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Thousands of dead loons on northern Michigan shorelines might be linked to invasive species WITH VIDEO

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For The Oakland Press

The rapidly changing ecology of the Great Lakes Basin, brought on in large part by non-native, invasive species, is causing devastation among Michigan's waterfowl, especially common loons.

The common loon, a beloved, iconic bird known for its eerily lonely, two-note call and its beautiful markings, suffered devastating losses along Lake Michigan's northern shoreline this fall. Thousands of dead birds, mainly loons, washed ashore — from the Upper Peninsula down to Sleeping Bear Dunes National Lakeshore. A large percentage of the dead loons had just entered their first year of breeding maturity.

The reason for the die-off, which follows similar incidents in 2006 and 2007, isn't fully understood. But it is suspected that it is driven by the food chain linking the loon to invasive species, specifically, the quagga mussel, the zebra mussel and the round goby.

Since 1988, when the first zebra mussels in Michigan were found in Lake St. Clair, the invasive mussels have been clearing and "cleaning" Great Lakes water columns by consuming plankton.

While the end result is a more aesthetically pleasing water column, the clearer water has allowed the sun's rays to penetrate deeper, causing larger and larger algae mats to flourish on the bottom. As the algae mat builds upon itself and dies, it becomes anaerobic — depleted of oxygen — and type-E botulism bacteria develops.

Gobies living in that environment at the bottom of the lake pick up the toxin produced by the bacteria. The gobies are then preyed upon by the loons and other fish-eating waterfowl, which become infected by the botulism.

The toxin affects the bird's nervous system and musculature, leaving it unable to fly. Soon, it can no longer keep its head aloft and it drowns.

In just a seven-mile stretch of Lake Michigan beach near the Upper Peninsula town of Gulliver, 865 water birds turned up dead during a two-week period in October.

Among these water birds were 302 common loons, 157 horned grebes, 142 long-tailed ducks, 103 white-winged scoters, 101 red-necked grebes and smaller numbers of ring-billed gulls, double-crested cormorants, herring gulls, red-breasted mergansers and common mergansers. All of the species are primarily piscivores, or fish eaters. That totaled an average of 121 dead birds per mile. Similar numbers were found further west, on beaches near the town of Manistique, as well as along the Lower Peninsula's northern west coast and the Sleeping Bear Dunes National Lakeshore. It is believed these areas saw the most dead birds wash ashore due to prevailing wind patterns at the time.

In the Sleeping Bear Dunes, 1,444 sick or dead birds representing 18 species were documented between June 21 and Nov. 20. Of those birds, 580 were common loons, with 422 found dead in October. Both numbers were the highest mortality rates ever recorded at the Lakeshore since accurate records began in 2007. Only 30 dead loons were recorded in 2011, and only 180 were recorded from 2007-2011.

Dan Myers, of the Tip of the Mitt Watershed Council, said 25 volunteers monitored about 25 miles of shoreline in Charlevoix and Emmet counties this fall. While complete numbers have yet to be collected, about 100 dead loons have been identified, with complete data expected this month.

More than 200 years ago, loons flourished in and around Lake St. Clair, inland lakes in Oakland County and the rest of the southern Lower Peninsula, but loss of habitat and human encroachment has forced them farther and farther north.

In Michigan, the highly territorial, shy birds are now primarily located only in the northernmost reaches of the Lower Peninsula and in the Upper Peninsula, which is really the southern end of their nesting area.

Now it appears that few common loons stop in Lake St. Clair as part of their migration pattern. Information provided by the United States Geological Survey on common loon migration patterns in 2011-2012, shows most of the birds from the Upper Peninsula, Minnesota and Wisconsin flew along the Lake Michigan shoreline on their way to the Atlantic Ocean or the Gulf of Mexico.

In this study, a large number of male common loons were caught, banded and fitted with a transmitter planted in their abdomens in 2011.

In 2012, seven of these loons still had functioning transmitters, which are designed to last for about a year. No new loons were tagged in 2012. In the fall 2012 migration, two of the loons, leaving areas around the Mackinac Bridge and Harbor Springs, did potentially fly over Lake St. Clair in late November migrations, but only took two days to reach the Atlantic coast, meaning they spent little or no time at the lake.

In the 1980s, a DNR survey indicated there were only 300-pair of common loons in the state, leading to a “threatened” status in Michigan. But that survey has since been debunked for lack of a comprehensive gathering of evidence.

The latest surveys in 2007 had indicated about 800-900 pairs in Michigan (before the die-off), which still qualifies the loon as “threatened” in Michigan.

Wildlife biologist Damon McCormick has been studying loons in the Upper Peninsula since 1997. He is the co-director of a research group called Common Coast Research and Conservation, based in Houghton.

