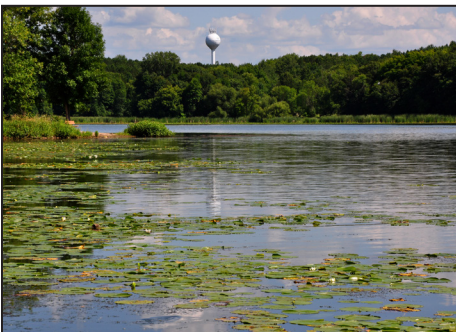


CHISAGO LAKES CHAIN OF LAKES



'Our water is our diamond'

As the cumulative effect of urban and rural conservation practices improves water quality, two lakes in the Chisago Lakes Chain of Lakes move toward removal from the Impaired Waters List. The Chisago SWCD's work with landowners is backed by lake improvement district matches, Clean Water Fund grants and NRCS funds.



Top: Barb Peichel, a Minnesota Board of Water and Soil Resources clean water specialist, looks at South Center Lake during a July 30 visit highlighting Chisago Soil & Water Conservation District projects accomplished through Clean Water Fund grants. Project partners have included the Natural Resources Conservation Service, the Chisago Lakes Lake Improvement District and the St. Croix River Association. **Above, from left:** White water lilies bloom in South Center Lake off the shore of Loren's Park in Center City. A boater crosses South Center Lake, part of the 20-lake chain. Where it dead-ends at South Lindstrom Lake in Lindstrom, Linden Street was made narrower. **Photo Credits:** Ann Wessel, BWSR



Casey Thiel



Jill Behnke



Craig Mell



John Olinger

CENTER CITY — On a hot summer weekday, a boisterous group of swimmers splashed near a private dock as the occasional boater crossed South Center Lake. On the opposite shore, a couple of anglers fished from Loren’s Park.

There’s a good chance none of them knew South Center Lake is on course to come off the Minnesota Pollution Control Agency’s impaired waters list as soon as 2022.

What residents and visitors do know is that water quality has improved.

From 2013 through 2018, phosphorus levels in both South Center and North Center lakes consistently surpassed water-quality standards for aquatic recreation. (Phosphorus feeds the algae that can

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Whether they live there or it’s a recreational cabin or getaway, they care about the lake the same. ... They’re well-used and well-loved.

— Casey Thiel, Chisago SWCD

turn lakes green.) Average Secchi disk readings, which measure water clarity, hovered at the threshold. Average chlorophyll-a levels, which indicate algal growth, remained high.

“Things have definitely gotten better, and they’re getting close to the point where we can delist specifically these two lakes,” said Lee Engel, MPCA water quality monitoring supervisor. “You can see that concentrations

are trending in the right direction.”

The 2018 results arrived in late January.

For the first time since the listing, South Center Lake came in under the threshold for chlorophyll-a. The 2018 average reading was 8.6 micrograms per liter. The threshold is 14 micrograms per liter. South Center Lake’s 2018 average readings for all three indicators were the best

they’ve been since being listed.

Nine lakes in the 20-lake Chisago Lakes Chain of Lakes were listed as impaired in 2008.

Ten years and more than \$2.2 million in water-quality improvement projects later, the Chisago Soil & Water Conservation District’s work with landowners and cities appears to be paying off.

“People are seeing the lakes improve. I hear that a lot from people,” said Casey Thiel, Chisago SWCD water resource specialist. “The fishing’s better. There’s less invasive plants. There’s more water. Water levels are a big issue. And then, ‘Hey, we haven’t seen that algae bloom that we usually get,’ or ‘We only saw one of those.’ People are noticing that.”

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In Lindstrom, new or rebuilt city streets are made narrower when possible — a strategy that reduces stormwater runoff and cuts city maintenance costs. Linden Street was made narrower where it dead-ends at South Lindstrom Lake. It’s flanked by a stormwater treatment system that includes rain gardens.

SWCD staff credits the cumulative effect of water-quality projects large and small.

