

Long Lake poised for gradual improvement



A drone captured an 0.83-mile-long segment of Middle Rice Creek in October 2018. The \$625,000 remeander, which doubled the length of stream, is part of Rice Creek Watershed District's \$6 million effort to improve water quality in nutrient-impaired Long Lake. This more natural, sinuous channel will curb erosion, and reduce sediment-loading to Long Lake.

Photo Credit:
Emmons & Olivier
Resources Inc.



NEW BRIGHTON — With four elements of a five-year, \$6 million project complete, the Rice Creek Watershed District (RCWD) anticipates the water quality of a popular north metro recreation spot will gradually improve. RCWD is monitoring four elements of the project targeting Long Lake.

With \$3 million in Clean Water Funds from a Minnesota Board of Water and Soil Resources (BWSR) Targeted Watershed Demonstration grant, RCWD staff in 2014 tackled projects aimed at reducing how much sediment and phosphorus enters the lake. Nearly a half-million people use Long Lake Regional Park's swimming beach, boat launch and trail system every year.

But the lake failed to meet state water quality standards for recreational use because of severe algae blooms.

"For visitors to Long Lake Regional Park, the

benefits of increased water clarity and less frequent algae blooms will be seen gradually over time," said Kyle Axtell, RCWD project manager. "We expect (these improvements) will make the park even more popular than it is today for swimming, boating and fishing."

The four targeted, grant-supported projects included remeandering a segment of Middle Rice Creek (a Long Lake tributary), managing invasive carp with an innovative barrier system, improving water quality plus increasing flood storage at Mirror Pond in St. Anthony, and improving and expanding a stormwater pond in New Brighton's Hansen Park.

Combined, the projects will keep an estimated 575 pounds of phosphorus and 123 tons of sediment — the equivalent of eight dump truck loads — out of Long Lake annually.

Middle Rice Creek remeander

Middle Rice Creek was straightened in the early 20th century for agricultural purposes, resulting in tall, erosion-prone banks. The straightened channel added increased sediment loads to nearby Long Lake.

To mitigate erosion, the RCWD restored 0.83 miles (5,400 linear feet) of shoreline to its natural, sinuous state. Adding 2,000 linear feet doubled the length of the once-straightened stretch and stabilized the banks. Planting native species reinforced the banks and improved wildlife habitat. Engineers designed the curves and placed boulders and root wads to further reduce erosion and sediment-loading.

Today, the winding paddle route keeps water from carving into the banks and allows sediment to settle. Deep-rooted native plants grow where invasive reed canary grass once stood. The habitat is more likely to attract great blue herons, egrets and turtles. It also provides a more leisurely and scenic paddling experience than the former straight channel. In total, the remeander is estimated to reduce 315 pounds of phosphorus and 107 tons of sediment per year.

Common carp management

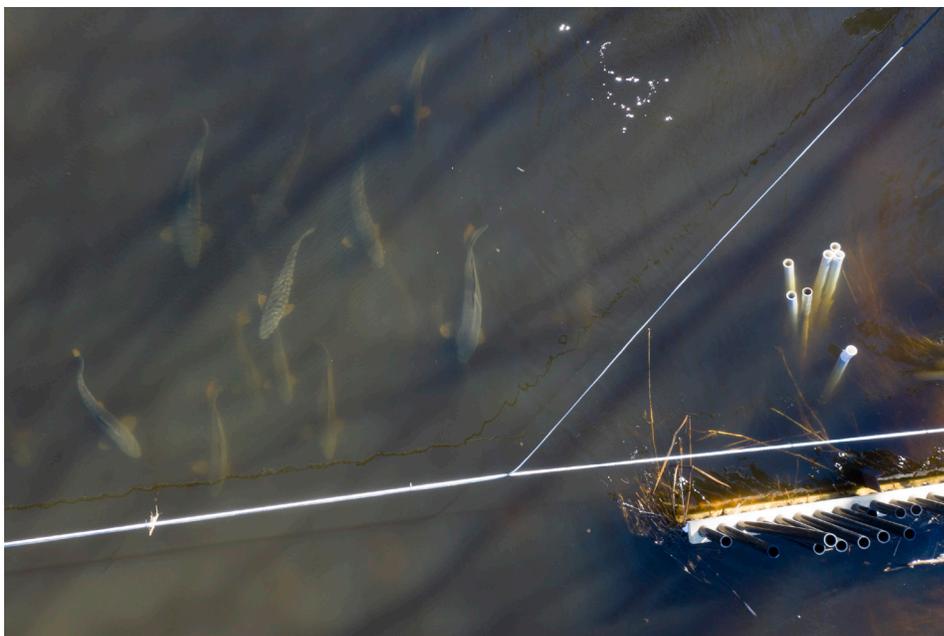
Each spring, an estimated 20,000 common carp that over-winter in Long Lake swim up Rice Creek to spawn in the shallow Lino Lakes Chain of Lakes. Carp stir up the lake bottom in search of food, increasing turbidity and freeing nutrients that feed algae growth.

