WALLEYE EDNA PILOT STUDIES PROPEL SCIENCE FORWARD

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This past spring we collected nearly **250 environmental DNA (eDNA) samples** from the St. Regis River during the annual **Skakahra'ksen walleye spawning migration.** The purpose of this study is to determine if eDNA samples can efficiently measure the walleye relative abundance and distribution of spawning sites without netting methods that require extensive effort and stress the fish during their migration. If we confirm the eDNA approach is reliable, it would provide an efficient way to detect changes in spawning walleye abundance through time and across multiple rivers. It could also help indicate where the best spawning habitat is and where other spawning habitats could be rehabilitated.

eDNA is genetic material that can be found in the earth or suspended in the air or water. Fish naturally shed skin cells, mucus, and waste products containing their DNA into the water. We filter the water to collect these fragments then run genetic tests to determine if, and how much of, the DNA of a certain species was present in the water. Studies have shown a reliable relationship between the concentration of eDNA and the relative abundance of a fish species where the sample was collected.

But let's back up a bit. Before we sampled the walleye spawning migration, we needed to confirm that our eDNA processes would work on walleye. We conducted a pilot study, which is a small-scale experiment that helps evaluate the feasibility, cost, and improve upon a study's design before performing the larger project. In the fall of 2024 we collected 27 eDNA samples and the results have been quite informative. We learned how to maximize the efficiency of our lab process to successfully detect walleye eDNA. Studies involving eDNA still vary widely in the methods used for sample collection and our understanding of the different factors which influence results. Water temperature, pH, and overall sample location in the body of water are all good examples. If we understand what other factors affect our success in collecting and analyzing eDNA, we can produce more reliable results.

An added benefit of eDNA sampling is that the same samples used to understand walleye can also help detect invasive species or threatened and endangered species. Our pilot study samples identified one invasive, the Round Goby as well as two important threatened species – Lake Sturgeon (Teiokién:taron), and American Eel (Kiawerón:ko). While the identification of these species in our data set is not surprising, it demonstrates the usefulness of the eDNA methods to detect these species of interest at relatively low cost and effort.

This research is funded through the Great Lakes Restoration Initiative and a partnership with the US Geological Survey and the SUNY Research Foundation. We are excited about the preliminary results from this collaboration, and look forward to learning more from our walleye study results later this year.