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Designed and published
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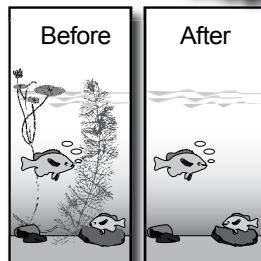
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FROM THE PUBLISHER

Welcome Spring



I am excited to feature Long Lake as our cover story for the spring issue of *The Michigan Riparian* magazine. There are quite a few Long Lakes in our state; the one we are highlighting is located in Kalamazoo County. It's a fascinating story about how their lake was formed; its early history and... you have to read about the sea serpent that once invaded the waters of Long Lake.

Michigan Lake and Stream Associations 56th Annual Conference is April 21 and 22. This year's conference is being held at Crystal Mountain Resort. See page 36 for more info or visit their website at www.mylmsa.org. The conference is an excellent place to learn more about preventing and managing aquatic invasive species, get a better understanding of Michigan riparian rights through Attorney Cliff Bloom, discover what riparian services are available by visiting vendor booths; and get the latest updates on numerous topics such as zebra mussels, starry stonewort, purple loosestrife and so much more. You will not want to miss this year's conference.

I hope you find this issue of the magazine useful, entertaining and informative and that it continues to lend you to best of lake living. In this spring issue you can read about proposed cuts to EPA, Round Goby Detection, lake muck, get briefed on the latest Road End details, Chara Vulgaris, how to sell your lake home and more.

Please keep sending us your pictures, questions and stories. We love hearing from you. If you are celebrating a wedding, hosting a reunion or other special event be sure to share your photos with us.

-publisher, Sharon Wagner

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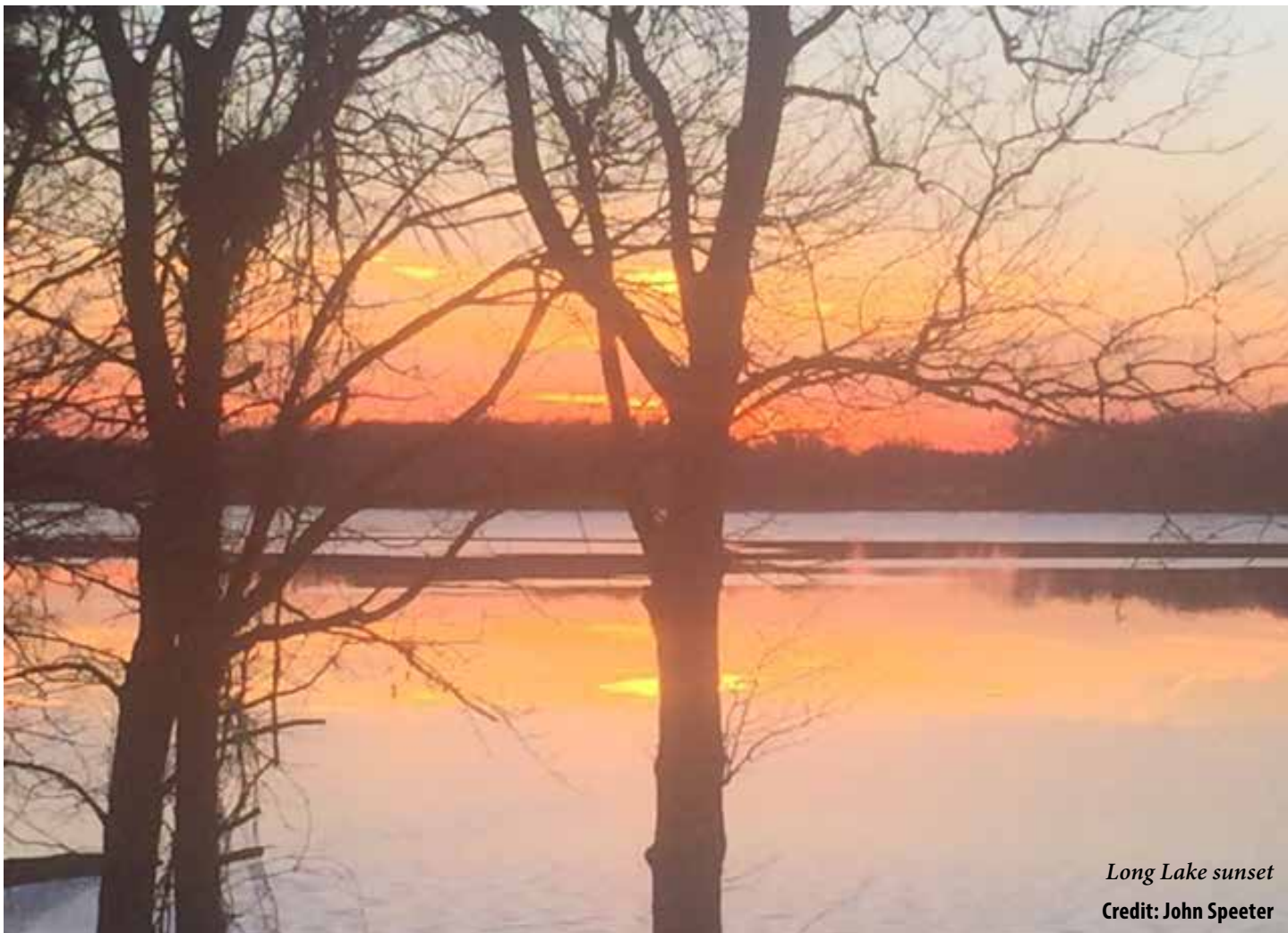
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Long Lake sunset

Credit: John Speeter

LONG LAKE

OF KALAMAZOO COUNTY

Long Lake is located in Kalamazoo County, Southwest Michigan and was formed as part of a glacial outwash plain around 14,800 years ago as the glacier that completely covered Michigan receded back to the north. The lake resides partly within the boundaries of Portage, Michigan and partly in Pavilion Township. It supports a residential community of approximately 320 homes along its scenic, historic shorelines. Long Lake occupies approximately 512 acres and is the fourth largest lake in the county with a maximum depth of 57 feet. The legal water level was set in 1925 by the circuit court at 856 feet above sea level.

Residential properties surround all but the north end of the lake. A State of Michigan public access site, with a cement launching ramp, is located at the south end of the lake. There are parking sites available for approximately 24 vehicles with trailers.

(Continued on page 6)

By John T. Speeter
President, Long Lake Association
Chairperson, Governmental Lake Board



LONG LAKE OF KALAMAZOO COUNTY

(Continued from page 5)

HISTORY

The areas that surround Long Lake were inhabited by the Potawatomie Native American peoples in fairly large numbers, even after their lands were ceded to the U.S. Government in 1817. They hunted, fished and planted corn in the Long Lake area. They traded and coexisted peacefully with early settlers in the region. The large number of Indian artifacts discovered evidence many years of Native American activity near the lake.

Even after their lands were officially ceded, the Potawatomie Tribe continued to live in the Long

Lake area. A large settlement existed in the area known as Indian Fields now occupied by the Kalamazoo Airport.



Credit: John Speeter
Indian Artifacts

Two primary routes for Native Americans ran close to Long Lake. The Portage Trail (now Portage Road) ran north and south connecting Kalamazoo with the Sauk Trail (US 12) and the Potawatomie Trail (Michigan Avenue). Most of the Potawatomie were forcibly removed by the Federal Government in the 1830's, and sent to reservations in the west.

The Portage area was one of the last areas in the region developed for farming

Potawatomie living quarters
Credit: Potawatomie Tribal History website





Indian Native Dress

Credit: Potawatomie Tribal History website



Railroad Depot

Credit: Portage Public Library

due to the dense hardwood forests, swamps and marshes. An early settler named Moses Austin opened a popular tavern in the early 1800's. This was located on the Portage Road trail somewhere in the area between Austin Lake and West Lake. This served as a stopping point for travelers for many years.

In 1834 Elijah Root built a sawmill on Portage Creek near Milham Road. This produced lumber for building in the area. Cottages first started appearing around the lake in the late 1800's. An old newspaper story recounts a resident that tried to move his cottage across the lake in the winter. Using a team of horses, he made it partway before it sank under the ice! Around the turn of the century there was some commercial fishing done in Long Lake and property owners began establishing vacation resorts. In 1886 the Grand Rapids & Indiana Railroad completed a spur that ran through the Ramona Park area and made day visits to the area very popular.

THE LONG LAKE SEA SERPENT

During the winter of 1901, as a newspaper article recounts, a lake resident by the name of Frank Denner and a friend decided to “liven things up on the lake”. They constructed a 10 foot, wooden sea serpent with a scary head and thorny tail. They towed the monster about 100 feet from shore and attached a wire and pulley device that ran back to Denner's boathouse. Several months later in the summer of 1902, Denner let the monster float to the surface—fisherman frantically rowed to shore and cottagers fled inside. The next morning residents patrolled the shore with shotguns. Intermittently the monster appeared over the years, sending the lake into a panic each time. The serpent eventually disappeared. The mystery was never solved until 1942, when Denner on his deathbed confessed to his role in the infamous case.

(Continued on page 8)

“The monster appeared over the years, sending the lake into a panic each time.”



LONG LAKE OF KALAMAZOO COUNTY

(Continued from page 7)

RAMONA PARK

Named for the Indian Princess in Helen Hunt Jackson's popular 1880's novel, Ramona Park and Ramona Palace Dance Pavilion were initially completed in the early 1930s. The Park was originally owned by the Waruf family, who also owned several cottages and a home on the lake. Featuring a large beach and picnic area, Ramona Park became a popular summer resort with sea swings, diving boards and a water chute. Actor/Olympian Johnny Weissmuller came to the park to do diving exhibitions. Top-level baseball teams travelled from all over Southwest Michigan and Indiana to play at the ball fields. At one point, Ramona was used to store ice, packed in straw and shipped to the city via railroad in the summer. The Circus used the grounds when it came to town.

