



QUARTERLY

THREE LAKES ASSOCIATION

SERVING LAKE BELLAIRE, CLAM LAKE AND TORCH LAKE IN NORTHWEST MICHIGAN

FALL 2023

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2023 Internship Program Update

By Gary Bart

Every summer Three Lakes Association seeks out local high school students with interest in aquatic science and the water quality of our beautiful area lakes. Three candidates were selected for the 2023 Internship Program after submitting their applications to TLA's website. The annual program is an excellent opportunity for students to gain valuable knowledge and experience in scientific field work, data analysis and reporting.

This summer's program followed up on work performed on Torch Lake last year by interns looking for Diporeia, a small native crustation in bottom sediments critical to the aquatic food chain, which increasingly is being forced to compete with invasive mussels. In addition to Diporeia, last year's interns uncovered the presence of quagga mussels, an invasive species similar to zebra mussels, in what appeared to be far greater densities and distribution than was previously believed.

The goal this year was to document the extent of this invasive mussel infestation in Torch Lake. For seven weeks the interns met every Thursday morning and boarded boats driven by TLA volunteers. For the next few hours, they collected samples from depths of up to several hundred feet below the surface using specialized equipment. With guidance from their mentors, the interns also adapted an underwater video camera to augment their collection of physical samples. It was a great way to enjoy the beauty of Torch Lake while gathering important ecological information. The samples and location data collected during each outing were then evaluated by the interns who were required to formalize their findings in a scientific report presented to TLA's board of directors and to their respective



Josh Woollard, Isabelle Borden, Steve Laurenz, Gary Bart, Carter Massey, Jeanie Williams and Alyssa Cogan

school boards.

Former TLA Executive Director Jeannie Williams led the program with assistance from Aylssa Cogan, MSU junior studying Environmental Science, Gary Bart, TLA education committee member, Beth LaVasseur, TLA volunteer, and our Torch Lake boat captains, Brian Hayes, Robert Milliron, and Greg Fredericksen.

This year's interns weighed in on their experience and here's what they had to say:

Carter Massey, Junior, Bellaire High School: "I joined the internship program this summer to gain life experience in the field of the job I dream of." "I loved the whole experience and would absolutely recommend this program to other high school students because this internship was an enriching experience and a great way to meet fantastic people."

Isabelle Borden, Junior, Kalkaska High School: Isabelle enthusiastically indicated that it was a great experience and recommended it to others during her presentation to the Kalkaska School Board.

Josh Woollard, Junior, Central Lake High School: "I thought it was a great learning experience." "I learned so much new information and I thought overall it was great."

"My best memory would have to be the crazy storm boat ride with captain Brian!"

Sneak peek

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New Board Members



Casey Wiggins Torch Lake has been a part of me since my parents bought a lot in 1955 and built a cottage. Summers were always spent here and, when I became old enough, I joined my dad and his friends fishing the lake and hunting the area throughout the year.

Educated as an engineer at Western Michigan University, I took a job as a design engineer fresh out of school. But soon after I found my calling in the data processing (now Information Technology) field. I spent 38 years in several different roles and retired in 2017 as a consultant and project manager to Fortune 1000 firms.

I'm still an avid pilot and skydiver (not at the same time) – this picture is from last weekend. My interest in serving TLA is toward preserving the beauty and serenity of Torch Lake and the local environment for everyone to enjoy as I have been blessed to.



Mike Haley My wife Mary and I have been lucky enough to enjoy the same beach and sunsets that drew my parents to Torch Lake some 80 years ago. I moved to Traverse City in 1977 where I practiced law and then served as District Judge for eighteen years before retiring in 2015. I still work as a judge occasionally, but mostly you can find me swimming in Torch Lake or riding my bike somewhere near Torch. We live on the same property my parents bought when Lone Tree Point really had only a couple of trees. The Bellaire log cabin they used as a summer place is now part of Torch folklore and we built a slightly bigger cabin on the same dirt. I am hoping to make some contribution toward the quality of the water we all love by serving on the TLA board.

