
THE CULLEN CURRENTS

Spring, 2022



CLA receives a DNR grant for CLP treatment in Upper Cullen Lake

AIS Committee co-chair Carol Lindahl again applied for the DNR aquatic invasive species grants on behalf of the three Cullen Lakes. Recipients are chosen through a lottery system. This year only Upper Cullen was selected for a grant. The amount of the grant is \$1,650, the same as last year.

Also the same as last year, the DNR grant requires that an aquatic plant surveyor who is not the treatment contractor do a delineation survey of the areas of CLP proposed to be treated. The cost of this survey is \$1,000, greatly reducing the grant funds available for the actual treatment, but still funds that are appreciated.

Cooler than average spring delays ice out

As of this writing, April 26, the three Cullen Lakes are still largely covered by ice, although there are areas along some shorelines that are open water. The ice is getting grayer each day, but with nighttime lows dipping into the low to mid 20s and daytime highs predicted to remain in the 40s for the next week, when the lakes will be completely ice free is anyone's guess.

In 2020, the ice out dates were:

Upper Cullen — April 11
Middle Cullen — April 12
Lower Cullen — April 13

The 2021 ice out dates were:

Upper Cullen — April 4
Middle Cullen — April 6
Lower Cullen — April 6

The delayed ice out this year means the spring surveys for curly leaf pondweed (CLP) and the treatment of identified areas of heavy CLP will be later than in the past few years.

Spring bird feeding tips from the MN DNR web site



Spring is the time to adjust your bird feeding system to accommodate springtime migrants, as well as the winter birds and permanent resident birds that have been visiting your feeders all winter. The most delightful aspects of spring bird feeding are the variety of species and the stunning spring breeding plumages.

The biggest change necessary for spring is to increase the proportion of millet mix provided both in feeders and on the ground. Many migrant birds and returning mourning doves prefer the smaller seeds of millet-type mixes. By early May millet can also attract indigo buntings. Black oil sunflower seeds and cardinal mixes can also be provided for northern cardinals, blue jays, chickadees, house finches, and purple finches. Suet is another staple that should be provided throughout the spring. Keep finch feeders stocked with niger thistle to attract goldfinches and any redpolls or pine siskin that linger from their winter visits to your feeders.

Save the date!
CLA Annual Meeting
Saturday, August 13

Barring a surge in COVID cases in Minnesota, the meeting will be in person and held at Lutheran Church of the Cross. Registration and coffee "hour" will begin at 8:30 a.m. with a business meeting at 9:00.

The morning's special program has not yet been decided. If you have any suggestions for a program topic, please share them with any Board member.

Boating study releases results
Larger waves from wake boats need more distance
from shore to reduce size, power.
excerpts from a Brainerd Dispatch article
by Kristi Marohn, MPR news

A new study from the University of Minnesota suggests that wake surfing boats need to stay farther from shore than traditional boats to reduce potential damage from their larger waves. The study's findings, released February 1, have been highly anticipated by advocates of stronger regulations for wake surfing boats.

The sport of wake surfing — coasting behind a boat with a specially designed hull that creates a large, curled wake — has been growing in popularity on Minnesota lakes, sparking concerns about shoreline erosion and other impacts. “This is a topic that’s become quite of interest for many people in the state, people that own boats and people that use our lakes and rivers,” said Jeff Marr, associate director of engineering and facilities at the University’s St. Anthony Falls Laboratory.



Researchers from the lab launched the study to analyze and measure the waves created by wake surfing boats compared to more traditional recreational boats. In fall 2020, on Lake Independence in Maple Plain, MN, they used sensors to measure the height of waves produced by four types of recreational boats. They also calculated the power and energy of the waves and how they changed as they moved toward shore. “What we learned is when you operate wake surfing boats in a surfing mode, the waves are two to three times larger than a non-wake surfing boat,” Marr said. “That’s an important number to finally understand how much bigger they are.”

Researchers also found that when the boats are operated in their typical mode, waves from wake surfing boats need to travel a greater distance —more than 500 feet— to decrease to the same height, energy and power as those from traditional boats. While there’s no requirement in

state law, Minnesota guidelines recommend all boaters stay 200 feet from shore, docks and other structure to reduce the likelihood that their wakes will cause damage.

The findings likely will fuel debate over whether wake surfing boats should face additional regulations. State lawmakers have proposed bills in the last two legislative sessions that would impose limits on how close to shore wake surfing boats can operate, and prohibit their use on smaller lakes. Those measures failed to pass.