Implemented over the past decade in three cities and four townships, those conservation practices include 88 rain gardens, 21 water and sediment control

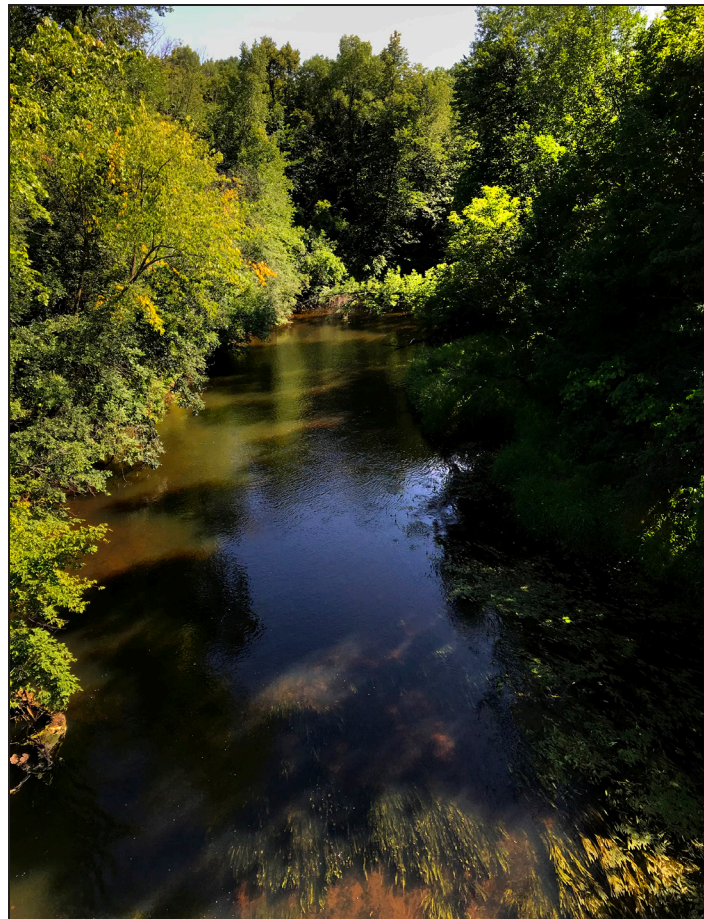


basins, 13 lined waterways, 10 storm drain inlet protections, nine vegetated swales, eight shoreline plantings, eight

grassed waterways, seven gully stabilizations, four iron-enhanced sand filters, three stormwater pond retrofits, two diversions, a livestock access control, one wetland restoration, enhanced city street sweeping and a long-term hay planting.

“What it shows is that the actions taken have definitely had an effect on water quality. The reality is that these things don’t just change with a flip of a switch. They take some time to switch back to meeting standards,” Engel said.

About \$1.7 million in Clean Water Funds from the Minnesota Board of Water and Soil Resources — including a Targeted Watershed Demonstration grant that wraps up in early 2020 — has helped to pay for the projects. To date, the SWCD has leveraged \$380,000 from the Chisago Lakes Lake Improvement District, \$116,700 from the Natural Resources Conservation Service’s Mississippi River Basin Initiative, and \$50,000 from the St. Croix River Association.



The Sunrise River benefits from water-quality improvements in the Chisago Lakes Chain of Lakes watershed. Water from the 20-lake chain drains into the Sunrise River, which eventually reaches the St. Croix River and then the Mississippi River.

Chisago Lakes Chain of Lakes

IMPAIRED: The Minnesota Pollution Control Agency added the following lakes within the 20-lake Chisago Lakes Chain of Lakes to the impaired waters list in 2008: Little, Linn, Ogren, Pioneer,

North Center, South Center, Wallmark, School and Emily

WATERSHED: 36,800 acres

DOWNSTREAM WATERS: Sunrise River, St. Croix River, Mississippi River

“The nice thing with this MRBI, we know if we get a landowner who’s interested who meets our criteria as far as assessment work and they apply they will get the federal funding, which has been huge for us to be able to provide the dollars needed to the farmers to get the projects done,” said Craig Mell, Chisago SWCD administrator.

“The other really nice thing was the lake improvement

district gives us the match money,” Mell said. “Landowners can come to us and then we can allocate the funds.”

Conservation projects gained momentum as SWCD and NRCS staff earned landowners’ trust and as word spread.

“People don’t say, ‘You want me to do a *what?*’ They know what we’re talking about when we come to them.

Whether they’re interested or not is a different story. But they don’t look at us as funny anymore,” Thiel said.

