



HEALTHY TWELVE MILE CREEK

Environmental DNA (eDNA) Sampling In Twelve Mile Creek

eDNA Sampling for Brook Trout in Twelve Mile Creek - A project from the Niagara Chapter of Trout Unlimited Canada in partnership with the University of Guelph

Environmental DNA (eDNA)

All living organisms leave traces of DNA in their environments, reflecting their current or recent presence. This environmental DNA - or eDNA - is released into the environment through multiple forms, including tissue, feces, urine, gametes, etc., and can also be the result of the decomposition of dead organisms.

eDNA is characterized by a complex mixture of nuclear, mitochondrial or chloroplast DNA, and can be intracellular (from living cells) or extracellular. It enables the detection of a species regardless of its life stage or gender.



eDNA Sampling Process

Species & Site Selection

Determine species of interest and select locations in aquatic system (streams, wetlands, etc.) based on possible presence.



Collection & Filtration

The collection of water samples from the selected sites and filtration of samples on-site.



Processing & qPCR Assay

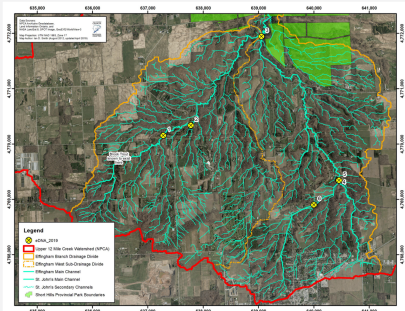
The collected samples are processed in field, and a qPCR assay is completed in the lab to infer the presence or absence of selected species in the samples.



Brook Trout in Twelve Mile Creek

Brook Trout, *Salvelinus fontinalis*, are an indicator species for cold, clean water. Once plentiful in the headwaters of Twelve Mile Creek, Brook Trout numbers are dwindling due to development, poor land-use practices, and climate change impacting the system.

In November 2019, eDNA samples were collected in partnership with the University of Guelph in six selected locations across two major branches of Twelve Mile Creek - the Effingham Branch and the St. John's Branch. While Brook Trout have been recorded in the Effingham branch, their presence was unknown in the St. John's.



A map of the upper Twelve Mile Creek watershed with the eDNA sampled locations indicated

Brook Trout presence detected in both major branches of Twelve Mile Creek !

Once the laboratory analysis was completed by the University of Guelph, results showed indicators of Brook Trout presence in 5 of the 6 sampled locations - confirming the possible presence of this sensitive species in both branches of the Twelve!

Continued sampling is encouraged to further corroborate findings, but these results are promising, and demonstrate the need for continued restoration and preservation efforts for Niagara's most significant coldwater stream.



For more information on the Healthy Twelve Mile Creek initiative, visit our website at www.healthytwelvemilecreek.ca



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