The Ramona Palace was a popular dancing establishment and hosted top name entertainers from around the country. The original structure eventually closed in the 1940's. In 1967, the Palace was reopened under the name "The Summer Palace". Several popular groups including Tommy James and the Shondells played at the venue. Attendance dropped, and the facility burned and eventually closed. The entire area became the property of the City of Portage. Ramona Park is still a popular destination today with a beach, kayak rentals and a fishing pier.

Visit:

<http://www.portagemi.gov/Departments/PRSCS/ParksRecreation/ParksAmenitiesListing/RamonaPark.aspx>



Romana Palace Structure



Romana Palace Beach



Romana Palace Beach Bathhouse



All photo credits on this page:
Portage Public Library

Romana Palace Concession Stand



Romana Palace Dancers



Credit: Portage Public Library

THE ROLLER RINK (BUCHOLZ RESORT/SUMMER HOME PARK)

Beginning in 1952, the Long Lake Roller Rink is still operating today and is one of the longest running facilities of its kind in Michigan. The Rink and surrounding properties once housed the Summer Home Park. It was one of the most popular spots in Southwestern Michigan with a large sports complex, grandstands, baseball fields and a beach. The building housing the Rink was originally built in the 1920's as Bucholz Resort, a lakeside pavilion with dancing upstairs, a beach house downstairs, paddle boat rentals, raft, slide and concession stand.

PLANE CRASH

Tragedy struck Long Lake early on Saturday, January 24, 1970. Two Ohio men were killed when a light plane crashed into the south end of frozen Long Lake.

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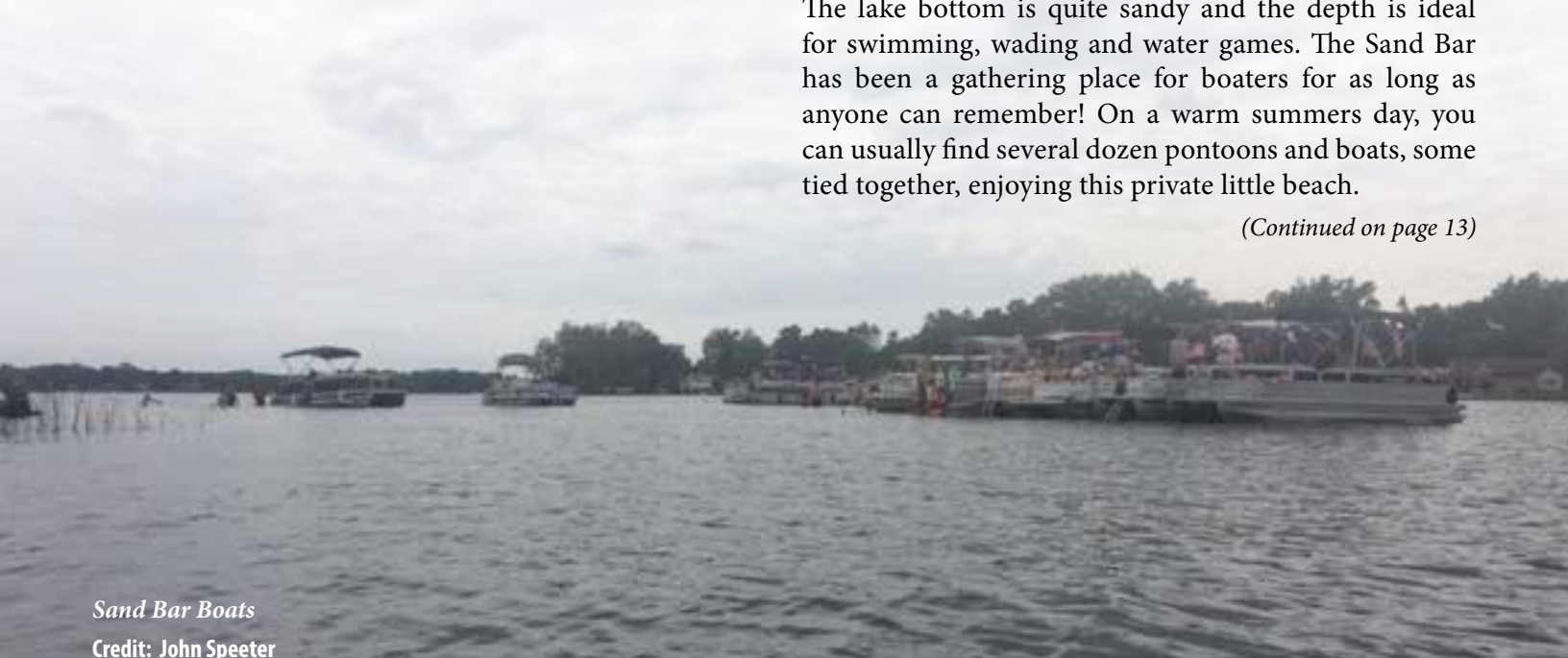
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THE SAND BAR

Located about $\frac{3}{4}$ of the way down the lake from the public landing is the most popular place on Long Lake. Anchored from a small, grassy island, the sand bar extends several hundred feet directly across the lake. The lake bottom is quite sandy and the depth is ideal for swimming, wading and water games. The Sand Bar has been a gathering place for boaters for as long as anyone can remember! On a warm summers day, you can usually find several dozen pontoons and boats, some tied together, enjoying this private little beach.

(Continued on page 13)



Sand Bar Boats
Credit: John Speeter

SEARCH FOR ARTICLES IN THE MICHIGAN RIPARIAN MAGAZINE ARCHIVES – NOW AVAILABLE! –

Until recently, past issues of the Riparian were available at the Riparian website <http://www.mymlsa.org/search-for-articles-in-the-michigan-riparian-magazine-archives-now-available/> but did not have a search function to find specific articles. As there is a diverse array of knowledge contained in these articles, we wanted to make this knowledge easier to find for our members. As such, we have assigned each issue keywords that are searchable using the search box in the "Archives" page: just enter in your search term, and the issue(s) with the relevant article will be displayed. Download the issue, and scan through until you see the appropriate article (due to resource and logistical constraints, separating out each article wasn't possible). This feature is available for issues dating back to 1990 and includes articles on common topics such as road ends and Eurasian watermilfoil control, to less common topics such as descriptions of native turtles and lake classifications. See if your lake is featured in any of the articles – or check out the articles on Michigan's most picturesque waterfalls. If you can't find the topic you are looking for, suggest the idea to Alisha Davidson (ML&SA's Research and Development Coordinator). She will look to find any existing articles – and if there aren't any – perhaps write one! She can be reached at alishad@mlswa.org.

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Tips for Sellers of Waterfront Property

Potential buyers of waterfront property are not the only ones who face a sometimes daunting task, particularly with regard to “due diligence” investigations. Sellers of waterfront property must also be very careful.

Perhaps the best advice that can be given to someone contemplating the sale of a waterfront property is not to exaggerate or misrepresent any of the characteristics of the property. Should that occur, in many cases, it will come back to “bite” the seller, either in the form of a lawsuit or a bitter purchaser (or both!). For example, if the property involved is a backlot with a shared lake access site, the seller should not advertise or indicate that the property has “deeded access,” riparian rights, or similar potential misrepresentation. Use fully truthful language. Full disclosure (within reason) regarding any problems or “issues” associated with the property is usually the best avenue.

If “deeded access” is normally not a legally-appropriate phrase, what language should the seller of a backlot or off-lake property near the water use to indicate that a nearby lake access is available? Perhaps the best wording is simply to indicate that “limited lake access to Marble Lake is located nearby.” Any language that states or implies that the particular backlot has its own exclusive lake access device, that the backlot has permanent docking and boat mooring privileges, or that the backlot has a lake access device where virtually any use can occur thereon, can get a seller (and potentially, a realtor or real estate agent) in trouble if the wording is not true or fully accurate. This is one area where exaggeration (or what the seller might consider “puffery”) can get a person into trouble.

Prospective buyers are not the only ones who have to be careful regarding the language of the negotiated purchase/sales agreement—sellers must be equally cautious. If there are too many contingencies contained in the written agreement in favor of the buyer, it will make it easier for the buyer to back out of the closing without penalty.

Sellers should make sure that any contract for the sale of their waterfront property contains the appropriate “As-Is” language that makes it clear to the prospective purchaser that there are no warranties, guarantees, representations, promises, etc., being made regarding the waterfront property except, perhaps, the warranties of title to be given in the warranty deed or land contract. A good real estate attorney can assist the seller of a waterfront property with the

appropriate language to limit the seller’s liability exposure should the purchaser discover something that he/she does not like about the property after closing.

Given all the “toys” associated with most waterfront properties, it is also very important for the seller (as well as the buyer) to specify in the purchase/sales agreement exactly which specific outdoor items (if any) are included within the sale and sales price. The contract should address such items as dock sections, swim rafts, boat hoists, lawn furniture, boats, sheds, and any other waterfront paraphernalia. With regard to the interior of the house or cottage, movable or removable items such as a washer, dryer, freezer, refrigerator, water softener, trash compactor, and similar items should also be specifically addressed in the purchase/sales agreement.¹

The seller’s realtor or real estate agent can assist the seller with setting a proposed (and realistic) sales price for the waterfront property involved. If the seller wants to obtain a second opinion regarding the price at which the property should be listed, the seller can retain a third-party real estate appraiser to give a more in-depth analysis of the true fair market value of the waterfront property.

If the seller will be retaining ownership of an adjoining lot or parcel after the sale of the land at issue, the seller may want to consider putting one or more recorded deed restrictions or restrictive covenants on the land to be sold (in order to protect the property being kept by the seller). Such restrictions could include prohibitions on mobile homes, further division of the land, setback minimums, a minimum size requirement for any new dwelling, and other restrictions on use. Any such restrictions should be in place before a purchase/sales agreement is signed (or be inserted into such an agreement) and drafted by a competent real estate attorney.

