



CRYSTAL WHITECAPS

The Newsletter of the Crystal Lake & Watershed Association

Protecting Crystal Lake Now for Generations to Come.

Vol. 16, No. 2

Spring 2022

PROTECTING THE CRYSTAL LAKE WATERSHED FOR 28 YEARS

Why is the CLWA called a “watershed” association” rather than a “lake association” like most of its peers around the states?

We owe it to our forward thinking predecessors, who recognized that the waters of Crystal Lake are not an isolated entity but part of a complex and extensive ecosystem impacting several townships over much of Benzie County. This is the Crystal Lake Watershed: an expanse of land that drains into a single body of water, Crystal Lake.

Rainwater, snow melt, springs and ground water flow from higher elevations to the low point, the lake. Along the way, those waters pick up hitchhikers from the land they flow through, such as chemicals, E. coli, bacteria and other substances that can be harmful to those crystal clear waters that we prize.

Zoning for Water Quality

In 1994, out of concern for the accelerating development in the area, Benzie County adopted the Crystal Lake Watershed Overlay District zoning ordinance, which focused on restricting construction on steep slopes, controlling erosion, and maintaining shoreline vegetation. Now administered by the townships of Benzonia, Crystal Lake, Lake, and Beulah village, the Overlay creates uniform protective standards within the environmentally sensitive Watershed, “overlying” the established political boundaries. The Overlay imposes special provisions **in addition to** the zoning that exists for all property in each Township.

By 2018 the CLWA had become aware that the scale of development was accelerating and new scientific research demonstrated that the Overlay standards needed updating.

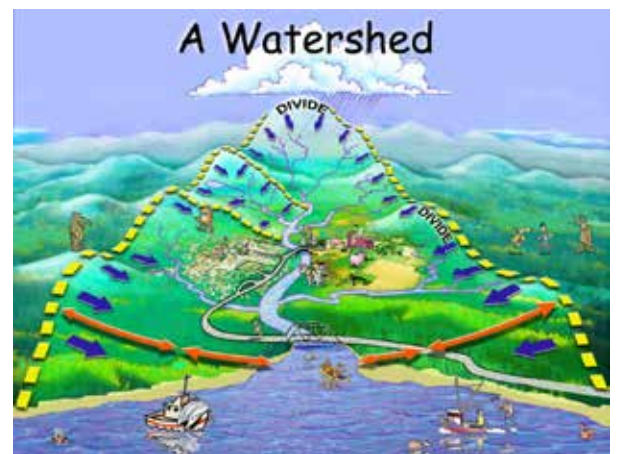
In response, the CLWA Land Use committee formed a broad working group that undertook an intensive 3-year study resulting in recommendations for strengthening the Overlay. The group included township zoning and planning officials and volunteers representing diverse interests and expertise such as engineering, biological sciences, forestry and real estate.

After immersing themselves in research reports and consulting widely with experts throughout the state, the group presented their proposals to the Crystal Lake Township Planning Commission, who provided their own input and held two public meetings during the summer of 2021. After final revisions, the Planning Commission recommended the revised Overlay ordinance to the Crystal Lake Township Board, who approved its adoption on September 3, 2021.

Continued on pages 4 and 5



Map of Crystal Lake Watershed (Sara Kirk)



How a watershed functions (courtesy University of Colorado, Boulder)

YOU CAN ASSIST THE CLWA'S SWIMMER'S ITCH RESEARCH AND CONTROL PROGRAM BY REPORTING SIGHTINGS OF MERGANSER BROODS OR CASES OF SWIMMER'S ITCH. YOU WILL FIND THE LINK ON CLWA'S HOME PAGE, WWW.CRYSTALLAKEWATERSHED.ORG.



PRESIDENT'S MESSAGE

As another Michigan winter draws to a close, we look forward to the arrival of Spring. The CLWA's work, however, continues throughout the year, so this issue surveys some of the many accomplishments made by your Association while Covid interfered with much of our lives.

