Higgins Lake Property Owners Association

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To Protect, Preserve and Enhance the Quality of Higgins Lake and Its Surrounding Watershed

In this edition:

President's Message

Spring is a glorious season at Higgins Lake and the welcome to summer soon to follow. Ice-out date must be arriving soon!

Your HLPOA Board, committee members, and members-at-large continue with efforts and challenges to "protect, preserve, and enhance Higgins Lake and its surrounding watershed".

Please peruse this issue for detailed descriptions of some of our accomplishments, efforts, and plans for the betterment of Higgins Lake.

Think summer,
Charlene Cornell
HLPOA, President

Dedicated to Preserving the Quality and Beauty of Higgins Lake

Gerrish Lyon Utility Authority Meeting

The next Gerrish Lyon Utility Authority (GLUA) meeting will be held at the Gerrish Township Hall, Monday, April 18, 2022, 9:00 am

SAVE THE DATE
HLPOA Annual Meeting
Saturday, July 16, 2022, 8:45 am
Please note: This meeting may be virtual or hybrid. Watch for future announcements.

Higgins Lake Swimmer's Itch Update

When I first started writing this article, I began by saying that the Higgins Lake Swimmer's Itch Organization (HLSIO) was once again setting up to do the things we had done in the past. We intended to employ the same scientific team, Swimmer's itch Solutions (SIS), with the same people, Drs. Curt Blankespoor and Randy Dejong, that had been so successful in the past. SIS had once again been contracted to capture and relocate merganser ducks, taking them away from Higgins Lake before they could cause the parasitic infestation that results in Swimmer's itch (SI). We intended to relocate Canada geese as we had in the past, and we intended to hold our popular fundraising dinner in August. Plans for all these things were underway.

Before I submitted the article, things had changed. Due to what the DNR describes as a highly pathogenic avian flu that has already affected both wild birds and commercial flocks, relocation of merganser ducks and Canada geese will not be permitted this year. How this will affect Higgins Lake this summer remains to be seen.

In the past two summers we have not had merganser broods on the lake and relocation was not necessary. Another important result of our relocation program is that the snail infection rate needed to carry out the SI cycle has been kept to an extremely low percentage. But the "zero brood" scenario was highly unusual and seems unlikely to continue. Our relocation program has definitely been a factor in keeping mergansers from returning in the numbers that we had seen in the past, but yearly migration does allow for new birds to view Higgins Lake as a breeding ground.

For now, we will be pursuing whatever paths may be available to us and that we feel may help reduced SI on Higgins Lake. We have some thoughts about what we may be able to do and we have some research ideas to think about, but the relocation program is on hold.

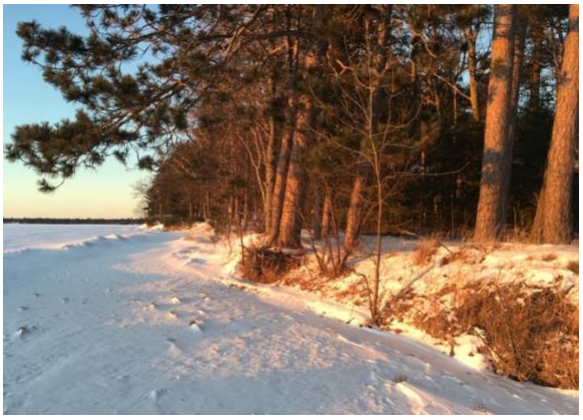
On the positive side, we do still plan to have our August dinner. There will be more information about this as the summer gets underway. Please feel free to visit our HLSIO website www.hlsio.org for Swimmer's itch information and potential updates to what we may doing this summer.

Thanks once more to all the HLSIO supporters. You have been the reason we have been successful in fighting Swimmer's itch on Higgins Lake. And on your behalf, the HLSIO Board considers it a privilege to work for the best interests of the Higgins Lake community.
Greg Semack, HLSIO Chairman

Lake Assessment Update
In August of 2019 Restorative Lake Sciences (RLS) was hired by HLPOA to create a comprehensive baseline study of Higgins Lake. Included was an invasive species assessment, and evaluation of the current health of the lake. That study is available on the HLPOA website and was reported on by Dr. Jennifer Jermalowicz-Jones at the 2021 Annual Meeting.

Now that the lake study project has begun, it is important that these studies are continued on a routine basis so as to continue monitoring the status and health of the lake. It could be said that we are purchasing a routine physical examination for the lake.

In the Winter Newsletter it was reported that the Board voted to hire RLS to return and conduct a lake assessment study to be conducted in late summer of 2022. This study like the original will be expensive, with the cost being approximately $19,000.00. **We are happy to announce that the study is fully funded and was made possible from annual dues and by very generous gifts made to the Environmental Fund by individuals and the Higgins Lake Land Conservancy. Thank you!**



Membership Update
Thank you to the many that have renewed their membership dues for 2022. The annual membership of $100. 00 is due each year by January 31st. Join now to ensure you are included in our 2022 Membership Directory.

