



Left: Inlets to underground sediment collectors lie just off Crow Wing County Road 66 at Big Trout Lake. **Middle:** Maintenance involves periodic removal of accumulated sediment. **Right:** Crow Wing SWCD Manager Melissa Barrick posed with AmeriCorps intern Reece Boucher in 2018 along Big Trout Lake where a sediment collector was to be installed. **Photos Courtesy of Crow Wing SWCD**



An Island Loon Lake retrofit replaced drainage that sent stormwater directly into the lake. The project involved Crow Wing SWCD and county, Crosslake, the Whitefish Area Property Owners Association and Crosslakers. It drew from BWSR Clean Water Funds.

Chain reaction

Crow Wing SWCD's success protecting Big Trout Lake water quality sparked similar stormwater projects elsewhere in the Whitefish Chain

CROW WING COUNTY — The Clean Water Fund project that protects Big Trout Lake's cold-water fish habitat by treating pollution-carrying stormwater became a catalyst for similar water-quality work at two more sites along Crow Wing County Road 66.

From Manhattan Beach to the town of Crosslake, over the span of 4 miles the highway threads its way past five lakes in the Whitefish

Chain. Built 40-some years ago, the road pre-dates the sort of stormwater treatment that allows sediment — and the algae-feeding phosphorus it carries — to settle out before it's discharged.

"There wasn't a problem with the road. The problem was the storm sewer collection going directly to these high-quality water bodies," said Assistant Crow Wing County Engineer Rob Hall.

When the road was built, curb-and-gutter was installed where it was needed; so was the storm sewer. “You drained it to where water had always drained, which in this instance was the nearest lake.”

The \$388,000 Big Trout Lake project installed pipes that channel stormwater runoff to three underground sediment collectors. It drew from a \$310,000 Clean Water Fund grant from the Minnesota Board of Water and Soil Resources.

Work finished in 2018.

The system treats runoff from 121 acres, keeping an estimated 40 pounds of phosphorus out of the lake each year. Once it enters the lake, each pound of phosphorus can produce up to 500 pounds of algae — which can affect water quality. Decomposing algae also reduces dissolved oxygen in the water.

Water clarity is affected by additional factors including invasive species, wave action, water temperature, precipitation and ice-out. Over the past four years, Big Trout Lake’s water clarity

“ I think it’s a huge benefit for us. You’ve got this water-quality group that gets together and helps prioritize. They didn’t come pointing at one group or the other saying, ‘You need to fix this.’ They got together, said, ‘Let’s prioritize this. Let’s see if some of these funding sources that are meant for water quality can help out in these situations.’ ”



— Rob Hall, assistant Crow Wing County engineer

averaged 14.9 feet — an increase of 1.6 feet compared with the longtime average from 1992 through 2016.

Deep and cold, Big Trout Lake supports Crow Wing County’s only population of stocked lake trout. Sandy beaches are part of what attracts lakeshore property owners. The county’s assessed value for Big Trout lakeshore lots and homes exceeds \$213 million.

“That’s an important resource, and it’s a resource worth saving,” Jeff Laurel of the Whitefish Area Property Owners Association said [during a 2017 site visit](#).

The WAPOA board set a precedent when it agreed to pay 75% of the estimated \$1,500 annual routine maintenance cost to pump out the sediment collectors. Manhattan Beach will pay the balance.

Crow Wing County Highway Department staff reviewed the plans. The county owns the system, will handle any safety concerns that arise, and eventually will be responsible for replacing it. The highway department was more involved with subsequent stormwater projects in Crosslake.

“This project is definitely a catalyst,” said Crow Wing

Soil & Water Conservation District Manager Melissa Barrick.

“I think that Big Trout project really helped forge a stronger partnership. People saw what we did, and then citizens wanted to be involved. It corresponded really well with the city of Crosslake’s comprehensive plan,” Barrick said. “The combination of the citizens, the city and the county really helped to bring a larger perspective to that entire corridor.”

Hall met once a month for about five years with the Crosslake Water Quality Work Group, which is composed of county, city and community members. The aerial maps the county highway department created to clearly show the stormwater treatment system — its catch basins and manholes and the drainage path — helped the group prioritize drainage projects, starting with Big Trout Lake.