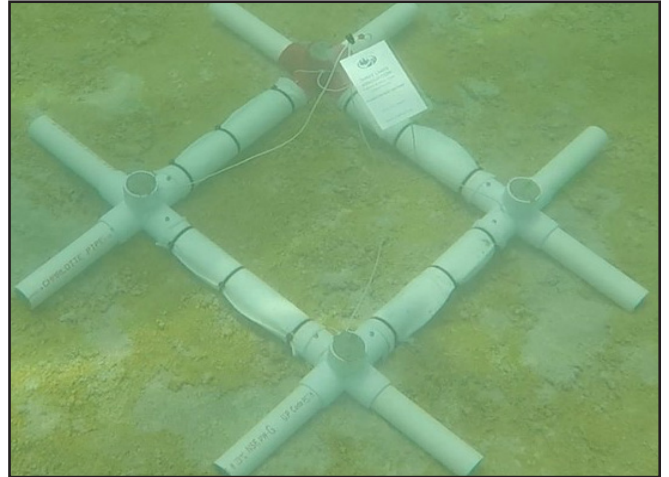
In-lake GBA experiments update

By Jan Stevenson

The last article I wrote for this newsletter described an experiment conducted during August 2022. In that experiment, named the high nutrient experiment, we released small amounts of phosphorus and nitrogen on the bottom of Torch Lake to determine if changes in phosphorus or nitrogen availability, or both, were causing the development of thick golden brown algal mats (GBA). We did the experiment in an area of the lake where the abundance of GBA is very low so an increase in phosphorus, nitrogen, or both would indicate excess nutrients were responsible for GBA development. The high nutrient experiment was designed to determine if groundwater or surface water enrichment by phosphorus or nitrogen, from septic tank contamination or runoff for example, could be causing GBA.

During August 2022 we also ran two other experiments to determine if a decrease in phosphorus could cause GBA development. The rationale for these experiments was to determine the plausibility that the decreasing phosphorus concentration during the last 20-plus years in many large low-phosphorus lakes in northern Michigan, caused GBA. We refer to this as the low P hypothesis. Calcareous algal mats like GBA are known to be limited to very low phosphorus conditions in high calcium wetlands and streams because phosphorus pollution which occurred in some of those ecosystems caused the loss of those calcareous mats. High abundances of calcareous algae can accumulate in low phosphorous habitats even though the algae are growing more slowly than in high phosphorus environments because the calcareous matrix makes the algal mats resistant to physical disturbance so they endure for a long time.

Planning the low P experiments was challenging because we cannot actually decrease phosphorus concentrations further in the lake. But we thought that if we increased phosphorus concentrations in areas where GBA was occurring in relatively high abundance, we should see a decrease in GBA-like characteristics of the algae. The added phosphorus is expected to increase



PVC pipe frame positioned on lake bottom

algal growth in general but that added growth and the existing algae at the location would become less characteristic of GBA.

We used two low P experimental set-ups to determine if phosphorus enrichment decreases GBA characteristics in benthic algae. For one of them, we used PVC pipe frames like the frames I described in the newsletter last year for the nitrogen and phosphorus enrichment experiment. Four PVC pipe frames were filled with phosphorus-laden agar and four other control-treatment frames contained only agar. The frames were placed on the lake bottom in areas where relatively high GBA occurred. If the low P hypothesis is true for Torch Lake and other northern Michigan Lakes, we expect characteristic GBA to continue to thrive in the control treatment but lose its characteristic GBA features in the added-phosphorus treatment.

In the second of the two low P experimental set-ups we fashioned bowls made from four-inch diameter PVC tubes cut into four-inch long sections. The bottoms of the bowls were capped and agar with or without phosphorus was added to the inside bottom of each bowl. The agar was covered with fabric to separate it from the algae and sand that would be added in the next step.

Algae and sand were collected from the lake bottom, mixed, and added to the bowls. The bowls were then lowered to the lake bottom and left undisturbed until we collected them about a month later. For the same reasons as above, we expected to get more algae growing in the high phosphorus bowl treatment than the control bowl treatment, but we expected characteristic GBA algae only in the control bowl treatment if the low P hypothesis is true. We ran the bowl experiment because

continued from page 2

I thought it would be more sensitive than the frame experiment which requires large changes to occur in the pre-existing thick mats for differences between treatments to be detected.