The dedicated Land Use Committee and their team continue their efforts to bring about much needed updates to the Crystal Lake Watershed Overlay zoning ordinances. Crystal Lake Township adopted the changes first. If you live in Lake or Benzonia townships or the Village of Beulah – where the

changes are now being considered – and would like to help protect Crystal Lake, please contact us.

Last summer's treatment of invasive Eurasian watermilfoil appears to have been effective in reducing the infestation. The first two applications reduced the growth from over 7 acres to 6. CLWA will assess the status as regrowth begins this Spring to determine how we proceed in controlling this noxious aquatic invader.

Our experience with this determined plant has taught that it is better to prevent the introduction of invasive

species than to try to get rid of them after they have taken root. The CLWA boat wash at Mollineaux road is Crystal Lake's primary weapon in that fight: fortunately it had another busy season with record-setting numbers of boats washed. But the dozens of secondary launch sites are unprotected, and CLWA has begun to address that with new signage.

Thanks for your continued support! Without your membership we could not "protect Crystal Lake Now for Generations to Come."

Dave Wynne, CLWA President

CLUB MEMBERS VIEW "GARDENING FOR WATER QUALITY"

In July 2021 the CLWA joined forces with the Periwinkle Garden Club to host the Club's biannual Garden Walk. This fundraiser assists the Club in their work of beautifying the City of Frankfort and maintaining its public gardens.

The theme this year was "Gardening for Water Quality," an initiative that the CLWA has long supported. Approximately 200 ticket-holders attended, including garden enthusiasts from throughout western Michigan and as far away as Indiana and Illinois.

From the tour's home base at Bellows Park, participants visited the gardens of five homes around Crystal Lake. Bellows Park itself has some of the lake's most notable landscaping, a series of rain gardens that the City of Frankfort installed in 2018 that has successfully controlled the severe runoff and erosion that damaged the park for many years. The CLWA and Garden Club provided information and answered questions on lake-friendly gardening.

The featured gardens displayed a variety of solutions to problems of erosion, runoff, and maintenance. Early adopters

of lake-friendly landscaping were Jim and Leslie Hamp, who installed a beachfront buffer zone in 2007 that continues to thrive. Native plants and grasses stabilize the shoreline and require no fertilizers, watering or mowing. Newer gardens on the tour provided fresh inspiration for visiting gardeners wanting to get started. The forested slopes at the Crystal Conference Center gave the participants a close-up view of valuable tree protection.

CLWA thanks the Periwinkle Garden Club for their leadership and the opportunity to join this enjoyable and educational event.



CLWA information booth at Bellows Park, rain gardens in background catch runoff from road



Shoreline vegetative buffer zone at Hamp home on South Shore

Protecting Crystal Lake Now for Generations to Come.



MAINTAINING THE FIGHT AGAINST SWIMMER'S ITCH

CLWA's program to combat swimmer's itch continued during the summers of 2020 and 2021. CLWA's approach is a multifaceted effort built upon a solid foundation of research and experience. It centers on the trapping and relocation of all common merganser duck broods, a strategy begun in 2017.

Swimmer's itch is caused by parasites that naturally inhabit a primary avian host (merganser ducks on Crystal Lake) and a secondary host (snails). When the parasites attempt to enter a human instead of a duck, they die and often cause an allergic reaction. Removing merganser broods from the lake interrupts the parasite's life cycle.

The CLWA's locally trained team, Tim Reznich and Tom Thorr, relocated a total of 10 broods in 2020 and 11 broods in 2021. The local lake community once again made an important contribution by reporting brood sightings via an online form, enabling a quick response from the team. Broods will begin to appear again in early June.

The public is also able to report cases of swimmer's itch at the online form:

CLWA placed signs at several popular beaches to request this information. More cases were recorded this way in 2021 than in 2020, and anecdotal reports suggested a slight increase in swimmer's itch infection last year. Data from the Congregational Assembly beach also showed a slight increase. It is possible that some early-appearing broods were missed, emphasizing the importance of the public's reports of early sightings.

Additional research, carried out for CLWA by Swimmer's Itch Solutions LLC, is providing more scientific data on the rate of swimmer's itch. Two metrics are currently being used – the snail infection rate and the amount of parasite DNA in lake water – obtained from samples taken twice a year at 10 sites (see map).

