# Surveying Mussels in the Apostle Islands

## Discovery of First Invasives

By Kyle Antholt '19

Research Associate Dr. Toben Lafrancois was shooting underwater photographs during a National Park Service resource inspection near Sand Island on Lake Superior in the summer of 2015 when the team noticed something attached to the bottom of a sunken steamboat. As Lafrancois picked it up, he and the team suspected they had found the first invasive zebra mussel situated in the Apostle Islands. The University of Minnesota Aquatic Invasive Species Research Center confirmed their finding.

This discovery resulted in the first survey of the Apostle Islands mussel communities since 1991, when Wildlife Biologist **Thomas Doolittle '80** surveyed in the area. Since 2015, Lafrancois and other researchers have built on Doolittle's survey, adding the zebra mussel along with another invasive, the quagga, to the survey inventory. They also confirmed five of the eight native species remain.

While there are two known zebra mussel communities in Lake Superior—in the major ports of Duluth, Minnesota, and Thunder Bay, Ontario—mussels generally have a tough go in Lake Superior because the lake is too cold and doesn't offer enough nutrients to sustain them. The discovery of mussel communities in the Apostle Islands has raised questions about how these mussels survive.

"Is it genetic variance? A localized situation? We still don't know," said Mark Hove of the Minnesota Aquatic Invasive Species Research Center. "We are still working with a variety of experts with specializations in areas from mussels to lake chemistry. It might be another year before there is a definitive conclusion."

Having led more than thirty dives with the National Park Service regional dive team with the support of the Apostle Islands National Lake Shore and Great Lakes Inventory and Monitoring Network, Lafrancois and Hove, in conjunction with the EPA, have begun mapping the mussel communities in the Apostle Islands and collecting samples of the invasive species for lab work.

Zebra and quagga mussels have worked their way through the Great Lakes and are infamous for their ability to reproduce exponentially and out-compete other species for food, causing over-filtration and effectively damaging aquatic systems. They also can clog up coastal infrastructure, such as pipes, that can have adverse inland effects as well.

Lafrancois and other researchers report the density of these invasive mussel communities have been fairly low in the Apostle Islands but surprisingly wide-spread throughout coastal areas.

"Right now, they are manageable," said Andy Teal, the aquatic invasive species coordinator for Bayfield County. However, experts know that without close monitoring and control of the situation, the invasive mussels could cause irreparable damage to the Apostle Islands, the shipwrecks, and the marinas.

"At current densities and distributions, one of the most consistent means of clearing invasive mussels is by manually diving and removing them, Lafrancois said. "Work by divers from UW-Milwaukee at Sleeping Bear Dunes National Park shows this is effective at a very local scale."

Lafrancois emphasizes that diving is just one tool—"and at current conditions, I think a strong one, but it's only part of a larger effort," he said. "The bottom line is that viral agents and other chemical control measures are extremely expensive."

Lake Superior is the largest freshwater lake in the world "so prevention is key as we struggle to manage what is already here," Lafrancois added.

Along with other research and volunteer dive teams, Lafrancois is working to coordinate efforts to remove the zebra and quagga mussels, determine their distribution, and whether they are increasing in density.

Lafrancois would like to get students to aid in mussel removal as an ecologically interactive educational experience. Students of all ages could help guide underwater retrieval vessels around docks, learn to snorkel around the more shallow shipwrecks, and provide aid in the research labs. "With students, I can create a unique and rich educational experience that teaches them they have agency over their surroundings," he said. "And at the same time, we can alleviate the problem of invasive mussels in Lake Superior.

Photo by: T. Lafrancois (Zaaga'igan Ma'iinganag)