When we combine results from the three experiments run during August 2022, we should learn whether an increase or decrease in phosphorus is causing GBA. In combination with ongoing and past surveys of lake bottom algae in Torch Lake and other lakes of northern Michigan, we hope multiple lines of evidence will be available to formulate conclusions about the changes in water chemistry that have caused development of GBA over the last 20 years in Torch, Bellaire,



Four-inch diameter PVC bowls

and other northern Michigan lakes. When we couple information from TLA's support of research relating GBA to water chemistry with the USGS research linking changes in

water chemistry to natural and human factors regulating watersheds, we will understand how human activities have caused GBA and what can be done to solve the GBA problem.

Editor's Note:

"Three Lakes Association has spent nearly \$100,000 over the last 6 years trying to better understand what is Golden Brown Algae (GBA) and what is causing it's recent increased growth in Northern Michigan lakes. We plan

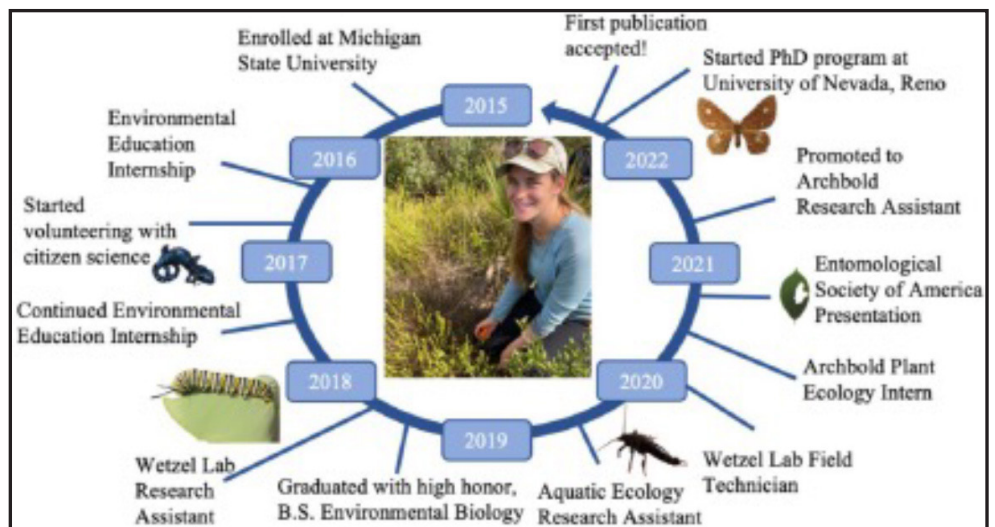
to continue our research over the next several years to better understand how water chemistry changes in our lakes have impacted GBA. If you would like to contribute to our GBA Research Fund to support this ongoing effort, please see the attached link for instructions. All

donations to our GBA Research Fund are fully tax deductible. Donate - members.3lakes.com.

Visit the IPR news page where you can read or listen to the GBA article. interlochenpublicradio.org/tags/news

Catching up with Haley Dole

My 2014 internship with the Three Lakes Association was truly amazing. Not only did it provide a summer filled with unforgettable experiences, but it also equipped me with invaluable skills in science and field ecology. The experience I gained from my internship helped pave the way for my journey into ecological research later as I pursued my Bachelor of Science degree at Michigan State University. Upon graduation, I worked in research labs, including a plant ecology, a plant-insect interaction, and an aquatic ecology lab for three years. These diverse experiences deepened my passion for the field. I am now a graduate student in the Ecology, Evolution, Conservation Biology Program at the University of