Jeff Forester, executive director of the nonprofit Minnesota Lakes and Rivers Advocates, said he hopes data from the study can be used to develop best practices for boat operators that can be taught through an education and certification program. “Once we have this information, boaters will know how to operate in a way that doesn’t degrade the lake or the river that they’re recreating on,” he said.

Marr said the study is the first step to a greater understanding of the waves that boats produce, but there’s more work to be done to understand their impacts. In the next phase, researchers plan to study the effects of propeller wash or turbulence caused by boat propellers. They also want to better understand how waves interact with the lake bottom and aquatic vegetation.

CLA to redesign its web site

At a special Zoom meeting on April 23, the CLA Board of Directors authorized the redesign of the current CLA web site to give it a more contemporary look and make it easier to navigate. This initiative was discussed at the October 9, 2021 board meeting and Education Committee members John MacGibbon and C.B. Bylander volunteered at that time to explore contacts and ideas and report back to the Board in the spring.

The Education Committee will be responsible for the content and maintenance of the new web site, with C.B. Bylander, committee chair, being the lead person for making any changes to the site content. The new site is expected to be ready by late spring or early summer.

Currents on the Cullens

Deaths

Paul Desens — Middle Cullen (M44)

New owners

Darrin & Krista Jass — Middle Cullen (M124)

CLA membership update

As of April 26, 2022 we have 233 paid members and 7 complimentary members (new owners). Membership letters for 2022 were mailed in early December to allow for those wanting to use a donation for 2021 tax purposes to do so. A second dues notice was mailed in late March to those who had not yet sent in their 2022 dues. This brought in dues and donations from several more people and checks continue to trickle in. However, there are still 38 past CLA members who have not sent in their dues yet. ***If your name is highlighted on the mailing label, you haven't yet paid your 2022 dues.*** We hope this is merely an oversight on your part. People who have not paid their dues by July 1 will be changed to non-member status.

If you haven't already sent in your \$25 membership dues (and hopefully a contribution towards the treatment of curly leaf pondweed), please take the time now to write your check, make any necessary corrections to your personal data on the membership letter you received, and mail them both to CLA, P.O. Box 466, Nisswa, MN 56468.

For those lake properties that are co-owned, we encourage all owners to have their own membership in CLA. This not only provides additional support for the lake association, it also guarantees all owners will receive important information concerning the lakes.

Please help us keep our membership records current by sending any changes in your mailing address, email address, or a change in ownership of your property to either Ann Beaver, newsletter editor, or to Carol Lindahl, Membership Committee chair. Their contact information is on the last page of this newsletter.

Curly-leaf pondweed (CLP) management donations update

The CLA Board of Directors would like to thank all who have contributed thus far to the 2022 CLP treatment fund. The very positive response is truly impressive.

Here are some of the statistics as of **April 26**:

*182 property owners and family members have made a CLP donation. There are 233 paid CLA members so far this year, so that's 78%.

*80 contributions were the \$250 suggested in the membership mailing. This does not include the co-owned properties whose owners split the donation among themselves. (We don't expect co-owners to each contribute the suggested amount.)

*36 contributions were more than the suggested \$250.

*Contributions have ranged from \$25 to \$2,000.

*Contributions total \$41,335.

THANK YOU!



Fourth of July boat parades

Each of the three Cullen Lakes will again have a Fourth of July boat parade informally organized by its lakeshore property owners.

Participants are asked to gather at the east end of their lake on July 4 shortly before 2:00 p.m.

Please plan on making one entire trip around the lake so on-shore observers can view all parade participants.

For safety reasons, please avoid excessive speed and do not weave in and out of the line-up of boats.

Send photos you take of your parade to the newsletter editor to be included in the summer newsletter.

Crow Wing County to offer free nitrate testing of well water information from the Brainerd Dispatch

The Crow Wing Soil and Water Conservation District recommends testing private wells for nitrate every other year. The EPA recommends nitrate levels remain under 10 milligrams per liter to be considered safe.

If you are interested in having your well water tested for nitrates for free, you can drop off a fresh water sample (taken within a day of analysis) in a container that can be left at one of the following testing sites on the date indicated.

