

# Utilizing eDNA technology to identify presence of Eastern Ribbonsnake (*Thamnophis saurita septentrionalis*) in Nova Scotia

Jessica Ferguson<sup>1</sup>, Lori Phinney<sup>2</sup>

<sup>1</sup>*Clean Annapolis River Project, Annapolis Royal, NS*

<sup>2</sup>*Mersey Tobeatic Research Institute, Kempt, NS*

The Eastern Ribbonsnake (*Thamnophis saurita septentrionalis*) is a small-bodied, semi-aquatic snake that can be challenging to detect on the landscape due to its cryptic nature and rare (provincially Threatened) status. Visual encounter surveys are a standard method used to identify presence, but exploring novel technologies could augment visual survey effort and increase detection rates of Eastern Ribbonsnake in Southwest Nova Scotia. Environmental DNA (eDNA) technology was explored to determine if it could be effective method for detecting Eastern Ribbonsnake in Nova Scotia. We initiated a 3-year project aiming to assess presence at a waterbody with historic Ribbonsnake sightings where current occupancy is uncertain, and snakes have not been observed during visual surveys. In 2023 and 2024, water and vegetation samples were collected at 6 locations with favourable microhabitat conditions; two of these sampling locations aligned with historic observation records. In 2024, we conducted additional sampling to test detection sensitivity and aid in the interpretation of lab results. Sampling was conducted at two additional waterbodies in southwest Nova Scotia with comparable environmental conditions and known Eastern Ribbonsnake concentrations. At these sites, water and vegetation samples were collected at incremental distances from live snakes and, in one instance, a shed skin. Lab results from Year 1 were negative and results from Year 2 are pending. Following our third year of sampling, we intend to use lab and field results to inform the usefulness of this technique, conservation action and support future research on species range.

Keywords: herpetology, snake, eDNA, species at risk