Haley Dole

Nevada, Reno. I have recently published my first research paper in the journal Florida Entomologist, Insect Herbivory Following Fire on *Lyonia fruticosa*, an Ericaceous Shrub of Florida Scrub, and I am an author on a few other exciting papers on the way. My TLA internship was my first work experience in ecology and served as a steppingstone into the field. I am forever grateful for the experience. Conservation is key. During undergrad, I volunteered three years with the Grand Traverse Conservation District controlling invasive species and with Grass River Natural Area

monitoring aquatic macroinvertebrates annually. I learned volunteers have a huge impact and I made connections with many organizations. Insects are key components of trophic interactions and play important roles such as pollination, however, as my grandpa observed, insects are in decline. My PhD research goal is to contribute to our understanding of how high insect diversity is maintained in pristine systems, and provide insight into the ways disturbances are contributing to insect loss. With my graduate education, I aim to become a female entomology professor and run my own plant-insect interaction ecology lab in the future.

Loons

By Fred Sittel

If you spend any time near one of our three lakes you have likely heard the seemingly lonely call of a Common loon (*Gavia immer*) in the middle of the night. At other times, loons can be downright noisy. They make a variety of calls and some, such as when claiming their lake territory to other passing loons, can sound quite alarming. Whether it's their call, prominent black head and red eyes, or the detailed color pattern of their feathers, loons are prized summer visitors to the Elk River chain of lakes.

Over the years the range of loons in Michigan has steadily crept northward as lakes have become more developed. Thanks in part to local volunteers, Bellaire, Clam and Torch Lakes continue to attract significant numbers of these large, solid boned water birds which can grow to weigh ten pounds with wingspans greater than three feet. Volunteers are making a difference by providing breeding pairs with Artificial Nesting Islands (ANI) made from floating plastic pipe wrapped with fabric or wire mesh and covered with straw or sedge grasses. Loons are attracted by these artificial islands anchored a distance from the shoreline because they provide isolation from predators such as raccoons, mink and ferrets which threaten their eggs. Less developed lakes often have abundant natural outcroppings in marshy areas away from shorelines but nesting may still be impacted from year to year by varying springtime water levels which inundate natural



Clam Lake ANI this May

outcroppings. The floating ANI's help avoid these problems.

Banding and tracking of loons on the chain of lakes conducted between 2009 and 2015 demonstrates that loons often return to the same lakes and territories for many seasons. In 2011, a male bird captured on Lake Bellaire to collect blood and feather samples was found to be carrying a Fish and Wildlife Service tag that identified it as a juvenile on Clam Lake in 1991.



A loon rises to the surface of Lake Bellaire after traveling underwater.

Because of their body weight and narrow wings, loons fly straight and fast with their wings constantly in motion. On water, they are proficient divers often traveling underwater for hundreds of yards at incredible speed. A single dive may last from five to ten minutes. Their diving prowess is aided by large webbed feet and strong legs. The cross section of the leg is shaped like an airfoil to reduce drag and their legs are positioned far back on the body to optimize swimming underwater. But this adaptation means they can only stand upright briefly on land and cannot walk at all. A loon which finds itself on solid ground a great distance from water will be unable to take flight again on its own. When flying overhead, their stout legs and large feet can be seen trailing well behind their modest tailfeathers. Unlike ducks and geese that land on water feet first like a water skier and flap their wings to brake against the air, loons land fast and skid to a stop ungracefully on their bellies without using their wings to slow down.

Although loons are long lived, it takes fledglings five to eight years to begin breeding successfully and typically lay only two eggs per season so every successful nesting is important to keep population numbers up. This summer volunteers helped by managing four ANIs on Lake Bellaire and one on Clam Lake. In the fifteen years since the spring of 2009, when the current Clam Lake ANI was first placed at a location near the mouth of Grass River, it has been used by breeding loons twelve times. A total of eighteen chicks hatched over those years, eleven of which survived and were observed to have fledged. Thanks to many other local volunteers, ANI's can also be found each spring on Intermediate Lake, Thayer Lake, Torch River Bayou, and Elk-Skegemog Lake.