To take a sample, run the cold tap for 5-10 minutes and then collect about one cup of water. Place it in a clean jar or a double plastic Ziplock bag and keep it cool until arrival at the testing site. When dropping off the water sample, fill out a survey about the well's depth and location. This will help build a countywide database of nitrate levels.

Local free nitrate-testing sites include:

Nisswa Community Center, 10 a.m. - 2 p.m., June 10

Crosslake City Hall, 10 a.m. - 2 pm., July 1

For more information, contact Ross Brink at 218-828-6197 or ross@cswcd.org.

Important lake study conducted by early Board members

by Tom Beaver, former CLA Board member

In 1992, ten years after the Cullen Lakes Property Owners Association (now the Cullen Lakes Association) was formed by property owners on the three Cullen Lakes, Board members Ted Soteroplos and Bill Maucker set out on a mission. Their goal was to establish a complete profile of the three lakes, their anomalies and their vulnerabilities. They were the original odd couple, yet they complemented each other. Dr. William Maucker, a former college president, was the

statistical partner. Ted, a mineralogist and former flower store owner, was a merchant marine during World War II. His ship brought supplies and arms to northern Russia through the U-boat infested Atlantic. He loved a good adventure. When in the Russian port, he would jump ship and frequent the local bars, knowing full well if he was caught it would be a one-way ticket to Siberia.

The two of them started by developing a water budget (see diagram), then follow up with a phosphorus budget, a dissolved oxygen budget, and a lake biology. They recruited me, Ann, and a few other property owners do field work for the team.

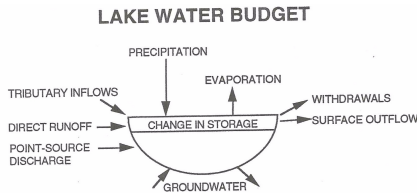
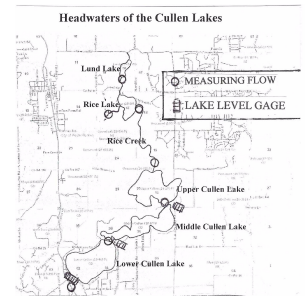


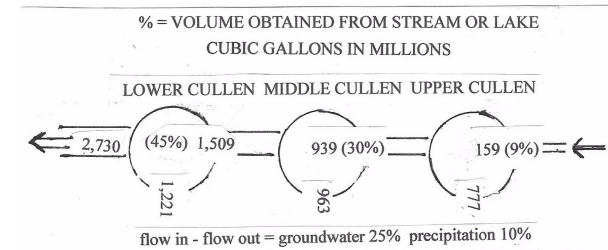
Figure 33. Schematic of a water budget. Source: Moore and Thornton, 1988.

To achieve a true annual budget, they felt it was necessary to measure each lake and the stream flowing through them every week for one complete year, which we did. Measuring the volume of stream flow in and out of each lake took some math, an orange (to float in the current and time its flow), and cold hands and feet, but we succeeded in getting the data. There were seven flow sites and four gages (see lakes map). We also measured precipitation but found out from the MPCA that the rain budget in central Minnesota was very similar to the lakes' evaporation rate, which would be a wash, so we did not calculate it.

It was impossible to measure the volume of the groundwater (intake and outflow) directly. However, we proved it happened and were able to attain groundwater volume by again doing the math — the volume variation



between what flowed into the lake minus what flowed out of the lake. This involved using an a piezometer, an instrument that measured the water pressure from beneath the benthic layer (confined lake bottom). This allowed us to tell whether groundwater entered or left through the lake bottom. If the pressure was greater than the lake, groundwater entered the lake; if the pressure was less, the lake lost water into the ground. These readings, combined with winter aerial photos, taken with the assistance of Alan Cibuzar of A.W. Laboratories, helped locate the points where groundwater was entering the lake. The photos were



taken in early spring when there was generally thick ice cover except along the shoreline, usually in the north, where there was open water or very thin ice which indicated warmer groundwater entering the lake.

So what were the conclusions? The Cullen Lakes were classified as mesotrophic (middle aged and moderately clear), which could have been determined by measuring water clarity using a Secchi disk and having water samples analyzed for phosphorus and chlorophyll *a*, which CLA has been doing since the early 1990s. So was it worth it? Yes. We found out the watershed did not need cleaning up, the stream was healthy, and with a few exceptions, the groundwater intrusion was low in phosphorus (which acts like a fertilizer for aquatic vegetation). For me personally, as one of Ted and Bill's minions, I now have a better understanding of their passion for our waters. This study opened my eyes to the bigger picture: our lakes cannot be taken for granted. They need to be watched, respected, and preserved.