While much of the advertising today for the sale of waterfront properties occurs via the internet, social media virtual tours, and other techniques in the ethersphere, sellers, realtors, and real estate agents still use temporary outdoor real estate signs fairly extensively for sales. Such signs can be an effective tool for helping to sell real estate. However, it should also be kept in mind that many real estate signs violate not only local municipal sign regulation ordinances, but also potentially the property rights of others, depending on the sign’s location.

By Clifford H. Bloom, Esq.
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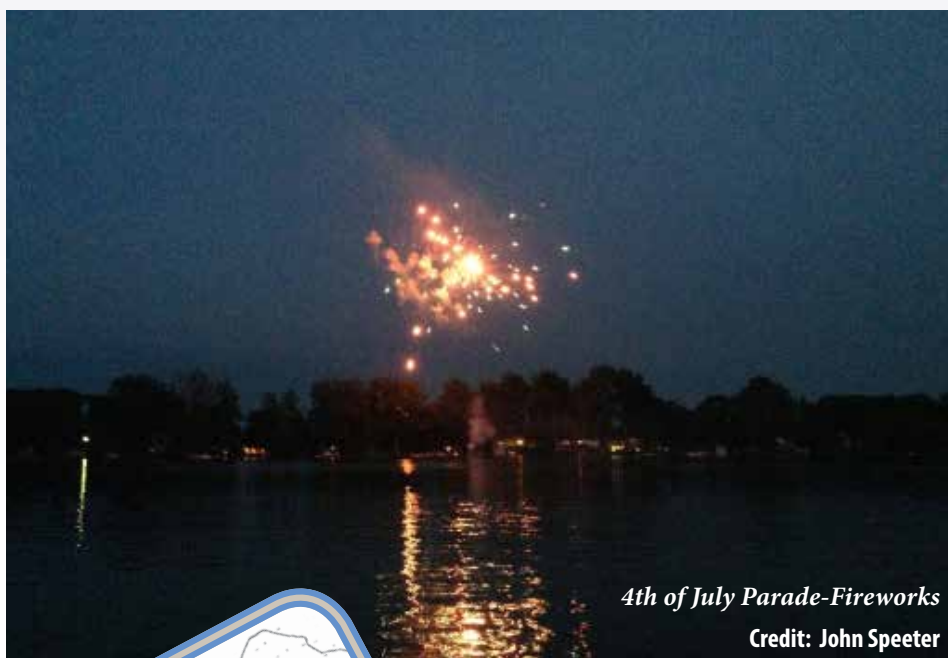


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Founded in 1971 on the site of an early 1834 farm, this pasture-based, organic, farm cooperative occupies approximately 300 acres on the northwest side of Long Lake. The farmland and shoreline are protected from all non-farm development through enrollment in various local and state farm and open-space protection programs. This ensures that most of north side of the lake remains in its natural state. The farm offers locally grown, organic foods, nature trails, community living, and multiple educational opportunities.



4th of July Parade-Fireworks
Credit: John Speeter

WATER LEVEL ISSUES/GOVERNMENTAL LAKE BOARD ESTABLISHMENT

Cyclical dry spells and low water levels have been a major concern at Long Lake for several decades. Aerial photos of the lake in the early 1960's and again in the 1980's show what appears to be 25% of the lake surface dried up, with boats and docks far from the water. At one point records indicate the lake level was down

JULY FOURTH ANNUAL PARADE

For over 50 years, the Long Lake 4th of July Parade has been a tradition. Starting at 1:00 PM, residents decorate their boats and travel around the lake, greeting folks on the shoreline and celebrating the holiday. After dark there is usually a fine fireworks display from some of the lake residents.



Tips for Sellers of Waterfront Property

(Continued from page 11)

Almost all local municipalities have sign regulations. For some municipalities, those regulations are found in the municipality's zoning ordinance. In other municipalities, the sign ordinance is a "standalone" ordinance separate from the zoning ordinance. Typically, municipal sign regulations allow one or two outdoor real estate "for sale" signs if installed on the property that is listed for sale. Placing a real estate "for sale" sign on any property other than the property being offered for sale (for example, down the road at a street intersection) is often a violation of the local municipal sign regulations. In addition, placing real estate signs on utility poles or installing signs directing prospective buyers to a property located some distance away is almost always unlawful under the local municipality's sign regulations.

Even apart from municipal sign regulations, placing a real estate sign on the property of another without permission is an unlawful trespass. Some sellers are also under the mistaken assumption that it is permissible to place a real estate sign in the public road right-of-way adjacent to another person's property without permission, as the public right-of-way normally extends 10 to 20 feet into the lawn of an adjoining property. However, that too would usually be a trespass, unless done with the permission of the adjoining property owner. In most cases, the public road right-of-way is akin to an easement to be used for road purposes only and the adjoining property owner typically still owns the land under the public road easement and has the authority to disallow the private signs of others without permission.

Finally, placing real estate signs at intersections can be downright dangerous; as such signs can interfere with the clear sight distances necessary for motorist visibility and safety.

All real estate transactions have potential tax (local, state, and federal) consequences, particularly for the seller of real property. Issues regarding income taxes, capital gains, and other taxes relating to a lakefront real estate transaction are beyond the scope of this article. Nevertheless, sellers and buyers should consult with the appropriate tax professional early on in the property sale or purchase process. *R.*

¹It is generally also advisable for the parties to execute a "bill of sale" at closing with regard to any non-real estate items that are part of the sale (such as furniture, appliances, docks, swim rafts, etc.). Such a document might be helpful not only for tax purposes, but also for future reference or documentation of the transaction. The seller should also include an "as-is" clause in the bill of sale.



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Chara vulgaris – A.K.A. MUSKGRASS:

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Article and Photos by
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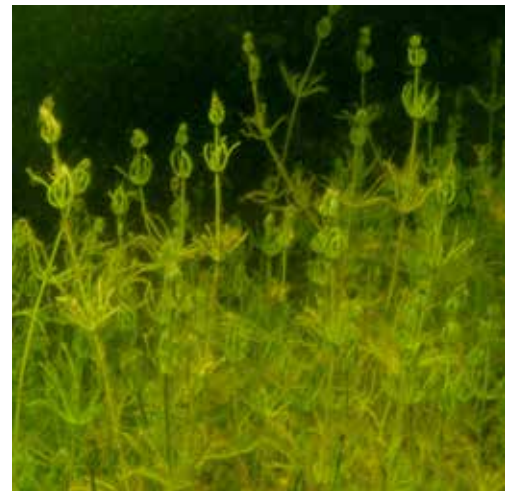
Chara vulgaris is a member of the diverse Characeae family of freshwater macro-algae that contains over 300 species. Considered the most widely distributed Characeae species on earth, occurrences of *Chara vulgaris* have been reported on every continent except Antarctica. The broad geographic distribution of *Chara vulgaris* is primarily due to the ability of the species to survive in a relatively wide range of light conditions and water temperatures. A reliable indicator of the presence of calcium carbonate rich hard water, abundant growth of *Chara vulgaris* has been associated with calcium carbonate



Chara vulgaris



Chara meadow



Chara vulgaris

concentrations of 55 mg/l, or higher. The fact that the species is so widely distributed across the surface of the earth serves as an important reminder of the vital role of calcium carbonate in regulating aquatic ecosystems.

One of several Characeae species that are native to Michigan waters, *Chara vulgaris*, also commonly referred to as muskgrass, is frequently observed in inland lakes growing on flat or gradually sloping bottom substrates consisting of fine organic particulate matter, and in water depths extending from less than one foot to eight feet. Occurring in lengths ranging from just a few inches to over two feet, *Chara vulgaris* appears in lake water chemistry dependent colors ranging from dark grey to light green. First appearing as periods of daylight get longer, and as water temperature begin to warm in mid-to-late spring, the plant-like structures of the unique macro-algae species are often found heavily encrusted in a form of calcium referred to as calcite by early summer. Depending on water clarity, and on the amount of calcium carbonate and other nutrients that are available in your lake to support growth of the species, muskgrass may appear in sparsely populated patches, or in dense, wide area meadows that may extend from near-shore shallow areas to just beyond the edge of the “drop-off”.

Depending upon the maturity of the plant, the main growth axis of *Chara vulgaris* consists of a series of variable length internodes that are separated from


one another by axis nodes that each host five to seven thin branchlets that appear in the form of a whorl. Representing the apex of the structure, the upper most whorl often forms the shape of a crown. The internodes of Characeae species are comprised of a single multi-nucleate cell that represents one of the largest discrete cells on earth. The frequently studied internodes of Characeae species are capable of sustaining basic cellular function long after they have been separated from the main axis. *Chara vulgaris* is capable of reproducing sexually by producing both female oogonium and male antheridium on the same plant. The maturation and emergence of fertilized reproductive structures called oospores are stimulated by increasing light intensity and water temperatures associated with

(Continued on page 16)

Chara vulgaris

(Continued from page 15)

the peak growth period of late spring or early summer. The species is also capable of reproducing vegetatively by spreading its rhizoids into unoccupied substrate.

Dense meadows of *Chara vulgaris* are known to help create and sustain water clarity by minimizing re-suspension of coarse and fine particulate matter, by effectively competing for, and storing nutrients, by creating an ideal habitat for phytoplankton grazing zooplankton species, and by releasing substances that act to suppress phytoplankton production as well as the growth of cyanobacteria. Due to the important role of the species in promoting and maintaining clear water conditions while providing ideal habitat for juvenile fish and aquatic insects, *Chara vulgaris* is classified as an ecological foundation species. Moreover, abundant meadows of muskgrass that often appear in shallow waters serve as an important, and readily accessible source of food for a myriad of highly valued waterfowl species. 



Chara vulgaris

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A Coyote? Or a Wolf?

By Dominic Manzi, Board President
Twin Lake Property Owners Association

Twin Lake POA is located in Montmorency County, Michigan

Do wolves live in the lower peninsula? Several articles have been written on the subject. Many experts say they do not. I have friends that claim they've seen a wolf. In one case, friends said they saw a pack of five wolves together. To be honest, I'm skeptical. Not because I think my friends would lie, but because they simply look so much alike.