He said similar die-offs occurred in 2006, 2007 and 2010, with this year being “atrocious” and perhaps the worst yet.

“This is the third or fourth really bad year,” he said. “If that continues, if what happed this year continues into future seasons, it’s potentially catastrophic. If it continues without pause, it’s probably only a matter of decades before the Michigan population is deeply impacted.”

Part of the problem with determining the full impact on the Michigan population of loons is that McCormick suspects a large percentage of the those birds that washed up upon the beaches this autumn were already in the early stages of their migration, coming down from Canada, Minnesota or Wisconsin, and were stopping in Lake Michigan to refuel.

Populations in Canada and those states are still thriving. But even if a small percentage of those dead birds spent their mating time in Michigan, effects can still be long-lasting.

“If you have several thousand loons dead on Michigan beaches on an annual basis, even if only a small percentage of those birds are from Michigan, that still represents a sizable percentage of the state population,” McCormick added.

Compounding the problem for the survival of the Michigan loon is that only breeding adults were affected. And of those birds, a large percentage was entering their first year of breeding age. It seems first-year juveniles were not affected because they don’t yet have the hunting capacity to catch the infected gobies.

The Whitefish Point Bird Observatory, a nonprofit group located in the Upper Peninsula on Whitefish Bay, has been recording the migration patterns of the common loon for the past 30 years. While most, if not all, of the loons the group observes are on their way to and from Canada, their numbers are disturbing, as well.

Tony Janisch, the group’s executive director, said the numbers recorded this year are some of the worst on record. Volunteers and staff worked eight-hour daylight shifts on the Point — April 15 through the end of May in the spring and Aug. 15 through Nov. 15 in the fall, and record bird numbers as they travel through the area.

In the spring, a little more than 3,000 common loons were sighted, the fourth-lowest seasonal count since 1984. Just this past fall, slightly more than 2,000 common loons were observed, the second-lowest seasonal count since 1989.

Janisch said he saw some dead birds wash up in the bay and along Lake Superior this fall, but no official numbers or the species of birds were recorded. That area of Lake Superior shoreline typically doesn’t see many nesting common loons since the habit isn’t suitable for loon reproduction.

Loons reach sexual maturity at the age of 3. After being born in northern regions, such as Michigan, the juveniles head south to the Gulf of Mexico and the South Atlantic Ocean and stay there for their first three years. That time is fraught with peril from a variety of predators. Only about 60 percent survive that time period.

At 3 years of age, they head north to look for and establish territory and to breed and then return to that area year after year.

When they do mate, they typically only produce an average of two eggs per season.

McCormick said once they return south during their fourth year, their chances of returning north for the following season is 96 percent. That makes the number of first-year breeders among this year’s dead an even more numbing statistic for Michigan loons.

McCormick admits much surrounding the loon die-off is still unknown, and most of today’s explanations still come from working hypothesis.

For example, it's quite possible last year's mild winter combined with a hot summer and historically low lake levels were the additional ingredients that helped cook up this year's staggering numbers. Those two factors probably contributed to even larger levels of lake algae growth and increased levels of botulism being formed.

Post-mortem examinations of loons conducted by the USGS in December indicate that most, but not all, of the common loons died from type-E botulism.

So then what is killing the other birds?

"The short answer is more studies are needed," said Jennifer Chipault of the USGS. "We only tested these birds for botulism type E, so we don't know if they are dying from something else that we're just not testing for. However, that said, we do note abnormalities when we do the dissections and most are in good body condition (died fast, which is consistent with botulism E).

"There also hasn't been much research on what species are most sensitive to the toxin. It could be that loons are so sensitive that they get killed by an amount of toxin that wouldn't kill the mouse during our lab test, thus resulting in a false negative. At this point, it's hard to say what is really happening. We just don't know enough about bot E yet."

Perhaps the most sobering and emotional part of the loon die-off is what McCormick calls the individual "weight" of each death. Where he does most of his research, Seney National Wildlife Refuge in the central Upper Peninsula, the average age of the loons is 13. But loons typically live 25-27 years; some even live into their 30s and 40s.

"Most people just see birds as birds. But when you look at a beach littered with 100 loons, there is something about that aspect of time, of age, being significant," McCormick said.

"It seems somewhat different than a duck or some other species that may be 2 or 3 years old. The age factor seems to carry more weight. You may look around you on that beach and see a dozen dead loons, and they represent well over 100 years of life.

"I don't have words for that. Perhaps it shouldn't matter, but it does. The weight of the death is different. The fact of the matter is that on one seven-mile stretch of beach, more than 4,000 years of life were lost in a two-week period."
