THREE LAKES ASSOCIATION QUARTERLY
SERVING LAKE BELLAIRE, CLAM LAKE AND TORCH LAKE IN ANTRIM COUNTY, MICHIGAN
JANUARY 2016

Golden Brown Benthic Algae: 2015 Seasonal Growth

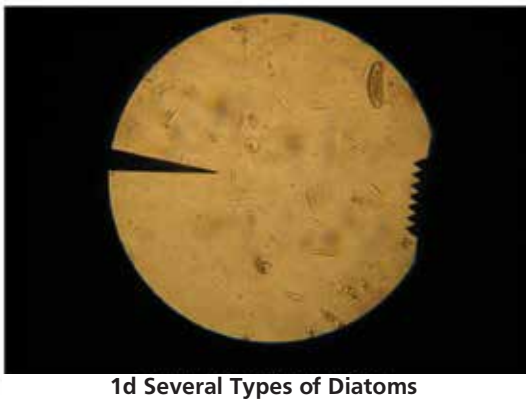
Trish Narwold, Becky Norris and Dean Branson

In 2015 aerial photos of the shoreline around Torch Lake were taken every month, as part of Three Lakes Association's golden brown benthic algae (GBA) investigation. These photos (courtesy of Art Hoadley) revealed a seasonal growth pattern. These mats of benthic algae started to grow on the near-shore sediment, sand, and rocks in large crescent arcs in June (photo 1a), and then the areas of algal growth significantly enlarged by August (photo 1b). Photo 1c of the same area about 1/4 mile north of Clam River was taken in September and shows these mats of benthic algae were beginning to recede. Similar patterns of seasonal growth were seen at other areas around the lake. Algae floating in the water column (phytoplankton) are a natural part of the food-chain, but these algal mats growing on the rocks and sand are neither normal nor desirable. So far it is our understanding that these algal mats are an aesthetic nuisance.

1a June 2015

1b August 2015

1c September 2015



1d Several Types of Diatoms

Photo 1d (courtesy of Becky Norris) shows a microscopic image of a few species of diatoms that make up the structure of these mats of golden brown benthic algae. According to Professor Rex Lowe (University of Michigan-Biological Research Station, Pellston, Michigan) about 140 different species of diatoms have been identified in these mats of benthic algae. Although some of the diatom species growing on the rocks and sand may be the same as the diatom species that typically live in the water column, a more detailed characterization of the species that make up these mats of golden brown benthic algae living on near-shore rocks and sand is expected in the first quarter of 2016. The diatom species that typically live in the water column can cause "algal blooms", such as recently reported in Lake Erie.

Sneak peek

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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 Bellaire, Clam Lake, Torch Lake and their tributaries.

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President's Message

Greetings to all,

Happy New Year to each of you. The year 2016 will see the fiftieth Annual Meeting of the Three Lakes Association. We will celebrate this significant mile-marker on August 11, 2016, at the Shanty Creek Resort. Be sure to mark your calendar! Planning for this event has been underway for nearly two years. If you are a person who would enjoy helping with this celebration, be sure to contact us by phone (231-544-7221), or by email (info@3lakes.com); or visit our website (www.3lakes.com) and fill out the volunteer form. Sandy Gourley is chairing this event; she will know what jobs still need willing hands to help.

Last year, the TLA Board lost several members for many different reasons. We lost three to death, others to heavy family obligations or career needs. If you've been thinking about stepping up and offering your service on the Board, now is the time to act. We have much to do in the coming year and would welcome your help. If you value the mission of the Three Lakes Association, and have a few hours you could donate in support of that mission, please get in touch (contact info above). We have room for you, whether on the Board, or in the field – or both.

Consider helping with our summer internship program, guiding local high school students as they learn about water sampling, native and invasive aquatic plants, the effects on our lakes of invasive species such as Zebra or Quagga mussels, measuring the health of streams by identifying and counting the macroinvertebrates that live there, and preparing a final report on their summer of environmental studies. Consider helping with the ongoing water sampling program that provides data for the long-term monitoring of the health of our waters. Consider helping with the building and deployment of fish shelters to provide needed habitat for the various fish species of our lakes – and to improve the fishing on these lakes. Consider writing articles on water-quality issues for our newsletter. Consider assisting with grant-writing and other funding opportunities to support the work of the association. Consider helping with our current investigation of the Golden Brown Algae, as we seek to learn what it is exactly, what causes its recently increased proliferation, and whether there is any appropriate remedial action to be taken. Whatever your talent or skill level, consider sharing it with us.