Then came my experience. About five years ago I did something you should never do. I went out on an ATV ride by myself. Too many bad things can happen. I knew better, but I wanted to ride and had no one to ride with. While on my way to one of my favorite ORV routes, I spotted an animal not more than 30 yards off the road just ahead. As I pulled up to where it was standing, I came to a stop. He (or she) just stared at me for what seemed to be well over 30 seconds.

I became a little concerned. Why wasn't he afraid of me, I thought. As I began to move forward, he followed me, the whole time staying about 25 yards to my right. Just as I began to get even more concerned and ready to pounce on the throttle, he decided I was no longer interesting. He trotted up a small wooded hill, stopping at the top and looking back one last time before disappearing out of my sight. I can still vividly recall those piercing eyes staring at me.

To this date I can't say for certain whether it was a very large coyote, or a grey wolf. One thing was certain, he was every bit as big as a large Alaskan Husky.

How do you tell the difference? According to the MDNR and other articles on the subject, wolves tend to be 5-6 feet long (nose to tail), and 27-33 inches tall at the shoulders. A coyote is smaller; 3.5-4.5 feet nose to tail and 20-22 inches tall at the shoulders. Another difference is that a coyote's ears are much larger in proportion to its head. Additionally, coyote's ears are pointed whereas a wolf's ears are rounder. Another way to tell the difference is their snouts. A coyote has a more narrow pointed snout, while a wolf snout is blocky. In my experience, I'll never know for certain what I saw that day. The eye contact we made was unnerving at best, and I was somewhat relieved when the encounter was over. *R.*



Coyotes tend to be far smaller than wolves

Credit: www.wildnature/images.com



A Wolf is bigger and although usually grey, can be solid black.

Credit: www.pixabay.com

LONG LAKE

OF KALAMAZOO COUNTY

(Continued from page 13)



almost 60 inches from the legal level. In the late 1990's residents decided to take action to preserve the quality and recreational value of the lake. Part of the lake is within the boundaries of the City of Portage and part within Pavilion Township, making action plans problematic. The following steps were initiated:

1. Petition the governing bodies for the establishment of a Governmental Lake Board. This unit would have the power to levy tax assessments and initiate engineering studies.

2. Subsequent to establishing the board, an engineering study was commissioned in 1997 to investigate alternatives for stabilizing the water level of Long Lake.

3. One option was to install a 16", 100 HP, 1770 RPM water cooled pump to a depth of approximately 174 feet below ground level. This unit would pump water from a ground water source below Long Lake at a rate of around 2,500 gallons per minute. Estimates at the time was that the lake level could be increased by about a foot with 120 days of continuous pumping.

4. The following years saw considerable debate on the pros and cons of installing a pump. Petition drives, public hearings and some heated conversations between neighbors ultimately resulted in a decision to install the pump. The tireless efforts of then Association President, Ms. Judy Ellis and the unfortunate dry condition of the lake were the deciding factors.

5. In the year 2000, the pump as described above, was installed and a pump house was constructed to protect the unit. Land for the pump house was leased from the City of Portage and located just north of Ramona Park. The pump has been used on multiple occasions. Essentially, it is effective in reducing the rate of evaporation, but not raise the water level to any significant amount.



Long Lake during the drought in 2000 about 60" down!! Shortly after, the augmentation pump was installed in 2000.

Credit: John Speeter



Long Lake sunset

Credit: John Speeter

Perhaps more important to the lake level is the channel that runs from Austin Lake to Long Lake. The natural springs that once fed Long Lake have all become inactive. There is no natural input from creeks or streams so water from the chain of lakes that feed into Austin Lake became critical to stabilizing the water level.

The condition of this narrow, connecting channel has, on many occasions, become occluded with debris. Residents still struggle with the flow through this channel, which most agree is still experiencing restricted water flow.

WEEDS

Beginning in the fall of 2009, the Long Lake Association began an active involvement in the issues of weed control in Long Lake. The problem of weed beds and floating masses of aquatic vegetation had become a noticeable hindrance to recreational and boating activities. The board approached Progressive AE, a consulting firm from Grand Rapids, Michigan, about devising a plan for managing invasive aquatic plants. Over the course of the next two years, the Governmental Lake Board commissioned an engineering study of this issue and examined options, focused on the targeted control of several invasive species. Eurasian Milfoil, Phragmites, Purple Loosestrife and Starry Stonewort became the focus of initial concerns.

After considerable debate as to the methodology, safety and effectiveness of the proposed chemical treatment plan, public hearings were held in the summer of 2012. The majority of the 315 residents at the time voiced approval for an assessment to cover the cost of the program for three years. A special assessment district was established and the program was put in place in 2013. To date the program has been extremely successful with a marked reduction in the total surface area affected by invasive weed species.

From the early days of Native American habitation through pioneer settlements, big band dances at Ramona Palace and quiet fishing boats, Long Lake remains a picturesque, welcoming place for both residents and visitors. *R.*

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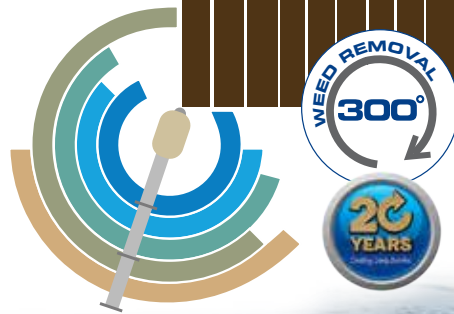
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Proposed Cuts to EPA and Elimination of Clean Water Regulations Are Ill Advised

An Editorial by Scott Brown, ML&SA Executive Director



“Pollutant free water resources that are capable of providing us all with clean, potable water are an absolute requirement for life, liberty, and the pursuit of happiness”

For those of us old enough to at least vaguely remember a thankfully bygone era when our nation's rivers, streams, lakes, and wetlands were commonly used as convenient dumping grounds for industrial waste, December 2nd, 1970 represented the beginning of the end of a particularly tragic period in our nation's otherwise remarkable history. On this great day for our country, President Richard M. Nixon signed legislation that created the United States Environmental Protection Agency (USEPA), an event that would mark the start of a promising

new era in environmental protection. Legislation creating the USEPA was ultimately prompted by progressively heightened public awareness that our nation's air and water were becoming increasingly polluted, a fact that was affirmed in the minds of many Americans during the early summer of 1969 as the now infamous photo of Cleveland's Cuyahoga River engulfed in flames appeared on the nightly news, and on the cover of a then widely read *Time* magazine. The Cuyahoga River fire would also help spark the passage of the Clean Water Act of 1972, landmark legislation that would serve to define the mission and goals of the fledgling USEPA by establishing a basic system for regulating discharges of various pollutants into the waters of the United States, and for establishing and regulating surface water quality standards. Under the Clean Water Act, the USEPA has worked to establish and implement wastewater standards for industry, and water quality standards for contamination of surface waters. The Clean Water Act also made it unlawful to discharge any pollutant from a point source into the navigable waters of the United States, and established the National Pollutant Discharge Elimination System permit

program that regulates discharges into the nation's waters. The non-partisan federal Office of Management and Budget has consistently given its top cost effectiveness rating to the USEPA, noting that the value of the benefits derived versus the cost of investing in efforts to protect, and/or restore our nation's water and air quality often exceeds a remarkable 10 to 1 ratio. The direct and in-direct benefits to human health and economic productivity that have resulted from successful USEPA efforts to protect, and/or restore our nation's air and water quality have contributed trillions of dollars of wealth to our citizens, to our public and private institutions, and to our corporations.

For the Great Lakes state, blessed with 36,000 miles of streams, 11,000 thousand inland lakes, and countless acres of wetlands, recent “promises” by the new administration to eliminate the USEPA, or to dramatically reduce the agency's operating budget and staffing levels, and rescind federal regulations that help ensure that our waters stay clean and potable, all carry the potential to have a devastating

(Continued on page 23)

Michigan Waterfront Alliance

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Dear MWA Members and Friends,

The Michigan Waterfront Alliance has taken on the daunting task of attempting to reform the policy of the Michigan Waterways Commission and the DNR with regard to the development and maintenance of state operated lake access sites. Board member Lon Nordeen and MSU Professor Ed Mahoney have put in countless hours to develop a MWA position paper on the topic. This spring the position paper will be sent to all MWA members for consideration and support.

Tourism and recreation currently contribute billions of dollars of annual revenue to the state's economy. Beyond tourism dollars, lakes contribute tremendous value to the economic vitality of Michigan. A 2008 study estimated the value of shoreline property on Michigan lakes at \$200 billion, generating tax revenues of \$3.5 billion.

The health of tourism, public recreation and lake ownership depends on maintaining the ecological and aesthetic vitality of Michigan's lake environments. No one wants to visit, rent or own property on a waterway choked by weeds, zebra mussels and other aquatic invasive species (AIS).

AIS are rapidly spreading throughout Michigan's lakes. AIS is a significant ecological,

economic and quality of life THREAT. It has been nearly 100 years since AIS was first detected in Michigan waterways. The Michigan legislature, along with state agencies, universities and other groups have supported a number of AIS studies and education efforts. However, there has been no coordinated or sustained state effort to track and identify the spread of AIS, or to invest in proven ways to halt the spread of AIS. The current AIS state management plan unfairly places the entire burden of inland lake AIS management on lake property owners. Property owners and residents currently spend more than \$25 million annually on the lake management programs, while the MDNR dedicates limited funding toward lake treatment permits and minor research.

The Parks and Recreation division of MDNR continues to recommend the development of new public access sites, as well as renovation and expansion of existing public access sites without having the data or scientific analysis to justify expansion. For many existing sites, MDNR does

not even have accurate counts of the number or types of boats that are launched. The State cannot scientifically assess boating demand or the adequacy of launch capacity on Michigan inland lakes. The State does not have a *science or data based public access needs assessment*.