Outside of the grant-funded projects, Thiel said education and an evolution in accepted practices are having a cumulative effect on improved water quality, too.

“People learning what should and shouldn’t be done I think is huge. And getting people to buy into the project,” Thiel said. Once they learn the difference it makes, Thiel said residents start to sweep up the grass in the street, refrain from using phosphorus fertilizer and choose more natural shoreline alternatives.

BWSR awarded the Chisago SWCD two more Clean Water Fund grants related to Chisago Lakes Chain of Lakes work in December. A \$250,000 grant will fund additional best management practices in the chain. A \$100,000 grant will fund a gully stabilization affecting Green Lake in Chisago City.

The BMP work started at the top of the watershed, and is moving east to west. The next projects will be in the middle of the 36,800-acre watershed — targeting land that drains into North Center, South Center, North Lindstrom, South Lindstrom and Chisago lakes.

Work accomplished through the 2015 targeted watershed grant was calculated to reduce at least 690 pounds of total phosphorus annually — 11 percent of the Total Maximum Daily Load.

“One of the things that is really unique about the watershed, it’s a very large watershed. It encompasses three cities, parts of four townships, and we have very differing cities,” Thiel said.



Erosion control structures at Loren's Park in Center City reduce the amount of sediment that washes into South Center Lake. The structures are among conservation practices put in place over the past 10 years that are helping to improve water quality.

Thiel described the lakes' wide-ranging appeal:

"The whole chain of lakes is a huge recreation area, so we have people coming to use the lakes. Because it's so large and so much surface area, we also have really fantastic fisheries for an almost-metro lake. So we have a lot of people coming to sportfish, for tournament fishing and recreation in general. We have a wide mixture of people who live on the lakes as well as people who have them as their cabins."

Fishing is the backbone of Chisago City-based Frankie's Live Bait & Marine, which bills itself as the No. 1 Ranger boat dealer in the world. Frankie Dusenka's grandfather started the business. He got involved at age 12, and is on the lakes every day.

"Our water is our diamond," said Frankie Dusenka, 62, on a late December afternoon as he was heading out to check on the minnows. "That's the catalyst that makes everything thrive in this area. ... To keep the diamond shining, you've got to take care of it. It all starts with water quality."

Dusenka has hosted carp tournaments meant to thin lakes' populations of the bottom-churning invasive species. He was a little surprised when the

lakes were listed as impaired, he said, and wondered how much of a role temperature and water levels played in those monitoring results.

"I believe it's the most important thing here next to the schools — lakes being first, schools being second," Dusenka said. "Why would we want to live here? It's nice having a lake in our backyard. It's nice having a lake you can see every day."

In Lindstrom, a panorama of South Lindstrom Lake unfolds at the end of Linden Street.

The street is intentionally narrower to reduce runoff and cut city maintenance costs. In July, bright flowers framed the stormwater treatment system — rain gardens, a pretreatment area, a rock spillway and iron-enhanced sand filters.

The Linden Street project was the first Chisago Lakes Chain of Lakes project funded with the SWCD's share of \$1 million in Clean Water Funds available through a direct appropriation to the Anoka Conservation District.

Most of Lindstrom's 3.5 square miles lie within the shoreland district. It's a 3-mile-long peninsula; most properties are within 1,000 feet of a lake. Twenty percent are lakeshore properties. One of the city's stated values is to protect

Path to delisting

MEETING STANDARDS: Minnesota has a two-part water-quality standard for eutrophication, which describes the effect of nutrients. Phosphorus levels must be at or below a certain level. Additionally, either Secchi disk readings, which measure clarity, or chlorophyll-a readings must meet the standard.

DATA COLLECTION: The Minnesota Pollution Control Agency needs more data before it can recommend removing South Center and North Center lakes from the Impaired Waters List, a list of U.S. lakes and rivers that do not meet water-quality standards. Both lakes have met the standard for phosphorus concentration. Secchi disk readings have been at the standard. Neither lake has consistently met the standard for chlorophyll-a. MPCA staff believes the variables will continue to improve over the next few years, potentially leading to delisting.

The continued review coincides with Lower St. Croix River watershed sampling in 2019 and 2020, part of the MPCA's intensive, once-every-10-years monitoring of the state's major watersheds. The Chisago Lakes Chain of Lakes is part of the Lower St. Croix River watershed.