One Crosslake stormwater treatment project finished in 2020. Another will coincide with a planned sanitary sewer expansion.



The \$608,000 stormwater retrofit for Island Loon Lake expanded upon partnerships developed during similar work affecting Big Trout Lake.

Both received Clean Water Fund grants from BWSR.

A \$608,000 targeted stormwater retrofit for Island Loon Lake addressed declining water clarity. With a \$475,000 Clean Water Fund grant awarded in 2019, the SWCD worked with the county highway department, city of Crosslake, the WAPOA and the Crosslakers — a citizen-led group focused on the city's future — to install three underground sediment collectors and a 13,500-square-foot basin to capture runoff.

The work will reduce phosphorus-loading by an estimated 6 pounds per year. Because nutrient levels are low, small changes can dramatically affect the lake's ecosystem and water clarity.

The system replaced drainage that sent stormwater directly into Island Loon Lake.

The county reviewed plans and contributed \$50,000. Crosslake bought the 2.59 acres where the pond was built and contributed more than \$75,000. The city is responsible for sediment collector clean-out and stormwater pond maintenance.

Crosslake Public Works Director Ted Strand explained the lakes' significance:

"I always say the quality of part of our life is the quality of the water. We protect our waters, we protect our quality of life. The quality of our life goes down, our property values go down,



The Big Trout Lake project held up well after a large rain. The long-term goal for Big Trout Lake, as established in the Pine River Comprehensive Watershed Management Plan, is to reduce phosphorus-loading by 5% — the equivalent of 45 pounds per year. Crow Wing SWCD will work with individual landowners to accomplish the remaining 5-pound-per-year reduction.

people don't want to recreate here," Strand said.

The community of about 2,000 expands and contracts with the seasons. About 1,000 full-time residents stay through the winter. Strand sees the fluctuation reflected in water use. In early April, the public works department was treating about 30,000 gallons of water a day. Over the July 4 weekend, with the cabins and U.S. Army Corps of Engineers campground full, it will treat about 100,000 gallons a day.

"It's a great cooperative project between the county and the city. We're very thankful that we got the grant and the funds to move forward with some of these projects. Water quality is key. We have a very active WAPOA and a very active lake association. We're all a part of the team," Strand said.

Without the Clean Water Funds, Strand said the direct pipe to Loon Lake likely

would have remained in place.

The second Crosslake project draws from a \$315,000 Clean Water Fund grant for runoff retrofits, awarded in 2020. Partners will contribute \$78,500 in matching funds.

That water-quality work will be coordinated with the city's planned sanitary sewer expansion under County Road 66, which will close the road and expose the storm sewer.

It will address the high ratio of impervious surfaces surrounding the high-value lake, which the Pine River Comprehensive Watershed Management Plan and the county's water plan identified as a priority concern. Working with five landowners, the SWCD will partner with the county highway department, city, WAPOA and Crosslakers to build four stormwater retention basins that can store 15 acre-feet of water a year.

The project is in the design stages.

The sanitary sewer expansion will accommodate growth. Septic systems handled wastewater until the city treatment plant was built about 20 years ago. It's designed to handle about 150,000 gallons per day. The planned expansion will increase its capacity to 175,000 gallons per day.

The highway department is working with the sanitary sewer project designer. The county will contribute a \$37,500 match. The city bought a parcel, less than 1 acre in size, to install a stormwater pond.

"Between the water quality group and the city and the county, if they needed to find and budget for \$300,000 to \$400,000 each time one of these big improvements or mitigation projects is done, I don't know if any of these would be done at this point," Hall said. "The funding is the key. We can have all the great ideas and data we want, but you still need that bankroll to make these things happen."

Next, Hall said the work group is seeking ways to fund a project near the U.S. Army Corps of Engineers campground in Crosslake that addresses stormwater discharge to the Pine River, which flows out of the Whitefish Chain to the Mississippi River.

"They're looking out for overall water quality, not just what's in their backyard, so I give them credit for that," Hall said.



The Minnesota Board of Water and Soil Resources' mission is to improve and protect the state's water and soil resources by working in partnership with local organizations and private landowners.
Website: www.bwsr.state.mn.us