We need to change the way we do business if we want to save Michigan lakes and sustain our tourism and lake economies! An honest airing of the issue needs to take place at the highest levels of government with solutions to follow.

MWA looks forward to the release of our position paper on this important issue. When you receive your copy of the position paper we hope you will take the time to study, critique and provide input to the MWA board.

Sincerely,
Bob Frye,
MWA President

MICHIGAN WATERFRONT ALLIANCE

P.O. Box 369

Fenton, Michigan 48430-0369

www.mwai.org



Proposed Cuts to EPA and Elimination of Clean Water Regulations Are Ill Advised

(Continued from page 21)



effect on current efforts to protect, and restore Michigan's water resources. The many important projects that the USEPA currently funds and administers on a collaborative basis in the Great Lakes region include efforts to prevent the spread of Asian carp, funding and administering the Great Lakes Restoration Initiative that provides grants to state and local projects that are designed to prevent invasive species, restore impaired watersheds, and restore fish habitat. In addition, USEPA provides Great Lakes region states, including Michigan, with grants that fund projects designed to reduce non-point source pollution levels that often lead to excess nutrient loading in many of our lakes and streams. The USEPA also administers federal grant programs that support various national, state, and local initiatives designed to improve water and air quality, combat invasive species, and to improve drinking water infrastructure. Michigan's on-going Flint water crisis should have provided us all with a wake-up call regarding the increasingly desperate need to invest in a much needed modernization of our nation's drinking and waste water management infrastructure.

The new administration and its allies in Congress are also "promising" to eliminate the **Waters of the United States** rule which was instituted in 2015 in order to fully restore federal government authority to limit pollution in our nation's wealth of lakes, rivers, streams, and wetlands. Culminating many years of research and monitoring by the United States Environmental Protection Agency and the U.S. Army Corps of Engineers, and carefully crafted to include the latest scientific data, and significant input from a diverse group of public and private stakeholders, the final language of the rule served to re-establish a modest level of protection to the water resources that one third of Americans (110 million people) rely upon for their daily drinking water. Moreover, for the first time in many decades, tens of thousands of our nation's wetlands, streams, and inland lakes that provide essential habitat to fish and wildlife, and that serve as immense economic treasures, were once again placed under some degree of protection. Did you know, for example, that sport fishing in America helps support more than 800,000 jobs, and that the 30 million people who fish spend close to \$50 billion annually on equipment, licenses, trips, and other fishing-related purchases? The fact is, pollution free streams, rivers, and lakes that are capable of supporting and sustaining healthy fish populations represent the very foundation of our nation's recreational fishing industry.

To even the most sadly uninformed of our fellow citizens, there should be no surprise in learning that clean water is an indispensable resource for sustaining life on earth. Regardless of our race, religion, political beliefs, economic status, or how we choose to live our lives, pollutant free water resources that are capable of providing us all with clean, potable water are an absolute requirement for "life, liberty, and the pursuit of happiness". We encourage you to share your views regarding the importance of maintaining clean, healthy, and sustainable water resources with your respective member of the United States House of Representatives, and our United States Senators. [R](#)



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Email: swagner@mlswa.org
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Question: When is the best time to pull garlic mustard?

Answer: While garlic mustard isn't an aquatic plant, it often lives in moist riparian areas, including lawns and woodlands near lakes and streams. Garlic mustard is very difficult to eradicate once it is established and spreads rapidly and displaces native or other desired plants in a relatively short period of time. Each year, an average plant produces 400-500 seeds that germinate readily in both well-lit and shaded environments. Eradicating garlic mustard is easy (the plants pull out of the ground fairly easily), but takes perseverance. Because each plant produces so many seeds, removal efforts must continue until no new garlic mustard plants sprout (which means the seed bank is depleted). This may take 2-5 years in any confined area. In addition to perseverance, the timing of removal efforts is critical. Garlic mustard should be removed before seeds have a chance to form. Early spring or, at the latest, once their small white flowers bloom around May, is best. Garlic mustard can set seeds days after blooming, so removal efforts should be finished before then. Otherwise, removing plants can release the seeds – leading to a bigger seed bank next year. Once removed, all plant matter should be bagged, dried and then burned or buried deep into the ground.

Alisha Davidson, PhD
ML&SA Research and Development Coordinator
alishad@mlswa.org

* * * * *

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The Cooperative Lakes Monitoring Program staff is coming to the western Upper Peninsula to teach residents how to get involved in the program and how to monitor their lakes. This free training is required for a number of different parameters offered by the program. Whether you have been involved with the program for a number of years, just getting started, or just curious as to how it may help you protect your favorite lake, everyone is encouraged and invited to attend this free event. Food, lodging, and transportation are the responsibility of each attendee. A lunch will be available to order.

Date: May 3, 2017

Location: Windsor Center, 612 W. Adams Street,
Iron River, Michigan, 49935

Please RSVP: Jim Novitski, jjnovitski@gmail.com

Agenda (Central Time Zone):

- 8:00- 8:15 Welcome and 2016 CLMP Review,
Ms. Marcy Knoll Wilmes, Michigan
Department of Environmental Quality
- 8:15-9:15 Secchi Disk Transparency and Total
Phosphorus, Dr. Paul Steen, MiCorps
Program Manager
- 9:15-9:30 Break
- 9:30-10:45 Chlorophyll-a, Dr. Paul Steen
- 10:45-11:00 Break
- 11:00-12:00 Score the Shore (Nearshore Habitat
Assessment), Dr. Paul Steen and
Dr. Jo Latimore, Michigan State University
- 12:00-1:00 Lunch
- 1:00-2:00 Dissolved Oxygen and Temperature,
Ms. Marcy Knoll Wilmes
- 2:00-2:15 Break
- 2:15-4:15 Aquatic Plants, Dr. Jo Latimore and
Mr. Erick Elgin, Michigan State University
Extension, Mr. Paul Skawinski, University
of Wisconsin Extension
- 4:15 Program Ends

Please Note: To monitor your lake through the CLMP, you need to register at www.micorps.net/lake-monitoring/become-a-volunteer, or contact Jean Roth at jroth@mlswa.org or 989-257-3715. The CLMP training is free, but there are small fees to enroll in the program itself. Anyone interested is welcome at the free training, whether their lake is enrolled in the program or not.



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Wheels to Woods: Connecting schools and forests



Nick Sanchez
Conservation District Forester
989-831-4606 Ext 106
nick.sanchez@mi.nacdnet.net

Montcalm, Kent & Ionia Counties
www.montcalmcd.org

Kids these days, am I right? Did you know that kids these days have an opportunity to get out of the classroom and spend the day learning about the great outdoors in a forest? Wheels to Woods is a school-to-forest bus fund available for any public or private K-12 school in Michigan. In 2016, this unique opportunity helped 8,016 students, 353 teachers and 1,209 parents go on 94 educational field trips. That's a lot of place-based learning but we have 20 million acres of forests to explore! The Michigan Tree Farm Committee can

help connect your student's classroom to a local family forest certified by the American Tree Farm System or nearby public land, they can also put you in touch with a natural resource professional to help support the educational component of the field trip, like your local conservation district forester. This non-competitive grant award reimburses the actual costs of transportation up to \$350 per bus with a maximum of \$1000 per school or group per academic year. The one page application form can be found at www.treefarmssystem.org/school-forests. This grant is generously supported by the Michigan Tree Farm Committee, DNR Forest Stewardship Program, Project Learning Tree, Michigan Forest Association and many other cooperating organizations.

The American Tree Farm System just celebrated its 75th anniversary as a network of landowners working together with professional foresters to restore, regenerate and actively manage their forestland. Tree Farm recognizes family-owned forests that meet sustainability standards set by the American Forest Foundation. This certification documents their good forestry practices, ecological values, and protection and enhancement of public goods such as healthy soils, wildlife habitat, clean air and clean water. Certified wood is good wood, grown and harvested from an environmentally sustainable source. Thank a Michigan Tree Farmer today!



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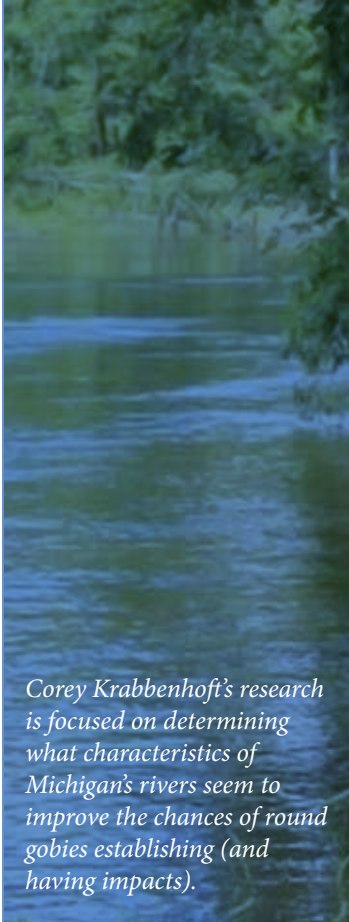
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Degraded river and lake habitat may allow round gobies to more easily establish in Michigan waters

By Alisha Davidson, PhD
ML&SA Research and Development Coordinator



Corey Krabbenhoft's research is focused on determining what characteristics of Michigan's rivers seem to improve the chances of round gobies establishing (and having impacts).

Disturbance events, such as flooding or vegetation removal, can lead to habitat and water quality degradation. Such degradation often leaves these aquatic communities in a vulnerable state, which increases the opportunity for non-native species to colonize (relative to non-degraded communities). Ecologists call this phenomenon “invasibility” and have observed it in both aquatic and terrestrial ecosystems around the globe. Wayne State University's Corey



Krabbenhoft is exploring this hypothesis in a local context by assessing land use, water quality, and fish and macroinvertebrate communities across a disturbance gradient (i.e., from pristine sites to severely degraded sites) in rivers across Michigan to determine the factors associated with invasibility of the infamous round goby (*Neogobius melanostomus*). Put more simply, Corey wants to know what characteristics of Michigan's rivers seem to improve the chances of round gobies establishing (and having impacts).