The MPCA will use that data collected to assess whether the lakes meet the standard. Minnesota submits its list of recommended delistings and additions to the U.S. Environmental Protection Agency's Impaired Waters List every two years. The soonest South Center and North Center lakes could be delisted is 2022.

ACCEPTABLE LEVELS: For 889-acre South Center Lake to meet water-quality standards, total phosphorus levels must be below 40 micrograms per liter and Secchi disk readings must be at least 1.4 meters. For 754-acre North Center Lake, phosphorus levels must be below 60 micrograms per liter, Secchi disk readings at least 1 meter. The standards differ because South Center Lake is classified as a deep lake, North Center Lake a shallow lake.

the environment and conserve natural resources.

“That’s our market value, that’s our quality of life,” said Lindstrom City Administrator John Olinger. “That’s what we’ve worked on is to improve our quality of life.”

The city’s comprehensive plan identified water quality as one of the most important issues. When the lakes were put on the impaired waters list, Olinger said the council made cleaning up the lakes a priority. The city put a minimum impact design ordinance in place, brought septic systems off the lake and onto the city sewer system, and focused on filtering the water before it entered the lakes.

“These lakes are not river-fed and they’re not spring-fed, so they don’t get flushed. This is like a tub. Whatever we put into it stays there,” Olinger said. “(The lakes are) very susceptible to rainfall events and the cyclical nature of dry and wet periods.”

Chisago Lakes LID board member Jill Behnke, 60, was born in the Chisago Lakes Chain of Lakes area, where she’s lived for all but 15 years. She grew up in Chisago City — “We were on the lake probably from sunup to sundown. If we weren’t in a rowboat, we were in the lake swimming.” — and now lives on South Center Lake in Center City in the house her grandparents built in 1956.



An angler fished from shore at Loren’s Park in Center City as a pontoon boat passed by on South Center Lake. People are starting to notice water-quality improvements in South Center and North Center lakes, where the cumulative effect of targeted conservation work is becoming apparent.

“I’ve seen the lakes where this bay that goes into the bridge to Highway 8 — I could walk across in 1964. It was that dry. I have a picture of myself walking across,” Behnke said as she looked over the water from Loren’s Park. “That bay was all dried up. I’ve seen that happen twice here. I’ve also seen the lakes be over ordinary high water. So I’ve seen them flooded. As a kid growing up, I could canoe from Chisago City all the way over here to this property in Center City ... without having to get out of the canoe and portage anyplace.”

Behnke said the LID originally formed to operate the weir system that was built in response to flooding and designed to keep lake levels at the ordinary high-water mark.

“As those things got taken care of, now we’re looking at the quality of the water

YouTube video

See the resource, and hear from Chisago Soil & Water Conservation District staff: <http://bit.ly/ChisagoLakes>

and trying to improve the quality of the water. By working with soil and water conservation, we’ve been able to implement all kinds of strategic things,” Behnke said. Rain gardens and other stormwater treatments accompanied road improvements.

In recent years, Behnke said she hasn’t seen as much algae.

“Everything we put in this lake makes a difference because it all ends up in the Sunrise River, and from the Sunrise River it ends up in the St. Croix River. So for us to be able to start seeing improvement is a great accomplishment, and it needs to be continued,”

Behnke said.

Behnke considered how water quality affects the communities within the watershed:

“More people are saying, ‘What a lovely place to live, raise your kids, be able to get out on the lake and enjoy a good time.’ Water quality is a big thing. It not only affects the lakes but it also affects all the wells and everything else within your cities. Because any chemicals that are going into the ground are going into the water that’s being used by all of us.”

About 75 percent of the projects completed to date are within the urban areas. Initial assessments focused on urban stormwater. A 2014 Clean Water Fund grant plus the NRCS funding allowed the SWCD to expand its reach to agricultural producers within the watershed.

Meanwhile, an extension of the Mississippi River Basin Initiative funds will allow more conservation work on cropland.

“In general, we would like to see the successes in the upper reaches of the watershed just continue throughout the entire watershed. In the middle of the chain there are a couple of really high-quality water bodies. We would like to use our funding and our resources to protect those to keep them really high quality, and then ultimately protect the downstream waters,” Thiel said.



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