

Crow Wing County Lake Hosts Zebra Mussel Control Study

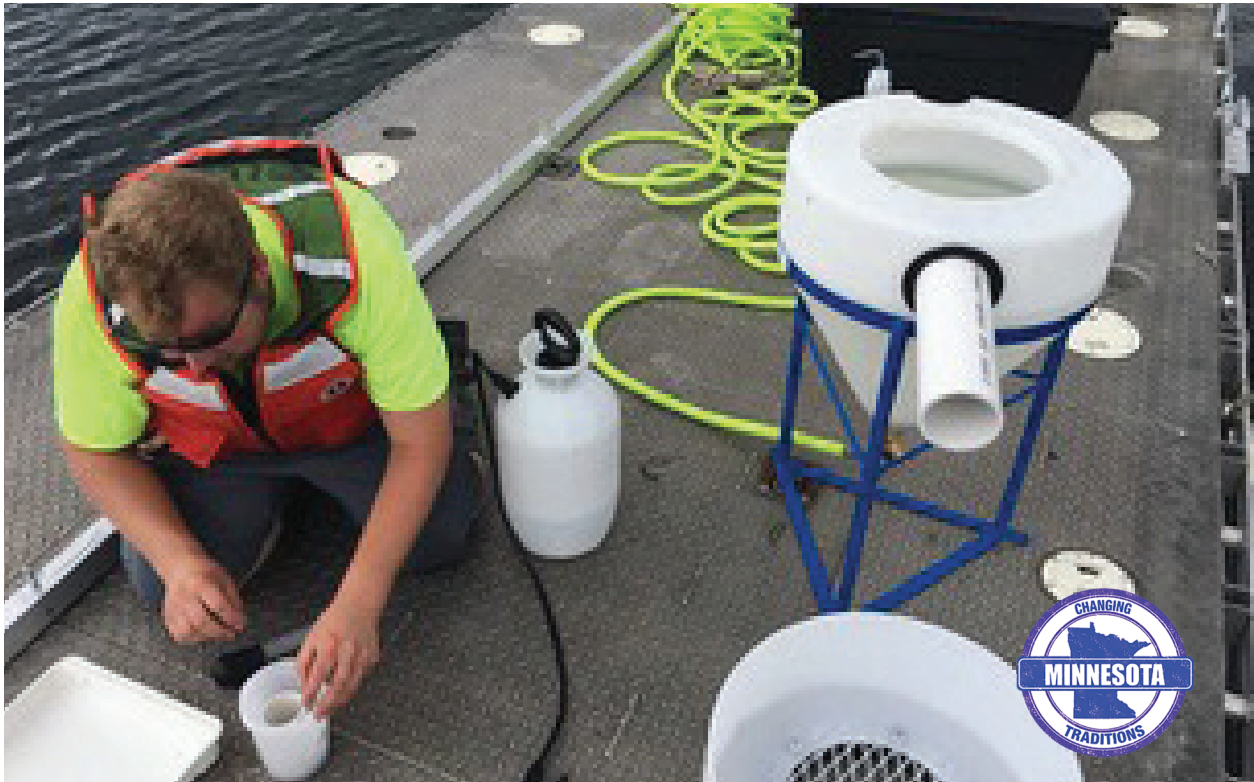
For 20 days in July Pelican Lake will be at the center of an ongoing study conducted jointly by the Minnesota Aquatic Invasive Species Research Center (MAISRC) and the U.S. Geological Survey (USGS) aimed at suppressing and controlling established populations of zebra mussels.

The Pelican Lake project, scheduled for July 10-30, is an extension of a research effort on Lake Minnetonka that started several years ago. In earlier phases of that study researchers determined that the application of low doses of copper to the water is highly effective at controlling both adult and veliger (larval) zebra mussels, without severely impacting non-target species.



Angelique Dahlberg, who is working toward her PhD in Conservation Science, is an MAISRC Graduate Research Fellow and has been part of the research team since 2018.

“Copper has been used to control snails and barnacles for a very long time, so we know a lot about it,” she said. “Early in the study we found that it is also effective against zebra mussels, especially larval-stage mussels.”



Research centering on the control of zebra mussels on Lake Minnetonka evolved from small-scale tests to treating an entire bay of the big lake. On Pelican Lake all testing will be done inside a mobile laboratory.

Right now, she explained, the research is focused on determining how little copper can be used while still controlling veliger zebra mussels, which would disrupt the mollusk's reproductive cycle and ultimately suppress the entire population in a lake. Though copper is relatively inexpensive, using the lowest possible dose would reduce the cost of each treatment, as well as reduce any potential impact on non-target organisms.

Pelican Lake was chosen as a test site because of its size; because it has an established population of zebra mussels, and because the lake community is in favor of the type of work being done.

“We are interested in anything that concerns water quality,” said Susan Koering, president of the Pelican Lakes Association of Crow Wing County. “It’s actually very exciting that Pelican Lake was selected for this study.

Another basic reason for the selection is simply that Pelican Lake is not Lake Minnetonka, according to Dahlberg.



University of Minnesota PhD student Angelique Dahlberg joined the zebra mussel project in 2018. This is the first year the study has expanded to include another lake.

“We know that the toxicity of copper changes with bioavailability, which is dependent on water chemistry,” she explained, “and that different lakes have a different chemistry. So, we’ll be doing some water chemistry work on Pelican, then use a predictive model to figure out the lowest possible amount of copper we can use, and finally test what the model indicates.”

They won’t be treating any part of Pelican Lake, however. “We’ll have a small mobile laboratory in a trailer parked on the shoreline,” she explained. “We’ll pump lake water into aquarium-type tanks in the lab, and run our tests in the contained tanks. Some tanks will contain zebra mussels and others will hold native organisms; we’ll test different copper concentrations to determine how well the predictive modeling works.”

The MDNR reports the presence of zebra mussels has been confirmed in more than 200 Minnesota lakes, each of which potentially has its own chemical characteristics. The fundamental goal of the Pelican Lake study is to take the first steps toward designing successful control protocols for all infested waters.



A critical part of testing any control treatment is determining its impact on non-target species. Copper's negligible effect on fish and other organisms has been understood for many years.

“Controlling zebra mussels is not a one-size-fits-all scenario,” said Dahlberg. “This work will eventually help us refine prescriptive doses of copper for different water bodies.”

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