For the past fifty years, TLA has striven to bring science-based information to the people of our communities, and to provide sound environmental education to both young and old. It began as a grassroots, volunteer organization, with an ethical stewardship mission to use good science to monitor and maintain the health of our lakes and their tributaries – and it continues in that same guise to this day. We volunteer our time and our talent, and we contribute our monies in support of the mission "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 Bellaire, Clam Lake, Torch Lake and their tributaries."

If this speaks to your passions, please join us. It's hard work, but very rewarding!

Wishing you all the best in this new year of 2016,

Tina

New Members

Lewis Cooper III (LIFE member)
Janice Douglas
Philip & Bonnie Drick
Daniel & Linda DuBay
David & Joan Heinz
Steven & Catherine Hilfinger
Inspire Health Chiropractic
John & Ann Kassen
Thomas & Mary Lane
Mickey & Martha McGuire
Sally Miller Trust
Michael & Susan Novak
Claudia Penoza
Gustave & Kathleen Ploss
Michael & Pauline Suszan
Robert Trezise
David & Beverly Visser
Rachel Darnell
Mera Kohler
Andrea Smith
Jean Jocks
John Wright
Wade Roush
Mark & Sherie Priest
Randy & Jodi Balconi

Quaggas Drift Inland From the Freshwater Seas

By Kevin Cronk
Director of Monitoring & Research - Tip of the Mitt Watershed Council

Adrift in the freshwater seas, an unfathomable number of microscopic veligers (invasive mussel larvae) move through the Great Lakes at the mercy of wind, waves, and currents. Within a few days of inception, veligers develop new organs and a minute shell. Between 20 to 90 days, they begin to attach to rocks, wood, or even to other mussels on the lake bottom. Their reproductive and colonization strategies have given quagga (and zebra) mussels a competitive edge that has resulted in their spread to freshwater lakes and streams across the entire planet. Of course, humans and our global economy have greatly accelerated their spread with mussels hitching rides on boats and trailers.

While conducting an aquatic vegetation survey on Crooked Lake in early July, a handful of tiny mussels on the stems of aquatic plants caught the attention of AmeriCorps volunteer Matt Claucherty. Watershed Council field staff are accustomed to finding zebra mussels clinging to aquatic plants, which is why we strongly encourage removing weeds from boats and trailers, and why state law requires it. But these were different. Matt noticed slightly different coloration and patterns, but the clincher was the hinge side of the shell – it was rounded, not flat like that of the zebra mussel. Suspecting quagga mussels, specimens were sent to Ann Arbor where mussel researcher Ashley Baldridge, PhD, confirmed that there was a new invasive mussel in Crooked Lake.

Practicing due diligence, Matt immediately reported the infestation to the Midwest Invasive Species Information Network (MISIN), where he found this was the first report of quagga mussels in an inland lake in Michigan. Upon learning this, the Watershed Council shared the discovery with partner organizations, State and Federal agencies, and the media. This breaking news reverberated throughout the State, picked up by newspapers from Petoskey to Detroit.

Quagga mussels were first discovered in Lake Erie in 1989, just three years after the discovery of zebra mussels, but they did not spread and proliferate as quickly as the zebras. Mussel studies in Lake Michigan showed an explosion in quagga mussel populations in the early 2000s, reaching an estimated 950 trillion by 2011 – that's well over 100,000 mussels for every human on earth, and just in Lake Michigan! It seemed inevitable that they would spread to our inland lakes.

Although Matt only found quaggas at three locations near the Little Traverse Boat Launch on US31, subsequent surveys by the Pickerel-Crooked Lake Association determined they are present in other areas of the Lake. In addition, we learned that quagga mussels were found in Mullett Lake in 2012, but never reported on MISIN. Therefore, these invasive mussels will invariably spread to other lakes and streams throughout the Inland Water Route, if they haven't done so already.

What are the implications to the lake and stream ecosystems of the Inland Water Route? The answer is that we are unsure. Little research has been conducted on quagga mussel infestations in inland waterways. However, if changes brought on by quagga mussels in the Great Lakes are any indication, there may be serious and perhaps dire ecosystem changes on the horizon. Nutrient cycles and food webs could be significantly disrupted, which could lead to problems such as excessive algae growth and reductions in top predator (sports fish) populations. In spite of this setback, the Watershed Council has not lost hope and is taking action. We hope to work with a consulting company on a trial open-water application of Zequanox in Crooked Lake, which is an environmentally-safe quagga and zebra mussel control product. An aquatic vegetation survey scheduled next year will help determine if quaggas are present in Burt Lake. And most importantly, the Watershed Council is intent upon reducing the spread to other lakes and streams by redoubling invasive species outreach and education efforts to the boating community.

