

Tracking Lake Erie water snake in fight against invasive fish

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These are Lake Erie water snakes. Credit: Provided by Lauren Flick, University of Cincinnati

Thanks to research by a University of Cincinnati undergraduate student and two team members, there's a new tool that's now been tested and found to work in continuously recording the habits of snakes.

This small-scale study is the first-ever use of Lotek Archival Tags (LATs) on [snakes](#), since the LAT devices were originally developed for use in avian and [fish species](#) due to LATs' ability to measure temperature and pressure – measuring pressure translates into altitude and depth.

UC's Lauren Flick, a triple-major pursuing simultaneous undergraduate degrees in biology, psychology and criminal justice, will present the

findings of the snapshot study, "Comparing the Effectiveness of Lotek Archival Tags (LATs) in a Behavioral Study of the Lake Erie Water Snake," at the March 23-25 Midwest Ecology and Evolution Conference, a conference specifically for undergraduate and graduate student research that will draw representatives from regional schools.

Participating in the study with Flick were lead researcher Kristen Stanford, a doctoral student at Northern Illinois University and recovery plan coordinator for the Lake Erie water snake, and Lindsey Korfel, a student at Wittenberg University. Their research study was conducted during summer 2011 at Ohio State University's Stone Laboratory located on Lake Erie.

A tool beyond a traditional radio transmitter

The traditional manner for tracking snakes' movements is primarily with a radio transmitter. In other words, a researcher would attach a location transmitter to a ground snake and then hope he or she could then stay or get within range over a period of time to visually determine its habits.



Kristen Sanford, left, and UC's Lauren Flick, right, measure a Lake Erie water snake. Credit: Provided by Lauren Flick, University of Cincinnati

What Flick, Stanford and Korfel did was to catch two female Lake Erie water snakes (LEWS) and arrange for the implantation of LATs. Importantly, the LATs record and store data on the snakes over time, such that it's not necessary for a researcher to be within visual range of the snake. In fact, a researcher could leave the snake undisturbed in its natural habits and environment for days, even weeks, at a time when using a LAT. (During this study, the snakes were not harmed, and the LATs were removed at the end of the study.)

"This was proof of concept that use of LATs in reptiles is a viable research method," said Flick, a resident of Cincinnati's Green Hills community. "For a study like ours, it's harder and less effective to rely solely on using the traditional radio transmitter on a water snake moving in the depths of the Great Lakes. And even when using the average transmitter with a ground snake, you have to stay within about 50 meters for the tracking technology to work. That kind of close tracking could also serve to disturb the very habits a researcher is hoping to observe."



This is a sign notifying residents of the role of the Lake Erie water snake. Credit: Provided by Lauren Flick, University of Cincinnati

Lending support to the Lake Erie Water Snake in the fight against the invasive round gobi fish

The Lake Erie [Water Snake](#) (LEWS), found only in the western Lake Erie waters of Ohio and Canada and only recently removed from the list of federally endangered and threatened species, is estimated to number more than 8,000 adults. Its population size had fallen to about 1,500 adults in the mid-1990s – very low because they were often killed by humans and because of loss or degradation of habitat on the shoreline or on the Lake Erie islands where they are native.

Explained Flick, "Basically, the islands and shorelines are an important part of the snakes' habitat. They live on land and only forage in the water. Humans on the Lake Erie islands didn't, for a long time, see value in having snakes around, even though we now know that these nonpoisonous snakes were and are a valuable part of the ecosystem."

And while those numbers have recovered sufficiently to remove the species from the endangered status, it's important to understand how the species is faring in terms of foraging, maintaining body temperature and finding appropriate mating, resting and hibernating environments because the LEWS are a major player in combating the invasive round gobi fish.

The round gobies, a bottom-dwelling species, are considered very harmful because they are voracious nest predators of many of Lake Erie's native game fish and bottom-dwelling fish, and there are now estimated to be billions of the round gobies in Lake Erie. However, as it

turns out, the native [Lake](#) Erie water snakes will eat round gobies.

And even though the student research was a snapshot involving just a pair of snakes, they found some intriguing results recorded by the LAT devices.

Said Flick, "Previous studies have estimated that the LEWS spend only 7 percent of the time foraging for food. The snakes that we studied actually spent 20-25 percent of the time foraging. One of the snakes even went out foraging at about midnight, which is unusual because the LEWS are not normally nocturnal."

And since it's estimated that 90 percent of the LEWS' diet consists of round gobi fish, more time eating by the LEWS should translate into fewer round gobies.

Provided by University of Cincinnati

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