



IsampleON: eDNA Sampling Results

Invasive Species Awareness and Monitoring Program for Lakes Education in Ontario

BACKGROUND

IsampleON is a pilot project that engages volunteers in monitoring efforts to help prevent the spread of invasive species. Environmental DNA (eDNA) monitoring was a part of what was being piloted during this monitoring program. For more information about eDNA, see the section “*What is eDNA monitoring?*”

Efforts from 2021 helped monitor for invasive quagga and zebra mussels, two species with a long history of invasion in the Ontario Great Lake Region. From the combined effort of volunteers, we collected samples from 25 lakes. Thank you to all of our volunteers!

WHAT IS eDNA MONITORING?

eDNA monitoring is a method of sampling to detect genetic material shed by organisms into the environment. Genetic material can be detected from cells, tissue and excrement amongst other sources. Using eDNA grants us the opportunity to get the jump on Invasive species because it can support detection early in the invasion process from even small amounts of genetic material. eDNA slots in well for early detection in part because it is quick, easy and it detects specific species, like invasive species. However, it does not tell us the number of organisms or whether that organism has persisted in the body of water. For example, the organism may have since passed through or died.

In the case of IsampleON, we looked for all types of eDNA shed by invasive mussels into the water of your lake. If we found eDNA, it meant that there might be invasive mussels in your lake. See the sections below about “*Reading the Results*” and “*Interpreting Positive/Negative Samples*”.

If you were a volunteer who conducted eDNA sampling, you filtered water from your lake through a filter following the [Aquatic eDNA Participant Guide](#). For more information about eDNA, check out our [Aquatic eDNA Factsheet](#).

READING THE RESULTS

A table of the results is found in Table 1 of this document.

Find your lake name listed in the first column.

Reading from left to right you will also see your local association and the nearest town to the sampling location. Use this information to identify the location you helped sample.

Three columns on the far right (shaded with green headers) show the results of three different sampling types.

- “*Zebra Mussel eDNA*” shows whether there was zebra mussel genetic material present in your sample.
- “*Quagga Mussel eDNA*” shows whether there was quagga mussel genetic material present in your sample.
- “*Mussel Veliger*” shows whether there were larva present from either quagga or zebra mussels in your sample. This method does not detect genetic material like eDNA.

“*Negative*” means the sample did not have mussel in it. “*Positive*” means the sample did have mussel in it.

Different sampling types provide different forms of information. For example, veliger sampling only picks up specific life stages of mussels (i.e., larval) whereas eDNA sampling picks up all stages of life. However, eDNA sampling will only detect genetic material before it falls apart. It is possible that Invasive mussels could shed genetic material into your lake, but it falls apart before you have the chance to capture it in your eDNA sample. Mussel veligers are detectable over a longer period of time.

It is also worth noting that the veliger and eDNA results come from different samples of water and therefore different parts of the lake. While a positive result means that the sample had signs of mussel in it, that doesn't mean that every sample taken from the lake will have the same result.

These reasons explain why two different types of samples taken from the same lake may not have the same result. A positive sample from any sampling type is reason enough to take precautions.

INTERPRETING POSITIVE RESULTS

Positive samples do not indicate whether Invasive Mussels have made a home in your lake.

In order to verify whether the organism is present, we recommend follow-up sampling to visually confirm the extent of invasion. Substrate sampling with dock hangers is one way to do so and we recommend a wider distribution of sampling throughout the lake.

Only once you have visually confirmed invasive mussels, do we recommend reporting your sighting through one of the sources below.

As always, we advise preparing for possible negative impacts and we strongly encourage you to address sources of possible introduction and spread.

INTERPRETING NEGATIVE SAMPLES

Negative samples do not mean invasive mussels are absent either. This result only means that they were not captured in the samples. Invasive mussels could be elsewhere in your lake or too low in abundance to detect.

Monitoring is an ongoing responsibility. Continue to keep a watchful eye out for signs of invasive species and practice preventative measures like [Clean, Drain, Dry](#).

Thank you for participating. Your role helps protect Ontario lakes from aquatic invasive species. Please refer back to your toolkit for advice on next steps.

Report invasive species to:

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

eDNA RESULTS

Location name	Lake/Cottage Association	Nearest Town	Zebra Mussel eDNA	Quagga Mussel eDNA	Mussel Veliger
Bennett Lake	BFLA	Fallbrook/Perth	positive	negative	positive
Big Cedar Lake	BCLRA	Burleigh Falls, Ontario	negative	negative	positive
Buckshot Lake	BLCA	Plevna	negative	negative	negative
Chandos Lake	CLPOA	Apsley	negative	negative	negative
Coe Island Lake	CILRA	Bancroft	negative	negative	negative
Crowe Lake	CLWA	Marmora	positive	negative	positive
Crystal Lake	CLCA	Kinmount	positive	negative	negative
Denna Lake	DLCA	Minden	negative	negative	negative
Desert Lake	DLPOA	Verona	negative	negative	negative
Fourteen Island Lake	FILMA	Verona	positive	negative	negative
Gananoque Lake	GLA	Lansdowne	positive	positive	negative
Knowlton Lake	KL	Sydenham	positive	negative	positive
Lake Clear	LCCA	Eganville	positive	negative	positive
Lake Esson (aka Cedar Lake)	CL	Wilber Force	negative	negative	negative
Lake Mississagagon	LMA	Cloyne	positive	negative	negative
Lake Opinicon	OECOAA	Elgin	positive	negative	negative
Limerick Lake	LWRA	Bancroft	negative	negative	negative
Little Silver Lake	LSRLPOA	Perth	negative	negative	negative
Malcom and Ardoch Lakes	MALA	Ardoch	negative	negative	positive
Miller Lake	ML	Dyer's Bay	negative	negative	negative
Sigsworth (Mink)	FILMA	Verona	positive	negative	positive
Six Mile Lake	SML	Port Severn	positive	positive	negative
South Lake	SLACAR	Minden	negative	negative	negative
Steenburg Lake	SLCA	Coe Hill	negative	negative	negative

Table 1. Invasive Mussel Sampling Results from the 2021 IsampleON Program