Left: Zebra mussel, Right: Quagga mussel

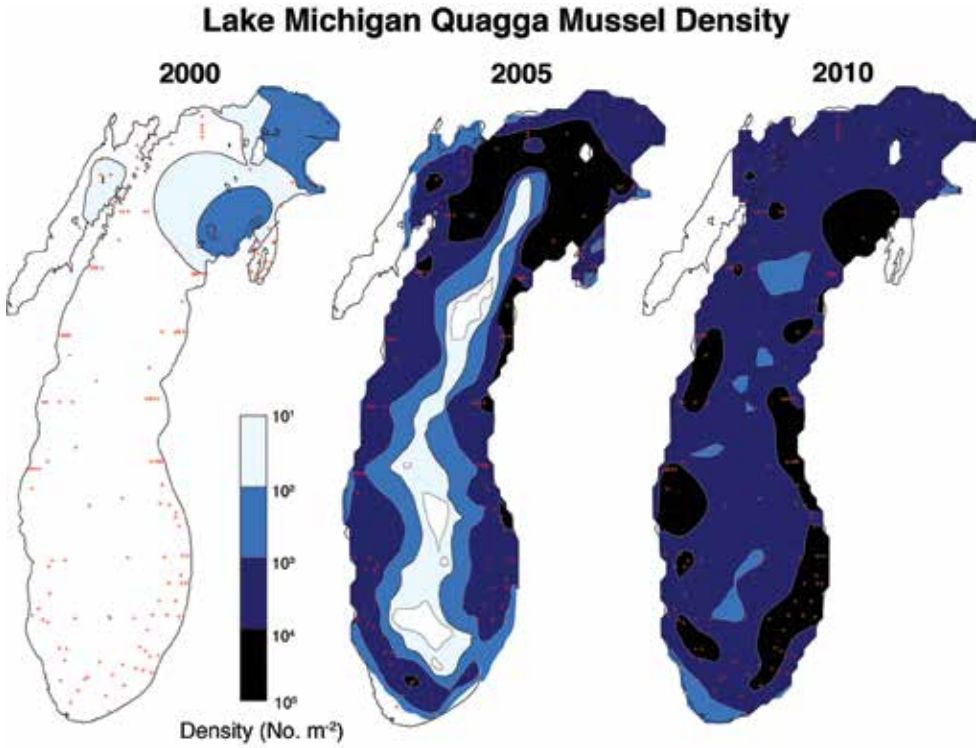


Illustration: Tom Nalepa, National Oceanic and Atmospheric Administration

The New Torch Conservation Center

In late summer 2015 the Torch Conservation Center (TCC) was created by a handful of committed Torch Lake enthusiasts. Their mission - to promote stewardship of the precious land and water in the Torch Lake Watershed. They have two main goals: To increase the acres of land in conservation; and To increase the number of residents using water-friendly practices.

Further, with only 5 acres of the 25,000 acre watershed preserved thus far, they have a lot of work to do! They will work to conserve land, regardless of its size. The team of experienced professionals will help landowners maintain the natural assets they treasure and protect the investment they've made in their land with four (4) conservation options available.

The Torch Conservation Center reaches out to visitors and landowners who've been touched by the spirit of the Torch Lake Watershed. They share how to live a water-friendly lifestyle, whether here for a day, a week, the summer or year round. They have designed the TRUE BLUE Living program which simplifies information, making it easy to understand and implement.

For more information:

Torch Conservation Center, Inc.
P.O. Box 178, Alden, MI 49612
(231) 377-7512
conservetorch.org






"It takes a Village." Special thanks go out to:

Antrim Conservation District for allowing us the use of all their great educational tools.

Jimmy Argo for providing plane rides to our summer interns and volunteers.

Deputy Scott Boni and the Antrim County Marine for an exceptional season of water safety and education throughout the Chain of Lakes.

Butch's Bait & Tackle, Helena Township & The Rowland Family for allowing benthic barrier testing in their adjacent waterways to control Eurasian water Milfoil.

Dole Family Foundation for their continued financial support of our water quality programs.

Duane Drake and the entire Cooperative Lake Monitoring Program team for their commitment to water testing in all three lakes since 1977.

Forest Home Township for supplying us meeting space for our monthly board meetings and special events.