Send checks to:

HLPOA
PO Box 55
Roscommon, MI 48653

Many members also add an extra contribution to their dues and ear mark it for areas of specific interest: Legal Fund, Environmental Fund or General Fund.

As always thank you for your support! Without you this great organization would not have been able to work the past 87 years preserving the beauty and quality of our beautiful lake.

Michigan Shoreland Stewards Program
On April 12, 2022, Michigan Department of Environment, Great Lakes, and Energy (EGLE) will be holding a seminar on how to implement lake-friendly landscaping and erosion control along your Michigan shoreline. To register for the webinar: **Michigan Shoreland Stewards Program: Does your inland lake property qualify?** https://content.govdelivery.com/accounts/MIDEQ/bulletins/3104573

Are Harmful Algal Blooms Possible in Higgins Lake? - Melanie Brown

With all the recent discussion about nutrients and other water quality issues for Higgins Lake, it may be helpful to take a deep dive into harmful algal blooms (HAB) and explore if that is a possibility for Higgins Lake. HABs have occurred in the Midwest U.S. lakes. In particular, severe blooms were observed in the western basin of Lake Erie in several years (shown below), and in 2014 access to drinking water for hundreds of thousands of people was temporarily interrupted due to elevated levels of a toxin associated with the bloom.

A European Space Agency (ESA) Envisat satellite.image taken on Oct. 8, 2011, using its MERIS sensor, showing harmful algal bloom in the western basin of Lake Erie. (ESA)

What organisms cause HAB?

The term HAB is a little confusing. HABs are caused by bacteria called cyanobacteria. (picture of bloom) Cyanobacteria can be found in the water as part of the phytoplankton along with algae. Cyanobacteria are interesting, as like plants, they use green pigment (chlorophyll a) to create energy from light and carbon dioxide through photosynthesis. Even though cyanobacteria are also called "blue-green algae", they are a bacteria, a less complex lifeform than algae. As a lifeform, Cyanobacteria are estimated to be 2.5 billion to 2.8 billion years old and likely gave rise to algae and plants on the evolutionary tree. A living example of the ancient cyanobacteria are stromatolites in Australia, pictured below. Cyanobacteria are some of the oldest types of lifeforms on the planet.

What conditions may lead to a HAB?

Higgins Lake has several conditions that may allow a HAB event. Because of the numerous variables that influence the occurrence, frequency, and duration of HABs, it is impossible to predict with certainty whether a specific water body will develop a bloom. The cyanobacteria that cause HAB need to be present along with the right environmental conditions to support the rapid growth of these cyanobacteria. Based on observations of affected water bodies, HABs often occur in waters with some or all of the following general characteristics: - High phosphorous concentrations (lakes that are eutrophic or hypereutrophic). - Low nitrogen concentrations. - Lakes that are shallow and thermally stratify. The ideal temperature for

cyanobacteria is around 25° C (77 degrees F). - Long water residence time, which supports high rates of growth and reproduction. - Low number of algal grazers (e.g., zooplankton). - Stable water conditions that support buoyant, surface-dwelling cyanobacteria. - The presence of zebra/quagga mussels

Higgins Lake has thermal stratification with warm water over shelves in the summer. In addition, the lake has a substantial population of zebra/quagga mussels.

What is the cycle for a HAB?

Under the right conditions, the cyanobacteria multiply rapidly, creating high concentrations of the cyanobacteria on the water surface and within the water column. Once the nutrients are exhausted, the cyanobacteria die and sink in the water column where they decay.

How is a HAB identified?

In general, it is not possible to just look at a bloom and determine if it is caused by cyanobacteria or an algae. Samples of the surface water and water column are looked at under a microscope to identify the types of algae and cyanobacteria that may be present. For a water body as clear as Higgins Lake, a bloom may be noticed if there is discoloration of the water or mats of growth on the surface. To determine if the bloom is harmful in Michigan recreational waters, the amount of cyanobacteria toxin (microcystin) is measured and compared to the World Health Organization limit of 20 ug/L or to other cyanotoxins at or above appropriate guidelines that have been reviewed by the State.

A bloom should be considered potentially harmful when the chlorophyll a level is greater than 30 µg/L and visible surface accumulations/scum are present, or cells are visible throughout the water column.

What makes the bloom harmful?

HAB can cause a number of harmful effects on the aquatic environment. The bloom at the surface of the water can block light from reaching plants located beneath the bloom, suppressing plant growth and habitat for animals that depend on these plants for cover, food and reproduction. Besides blocking light to plants, the decaying cyanobacteria deplete oxygen in the water, which can affect animals that cannot escape to areas where there is more oxygen. This lack of oxygen can kill fish and other animals.

