

The Coleraine solution



With collaborators ranging from fourth-graders to foundations, Itasca SWCD, city of Coleraine take a watershed approach to protecting Trout Lake

COLERAINE — The first elements of an Itasca County Soil & Water Conservation District project designed to protect Trout Lake’s water quality took shape this spring when 72 Vandyke Elementary fourth-graders planted curbside rain gardens on a hill

overlooking the lake.

The school, a golf course, a growing number of houses and the cities of Coleraine and Bovey hug the northern shore of the 1,890-acre lake, which has nearly 14 miles of shoreline and measures 135 feet at its deepest.



*Springs, precipitation and runoff feed Trout Lake, **above**, seen July 20 through smoke from wildfires. Before they planted rain gardens, Vandyke Elementary School fourth-graders learned how stormwater might affect fishing, boating and swimming. The rain gardens, **top left**, are the first of Itasca SWCD’s Clean Water Fund grant-backed stormwater projects sparked by discussions about a non-functional stormwater pond, **bottom left**, adjacent to the lake. Photo Credits: Ann Wessel, BWSR*



Left: Andy Arens, Itasca SWCD manager and water plan coordinator, checks on the rain gardens and sediment traps, which reduce how much sediment enters Trout Lake. **Middle:** Bottlebrush is among the species planted. **Right:** Vandyke Elementary School overlooks Trout Lake in Coleraine. Teachers worked fourth-graders’ rain garden planting into lesson plans. On the day of the planting, Earth science lessons included how communities’ water use can affect water supply and quality. **Photo Credits:** Ann Wessel, BWSR

A \$351,000 Clean Water Fund grant from the Minnesota Board of Water and Soil Resources supports the stormwater treatment work, which would keep an estimated 43 pounds of phosphorus and 15 tons of sediment out of the lake annually. Phosphorus feeds the algae that can turn lakes green. One pound of phosphorus can produce 500 pounds of algae.

“Trout Lake is known for its water clarity, water quality, for recreating, also the fishery — trophy walleye, smallmouth, Northern pike. It’s a tullibee lake. And it’s close to Grand Rapids and a large part of the county population,” said Andy Arens, Itasca SWCD manager and water plan coordinator.

Two city parks offer a swimming beach, boat access and shoreline trails.

But the lake had seen some summer fish kills and more algae blooms in recent years. Photographs and anecdotal evidence suggest Trout Lake supported cold-water-loving lake trout until about the 1950s.

Arens said the grant-funded work aims to preserve — and possibly improve — water quality. Reintroducing lake trout is not planned. Arens described the lake’s current

“ The town has been good to me. I grew up in Coleraine. My father died when I was 8 years old, and it seemed like people took you under their wing. When I came back to the area and started a business, people were very supportive of me then, too. I love the community and I’d like to see it become vibrant again. ”



— Cavour Johnson, on volunteering

condition as oligotrophic, the clearest, most oxygenated water on the tropic state index.

It hasn’t always been that way.

Mining operations that ran from 1907 to 1940 were an early source of sediment. An iron ore washing plant once stood on the east shore. Stockpiles sat on the west shore. But mining wasn’t the sole concern. Until the city built a treatment plant in 1958, raw sewage entered the lake. A 2008 Minnesota Pollution Control Agency report noted that untreated wastewater, which entered the lake from 1910 to 1987, sent Trout Lake into a eutrophic state — high in algae-producing nutrients, low in dissolved oxygen.

Water quality rebounded after wastewater treatment began in 1987.

The swimming beach reopened in 2005.

“The lake helps create a vibrant community,” said Cavour Johnson, a retired dentist who grew up in Coleraine, and then moved back in 1974 to open his practice. “People are drawn to a lake, and if you have a lake with good quality water, that’s just more and more of a draw.”

Johnson is a past chairman of the city’s economic development commission and one of two current members on the city’s parks, trails and landscaping committee. Through a conversation with Minnesota Department of Natural Resources staff, he learned that the stormwater pond adjacent to the lake was no longer functioning.

Sediment filled the subsurface separation between the pond

and the lake.

The pond, built in the mid-1980s, always had required periodic dredging.