The Gourley and Petty families plus Camp Hayo-Went-Ha for use of their lakefronts to study Golden Brown Algae.

Steve Grill, Gary Knapp and Dean Branson for their vigilant and continuous support of the TCE Plume remediation.

Art Hoadley our resident aerial photographer.

Ben Hollis and Heidi Shaffer for providing our educational program for the annual meeting.

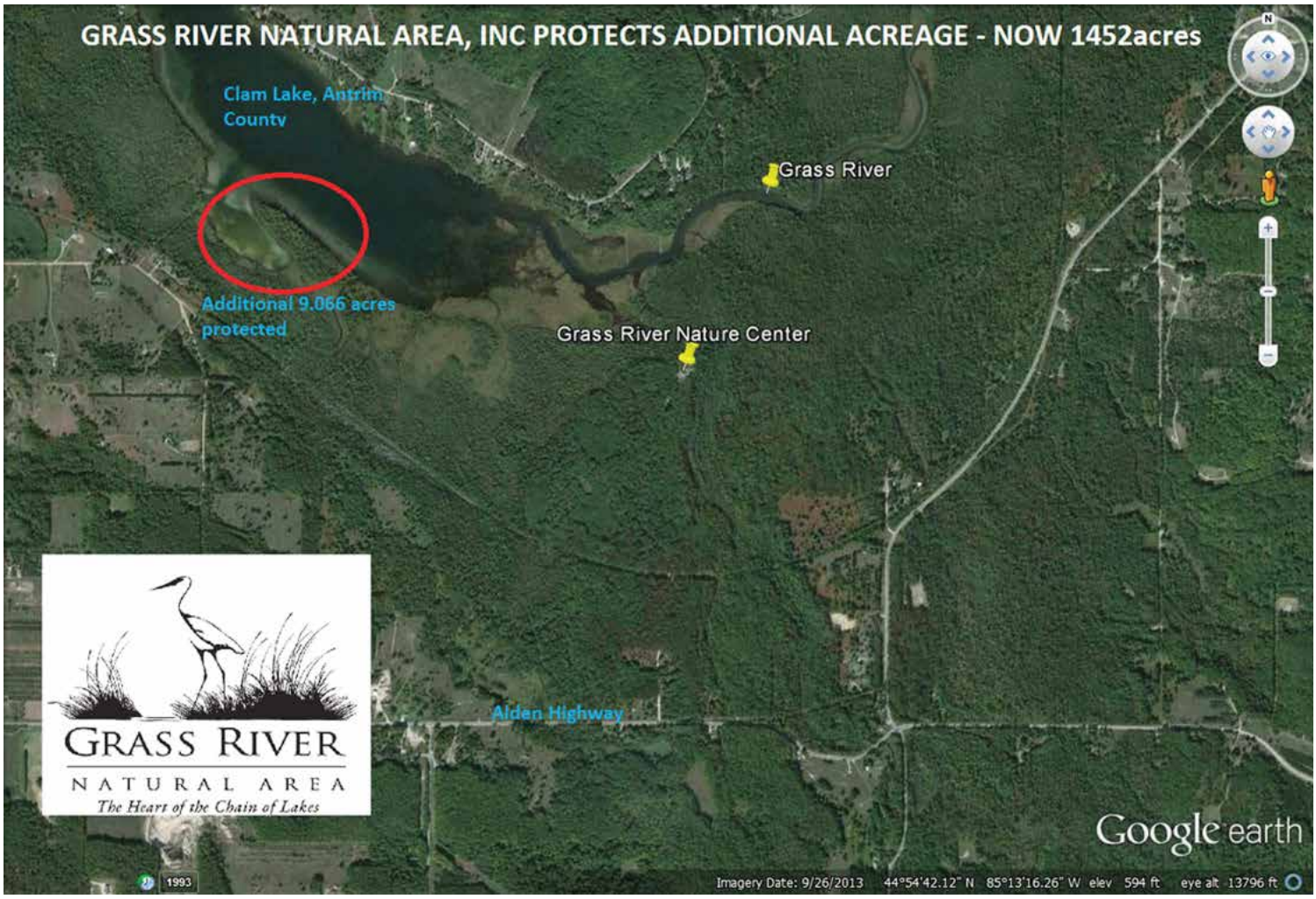
Lake Louise Association for the gift of 6 benthic barriers and materials to further our research.

Gordy Schafer and the Dockside - Torch Lake for their continued financial support for the Science Education Outreach Program.

Fred Sittel for the continued use his yard as a construction and storage site for Fish Shelters.