Corey began her research career at the University of New Mexico, where she received her bachelor's and master's degrees in aquatic community ecology. Out west, water management is largely focused on the amount of water and ensuring that river ecosystems have sufficient water to sustain the associated aquatic communities, as well as serve human needs. To pursue her PhD, Corey found a good fit with Donna Kashian's lab at Wayne State University in a field where the

Round gobies are small, soft-bodied fish (up to 7 inches). Their fused pelvic fin forms a suction disk on their ventral surface and distinguishes them from native sculpins. Adults have brownish gray bodies with dark brown/black blotches. Peter van der Sluijs, Wikimedia Commons



impacts. The round goby has led to the decline of native fish such as sculpins, darter, logperch, rainbow darters and northern madtoms through competition for food and habitat, as well as predation on these native species' eggs. This, in turn, may lead to further losses of endangered native Unionid mussels that depend on these fish to host mussel larvae for successful reproduction. Gobies may even lead to restrictions on sport fish catches due to a decline in sport fish numbers following egg predation. Lake trout and lake sturgeon eggs are particularly susceptible. Finally, the round goby may play a role in transmitting the avian botulism that leads to waterfowl mortality events. Round gobies feed on the zebra and quagga mussels that accumulate the botulism spores, and round gobies are then eaten by waterfowl which fall ill or die from the botulism.

Unfortunately, the round goby has spread inland primarily through transfer via bait buckets; anglers catch or buy bait from one water body, then release it into the waters they are fishing. This has led ecologists such as Corey to ask questions about how this species

(Continued on page 32)

important issue is often not the amount of water, but rather what is in the water, i.e., invasive species. As much of Corey's previous work was on fish, she decided to focus her PhD on the round goby and its recent movement from the Great Lakes into inland waters of Michigan.

The round goby was first found in the U.S. in 1990 in the St. Clair River, having been introduced via ballast water originating from the Ponto-Caspian region (original home of zebra and quagga mussels, as well). The goby has since spread to all five Great Lakes, as well as into inland lakes and rivers. A recent study found that of 30 Great Lakes tributary streams in eastern Michigan, round gobies were in 14 of them and on average were the most abundant fish in the samples (where present, they constituted 30% of the fish) (Campbell and Tiegs 2012). This establishment and spread is aided by the presence of zebra and quagga mussels, which can form a large part of the goby's diet. Unfortunately, this fish doesn't control these mussel populations and has other harmful



Corey (middle) sampling for round goby using nets.



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Degraded river and lake habitat may allow round gobies to more easily establish in Michigan waters

(Continued from page 29)



Mottled sculpins are native to the Great Lakes and may be outcompeted by the round goby due to similar diet and habitat. United States Fish and Wildlife Service, Mountain-Prairie Division, Wikimedia Commons

is establishing, spreading and having impacts in inland lakes and rivers. Her research has three main components: 1) determining impacts on native species, 2) determining factors that affect success of round goby establishment, or “goby invasibility”, and 3) integrating her efforts with long-standing stream monitoring efforts.

To measure factors that affect goby invasibility, she will be using several proxies of water quality. This is because there is no single, catch-all measurement of water quality. Rather, it can be measured using a variety of descriptors. In this study, Corey will incorporate land use (for example, areas with high agricultural runoff generally have worse water quality than natural, undeveloped areas); abiotic water parameters (for example, extreme pH and metal contamination can indicate poor water quality or presence of contaminants); and biotic water parameters including fish and macroinvertebrate communities). This last parameter

has been used by lake and stream monitoring groups for decades. The basic premise behind this proxy is that both the diversity and type of species present says a lot about the health of a stream or lake community. For example, there are certain macroinvertebrates that are very sensitive to pollution or other disturbances – if these are present, there is a good chance that water quality at that site is high. Same for diversity - generally (though not always) – the more species present, the better the water quality. That is because there are only a few species that can tolerate high pollution or low oxygen conditions and if there are only a few species

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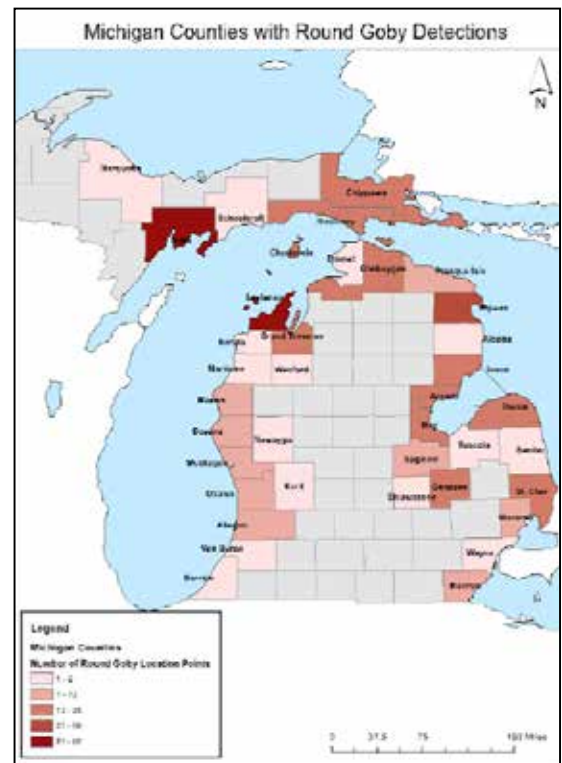
present, it probably means the water is of poor quality. The parallel on land is birds – in urban areas, you generally only see a few types of birds, like starlings and pigeons. In more natural settings, you can see everything from woodpeckers to owls.

In addition to measuring water quality, she will also measure goby success. She will measure success using both goby abundance, density, and (at the end of the three years of sampling) persistence – do gobies found in one location remain there for all three years. She will record these measurements at three sites in seven different river watersheds (21 sites total): Rouge, Clinton, Au Sable, Rifle, Muskegon, Ocqueoc and Stony Creek (near Huron River). As in all of science, analysis of her samples will depend on finding sufficient funding – she is currently applying for several grants that will allow her to process water samples and carry out other procedures such as a stable isotope analysis of the food web structure at each site to look for evidence of competition for resources between round goby and native species.

After analyzing the first year's data (out of a three-year study), she has started to see some results. As in the Great Lakes, she has observed a decline in species that compete with gobies such as sculpin. Of the water quality parameters, macroinvertebrate communities have been correlated with goby abundance. That is, areas with macroinvertebrate communities that have low diversity and absence of sensitive species also have more round gobies. As she continues to analyze samples, other impacts and predictors of goby establishment will likely emerge.

Understanding how round gobies invade Michigan waters differently will better allow natural resource managers to predict where gobies might be found next and where to focus monitoring, eradication or control efforts. This is particularly important as the round goby is not yet widespread in inland waters and a better understanding of its current and potential distribution may prevent or slow continued spread. Integrating her research findings with stream monitoring programs such as those run by the Clinton River Watershed Council and Friends of the Rouge will improve these predictions, as these monitoring programs often have data sets that span over a decade and large areas.

While this research is occurring within the realm of academia, it is relevant to Michigan Lake and Stream Associations (ML&SA) members, as well. First and most importantly, NEVER transfer bait between water bodies or release live bait into the water. All unused bait should be dumped in the trash (not just “in the woods” as things like earthworms can survive in the dirt). Second, keep your section of the lake or river in good condition, which includes an absence of trash and ideally, with natural shoreline vegetation that harbors a high diversity of native plants and animals. Corey indicated that as she sampled over the summer, she “would immediately notice areas where I was almost sure I would find round gobies without even going in the water...areas with trash (especially tires) or objects that impeded flow and created shelters for gobies were hotspots.” Finally, as for any plant or animal that is a suspected non-native species, please report any sightings of the round goby to the Midwest Invasive Species Information Network (MISIN) <http://www.misin.msu.edu/report/>. 



They found that when analyzed across a watershed, sites with greater disturbance had higher than expected abundances of round goby. These differences also seemed to affect fish community composition. More data is needed to determine exactly why that is, but this study will inform efforts to prevent the spread of gobies and other invasive species in Michigan waters.

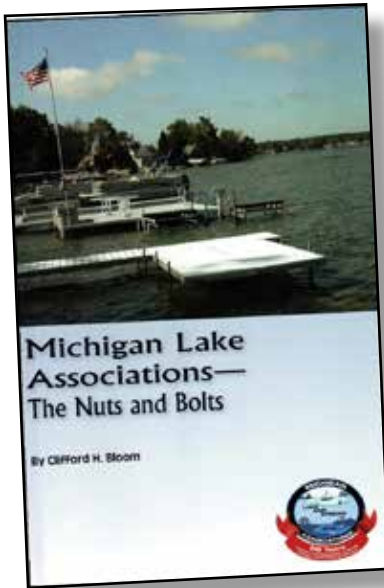
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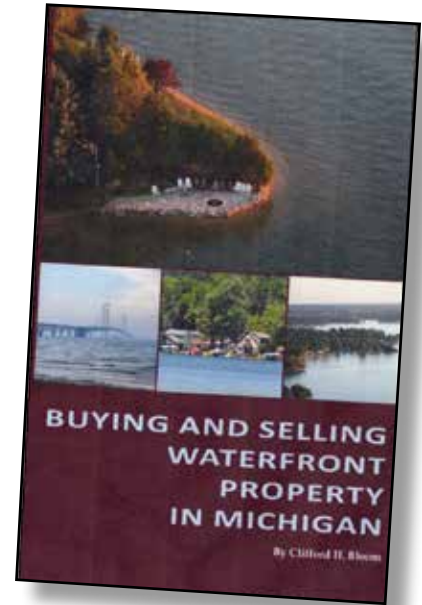
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Michigan Lake and Stream Associations Awarded 2016 MISGP Grant to Fund Expansion of the Clean Boats, Clean Waters Program

by Scott Brown, ML&SA Executive Director

Michigan Lake and Stream Associations (ML&SA) is pleased to announce that we have received a 2016 Michigan Invasive Species Grant Program award from the Departments of Natural Resources, Environmental Quality, and Agriculture and Rural Development administered program that will allow our water resources conservation focused organization to expand the operational footprint of the Michigan Clean Boats, Clean Waters (CBCW) program. The State of Michigan funded Michigan Invasive Species Grant Program provides funding to various statewide projects aimed at preventing, detecting, eradicating, and controlling both terrestrial and aquatic invasive plants and animals.