Another potential harm is the release of toxins in the water. Not all cyanobacteria release toxins but some species release cyanotoxins as they decay. Cyanotoxins are among the most powerful natural poisons known. Some strains of cyanobacteria are capable of producing numerous toxins that can affect liver and brain function. Health symptoms commonly associated with cyanotoxin exposure include nausea, skin rashes, gastrointestinal distress, numbness, and fatigue. There have been reports in recent years throughout the U.S. of human illness and dog and livestock deaths associated with exposure to HABs. Fish and bird mortalities have also been reported in water bodies with persistent cyanobacteria blooms. Unfortunately, there are no remedies to counteract cyanotoxin effects.

The most widespread cyanotoxin in the U.S. is likely microcystin. Microcystin is a potent liver toxin and possible human carcinogen. Microcystis is the most common bloom-forming genus of cyanobacteria, and is almost always toxic. Microcystis blooms resemble a greenish, thick, paint-like (sometimes granular) material that accumulates along shores. Scums that dry on the shores of lakes may contain high concentrations of microcystin for several months, allowing toxins to dissolve in the water even when the cells are no longer alive or after a recently collapsed bloom.

Does Higgins Lake have Cyanobacteria that have been known to cause HAB?

A recent study of water from Higgins Lake included testing for cyanobacteria. (Restorative Lake Sciences Higgins Lake Improvement Study and Management Plan 2020. http://hlpoa.org/wp-content/uploads/2020/05/2020-Higgins-Lake-Study_Less-C_RDB-Edits.pdf). Water samples collected from the deep basins of Higgins Lake included three genera of cyanobacteria: Lyngbya sp., Polycystis sp., and Chroococcus sp. Some strains of Lyngbya sp. are capable of making toxins that can cause skin irritation, liver damage, or gastrointestinal and neurological symptoms. There is no indication that either Polycystis or Chroococcus genera release toxins, and it is not known if the Lyngbya sp. detected in Higgins Lake may release toxins.

Nostoc sp. is a cyanobacteria that occurs in shallow waters of Higgins Lake and is not known to release toxin. They form gelatinous blobs that rest on the shallow sandy bottom and are indicators of nutrient poor environments with extensive freezing. Some Nostoc sp. are used in cancer studies and eaten, but the Nostoc sp. in Higgins Lake has not been identified and should not be eaten. Nostoc sp. are not involved in HAB.

How Does Cyanobacteria get into Higgins Lake?

Studies have shown that Lyngbya sp. cells can be transferred from one water body to another by boat hulls and bilge water, and by many animal species (e.g. birds, turtles, raccoons, insects, etc.) This can involve cells attached to the surface of the organism, or via viable cells in fecal material. Cells can also be transported by wind events such as storms that can transport water droplets or particulate matter over large distances. It is likely that other cyanobacteria may enter Higgins Lake by the same methods. One more reason to thoroughly wash boats and empty bilges before entering the lake.

What is the Relationship Between Mussels and Cyanobacteria?

Research by the Michigan State University identified a relationship between zebra/quagga mussels and cyanobacteria. In lakes not infested with mussels, the cyanobacteria usually need high nutrients to result in a bloom. Mussels filter the water to ingest phytoplankton, which includes cyanobacteria. Lakes colonized by mussels tend to have substantially higher and more variable amounts of cyanobacteria in the water. It is thought that the mussels ingest and spit out cyanobacteria reducing competition with algae for nutrients and increasing the proportion of cyanobacteria in the water compared to other types of phytoplankton. Normally total phosphorus is a positive predictor of cyanobacteria concentrations at the shoreline, but this is only true in lakes that lack mussels. It is possible for Higgins Lake to have the conditions that could support HAB because of our mussel infestation.

How can we prevent a HAB in Higgins Lake?

There are only two of the factors listed above that we may be able to control to reduce the risk of a HAB in Higgins Lake. The first factor is to reduce to the extent possible the amount of Total phosphorus in the water. This may be done by reducing phosphorus inputs from individual septic systems, by using no or low phosphorus fertilizers, reducing surface runoff and maintaining green belts. The second factor we can influence is the introduction of invasive species, particularly mussels and cyanobacteria, on recreational equipment and vessels. Boats, floats, skis, and water toys should be cleaned before entering the lake, particularly if they have been used in another lake that has invasive mussels or HABs.