Mark Stone for his diligence moving the Large Woody Debris project forward.

TLPA for their continued financial support of the Sand Bar Study and Golden Brown Algae research.

Great News - Grass River Natural Area is Growing!

Grass River Natural Area, Antrim County – On December 18, 2015, Grass River Natural Area, Inc. (GRNA) purchased an additional 9.066 acres of forested wetland located on the south shore of Clam Lake – an ecologically significant peninsula contiguous with existing GRNA land. This important addition enlarges GRNA's protected lands from 1443 to 1452 total acres.

This acquisition could not have been possible without a substantial matching challenge grant from the J.A. Woollam Foundation and significant matching funds from Mr. and Mrs. Matt and Deb Knudstrup of Rapid City, MI. In addition, many generous donors have given to our Land Protection Fund over the years which aided in the preservation of this parcel. GRNA, Inc. Board of Directors, Executive Director, and staff could not be more grateful for the generosity of all who made this acquisition possible.

This particular parcel has been on GRNA, Inc's priority list for about 30 years. It is not only significant in order to maintain high water quality within the Elk River Chain of Lakes Watershed but also to maintain the ecological integrity of wildlife habitat for species like the river otter, the common loon and several other species of waterfowl, diverse reptiles and amphibians, and sensitive wetland plant species.

Grass River Natural Area's (established in 1969) very first conservation efforts centered on acquisition of vital lands that offered resource protection of the Grass River and associated tributaries and wetlands. This 9.066 acre parcel has been a very important "piece of that puzzle" and is finally protected in perpetuity.

For more information, please contact:
Haley Breniser
Executive Director
Grass River Natural Area, Inc.
haley@grassriver.org
(231)-533-8314

Editors Note: How grateful we are that the TLA founders saw the importance of the Grass River and worked hard in the late 1960's to ensure its protection.

Watershed 101:

Algae

Algae are plants or plantlike organisms that contain chlorophyll and other coloring matter that trap light from the Sun. This light energy is then converted into food molecules via photosynthesis. Algae lack the true stems, leaves, or roots of plants and has a slimy feel.

Ecological Importance of Algae

Microscopic algae are the source of much of Earth's oxygen. Algae are the beginning of the food chain for other animals. Phytoplankton, a mostly single-celled type of algae, are eaten by small animals called zooplankton that drift near the surface of the sea. The zooplankton are in turn fed upon by larger zooplankton and small fish.

Algae are responsive to the physical and chemical conditions in the aquatic environment. Sometimes their rapid reproduction causes nuisance growths or blooms.

Algal Blooms

Algal blooms have dramatic effects on water chemistry. When algae remove carbon dioxide during photosynthesis they raise the pH by increasing the level of hydroxide. The opposite reaction occurs during respiration when carbon dioxide is produced lowering hydroxide and lowering the pH. Some algae produce toxins (most notably blue-green algae) and have been linked to the deaths of livestock and fish. They can also cause taste and odor problems or water discoloration.

Lake Erie 2011

Some algae form large mats, creating a nuisance, blocking passage or an aesthetic interference.

Blooms can be naturally occurring or influenced by human activity.

Scientists Eager To Try Out Lamprey Mating Pheromones

Regulators Recently Approved Substance To Manage Invasive Species In Great Lakes

By Chuck Quimbach

Sea lamprey pheromones — natural chemical secretions that can fool the parasites into thinking mating is in store — are a step closer to being used in the Great Lakes. The invasive sea lamprey have long harmed Great Lakes fish. Several means to control the lamprey are already being used. But the U.S.-Canadian Great Lakes Fishery Commission is celebrating a recent Environmental Protection Agency decision to register a sea lamprey mating pheromone as a biopesticide.

Commission spokesman Marc Gaden said the hope is to set up a fake love nest. "Maybe we could use the pheromone as bait in a trap, and instead of the lamprey swimming in a stream and thinking he's going to spawn, he instead would get sucked into a trap and we can remove that lamprey before it does have a chance to spawn," he said. But Gaden cautioned that the U.S. Fish and Wildlife Service still needs to do some testing and possible fine-tuning of the pheromone before it's used in the water. The lamprey pheromone is first pheromone biopesticide registered for a species that's a vertebrate.

Editor's Note: Wow! Jack Norris would have been bringing us this news if he was still with us. Jack brought us freshwater jellyfish, freshwater sponges and other exciting aquatic information for the many years he served as our Director Emeritus. Research is underway to use pheromones to combat other aquatic invasives.

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