Over time, rising lake levels had diminished the pond’s effectiveness. Sedimentation likely sped up as city and lakeshore development brought more impervious surfaces — and therefore more runoff.

Johnson was among those who brought the issue to the city in 2016, and then asked Itasca SWCD staff about cost-share to fund the necessary dredging. That request led to discussions about managing stormwater higher in the watershed, and, eventually, the 2020 Clean Water Fund grant.

Today, stormwater runoff is the primary source of sediment entering Trout Lake, which is fed solely by springs, precipitation and runoff.

“It’s fairly stable but we worry with minimal management of the city stormwater the (downward) trend will continue,” Arens said of the lake’s water quality and its periodic algae blooms.

Grant-funded practices being planned in Coleraine will treat about one-third of the 500-acre watershed, which includes most of the city.

“We’re a small city. It would be difficult coming up with the funds. We would have to bond. Or we would have to increase taxes,” said Coleraine Clerk-Treasurer Briana Anderson. “It’s just not something the city could afford. They’d have to look at other options, and it would take much longer. The Clean Water Fund is instrumental in helping us maintain the lake’s beauty.”

The city expects to contribute about \$80,000 cash plus in-kind labor. City crews helped with the rain garden project, which involved curb-and-gutter plus sidewalk work.

“This is certainly, from my personal perspective, a very feel-good project — to have the schools, the city, city staff, Itasca County Soil & Water and the Blandin Foundation — all the partners working together,” Anderson said of the rain garden installation.

Vandyke Elementary School Principal Sue Hoeft said the school’s lakeshore location lets students here experience what others might learn only in a video.

Fourth-graders observed how water flowed across the project site in winter and spring. They saw the rain garden construction. They may play a role in site maintenance.

“They had good questions and they were very interested and they loved the actual planting itself — getting their hands in the dirt,” Hoeft said.

The project not only fit with engineering and science learning standards, but also illustrated a real-world problem, Hoeft said, “and what people in different careers do to contribute to the solution.”

Among them: Engineers,



“It was really a great educational event,” Andy Arens, Itasca SWCD manager and water plan coordinator, said of the collaboration with Vandyke Elementary School. It involved 72 fourth-graders, 10 community volunteers, seven teachers, two TSA 8 staffers and two rain gardens. **Photo Credit:** Ann Wessel, BWSR



A winter view shows Vandyke Elementary School from Trout Lake, where algae blooms have increased in recent summers. **Photo Credit:** Cavour Johnson

scientists and city workers.

“I think understanding some of the career aspects and the real-world problems that can be solved with science was a big piece of it,” Hoeft said.

A highly visible pair of attractive rain gardens near the school could go a long way toward community acceptance of what some might see as unkempt gardens, said Johnson, who was among the volunteers helping with the project.

“I think it’s so important for us to learn at an early age how important it is to take

care of the water, and how our actions as humans can have such an effect on water quality. It’s so easy to be oblivious to the things we’re doing affecting the water,” Johnson said.

“These interactions of humans and environment — that just goes a long way to solving the problem. I think that’s in essence what this is all about, and that’s one of the best things that could come out of this, is education of people into how to protect our environment and our waters,” he 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.
www.bwsr.state.mn.us

Details

PARTNERS: City of Coleraine, Mississippi Headwaters Board, Technical Service Area 8, Vandyke Elementary School, Trout Lake Association, the Blandin Foundation

FUNDING: Grant and matching funds include the following:
\$351,000 BWSR Clean Water Fund grant
\$80,000 Coleraine’s expected cash contribution
\$10,000 Mississippi Headwaters Board contribution
\$5,000 Blandin Foundation grant
\$1,200 Trout Lake Association contribution to date

MISSISSIPPI HEADWATERS BOARD:

The Mississippi Headwaters Board’s BWSR Clean Water Fund-backed stormwater retrofit analysis study of Mississippi River cities included Coleraine. That analysis led to Itasca SWCD’s current Trout Lake-focused projects. In 2020, MHB contributed \$10,000 to the Itasca SWCD for engineering that explored pollution prevention practices related to the Trout Lake stormwater enhancement project.

TECHNICAL SERVICE AREA 8:

Engineer Bill Westerberg was involved in design. Project Facilitator Beth Hippert led educational outreach.