Loons may be spotted in the area starting in March or whenever the ice first leaves the lake. Many of these birds are on their way to lakes farther north. Eventually a territorial pair will reunite on a local lake. They nest far apart from other loons and claim a large area as sovereign territory. Loons will begin using the ANI soon after arrival to mate, which along with incubating their eggs are the only two things that force them off the water other than flying. Incubation starts in early to mid-May and chicks hatch around thirty days later. From the day they hatch chicks spend most of their time in the water or on their parent's backs. Throughout the summer months adults can be seen feeding their chicks constantly with a high protein fish diet which enables fast growth. Sometime in September the adults suddenly decide to leave their chicks, which by then have grown to near adult length, and go their separate ways to overwinter in salt water along the Atlantic and Gulf Coasts. Chicks, now able to feed and protect themselves, stay around longer until colder weather forces them to leave. Then we are left waiting for another spring and the return of Common loons to the chain of lakes.



A pair of loons and their single chick on Clam Lake this summer.

Science grants awarded for the 2023-2024 school year

By Steve Laurenz

Three Lakes Association (TLA) is excited that our Science Education Outreach Program (SEOP) expanded in 2023 to include more teachers! Each spring TLA reaches out to the local elementary schools to offer grants for field trips, programs, in room supplies and activities for students who would not likely be able to have these experiences. Once again, all the funded programs are excellent examples of hands-on science and environmental education for five of our local elementary classrooms. Grants for this school year have been awarded to nine teachers:

- Stephanie Gustafson from Birch Street Elementary is taking kids to AuSable Institute. Here the children will learn cycles in nature such as, water cycle, insect life cycle, and erosion.
- Kara Bontrager from Birch Street Elementary is taking kids to the Grass River Natural Area. Here the children study streams, find tracks, scat and other animal signs, and learn about reptiles, amphibians, fossils, rocks, minerals, seeds, plants, and trees.
- Raven Ziebarth from John Rodger Elementary will take a kindergarten class to the GT Butterfly House and Bug Zoo where students learn from experts about insects, their needs and ecosystem, and how we affect their ecosystems.
- Rebecca Molski from John Rodger Elementary is taking her class to Habitat Needs-Sleeping Bear Sand Dunes. Here they discover what plant and animal species live in or travel through the dunes at Sleeping Bear Sand Dunes. They will learn what factors make the dunes a challenge and learn about the ways they adapt to survive in this harsh environment.
- Donovan Eggleston from Central Lake Public Schools is using the funding to enhance their garden beds. TLA initially helped to fund these garden beds. The gardens allow for hands-on science, technology, engineering and math activities, as well as promoting environmental awareness, healthy eating, and sustainable farming practices.



Just a couple examples of hands on activities.

- Janet Steinhoff and Kevin Malboeuf from Rapid City is also taking kids to the AuSable Institute to learn cycles in nature such as, water cycle, insect life cycle, and erosion.
- Carolyn Woodhams from Mancelona and Kelly Wodehouse from Rapid City were both awarded grants for Grass River Natural Area and the AuSable Institute.

One of the requirements for teachers who receive a grant is to provide feedback from their events. This feedback includes newsletters to parents to share how Three Lakes Association provided the funding so their children could learn about our natural environment. You can look forward to this year's recipient stories and pictures in future newsletters and on our FaceBook page. Pictures from some of last year's events are included.

Our youth are our Environmental stewards of the Future, and these programs help ensure this future is supported. Our SEOP program continues to grow and expand so we need your help. If you would like to donate directly to support the SEOP grant program for the upcoming award cycle, please visit member.3lakes.com and indicate your donation amount under the SEOP program.

Great news for Watershed Protection!

Elk River Chain of Lakes Watershed Management Plan has been approved by the Department of Environment, Great Lakes, and Energy (EGLE), and the US Environmental Protection Agency (EPA).

A watershed management plan is a tool used to protect our waters from nonpoint source pollution and other threats. The Chain of Lakes plan summarizes information about the water resources, land use, and water quality within the watershed. Through extensive inventorying of nonpoint source pollution threats, such as road stream crossings, storm water, and shorelines, we were able to identify critical areas within the watershed. With this information, implementation steps were developed that, if implemented, will help restore and protect our waters.

