

Aquatic Invasive Species and eDNA ENABLING EARLY DETECTION



eDNA, short for environmental DNA, is genetic material that is shed into the environment by living or dead organisms. eDNA can be shed via feces, reproductive cells, mucous, skin, and hair.

WHY USE eDNA?

Easily collect species data to inform important resource management policies and decisions.

Engage volunteers and community science in conservation.

Avoid common misidentification problems with juveniles and look-alikes.

Collect samples quickly and inexpensively.

Monitor remote or difficult-to-access locations.

Apply widely to detect priority invasive species and species at risk.

Use in combination with other tools to improve monitoring success.



WHAT TYPES OF SAMPLES CAN BE TESTED?

Water

Soil

Air

Snow tracks

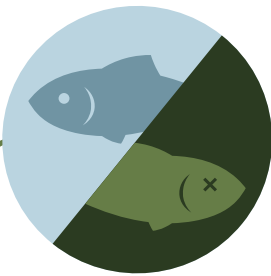
eDNA sampling allows scientists to detect invasive species such as Asian carps, water soldier, spiny waterflea, zebra mussels, and many others.



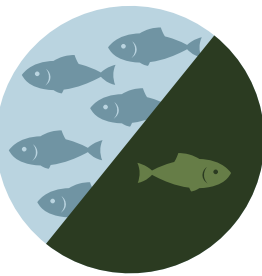
eDNA is a game-changing tool for early detection of aquatic invasive species.

- Earlier detection permits timely, cost-efficient control and increases the chance of eradication.
- eDNA can detect species that are present in low numbers. For instance, it can detect a species at the edge of its known distribution and act as an early warning system.
- Water easily disperses eDNA, providing widespread detection capabilities.
- Scientists can test for multiple species in a single water sample and can store samples for additional testing in the future.

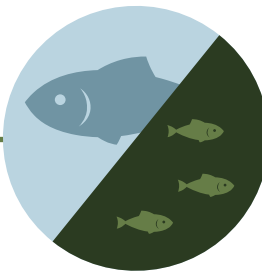
LIMITATIONS WITH eDNA



eDNA cannot distinguish between DNA shed from a live vs. dead organism.



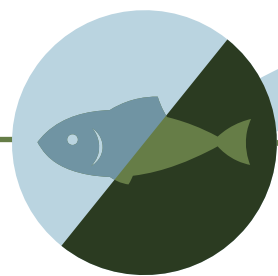
eDNA does not indicate species abundance, although some methods may indicate relative abundance.



eDNA cannot indicate the life stage of a species, e.g. juvenile vs. adult or fertile vs. sterile.



eDNA cannot distinguish between a resident species and one passing through.



eDNA cannot distinguish between hybrids and non-hybrids or a closely related species.

A positive detection means:



DNA from the species of interest was present when the sample was taken.

A negative detection means:



- Species could be absent from the location.
- Species exists in low abundance and sheds inadequate amount of DNA to detect in sample.
- DNA broke down in the environment before it could be detected in sample.
- Potential laboratory procedural error.



Invasive
Species
Centre

GREEN SHOVELS is an informal coalition of conservation organizations working collaboratively to address invasive species, delivering co-benefits to support local communities and the environment.

The **INVASIVE SPECIES CENTRE** is a non-profit organization that connects stakeholders, knowledge and technology to prevent and reduce the spread of invasive species that harm Canada's environment, economy, and society.

For more information and to sign up for invasive species news, visit www.invasivespeciescentre.ca.    