Hopefully, we will never experience a HAB on Higgins Lake but it is good to know more about how they can happen and what to do. For more recommendations regarding HAB, please see the Central Michigan Health Department website on swimming beaches and HAB at https://www.cmdhd.org/swimming-beaches-

New Addition to Huron Pines

Nick Theisen recently accepted a Water Program Technician position at Huron Pines. Nick's love of the state's aquatic resources grew from his frequent trips to visit his Grandparents (John and Mary Smith) and Uncle and Aunt (Brad and Becky Gibson) on Higgins Lake. Nick has a bachelor's degree in Environmental Science and Management with a minor in Science, Technology, Environment and Public Policy (STEPPs) from Michigan State University. Nick is skilled in identifying and conducting specie inventories in road and stream crossings. If you have a bug or a fish you cannot identify, he is sure to be able to figure it out for you.

***Lymantria Dispar* aka Gypsy Moth aka Spongy Moth**

The biological insecticide Btk (*Bacillus thringiensis kurstaki*) is a naturally occurring bacterial pathogen to the Spongy Moth. Btk has been an effective suppressant of the Spongy Moth population since the 1980's. When the Spongy Moth caterpillar eats this toxin, the alkaline gut and enzymes cause the caterpillar to stop feeding and die withing 1 to 2 days. This does not occur in humans, birds, fish, or other animals because of the acidic condition in their gut.

The Spongy Moth Suppression spray will occur in designated areas in May. An airplane sprays Btk which dries in 30 minutes. Btk has no effect on humans, pets, birds, fish, livestock, honey bees or other wildlife. To find out more about what you personally can do to help deter the Spongy Moth found on your property: http://www.roscommoncounty.net/DocumentCenter/View/1902/Moth-Busters-Egg-Mass-Hunt-2022?bidId=

Maintain a Healthy Waterfront

- Reduce runoff from your property going directly into the lake by planting a rain garden, harvesting rain water and minimizing pavement on your property. Plant deep-rooted Michigan native plants to help stabilize the soil and promote infiltration of the soil. For a resource guide for rain garden installation and plants to use go to: https://dnr.wi.gov/topic/Stormwater/documents/RainGardenManual.pdf
- Deter Canada geese by maintaining a vegetative buffer of 12"-24" between the lake and your lawn. Turf grass attracts Canada Geese. Stop mowing to the water's edge. Turf grass also has a shorter root system and provides an easy way for pollutants to enter the water.
- Do not dump grass clippings and leaves into the lake. It is against Michigan law. Grass clippings and leaves add excess nutrients and use up oxygen when they decompose.
- Avoid using fertilizers. If you must, use Nitrogen (N) 29, phosphorus (P) 0 and potassium (K) 4 (29-0-4.) to protect water quality. To find out what nutrients and organic matter your soil needs, get your soil tested. Michigan State University Extension Bookstore has soil test kits available for purchase. https://www.canr.msu.edu/spnl/Sample-Submission/soil-test-for-home-lawn-garden

Election Committee
Election of Directors for the HLPOA Board are held during each Annual Meeting of the Members. If you have an interest in running for a position on the HLPOA Board, please forward a short resume to hlpoa0@gmail.com or mail directly to HLPOA, PO Box 55, Roscommon, MI 48653. Due date for all submissions is May 13, 2022. If you would like more information regarding the Board, please contact Elections Committee Co-Chair, Robert McKellar. He can be reached at rlmckellar@msh-iplaw.com or 989-631-4551. The committee has sought and continues to seek applicants to fill positions on the Board during 2022. Incumbents seeking reelection this year (2022) are Wayne Brooks, Bruce Carleton, Curt Devoe and Herb Weatherly.

Higgins Lake Ice Data
Herb Weatherly has been HLPOA's "official" lake frozen and ice out data collector since 2006. At the time of this publication, we are awaiting Herb's "official" ice is off the lake for 2022.

Higgins Lake Ice Data

Freeze	Thaw	Snow Total
01/19/06	04/02/06	45.25
01/14/07	04/01/07	44.75
01/03/08	04/19/08	52.875
12/17/08	04/19/09	79.25
01/07/10	04/01/10	22
12/21/10	04/19/11	60.625
01/14/12	03/21/12	46.125
01/21/13	04/30/13	44.875
12/16/13	04/26/14	54.75
01/10/15	04/21/15	29.75
01/19/16	03/30/16	49.50
01/07/17	04/09/17	46.25
12/27/17	05/03/18	45.75
01/13/19	04/23/19	52.875
01/12/20	04/08/20	52.75
01/08/21		

Thank You Donors
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In memory of Bette Purdy: Bruce & Sally Cornett

2021-2011 HLPOA Board: President – Charlene Cornell, Vice President – Greg Semack, Secretary – Herb Weatherly, Treasurer – Bruce Carleton, Directors: Wayne Brooks, Jack Cornell, Becky Gibson, Curt DeVoe, Bob McKellar, John Ogren, Fred Swinehart. Administrative Assistant – Kathleen Barger