



THE GREAT LAKES FISHERY COMMISSION'S
contribution to
THE GREAT LAKES RESTORATION INITIATIVE



ACOUSTIC TELEMETRY

Great Lakes Acoustic Telemetry Observation System: *Innovative Technology Advances the Protection and Recovery of Great Lakes Fishes*

Every fish has a story to tell. Many Great Lakes fishes, such as sea lamprey and lake trout, migrate throughout their lives to feed and reproduce. Until recently, scientists could only guess at fish movement. Now, through support from the Great Lakes Restoration Initiative, the Great Lakes Fishery Commission is using innovative technology to unravel the mysteries of Great Lakes fish behavior for the first time. This work has real, on-the-ground implications for management decisions that support the \$7 billion dollar fishery.



How Does Acoustic Telemetry Work?

Through the GLRI, the commission has created the Great Lakes Acoustic Telemetry Observation System (GLATOS), a vast network of underwater receivers that allows researchers to track the movement of tagged fish, much like the GPS on a car. This investment has provided important information to control sea lampreys and to restore native fishes.

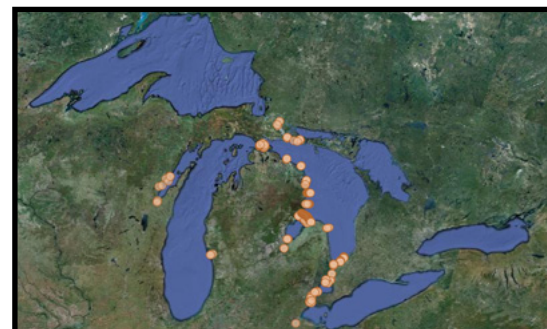
The network consists of more than 400 receivers – small, data-logging computers – that are anchored near the bottom of the lakes. More than 2300 fish have been tagged with transmitters that broadcast a series of “pings” into the surrounding water. The receivers “listen” for tagged fish and the transmitter’s unique ID code is saved with the date and time. To date, more than 54 million pings have been recorded. With each ping, researchers learn more about fish movements, migration patterns, habitat use, and survival.

Receivers have been placed in key areas of the Great Lakes to help investigate specific research questions—for instance, walleye movement patterns in Lake Huron and the Huron-Erie corridor and lake trout spawning around Drummond Island, Lake Huron. Any scientist with the right tags can take advantage of this network. As the network grows—either through GLRI projects or otherwise—the information and, perhaps, linkages among projects—grows as well!

Track a Project!

Most acoustic telemetry projects are online through the GLATOS website. Visit the website to read about projects and learn more about how this cutting-edge technology is being used to protect and improve the Great Lakes fishery.

www.data.glos.us/glatos



ON-THE-GROUND RESULTS!

The acoustic telemetry network, made possible by the GLRI, has already produced significant, on-the-ground contributions to Great Lakes restoration.

- **Large Populations of Sea Lampreys Found Hiding in the St. Marys River** – Through the acoustic telemetry project, researchers were able to collect better data on the size of the sea lamprey population in the St. Marys River. These data showed that the population in the river was much larger than previously thought, which allowed the commission to increase the efficiency of its sea lamprey control program and to redirect \$500,000 annually to improve control throughout the Great Lakes.
- **Walleye Proven to be Wanderers** – In recent years, the walleye fishery in Saginaw Bay, Lake Huron has experienced a renaissance. Using the Great Lakes Acoustic Telemetry Observation System, researchers found that walleye from Saginaw Bay migrate into the main basin of the lake in much larger numbers than previously thought – during 2011, half of the tagged walleye left the bay for the open waters of Lake Huron. The information gathered by this project will help fishery managers ensure that the experience of reeling in a Lake Huron walleye will be available to anglers in future generations.
- **Elusive Lake Trout Spawning Grounds Discovered** – After searching a huge portion of the bottom of Lake Huron, the commission and its partners were the first to identify exact locations where lake trout lay their eggs. These locations – six in all, each only the size of five parking spaces – could never have been located in the vast lake without the use of the acoustic telemetry system. At these sites, SCUBA divers captured the first ever high-quality video of lake trout spawning in the Great Lakes. These groundbreaking discoveries provide critical information to guide a 50-year program closer to its goal of restoring this native species in the Great Lakes.
- **Area of Concern Home to Ancient Fish** – Capitalizing on the acoustic telemetry project, the commission used the GLRI as leverage to secure additional funds to study the lake sturgeon, the Great Lakes' largest and oldest living native fish. By teaming up with the Great Lakes Acoustic Telemetry Observation System, researchers identified Lake St. Clair as an important overwintering area and feeding ground for these ancient giants, despite the lake's status as an "Area of Concern" or hotspot of contamination and habitat degradation. With lake sturgeon currently listed as threatened or endangered in many of the Great Lakes states, this discovery points to the importance of continued protection of Lake St. Clair and restoration efforts to clean up this Area of Concern.



Lake trout egg on fine substrate, Lake Huron.

THE FUTURE IS BRIGHT

The future of the acoustic telemetry project is bright! Once the word got out, researchers from around the basin and the globe contacted the commission to include their projects in the acoustic telemetry network. In the coming years, the commission looks forward to:

- Expanding its acoustic telemetry project to include new components.
- Using data from the acoustic telemetry project to develop or refine restoration programs for native species such as lake sturgeon and lake whitefish.
- Continuing to apply knowledge from acoustic telemetry to sea lamprey control and fishery management.

