GREAT LAKES SWIM PROJECT

Great Lakes Spawning Whitefish and Invasive Mussels (*SWIM*) Project

Invasive zebra and quagga mussels have been altering the Great Lakes region since their introduction in the 1980s. Among their impacts, invasive mussels clog fish spawning reefs. While options for lake-wide invasive mussel control remain limited, localized control methods show promise.

Since 2022, agency staff from U.S. Geological Survey, NOAA-Great Lakes Environmental Research Laboratory, National Park Service, Great Lakes Fishery Commission, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, and U.S. EPA - Great Lakes National Program Office have been meeting to scope a new project to enhance fish spawning habitat on reefs for Lake Whitefish by conducting small-scale experimental invasive mussel control. Lake Whitefish have undergone more than 50% declines in harvest in Lakes Michigan and Huron in the last two decades, and some scientists think that invasive mussels are the primary cause. Hence, agencies have engaged with fishery managers on Lakes Michigan and Huron and the Invasive Mussel Collaborative and have identified reefs where experimental mussel control could be implemented to evaluate potential benefits to Lake Whitefish egg and larval survival: the Thunder Bay reef complex in Lake Huron and Good Harbor Reef in Lake Michigan.

The initial multi-agency team has recently expanded to include scientists from state, Tribal, and academic entities and is receiving financial support from the EPA Great Lakes Restoration Initiative. Several implementation teams have been formed to lead various components of this experimental study, planned to take place over five years. The teams will be measuring how invasive mussel control will affect Lake Whitefish spawning behavior and embryo survival, as well as the invasive mussels themselves, invasive round gobies, benthic algae, and nutrients. The Great Lakes Commission provides administrative support and facilitation for this project.

MEET THE *Implementation Teams!*

Mussel Control

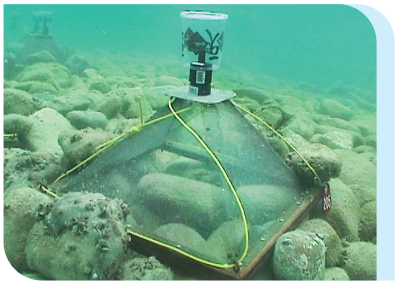
Led by the U.S. Geological Survey, this team is tasked with testing and selecting tools that will effectively control invasive mussels on a large enough scale to detect measurable impacts to Lake Whitefish larval survival on each selected spawning reef in Lake Michigan and Lake Huron. The team is considering safety to native organisms, cost, feasibility, and cultural acceptance of the potential control methods. **Team lead: Diane Waller, USGS**

Lake Whitefish Adult Behavior

Led by the U.S. Geological Survey, this team is investigating the movements and spawning behavior of adult Lake Whitefish on and around the selected reefs through the use of acoustic telemetry technology. **Team Leads: Tyler Funnell, USGS & Darryl Hondorp, USGS**

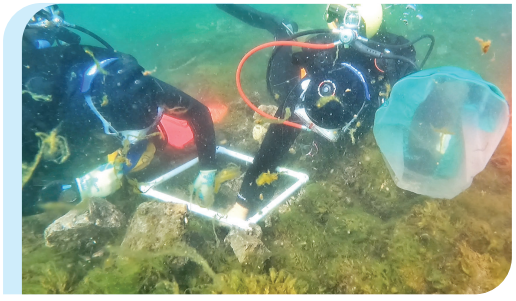
Lake Whitefish Egg Deposition and Larval Emergence

Jointly led by the University of Vermont and Michigan DNR, this team is working to measure Lake Whitefish egg deposition and larval emergence rates to assess impacts of mussel control on Lake Whitefish larval survival. Data will be collected using egg traps, larval emergence traps, and underwater cameras. **Team Leads: Ellen Marsden, UVM & Ben Turschak, MI DNR**



Habitat Mapping

Led by the U.S. Geological Survey, this team is mapping the underwater structure, substrate, and mussel density on the reefs to document mussel invasion and define habitats preferred by Lake Whitefish spawning, using underwater autonomous vehicles and sonar. **Team Lead: Peter Esselman, USGS**



Nutrients, Mussels, and Algae

Led by the U.S. Geological Survey, this team is assessing biotic and abiotic conditions which are predicted to affect fish behavior and egg survival including benthic algal growth, water chemistry and movement, dissolved oxygen, interstitial space, and round goby abundance. Scuba divers, specialized instruments such as hydrosondes, and cameras will be used to collect data. **Team Lead: Mary Anne Evans, USGS**

For more information visit www.glc.org/work/swim or contact:

Samantha Tank • Program Manager, Great Lakes Commission • **sam@glc.org**
Bo Bunnell • Research Fishery Biologist, USGS Great Lakes Science Center • **dbunnell@usgs.gov**

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