The recent grant award will allow ML&SA, and our primary collaborative project partner, MSU Extension, to continue various initiatives established since the inception of the program, and implement new strategies designed to enhance the self-sustaining nature and geographic scale of the Michigan Clean Boats, Clean Waters program. The MISGP funded project will allow us to use new materials, including a series of high quality training videos that were produced over the course of the last two years, to support additional AIS prevention leadership development events for volunteers and staff members representing regional Cooperative Invasive Species Management Areas (CISMAs). In addition, the new funding source will allow the Michigan CBCW program to expand outreach activities that will include on-site AIS prevention training for county sheriff marine patrol unit personnel, and fishing tournament organizers and participants.

The Michigan Clean Boats, Clean Waters (CBCW) program is designed to promote water resource conservation by pro-actively supporting the efforts of citizen volunteers in helping to prevent the spread of aquatic invasive species (AIS) at local public boat launches. The program directly

supports volunteer efforts by offering statewide volunteer training workshops, on-line volunteer leader development, and AIS prevention focused educational materials. CBCW program methods are well established, and are currently being implemented in several other Great Lakes region states, including Wisconsin, Minnesota, Ohio, and New York. The CBCW program compliments other water resource protection focused efforts such as the Michigan Clean Water Corps (MiCorps) Exotic Aquatic Plant Watch program, Clean Drain Dry Initiative, Stop Aquatic Hitchhikers!, and the Michigan DEQ AIS Landing Blitz. The CBCW program message parallels the AIS prevention message used by these programs to provide complementary protection efforts that take place at popular boat launches, and other areas with high recreational boater traffic.

To learn more about becoming a volunteer for the Michigan Clean Boats, Clean Waters program, visit our website at www.micbcw.org.



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A Short Fish Story

by Craig Kivi

Board of Directors: Portage, Base and Whitewood Owners Association

Editor's Note: Article is written with permission from the PBW Owners Association website. The lake association borders Livingston and Washtenaw Counties.

From sand in my diapers to my mid-fifties, I have been blessed to fish the Huron River Chain of Lakes. Over the years I have come to know well many of the weed beds, deep holes, underwater shelves, shallows and spawning grounds of this ecosystem. This knowledge has served me well during my career as a professional fishing guide and many are the happy stories of landing "the big one." However, let me share with you one of my favorite stories about the little one that ultimately got away but left an enduring impression on the soul of this fisherman.

It was a perfect, balmy, early August day on the Huron River, and I was fishing alone just below the old Bell Road Bridge. Just me and the ancient river as it traveled over rock and gravel contours forming rapids, gentle eddies, and calm pools between the forest shrouded river banks, unmarred by human development. There's a very narrow branch of the river along this particular stretch, a branch that loops its way around a small island, providing safe habitat for smaller fish in its slow moving shallows and occasional deep holes. As is often the case when I fish alone, on this day I sought more to indulge my curiosity than pursue "the big one", so I chose to explore this quiet backwater.

I love to fly fish, and this day my outfit was lean. Waders over tee shirt and cap, a very short fly rod, light line and a small box of flies were all I had,

and not even sunglasses as I knew the tree-lined river would be shaded from the sun's glare.

The juvenile Smallmouth bass I knew should be in this stretch have a fighting spirit that far surpasses their size. When hooked they will jump, shoot sideways, and run with an animation more like a 500 pound Marlin. Much different than the slower, more powerful fight of their massive sized brethren. By the time I had slowly and quietly worked my way part way around the island, I had caught and released several of these tough, little fighters. Then a short light cast was met with a fierce strike and I was onto a 7" Smallmouth that just would not give it up. He jumped and cart-wheeled, ran out line making repeated dashes towards the river bank. I finally landed him, and after briefly admiring his gorgeous shimmering colors, eased the hook out of his mouth and returned him to the river.

This fish...this catching of this fish. This perfect day...this perfect place. I sat down right in that river, sat down on the smooth gravel bottom in the mere six inches of water from which I had landed then released that spunky fish--the exact experience I was looking for. I sat very still there for at least ten minutes, maybe more, as the warm breeze rustled leaves, joining with the churning gurgle of the upstream rapids. Enchanted by the sunlight filtering through the trees and listening to the song of the river, again I recalled that fishing is about so much more than catching fish. It is a gateway to experiencing those times and places that stay with us forever.

The Michigan Department of Natural Resources has designated the 2 1/5 mile stretch of the Huron River downstream from the Mast Road Bridge as a NO-KILL area for Smallmouth bass. *R.*



Photo by Jack White

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A PRIMER ON Lake Muck

Jennifer L. Jermalowicz-Jones, Ph.D.
Science Advisory Chair, Michigan Lake and Stream Associations

INTRODUCTION

Most people who live on or visit a lake know that there are usually areas where soft, stinky, lake muck is present. There are some exceptions to this with lakes that have only sand or gravel as substrate. However, what we refer to as “muck” is actually a complex mixture of organic (carbon-containing) and inorganic (mineral) non-biological and biological sediment components. Many inland lakes in Michigan have what is called glacial till which consists of sedimentary deposits left behind from ancient glacial activity. In Michigan, more lakes were formed by glacial activity than any other formation process. The composition of sediments is discussed below along with common management tools to reduce excessive muck in our inland lakes.

THE COMPOSITION OF SEDIMENTS

First of all, lake sediments were once land soils that were eroded by glaciers and deposited into depressions that we now refer to as lakes. When soils become a component of the lake bottom, they are officially labeled as sediments. A typical sediment core sample will reveal a variety of biological life such as phytoplankton (algae), rotifers and other zooplankton, macro-invertebrates, pollen, decayed aquatic vegetation, small rocks or other mineral deposits, and bacteria. The majority of a lake’s metabolism is executed in the lake sediments via microbial (bacterial) decomposition and nutrient cycling (Wetzel, 2001). The deepest portion of a lake is referred to as the pelagic zone and it is there that the finest sediment organic matter particles are broken down. In the shallows where more aquatic vegetation and mineral sediments are present, the sediments are also capable of mixing with the lake water during turnover events and being deposited on the lake bottom. This is the primary rationale of how sediment composition changes in lakes with time.

Lake sediments may vary considerably in color, density, particle size, degree of organic and inorganic constitution, and concentration of dissolved oxygen. Many lake sediments are anaerobic and such organic matter is broken down by a process called methane fermentation. This results in the strong “rotten egg” odor that many lake enthusiasts can recognize.



Biologically active sediment components can come from the surrounding watershed or from within the lake itself. Fortunately, most inland lakes have the capacity to biodegrade these materials with time to slow the rate of muck accumulation. There are technologies available to reduce the quantity of sediment muck which are described below.

Dredging:

Dredging is a lake management option used to remove accumulated lake sediments to increase accessibility for navigation and recreational activities. Dredging activities remove sediments in shallow areas, along with some dense aquatic vegetation. Due to the non-selective nature of dredging on the lake sediment seed bank, the response by individual species of aquatic vegetation is highly uncertain. Selection of a particular dredging method and confined disposal area (CDF) should consider the environmental, economical, and technical aspects involved. Dredging is regulated pursuant to provisions of Part 301 (Inland Lakes and Streams) of the Natural Resources and Environmental Protection Act, P.A. 451 of 1994, and requires a joint permit through both the Michigan Department of Environmental Quality (MDEQ) and the U.S. Army Corps of Engineers (USACE).

The two major types of dredging include hydraulic and mechanical. A mechanical dredge usually utilizes a backhoe and requires that the disposal site be adjacent to the lake. In contrast, a hydraulic dredge removes sediments in aqueous slurry and the wetted sediments are transported through a hose to a CDF. The CDF must be chosen to maximize retention of solids and accommodate large quantities of water from the dewatering of sediments. It is imperative that hydraulic dredges have adequate pumping pressure which can be achieved by dredging in waters greater than three foot of depth. Dredge spoils cannot be emptied into wetland habitats; therefore a large upland area is needed for lakes that are surrounded by wetland habitats. In addition, proposed sediment for removal must be tested for metal contaminants before being stored in a CDF. If the sediment is not contaminated, it could be used for habitat restoration,

(Continued on page 40)

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A PRIMER ON

Lake Muck

(Continued from page 39)

HOW TO REDUCE MUCK:

landfill cover, agriculture, strip mine reclamation, or in other industrial or construction uses (U.S. EPA/USACE 2004).

Funding for dredging projects is usually limited and the process is costly. A Special Assessment District (SAD) may need to be established to fund the project. If a SAD is formed, then approval of the project would require a public hearing. A dredging feasibility study would also need to be conducted prior to the start of the project to determine the amount of sediment to be dredged and the associated removal and management oversight costs. The State of Michigan Department of Environmental Quality (MDEQ) has established threshold effects and probable effects concentrations for arsenic levels in sediments. The threshold effects concentration is at 9.79 mg/kg of dry weight and the probable effects concentration is at 33.0 mg/kg of dry weight.

Laminar Flow Aeration:

Laminar flow aeration (LFA) systems (Figure 1) are retrofitted to a particular site and account for variables such as water depth and volume, contours, water flow rates, thickness and composition of lake sediment. The systems are designed to completely mix the surrounding waters and evenly distribute dissolved oxygen throughout the lake sediments for efficient microbial utilization. In fact, the rates of decomposition for organic muck are much slower in anaerobic (low dissolved oxygen) sediments than in aerobic sediments.

