

## eDNA TESTING

Maxxam's scientists have been performing DNA analysis for more than 21 years and have experience with qPCR eDNA assays since 2017. Our validation methods include inter-laboratory verification of assays as an additional quality control.

We are committed to providing accurate and defensible data of the highest quality, and service that exceeds our customers' expectations.

Maxxam supplies:

- 1 L HDPE or HDPP sample collection container
- Cellulose nitrate membrane filter funnel
- Silica desiccant preservative
- Paper coin envelope to protect filter samples
- Plastic, zipper-seal bag

Environmental DNA (eDNA) testing is establishing itself as an efficient, cost-effective, non-invasive answer to the challenges of traditional ecological surveys. Reliable data on the distribution, patterns and populations of species are essential for environmental stewardship and conservation efforts to address the unprecedented decline in biodiversity over the past half century.

### OVERVIEW

Organisms leave genetic footprints as DNA found in excretions and sloughed cells they release into their environments. This environmental DNA found in waters, sediments and soils can be detected even at very low concentrations. The eDNA is isolated, amplified and detected by quantitative polymerase chain reaction (qPCR). eDNA testing provides scientific evidence to support environmental assessments for land use, natural resource management, stewardship for species at risk, and monitoring of invasive species.

The advantages of eDNA testing over traditional survey methods include:

- **Improved sensitivity** – eDNA detects cryptic and low density species with greater sensitivity;
- **Accuracy** – eDNA tests can be species-specific, eliminating the need for identification by a qualified expert;
- **Time savings** – eDNA samples require reduced sampling time compared to conventional methods;
- **Reduced costs** – ecological surveys can be completed more quickly and multiple target species can be tested from a single eDNA sample;
- **Reduced environmental impact** – eDNA replaces trapping and electrofishing and reduces the impact to sensitive habitats, including reducing risk of pathogen transfer;
- **Ease of access** – eDNA sampling does not require a permit;
- **Reduced observer bias** – eDNA sampling reduces error associated with observer experience or variation in surveying efforts;
- **Improved field safety** – field sampling can be done during daylight hours and under favourable weather conditions;

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Maxxam is a North American leader in analytical services and solutions to the energy, environmental, industrial hygiene, food and DNA industries.

We are a member of the Bureau Veritas Group of companies – a world leader in testing, inspection and certification services.

Maxxam supports critical decisions made by our customers through the application of rigorous science and the knowledge and expertise of our over 2,500 employees.

- **Expanded window of surveying** – eDNA sampling can be completed outside of conventional restraints, e.g., window of amphibian calling; and
- **Option for future testing** – properly archived eDNA samples can be tested at a future date for additional species of interest without the need to recollect samples from the field.

## HOW CAN MAXXAM HELP YOU?

Our highly sensitive and specific qPCR assays permit identification of eDNA from target species that are or were present in an environment. Maxxam eDNA assays have been validated for specificity and accuracy in field-derived eDNA.

Maxxam tests are:

- **Accurate** – each eDNA assay undergoes thorough validation, including inter-laboratory verification;
- **Fast** – receive results within 10 business days, or sooner with rush service;
- **Affordable** – competitively priced eDNA assays are a fraction of the cost of conventional survey methods;
- **Convenient** – samples can be sent to any Maxxam location across Canada. We will direct them to our Maxxam DNA testing laboratory; and
- **Collaborative** – if eDNA assays are not available for your species of interest, we will work with you to develop species-specific assays.

Maxxam runs eight technical replicates of each eDNA sample to provide sufficient statistical evidence of detect/non-detect for the target species. Before testing for the target species, Maxxam evaluates the quality of the eDNA sample to minimise the risk of false negatives using the IntegritE-DNA™ technique developed by Dr. Caren Helbing at the University of Victoria.

## ACCREDITATION

Maxxam is on target for accreditation of eDNA testing to ISO 17025 standards in Spring 2019.

## SAMPLING AND SHIPPING

Water samples must be filtered and preserved within 24 hours of sampling to ensure the integrity and quality of the collected eDNA.

For more information, contact us at:

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