Snail analysis done in 2020 demonstrated that the snail infection rate had decreased from 1.05% in 2016 (the year before trapping and relocation began) to less than 0.05% now, a 99% reduction (see chart). Another snail analysis will be done in 2022. Water samples taken from the

same 10 sites in 2018, 2019, 2020 and 2021 and analyzed by the qPCR method, revealed a small increase in the parasite's DNA in late summer 2021.

Of equal importance is the fact that the qPCR analysis has also shown that the ONLY type of swimmer's itch parasite in Crystal Lake is *T. stagnicola*, the species carried by common mergansers and *stagnicola* snails. Other Michigan lakes have reported that swimmer's itch there may be carried by mallards or Canada geese, but these types of parasites were not found in Crystal.

Swimmer's Itch Solutions's 2021 report concludes: "There is every reason to believe that [the merganser trapping and relocation program] alone is responsible for the significant decrease in SI cases since 2016."

CLWA thanks its members and the Crystal Lake community for the support that has made this work possible.

See the full research reports from Swimmer's Itch Solutions on the CLWA website.



Trapping team Tom Thorr and Tim Reznich



Map of sampling sites

Table 1. The percentage of *Stagnicola emarginata* snails infected with swimmer's itch at ten different locations on Crystal Lake (Benzie County, MI) in 2016, 2018, and 2020. Data from July 2016 serve as a pre-program baseline, as the CLWA initiated swimmer's itch control efforts in 2017. The number in parenthesis indicates the total number of snails examined. Color of cell indicates infection level. ■ = Ideal (<0.24%), ■ = Tolerable (0.25-0.49%), ■ = Moderate (0.5-0.9%), ■ = Severe (1.0-1.9%), ■ = Epidemic (>2.0%)*

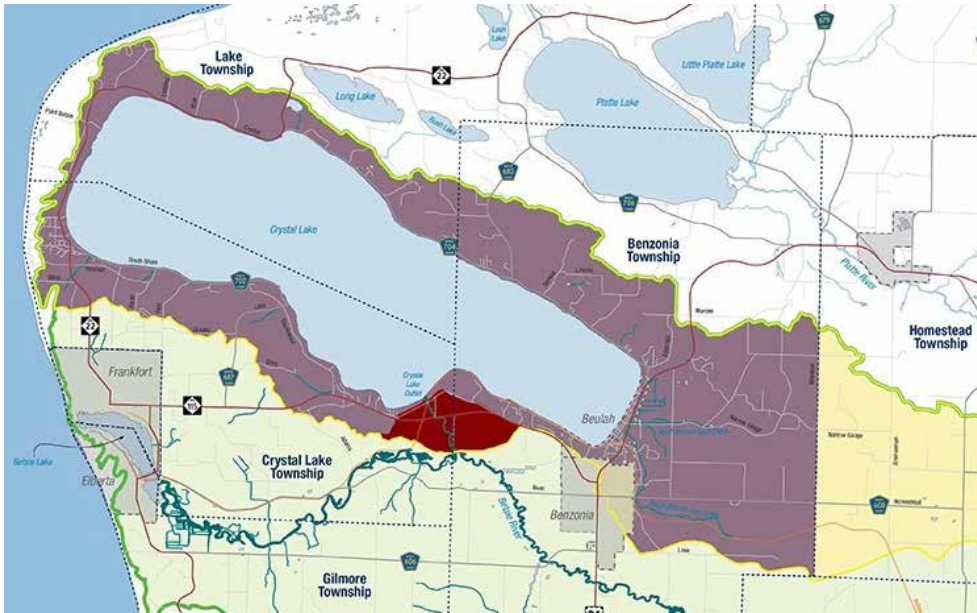
| Location | Pre-program Baseline | All Common Merganser Broods Trapped and Relocated (Our program started in 2017) | |
|--------------------|----------------------|---|---------------|
| | Year 0 | Year 2 | Year 4 |
| River Outlet (L11) | 1.0% (200) | 0.0% (199) | 0.0% (200) |
| Onkewee Rd (J11) | 2.5% (200) | 0.0% (200) | 0.0% (212) |
| CBCA (G7) | 1.0% (200) | 0.0% (200) | 0.0% (200) |
| CSA (A6) | 0.5% (200) | 0.46% (216) | 0.0% (212) |
| Marquette Ct (A5) | 3.5% (200) | 0.46% (216) | 0.0% (200) |
| Yacht Club (A3) | 0.0% (200) | 0.0% (216) | 0.0% (200) |
| MB Hotspot (M6) | 1.0% (200) | 1.38% (217) | 0.0% (212) |
| Nichols Rd (O7) | 0.0% (200) | 0.0% (216) | 0.0% (200) |
| Orchard Hill (R9) | 0.50% (200) | 0.0% (200) | 0.0% (200) |
| Beulah Beach (Q13) | 0.50% (200) | 0.5% (200) | 0.44% (229) |
| Lake-wide | 1.05% (2000) | 0.28% (211) | < 0.05% (211) |