The use of bacteria and enzymatic treatments to facilitate the microbial breakdown of organic sedimentary constituents is also used as a component of the treatment. Since bacteria are the major factor in the degradation of organic matter in sediments (Fenchel and Blackburn, 1979) the addition of microbes to lake sediments will accelerate that process. It may also reduce the amount of ammonia being released from sediments which can (in large quantities) be toxic to aquatic life.

Beutel (2006) found that lake oxygenation eliminates release of ammonia from sediments through oxygenation of the sediment-water interface. Allen (2009) demonstrated that ammonia oxidation in aerated sediments was significantly higher than that of control (low dissolved oxygen) sediments. Although this is a relatively new area of research for inland lake use, recent case studies have shown promise on the positive impacts of LFA systems on aquatic

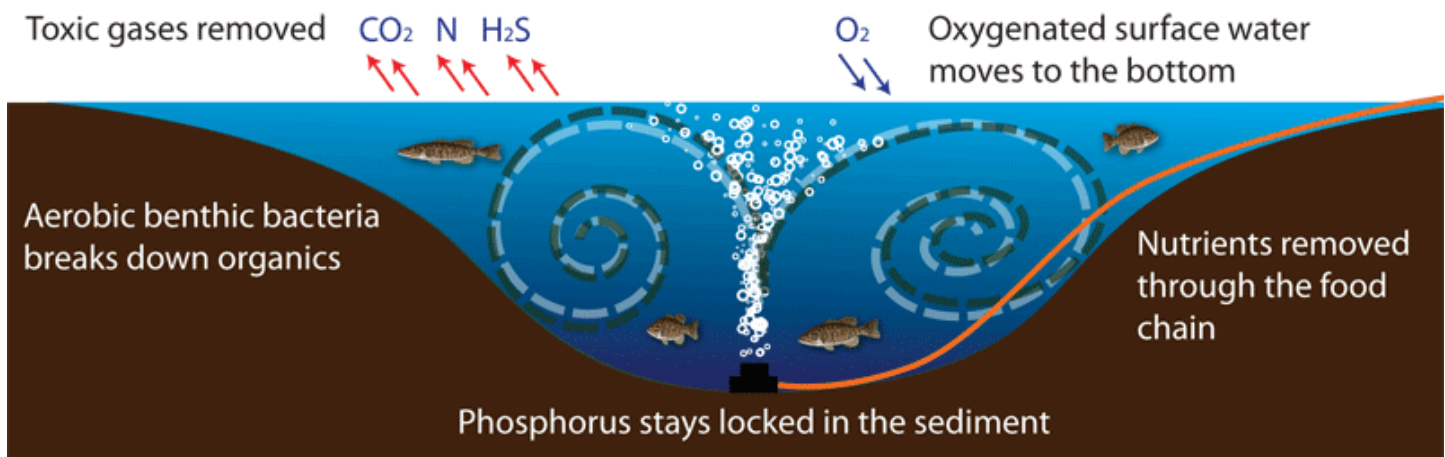


Figure 1. Diagram of the Laminar Flow Aeration Process (©RLS)

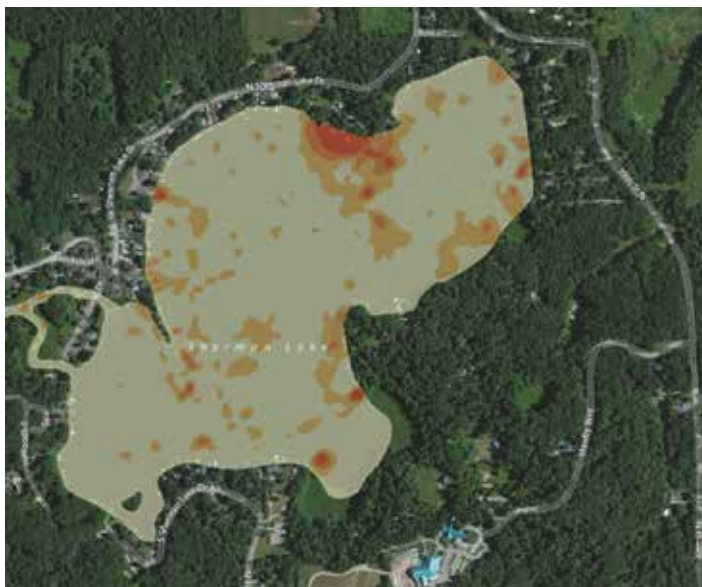


Figure 2a. Muck in Sherman Lake (Kalamazoo County, MI, before whole-lake aeration began.)

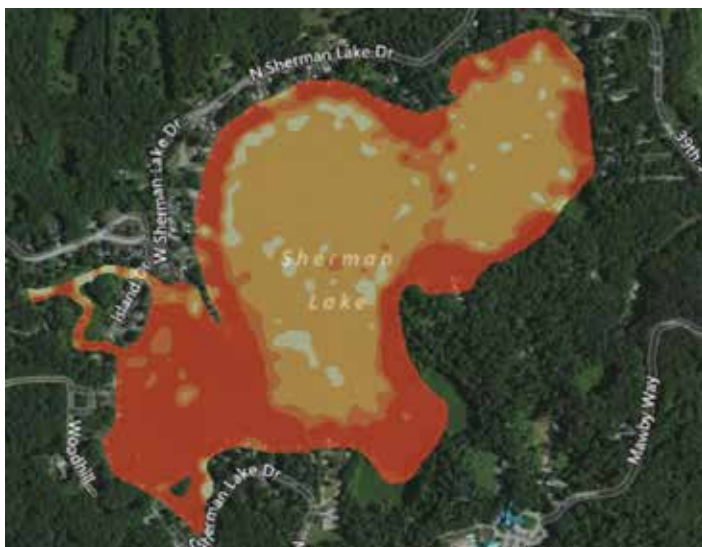


Figure 2b. Muck in Sherman Lake (Kalamazoo County, MI, after whole-lake aeration began.)

ecosystem management with respect to organic matter degradation and resultant increase in water depth, and rooted aquatic plant management in eutrophic ecosystems.

LFA is a useful method for reducing soft muck on lake bottoms and converting it to a more mineralized sediment type. Figures 2a and 2b to the left, show the reduction of soft lake bottom (beige color) and increase in more consolidated (firmer) bottom (dark orange color) in an aeration lake. A historic study by Laing (1978) showed that a range of 49-82 cm of organic sediment was removed annually in a study of nine lakes which received aeration and bioaugmentation. It was further concluded that this sediment reduction was not due to re-distribution of sediments since samples were collected outside of the aeration “crater” that is usually formed. More research on these reductions is currently being implemented on some inland lakes in Michigan. [R.](#)

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Another Lake Road End Case

By: Clifford H. Bloom, Esq.

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On October 25, 2016, the Michigan Court of Appeals released its unpublished decision in *O'Neill, et al. v Moses, et al.* (Case Nos. 329227, 330527, 329475 and 330529; 2016 WL 6269360). For purposes of full disclosure, I was co-legal counsel for three of the individuals involved in the lawsuit.

This case involved an unusual private avenue or easement, in that it is “elbow” or “L” shaped. The private road right-of-way approaches the lake at an approximately 45 degree angle and then turns and runs parallel to the lake. The road was created by a 1947 plat, which dedicated the road “to the use of the owners of lots”. The road right-of-way or easement has approximately 149 feet of frontage on the lake.

A number of off-lake property owners claimed that they have the right to install their own dockage, boat hoists and tethers along the lake frontage of the road and to permanently or seasonally moor their boats thereon. The three plaintiffs are riparian property owners who own lots adjacent to the road.

The litigation at the trial court level was long, complex and contentious. The trial court judge entered summary disposition in favor of the plaintiff riparians regarding most of the lake access issues. The trial court generally held that the road was for access only and cannot be utilized for private dockage, boat hoists or boat tethers and that the backlot property owners could not permanently or seasonally moor, store or keep their boats along the lake frontage of the road. The trial court relied heavily upon *Thies v Howland*, 424 Mich 282 (1985) and *Higgins Lake Property Owners Assn v Gerrish Twp*, 255 Mich App 83 (2003). The trial court also resolved numerous other issues.

On appeal, the Michigan Court of Appeals generally upheld most of the rulings by the trial court. The Court of Appeals agreed that the private road right-of-way cannot be used by the backlot owners for private dockage, boat hoists or boat tethers and that the backlot property owners cannot seasonally or permanently moor, store or keep boats along the waterfront. The Court held that the configuration of the road, as well as the dedication language “to the use of”, was

unambiguous and generally meant access only. The Court of Appeals agreed that evidence of historical use was not relevant or admissible due to the unambiguous nature of the plat dedication for the road. Given that the plaintiffs did not request or pursue relief preventing the backlot property owners from lounging, sunbathing and picnicking on the road right-of-way, the Court of Appeals held that the plaintiffs had conceded that issue and the trial court should not have banned those activities on the road right-of-way.

With regard to lake usage, the Court of Appeals did reverse a portion of the trial court’s decision that deemed one of the plaintiffs to have riparian rights on the claimed parallel portion of the road right-of-way in the plat based on *2000 Baum Family Trust v Babel*, 488 Mich 136 (2010). That matter was remanded back to the trial court.

There is also a discussion of certain prescriptive easement issues in the Court of Appeals’ decision.

The Court of Appeals did decide a number of other issues (which likely would not be of interest to most riparians), but generally upheld most of the trial court’s decisions. Due to all of the complex issues involved, this article is simply a summary for laypeople of the decisions by the Court of Appeals in the case.

A full copy of the written opinion by the Michigan Court of Appeals in *O'Neill v Moses* can be reviewed by going to the Court’s website at courts.mi.gov, clicking on “cases, opinions and orders”, click “case search”, enter case number 329227 and click “Court of Appeals”. [R](#)

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