In search of a fix, the RCWD staff took a creative and innovative approach. Contractors installed two experimental, low-voltage electrical barriers to deter the migration up Rice Creek to the carp's preferred spawning grounds. The idea combines technology used in Poland to keep fish out of hydroelectric plants with technology developed in the U.S. to pick fruit.

The barriers are used to halt migration and guide migrating fish into traps so they can be removed. Another

component known as “Whoosh Technology” is being tested to remove large numbers of migrating carp through a device informally known as a “carp cannon.” The electric guidance system funnels carp to a gate, creating a single route leading to a fish ladder built on a floating wood platform. When the carp reach a metal chute at the top, they drop into the carp cannon.

RCWD staff said the electric barrier is working well despite the carp's aggressive attempts to cross it. For now, Axtell said operators are loading the fish into the chute because the carp are wary of the gate. Axtell said the carp cannon provides an efficient way to load carp out of the in-stream traps for removal. Improvements to the entry system continue to be tested.



*Common carp approach one of two electrical barriers used in the RCWD's new carp management system. Two experimental, low-voltage electrical barriers aim to deter migration up Rice Creek to the carp's preferred spawning grounds. RCWD staff said the electric barrier is working well despite the carp's aggressive attempts to cross it. **Photo Credits:** Rice Creek Watershed District*



Staff from Carp Solutions LLC and the Rice Creek Watershed District remove carp swimming from Long Lake through Middle Rice Creek from traps. An electrical barrier system funneled the fish into the traps.

RCWD hired Carp Solutions LLC to complete investigative work, track carp and produce progress reports. So far, Carp Solutions has radio tagged more than 1,000 carp to track their movements at points along the creek and its tributaries. Over the course of the four-plus-year grant, staff estimate carp removal efforts reduced the population from about 17,000 (600 kilograms per hectare) in the system to 12,000 (390 kg/ha). The watershed district's carp management goal is 100 kg/ha.

Hansen Park pond improvements

Stormwater pond work in Hansen Park enhanced flood storage capacity and improved water quality. A new outlet structure was created to improve water retention and reduce downstream flows. The pond was expanded by about 8.75 acres, which improved its water treatment capacity. A pump-operated, iron-enhanced sand filter with four filter treatment beds was installed. The pump, which rotates among filter beds (allowing each to dry out), has the capacity to treat 250,000 gallons of water a day. This allows a much larger volume of water to be treated during the growing season. Traditional systems only treat the

Project cost summary

**Combined project costs:
\$6,000,000**

Hansen Park: \$3,745,000

Mirror Pond: \$1,215,000

Middle Rice Creek: \$625,000

Carp management: \$415,000

water during large enough rainfalls. Riparian buffers with native plantings now surround the pond, reducing bank erosion. Native vegetation enhanced a small island.

"The northern section of Hansen Park has been completely transformed," Axtell said. "Trails are modernized and no longer flood, and residents can actually see the pond and the wildlife that use it."

Combined, the Hansen Park improvements will keep an estimated 192 pounds of phosphorus out of Long Lake each year. RCWD partnered with the city of New Brighton to create a network of trails around the pond.

Educational signs will be added this fall.

Mirror Pond improvements

An expanded Mirror Pond in nearby St. Anthony provided additional stormwater treatment and retention. Phosphorus-laden sediments were removed from the pond bottom, greatly reducing the internal nutrient-loading that contributed phosphorus to Long Lake. Seven acres of drainage were redirected into Mirror Pond, treating stormwater before it entered Long Lake. Native plantings now ring the basin.

The St. Anthony improvements will keep an estimated 59 pounds of phosphorus out of Long Lake annually.

The multi-pronged effort to improve Long Lake's water quality was completed on time and under budget.

"Over time these projects, in combination with our efforts to manage common carp populations, should result in noticeable reductions to the in-lake total phosphorus concentrations, and improved water clarity in Long Lake," Axtell said. "Our monitoring program will track progress as we proceed."



A pump-operated, iron-enhanced sand filter with four filter treatment beds was installed in Hansen Park as part of the RCWD's \$6 million effort to improve water quality in Long Lake in New Brighton. The pump, which rotates among the filter beds (allowing each to dry out), treats 250,000 gallons of water a day. This allows a much larger volume of water to be treated during the growing season. Traditional systems only treat the water during large enough rainfalls. **Photo Credit:** Rice Creek Watershed District