Snail infection rate 2016-2020 (Swimmer's Itch Solutions LLC)



PROTECTING THE CRYSTAL LAKE WATERSHED FOR 28 YEARS

Continued from page 1



Map showing Crystal Lake Watershed Overlay District (in purple)

New regulations in Crystal Lake Township

The updated ordinance places a strong emphasis on the preservation and enhancement of vegetative cover. All native growing things function as a watershed filter, removing those harmful polluting hitchhikers as the plants' long roots slow runoff before it enters the lake.

Other features of the new amendments have similar objectives of filtering and slowing runoff and preventing erosion. The percentage of a lot that can be covered with an impervious surface is reduced and setbacks from Crystal Lake are increased. There are stricter limits for construction on slopes, and new regulations apply to tree management. Vegetative buffer zones are required at the lake

shore; shoreline retaining walls and drainage culverts emptying into the lake are prohibited.

Taken all together, the updated Overlay ordinance stipulates more detailed township oversight and a comprehensive permitting process. To avoid costly mistakes, any property owner in Crystal Lake Township who is contemplating **any** project – building a deck or patio, removing trees, landscaping, remodeling, moving earth – needs to fully understand the zoning requirements **before** starting. Consulting the Zoning Administrator is strongly recommended.

While the Watershed Overlay amendments are currently only in effect in Crystal Lake Township, they are under consideration in the other administrative bodies that are part of the Overlay District – Lake and Benzonia townships and Beulah Village.

Since the objective of an Overlay District is to have a special unified approach to the protection of a unique



Looking west from uplands east of Beulah showing various kinds of land use in the watershed: forest, grassland, cultivation, wetlands, recreation, town development



PROTECTING THE CRYSTAL LAKE WATERSHED FOR 28 YEARS

Continued from page 4

area, all Crystal Lake’s watershed jurisdictions need to adopt similar updates. Crystal Lake water pays no attention to township boundaries!

Don’t leave water quality up to the bureaucrats!

Updated ordinances provide expert guidance for the best practices to protect our environment, but all who inhabit or visit the watershed can do our part. The Michigan Department of Environment, Great Lakes and Energy (EGLE) warns: “The number one threat to lake health is land use.”

There are simple ways that each of us can improve the way we use the land of the Crystal Lake watershed. Here are some of the most effective:

1. Avoid turf grass lawns, especially close to the lake. Grass roots are shallow and don’t provide filtering. In addition, maintaining a lawn often requires chemicals and frequent watering. Grass attracts undesirable waterfowl such as geese, whose droppings add to the pollution.
2. Adopt lake healthy gardening Use native plants with long roots and avoid pesticides, herbicides and other chemicals. A vegetative buffer of this type is particularly beneficial close to the lake shore. Install rain gardens to control erosion and runoff.
3. Plant trees. Their roots increase soil filtration, and their canopies reduce stormwater runoff.
4. Reduce the amount of impervious surface. Choose materials such as pebbles and pervious pavers for your driveway, walkways, and patios.
5. Maintain your septic system. Have it inspected and pumped regularly, repaired or replaced if no longer working properly.