This approved Watershed Management Plan allows eligible organizations to apply for implementation funds through EGLE's Nonpoint Source Program. The plan can be found here: www.watershedcouncil.org



Lauren Dey
Watershed Management Coordinator
Tip of the Mitt Watershed Council

Your TLA membership is more important than ever!

During the past five years the demands for water quality testing and environmental monitoring of Lake Bellaire, Clam and Torch Lakes have increased significantly and so has the cost of testing equipment and laboratory analysis. Your membership and donations support our capacity and leadership to preserve and protect the environmental quality of the lakes we love.

If you are not a current member, please consider joining. If you are already a member, please consider increasing your membership level.

You can send a check to Three Lakes Association, P.O. Box 689, Bellaire, MI 49615, or use your credit card at member.3lakes.com.

Thank you for your commitment to our beautiful lakes.

CONGRATULATIONS TO THE FIRST ANNUAL THREE LAKE ASSOCIATION FISH PHOTO CONTEST WINNERS!



Bart Family photos are the President's Choice and Best Kid's photo.
The Roberts Family submitted the Most Votes photo.
Thank you for participating. Join us next year for another Great Catch Fish photo contest!

Your Membership Donation Makes It All Happen!

It's easier than ever to renew and donate online at member.3lakes.com

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- ☐ Publicity
- ☐ Office/Data Entry
- ☐ Other

Three Lakes Association is a 501(c)(3) corporation. Your dues and other contributions are tax deductible.

To join Three Lakes Association,

Please visit our website 3lakes.com or return this form with your check to: THREE LAKES ASSOCIATION, P.O. Box 689, Bellaire, MI 49615

Advancing stewardship, now and for future generations

By Marissa Duque

For over 30 years the Grand Traverse Regional Land Conservancy has worked to protect significant natural, scenic and farm lands – and advancing stewardship – now and for future generations.

Working hand in hand with the local community, we've protected over 200 of the most ecologically significant properties in Antrim, Benzie, Grand Traverse, Kalkaska and Manistee counties.

Right now, there are roughly a dozen high priority land and stewardship projects underway—including one on Lake Bellaire.

The proposed addition to the Golden Days Loon Nature Sanctuary: After years of patiently waiting for such an opportunity, a proposed 28-acre parcel will connect the Golden Days Loon Nature Sanctuary to a large swath of privately protected land, creating a contiguous

350-acre tract of high-quality habitat including nearly 1.75 miles of shoreline. This would bring overall protection totals on Lake Bellaire's north arm to nearly 200 acres with 2 miles of shoreline. The proposed addition includes over 13 acres of undeveloped wetlands and 650 feet of shoreline that provide critical habitat for waterfowl species and nesting loons, and serve an important role in filtering runoff and protecting water quality in Lake Bellaire. Managed as a nature sanctuary, the property will be left wild and undisturbed forever.

UPDATE, PLEASE NOTE:

The Milton Township Torch Lake Natural Area project is not currently moving forward as the request to fund the project has been pulled.

If you have any questions or would like to support our efforts, please reach out to Marissa Duque, GTRLC Director of Development, at mduque@gtrlc.org or 231-929-7911.



GOLDEN DAYS LOON NATURE PRESERVE
PROPOSED GARDNER ADDITION



**If you know, you know.
This place is special.**



Grass River Management Plan Special Report for TLA members

**December 5 • 6:30 - 8:00pm
Education Event via Zoom**

Join us as we gather to acknowledge the work that has been done to protect the Grass River, organization around future protection projects, and celebrate the official launch of the Grass River Adaptive Management Plan (GRAMP).

Zoom Info: <https://us02web.zoom.us/j/89932160038?pwd=dCtxcmc0OFliZGRkSWNyQXpmNGZNdz09>

Meeting ID: 899 3216 0038 Passcode: 362797

6:30 Welcome

6:45 Understand the contents of the plan & hear about immediate action steps

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The mission of the Association is to provide leadership to preserve, protect, and improve the environmental quality of the Elk River Chain of Lakes Watershed for all generations with emphasis on Lake Bellaires, Clam Lake, Torch Lake and their tributaries.