water. Below are some common places invasive species may be hiding:

Don't Dump Your Bait

Juvenile fish species can often be difficult to distinguish and invasive fish species such as Asian carp could be present in your bait. It is the responsibility of the angler to learn to identify their bait fish and empty bait buckets at least 30 meters away from the waterbody shoreline on dry land. Learn more about bait regulations in Ontario here.

Don't Let It Loose

Buy native aquarium and aquapond species and never release into the natural environment. It is against the law to introduce a plant or animal into a waterbody where it is not native. If it isn't where you got it, it isn't where it goes! Here are some ways to dispose of pets, plants and aquarium/aquapond waste:

- Try finding them a new home
- Return to your retailer
- Ask a veterinarian about how pets can be humanely euthanized
- Seal them in plastic bags and dispose of in the garbage

Continue monitoring for invasive species

Local residents and cottagers are the first to notice changes in their lakes and forests. Being familiar with the area and its characteristics will help to notice subtle changes as they occur. Have an awareness about you while you are enjoying yourself outside and you might make an early detection.

Learn

Take part in webinars and workshops to learn about the invasive species present or threatening to establish in your area. Learn what features to look for and how to identify invasive species or distinguish them from the native species in your area. There are plenty of resources on the Invasive Species Centre's website and many past webinars can be found on YouTube as well.

Take Action

Host a community science event to survey your lake for invasive species. This can be a fun way to get everyone involved of all ages and experiences. It's also great to have a baseline for (a) what invasive species are present, (b) where are they located so you can avoid the area, and (c) to what extent are they spreading. Simply observing to increase awareness can make a large impact.

Please note, should anyone wish to remove or manage any aquatic invasive species, there are rules and regulations in place, and you may need to consult your local Ministry of the Environment, Conservation and Parks, Ministry of Natural Resources and Forestry offices or experts in the field.

DIY Dock Hangers

Continue to monitor for adult zebra or quagga mussels by installing dock hangers! All you need is some rope and a small terracotta pot.

What to do:

1. String the rope through the hole in the bottom of the pot
2. Tie a knot on the inside to prevent the pot from falling
3. Hang the pots from your personal dock for a season
4. Check regularly for zebra or quagga mussel establishment
5. Be sure to remove them at the end of the season to avoid winter damage

Note: You can even use several pots at different depths along the same rope.

Report sightings of invasive species

Once you have an awareness of your surroundings and an idea of what invasive species to keep an eye out for, make sure you know how to report them.

What you need to make a report:

1. **Pictures** of the species
2. **Location** found
3. If possible, **identification** of what you think it is

Here are a list of places to report invasive species:

- EDDMapS App or Webpage (Early Detection and Distribution Mapping System)
- iNaturalist App
- Invading Species Awareness Hotline: **1-800-563-7711**

EDDMapS

EDDMapS is a reporting tool developed specifically for invasive species. It is simple to use and there is no need to have previous experience or expertise. Simply take a photo or two, and make a report, even if you are unsure about the identity of the species you found. When a report is made, it is sent directly to experts that confirm the identification. Once the report is verified, it is added to the distribution map. If a report is made of a high priority species (ie. Asian carps, Water Soldier etc.), it enacts a rapid response by authorities and organizations to follow up and work towards eradicating or containing populations before they spread further.

iNaturalist

INaturalist is a more generalized reporting tool used to capture biodiversity. iNaturalist uses Artificial Intelligence to help narrow down an identification, however some knowledge is needed to field through the results. Reports of invasive species can be made through iNaturalist and are then pulled into EDDMapS once they reach Research Grade status.

Continue the conversation

Continue to spread the awareness of invasive species through your networks. Let people know if you have invasive species present in your lake. Talk about it with your friends and family.

- Post signage at public boat launches about Clean, Drain, Dry or about the invaders present.
- Distribute zebra mussel and other invasive species resources at your lake association meetings, local marinas, bait and tackle shops and tourism offices (copies of available brochures are included in the monitoring kit and online sources are provided in the Appendix).
- Encourage other lake residents to install dock hangers on their docks too and check them regularly.
- Write articles on aquatic nuisance species in your association or community news sources.
- Share invasive species related materials on social media (Some great social accounts specific to invasive species include Invasive Species Centre, Invading Species Awareness Program, Ontario Invasive Plant Council, Asian Carp Canada, Play Clean Go, NAISMA or NAISMAorg).

APPENDIX

Here is a list of many resources available online for more information on invasive mussels, spiny waterflea and other aquatic invasive species.

Government Rules and Regulations:

- Ontario Invasive Species Act, 2015
- Federal Aquatic Invasive Species Regulations
- Ontario Fishing Regulations

Identification Resources:

- Invasive Aquatic Plants - A Quick Reference Guide
- Invasive Invertebrates - A Quick Reference Guide
- Invasive Fish - A Quick Reference Guide
- Bait Fish Primer

Species Resources:

- Invasive Mussels Species Profile
- Spiny Water Flea Species Profile
- ISAP Invasive Mussels Species Profile
- ISAP Spiny Water Flea Species Profile
- ISC Species Profiles

Management Resources:

- Best Management Practices Database

Community Science Opportunities:

- Community Science Program
- Take Action with the ISC
- EDDMapS
- Lake Partner Program – OVERVIEW | FOCA
- Healthy Waterfronts
- Mysterysnail Management and Removal Project
- Operation Bait Bucket
- Volunteer Water Steward Program
- Community Science Tree Check Form