Setting Mille Lacs priorities via Aitkin County SWCD-led drone study

CLEAN WATER LAND & LEGACY AMENDMENT

Watershed-Based Implementation Funding is supported by the Clean Water Fund.

Improving the overall condition of Mille Lacs Lake is the goal of a shoreline improvement effort that started with a 2,000-parcel drone study led by the Aitkin County Soil and Water Conservation District (SWCD).

The Aitkin County SWCD used Watershed-Based Implementation Funding (WBIF) the Minnesota Board of Water and Soil Resources (BWSR) awarded to the Rum River watershed planning partnership to support a drone study of Mille Lacs Lake's entire shoreline. The SWCD, with assistance from the Mille Lacs Band of Ojibwe Department of Natural Resources (DNR), captured video footage of the shoreline, which includes Aitkin, Mille Lacs and Crow Wing counties and the Mille Lacs Band of Ojibwe Reservation. The study aims to identify and prioritize shoreline properties that could benefit from restoration work, especially work related to curbing erosion, which sends soil and the pollutants it carries into the lake.

The second-largest inland lake in the state, Mille Lacs Lake covers more than 200 square miles. The lake is the headwaters of the Rum River, and water-quality improvements affecting the lake translate to water-quality benefits downstream.

"It's really nice to be able to get an overall view of what the shoreline is actually doing, and what parts might need a little bit more help and which parts are doing pretty good. When you're looking from a point of view of just a lake association, or individual landowners, you only get a partial view of what's going on in the lake," said Sam Seybold, the SWCD's buffer specialist.

The Rum River comprehensive watershed management plan developed under BWSR's One Watershed, One Plan

Mille Lacs Lake has more than 80 miles of shoreline. The lake is the headwaters for the Rum River. An Aitkin County SWCD drone study prioritized restoration projects that aim to improve the lake's water quality for future generations. **Photo Credits:** Aitkin County SWCD

(1W1P) program identified the need for the study, which cost $26,800. WBIF covered study costs.

The grant funds covered SWCD staff members' time spent filming, analyzing footage and then scoring over 2,000 parcels across more than 80 miles of shoreline. Veronica Lundquist, Aitkin County SWCD technician, was among those who reviewed the footage and developed a scoring system.

"We wanted to try and figure out a way where we could look at the whole lake and determine which properties needed the most help, and that's kind of where we came up with the drone study," Lundquist said.

From a boat, a crew of SWCD and Mille Lacs Band of Ojibwe DNR staff spent five days on Mille Lacs Lake in June 2023 collecting footage via a drone above public waters. The DNR staff donated their time to the project and provided and navigated the boat.

Aitkin County SWCD forester Kyle Fredrickson flew the drone about 45 feet above the water, 300 feet from the shore, and at about 8 mph, while the drone collected footage.

"We've been doing some other studies from the shore, and it is a lot more challenging. You need to maintain sight of the drone," Fredrickson said. "(If) you're in a boat you can keep moving and save a lot on return trips. … This was the first time we've flown from a boat. So, we were trying to really figure out the logistics of taking off from a boat and then landing on a boat."

The Aitkin County SWCD created a scoring system, which it used to prioritize

Aitkin County SWCD Forester Kyle Fredrickson flew a drone around the perimeter of Mille Lacs Lake to capture video footage in summer 2023.

for restoration or protection the segments of shoreline that pose the greatest risk to the lake's water quality. The scoring system helps identify parcels where erosion and the lack of vegetation is a concern, and where protective measures would help to keep banks from eroding, and pollutants and runoff from entering the lake.

By February, Lundquist and Seybold had reviewed the footage and scored each lakeshore parcel. Among the metrics: They considered the severity of erosion, and whether Kentucky bluegrass lawns extended to the shoreline — or if native plants provided a buffer.

Dilapidated boathouses were another common high-priority shoreline issue that emerged. Collapsing boathouses can drop chemically treated lumber, shingles and tar into the lake, which can pollute the water and harm water quality. Once the boathouses were removed, the area could be planted with shoreline-stabilizing native vegetation.

"One thing we were noticing (was) boathouses that were kind of just rotting into the lake. I think that was a really valuable thing to understand, seeing how many boathouses were there, because it's kind of hard to conceptualize when you're just on a boat," Fredrickson said, "but to actually intentionally count them out and see how many structures are right there on the water that probably should be decommissioned or should be addressed was a really valuable part of this study."

Lundquist and Seybold identified 4,831 best management practices that could be implemented to address high priorities identified in the study. Those included 3,087 within Mille Lacs County, 1,593 in Aitkin County and 151 in Crow Wing County.

Across the shoreline properties, the need to address mowed lawns was the most common issue, with 1,639 parcels listed as a high priority in that category. A potential BMP solution is to plant native vegetation to buffer the lake from excess nutrients, such as nitrogen and phosphorus, that are carried by runoff. Phosphorus can feed the algae that turns lakes green.

"A best management practice to help with erosion could be planting more native species, getting good roots down in the ground to help prevent erosion," Lundquist said. Other options might involve installing a coconut fiber log to help stabilize the slope.

The Aitkin County SWCD will share the footage and scoring results with surrounding SWCDs, the tribe and 1W1P partners, so they can pinpoint projects within their work areas. The data includes timestamps, so if the other partners want to look for erosion concerns, they can query the high-erosion parcels, look at the timestamp and view that parcel on the footage.

"We wanted to make it as simple and user-friendly as possible," Lundquist said.

Now, Lundquist will start contacting landowners about potential conservation practices and funding assistance. The Aitkin County SWCD plans to use funding set aside from the Rum River 1W1P for lakeshore landowners who want to implement restoration practices. The SWCD aims to start individual projects this summer.

"Individual projects that get implemented are just one more step toward better water clarity and progress across the lake," Lundquist said.