The CLWA Land Use committee produced a series of informative articles on best practices for watershed land use that appeared in the *Benzie County Record Patriot* during the summer of 2020. It is available as a booklet, “Stewardship for a Healthy Watershed,” on the CLWA website, www.CrystalLakeWatershed.org.



Evergreen and deciduous forest from slope on North Shore



Permeable driveway on South Shore



Native plants in rain garden and minimal mowed area on South Shore

WEBINAR ON LAKE-FRIENDLY LANDSCAPING AND EROSION CONTROL

The Michigan Shoreland Stewards Program is presenting a free webinar on Wednesday, April 13, 2022, from 2:00 to 3:00 p.m. It will demonstrate best practices for the use of shoreline property, help landowners assess the methods they are using, and provide recommendations for improving lake health. To register, go to www.mishorelandstewards.org.



MANAGING INVASIVE EURASIAN WATERMILFOIL

The CLWA began its long-delayed treatment of Eurasian Watermilfoil (EWM) during the summer of 2021, under the terms of authorization provided by the Michigan Department of Environment, Great Lakes, and Energy (for background, see *Crystal Whitecaps*, 16:1).

Despite unfavorable weather conditions on June 29, the CLWA team was able to treat almost all of the 7-plus acres of infestation, including the most heavy growth on the east end of the lake. A second treatment on July 27 completed the program for the year.

Inspection by aerial drone and underwater observer tube during the fall of 2021 documented greatly reduced EWM mass at the Beulah launch and at Cold Creek outlet. Most of the invasive plants were whitened, lying on the bottom, and appeared to be disintegrating. All the treated areas around the lake were checked and all showed effects of treatment.

The full results of the 2021 EWM management program will not be

clear until spring of 2022, when EWM plants normally begin to emerge. At that time, CLWA will inspect the treated areas to document the state of growth and determine whether a second treatment will be necessary in 2022. The CLWA is acquiring the required permit in that event, and will provide full legal notice to the public and affected riparian property owners.

The CLWA Eurasian watermilfoil management project originated from the comprehensive aquatic plant survey carried out in 2016-2018, which revealed the presence of invasive EWM (*Myriophyllum spicatum*) on ca. 6.05 acres of Crystal Lake's ca 10,000 acres of bottomland. This fast-growing invasive is common throughout Michigan, and if allowed to spread uncontrolled, can take over a lake's ecosystem and obstruct recreational activities and aquatic life.

CLWA's treatment of EWM is central to its mission to "Protect Crystal Lake Now for Generations to Come." It would like to thank all the property owners who provided their permission to treat the milfoil on their lakebeds and

for all the support we have received from the community as a whole. More details on the planning process, permit regime and regulations can be found on the CLWA website.



Preparation for EWM treatment June 2021: Clear Water Lake Management (l), Zero Gravity Aerial (r)



Eurasian watermilfoil invasive aquatic plants

"KEEP CRYSTAL CLEAR" EVENT RAISES FUNDS FOR CLWA

The CLWA motto, "Protecting Crystal Lake Now for Generations to Come," came to life on July 16, 2021, at the Five Shores Brewery in Beulah.

Lindsay Saldebar and Tommy Heidt, grandchildren of two long-time members of the CLWA Board of Directors, organized the event to bring together the communities and generations who want to preserve Crystal Lake, this precious natural resource that holds so many memories.

Nearly 200 attended and were able to spread out over Five Shores's outdoor



"Keep Crystal Clear" at Five Shores Brewery, July 2021

space on a beautiful summer evening. They enjoyed food, drinks, music and seeing old friends who had been Covid-isolated for some time.



Tommy Heidt and Lindsay Saldebar, organizers of "Keep Crystal Clear"

Plans are underway for the "second annual" Keep Crystal Clear in July 2022, so watch for further information.



