

Companion Document

Region of Durham- Investigative Upstream Monitoring Report for Layton River

2024



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Lake Scugog is an artificial shallow lake in Durham Region, Central Ontario. Given its proximity to the Greater Toronto Area, the lake and its streams and rivers have become popular destinations for tourism and recreational activities. During the characterization of Lake Scugog (2004-2008) for the Lake Scugog Environmental Management Plan (LSEMP), it was identified that Cawkers Creek and the Nonquon River were streams of concern due to higher levels of nutrients and pollutants found. This information indicated that further study was warranted, and thus the Region of Durham's Investigative Upstream Monitoring program was launched, where Kawartha Conservation's Integrated Watershed Management (IWM) staff monitored multiple locations along the creek to find specific hot spots, where increased levels of nutrients and pollutants could be found.

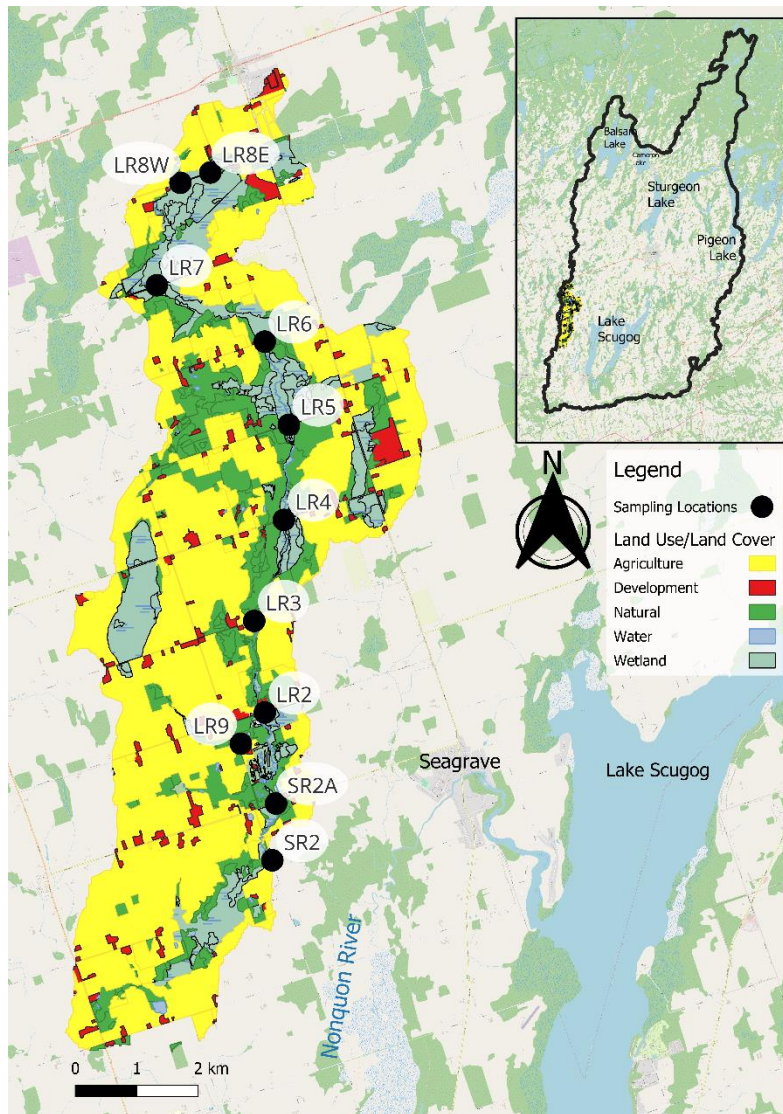


Figure 1. Site location and their associated catchments across Layton River.

From 2019-2022, Kawartha Conservation IWM staff focused their attention on monitoring the Layton River, the largest sub watershed of the Nonquon River during the spring, summer, and fall. Staff sampled a total of 9 sites (**Figure 1**) along the Layton River, including an extra site (SR2) from the Lake Scugog Environmental Management Plan program, successfully capturing 96% of the watershed.

We began our exploration by examining the fluctuations in Layton River's water levels and discharge. Our analysis revealed that these are primarily influenced by the annual spring thaw from February to April and rainfall from May onwards.

Nutrients act as the river's nourishment, fueling the growth of aquatic life. However, like any diet, balance is essential. We scrutinized nutrient levels to understand the river's nutritional health. Our investigation unveiled excess levels of certain nutrients, particularly phosphorus and nitrate, which can disrupt the river's ecological balance.

Headwater sites were notably different from downstream locations. Of particular concern was **LR8E**, which exhibited exceptionally high nitrate levels, deviating from the norm along the river. We found concerning levels of nitrates at LR8E, where 63.6% of samples were above the Canadian Water Quality Guidelines for the Protection of Aquatic Life. Across Layton River, phosphorus levels exceeded recommended limits, with **LR6** being the most critical site due to excessive upstream contributions. At this site, we found that 90% of samples exceeded the Provincial Water Quality Objective for phosphorus in rivers and streams. No concerns were found for water clarity (turbidity/murkiness, and suspended solids), chloride, pH, and ammonia.

Based on our findings, we propose the following recommendations:

1. **Priority Sites:** Focus on LR6, LR7, and LR8E to address their unique water quality challenges and support their recovery through stewardship activities (riparian plantings greater or equal to 30 m, reforestation, wetland restoration) and or agricultural Best Management Practise (reduce fertilizer usage, prevent runoff using cover crops, avoid fertilizer applications near watercourse).
2. **Continuous Learning:** Emphasize ongoing research on the background levels of water clarity and the monitoring of water quality and water levels to deepen our understanding of Layton River and ensure its long-term health.

For a more detailed report on the Investigative Upstream monitoring of the Layton River, please visit Kawartha Conservation's website at the following link <https://www.kawarthaconservation.com/en/about-us/technical-reports.aspx> to view or download the full technical report



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Kawartha Conservation

277 Kenrei Road, Lindsay ON K9V 4R1

T: 705.328.2271 F: 705.328.2286

GenInfo@KawarthaConservation.com

KawarthaConservation.com