Postscript: A middle aged lake doesn't mean a static lake. It gets older and more fragile just as we do. The Cullen Lakes' chemistry hasn't changed a lot yet, but human pressure on the lakeshore has altered the lakes' biology through the years and caused an exponential increase in aquatic plant growth from shoreline activities that have added phosphorus to the run off that enters the lakes. But that's for another day and another article.

The importance of wetlands

from a Crow Wing County factsheet

Wetlands were once considered wasted space, a hindrance to urban development and crop production. In Minnesota an estimated 11 million acres of wetlands



have been drained or filled over the last hundred years, leaving about 10 million acres. While this represents a 50% loss statewide, some areas of Minnesota have lost more

than 90% of their original wetlands. Crow Wing County is fortunate to have greater than 80% of the original pre-settlement wetlands remaining. Wetlands provide a number of important functions and values:

***Erosion control.** Wetland vegetation reduces erosion along lakes and stream banks by reducing forces associated with wave action.

***Fisheries habitat.** Many species of fish utilize wetland habitats for spawning, food sources, or protection.

***Flood control.** Wetlands can slow runoff water, minimizing the frequency streams and rivers reach catastrophic flood levels.

***Groundwater recharge and discharge.** Some wetlands serve as a source of groundwater recharge. By detaining surface waters that would otherwise quickly flow to distant lakes or rivers, the water can percolate into the ground and help ensure long-term supplies of quality groundwater. Some wetlands are groundwater discharge areas; they receive groundwater even during dry periods. This helps reduce the impact of short-term droughts on rivers and streams.

***Natural filter.** By trapping and holding water, wetlands store nutrients and pollutants in the soil, allowing cleaner water to flow into the body of water beyond or below the wetland. Vegetation, like cattails, can absorb some of the pollutants that remain in the soil. Wetlands also moderate water flows, providing time for sediments to settle out before the water is released to other wetlands, lakes, or streams. Less sediment means clearer waters and a better environment for aquatic life.

***Rare species habitat.** 43% of threatened or endangered species in the U.S. live in or depend on wetlands.

***Wildlife habitat.** Many animals depend on wetlands for homes and resting spots. Fish, amphibians, reptiles, aquatic insects and certain mammals need wetlands as a place for their young to be born and grow.

FAQs on zebra mussels

With the presence of zebra mussels now confirmed in both Lower and Middle Cullen, here are a few questions and answers you may find helpful.

Will zebra mussels change fishing?

Yes, because zebra mussels impact food webs, which directly impact the fish you may be angling for.

As they feed, zebra mussels deposit feces and regurgitated food on the bottom of a lake. These substances become food for bottom-dwelling worms, scuds, insect nymphs and larvae, making those invertebrate forms more abundant. Some fish may respond to this change by increasing their benthic feeding or orienting to other prey that forages on the bottom. Also, as zebra mussels feed, they filter plant plankton from the water. This in turn makes the water clearer. Fish that are light-sensitive may seek deeper waters to find shelter from the penetrating rays of the sun.

So zebra mussels making the water clearer isn't good?

Zebra mussels make the water clearer, but not cleaner. Although people often associate clear water with clean water, many chemicals and contaminants are invisible when they're dissolved in water.

As the sun penetrates deeper, aquatic plants can take root in more extensive areas than they did before zebra mussels moved into the area. Vegetation provides small fish with more places to hide and makes it more difficult for large predators to feed, so this can result in stunted fish populations and pose significant problems for boaters.

Will zebra mussels harm my boat, water toys, dock, etc?

Zebra mussels will accumulate on the submerged portions of nearly any substrate. But when zebra mussels die, they can easily be removed when these items are removed from the lake for the winter.



How will zebra mussels change swimming in the lakes?

As zebra mussels become more abundant, they will probably affect swimming areas by covering the bottom — and all surfaces — with shells. The shells are very sharp, making it necessary to wear foot protection such as water shoes when you're swimming or wading.

CULLEN LAKES ASSOCIATION
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To protect, preserve, and enhance the three Cullen Lakes and their environs in order to ensure the continued vitality of the lakes, high quality fish and wildlife habitat, safe and healthful family living, and the survival of these natural gifts for future generations.

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