BOAT WASHING UPDATE

Awareness of the Michigan campaign “Clean Boats Clean Waters” is growing, but probably not as fast as aquatic invasive species (AIS). Both the Benzie Conservation District and Michigan State University Extension operate mobile boat wash systems that are available for events in four regional counties and throughout Michigan. The CLWA receives regular inquiries from other lake associations wanting to establish their own.

Yet in southeastern Michigan the Department of Natural Resources is pushing to construct a new public boating access site without providing a decontamination station. The lake involved already has four different AIS present, so thus can be considered a “predator” lake – if exiting watercraft are not cleaned before entering other lakes, they will bring AIS hitchhikers with them. This lake is also susceptible to the introduction of *additional* AIS brought by unwashed boats from other lakes, further degrading this valuable recreational resource.

As old-timers may remember, this is the same issue that embroiled the CLWA in a costly legal battle back in the early 2000s, which resulted in a settlement allowing the CLWA to construct and operate the boat washing station on Crystal Lake at the DNR boating access site on Mollineaux Road. (For an account of this resolution, see <https://crystallakewatershed.org/boat-wash/>).

Since the CLWA boat wash opened in 2013, it has protected Crystal Lake by providing free washing facilities 24/7, May through September. The DIY process is fast and easy, and friendly helpful staff is on duty during peak times.

The past two summers have experienced a substantial increase in boat launches, over 1,000 boats more than recorded in 2019. Of these, over 800 were washed each season, with a slightly lower percentage in 2021 than 2020. Staff interprets the statistics as

indication that boating increased during Covid, but boaters were remaining closer to home. Regular users of the boat launch are issued a “Green Pass” stating that they only navigate in Crystal Lake and thus do not require washing.

Crystal Lake is fortunate to have a spacious, well-equipped boat launch, but the many secondary launch sites around the lake – where no washing facilities are provided – have long been recognized as potential entry points for AIS. These consist of public parks at Beulah and Bellows, as well as undeveloped road ends. To further education among the boating public, the CLWA in 2021 installed new signage at 25 launch sites around the lake. The signs provide information on Michigan law, the location of the DNR access site with its boat wash, and point out that non-motorized craft can also carry AIS. New signage on the boat wash itself has improved instruction about its use.



CLWA boat washing station at Mollineaux Road



Boat wash staff 2021: Allison Barker, Eric Costa, Gary Herbert (manager), Jeff Karns (volunteer)



Signage at secondary launch sites

Protecting Crystal Lake Now for Generations to Come.



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CRYSTAL WHITECAPS

is published twice a year and is a benefit of membership in the Crystal Lake & Watershed Association. Back issues and membership information are available on the CLWA website:

[crystallakewatershed.org/
education/newsletter](http://crystallakewatershed.org/education/newsletter)

CLWA ANNUAL MEMBERS MEETING 2022

All are welcome to come and hear updates on swimmer's itch control, invasive species treatment, and other current CLWA activities.

**SATURDAY
JULY 23 AT 9:30 A.M.
CONGREGATIONAL SUMMER ASSEMBLY
COMMUNITY BUILDING**

CLWA ANNUAL MEETINGS 2020 – 2021

The CLWA held a virtual annual meeting in 2020 and a hybrid meeting in 2021. New trustees and officers were duly elected, and a bylaws amendment was approved that changed the name of the Zoning and Land Use standing committee to "Land Use committee." Reports on current activities were given, and members attending had the opportunity to ask questions.

Full minutes and video recordings of the meetings are available on the CLWA website.

MEET THE CLWA!

The CLWA will be participating in these local events during the summer of 2022. Please visit our booth and say hello! Let us know what's on your mind. Information on protecting our watershed will be available. CLWA T-shirts and hats will be for sale.

- | | |
|--------------|---|
| July 27 | Congregational Summer Assembly Arts and Crafts Fair 10 a.m. – 4 p.m. |
| July 30 | Keep Crystal Clear Fundraiser, Five Shores Brewery, Beulah |
| August 6 | Beulah Sidewalk Sale and Community Showcase 10 a.m. – 4 p.m. |
| August 19-20 | Frankfort Art Fair |

Watch the CLWA website for possible changes and cancellations.