

WINTER
2015



Vol. 50 No. 1

THE MICHIGAN RIPARIAN

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THE MICHIGAN RIPARIAN (ISSN 0279-2524) is published quarterly for \$3.50 per issue by the Michigan Lakes and Streams Foundation, a Michigan non-profit corporation. Periodical postage is paid at Lansing, Michigan and additional mailing offices.

POSTMASTER:

Send address changes to:
The Michigan Riparian
300 N. State St., Suite A, Stanton, MI 48888

THE MICHIGAN RIPARIAN is the only magazine devoted exclusively to the protection, preservation and improvement of Michigan waters and to the rights of riparian owners to enjoy their water-front property.

THE MICHIGAN RIPARIAN magazine is published quarterly and is mailed to subscribers in the Winter, Spring, Summer, and Fall each year.

The Michigan Riparian

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Stanton, MI 48888

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SUBSCRIPTION RATES (4 issues/year)

Individual annual subscription: \$14

Lake association quantity subscriptions: \$12

ADVERTISING RATES

Advertising rates sent upon request or available on website.

DEADLINES: August 15 for Autumn issue

December 15 for Winter issue

March 15 for Spring issue

May 15 for Summer issue

Printed by Spartan Printing, Lansing, Michigan

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FROM THE PUBLISHER

Happy New Year!



We hope this issue of The Michigan Riparian finds you happy, healthy and on your way to a prosperous 2015! Something new for the winter issue of the magazine is the distribution date.

Just as it may be at your house during the holidays, it can get a little hectic around here for our writers, advertisers, printing company and postal service. Pushing back the distribution date to the end of January instead of the middle gives everyone involved a bit more breathing room.

This issue of The Michigan Riparian is filled with a variety of topics from zebra mussels to Hybrid Milfoil to microbeads. The Christiana Lake story will have you traveling back in time and will give you a fascinating glimpse at days gone by...from Indian Mounds, the start of the Miles Laboratory, and the development of the lake.

Be sure to mark your calendars for the upcoming Michigan Lake and Stream Associations' Annual Conference (see page 18 for conference highlights and this year's theme). If you have a passion for Michigan's inland lakes, think about getting involved and become a water resource leader. Registration deadline is March 30 for the 2015 class of the Lake and Stream Leadership Institute (see page 24).

The Michigan Riparian likes to keep you informed on any new developments that affect you and your lakefront property. See the latest happenings about a Senate Bill being reintroduced to collect boat launch fees, and turn to page 30 to review the latest three Michigan Court of Appeal rulings.

Keep contacting us to share your stories and pictures. We love hearing from you. Email me at info@mi-riparian.org if your lake association would like to be featured in The Michigan Riparian.

-publisher, Sharon Wagner
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Article written by current lake property owner Jeff Wilson for fun and largely based on research work conducted by Martha M. Pickrell, formerly of the Elkhart County Historical Society.

Christiana Lake

CASS COUNTY MI



In a county with over 275 lakes, 179 acre Christiana Lake in Southwest Michigan's Cass County is very easy to overlook. It is overshadowed by her big 1,000 acre sister, Diamond Lake, seven miles to the north. Christiana Lake is part of the Juno chain, which includes Eagle, Christiana, Painter, and Juno.

dozen of these mounds scattered around Christiana Lake and creek. However, by the 1930's only six mounds were still visible. It was during this period that these remaining mounds were completely uncovered in a series of excavations conducted by both the Cass County Historical Society and Michigan Archaeological Department and

their contents of bones, pieces of pottery, tools, and weapons were removed. The "Christiana Mounds" made somewhat of a splash in the archeological circles of their day, but are now all but forgotten.

Like all lakes in Michigan, the lake and surrounding territory changed hands from

Christiana Lake and its creek were named after Christiana McCoy, the wife of Rev. Isaac McCoy, a missionary who established a local Indian missionary school nearby the lake in the 1820's. Records indicate that Indians had been living in the area on a nearly continual basis for thousands of years based on ancient garden beds and artifacts found in burial mounds scattered around the area. In McCoy's day, the local Indians claimed the mounds were built by their forefathers as a monument to a great battle or series of battles that were fought around the lake long ago between warring tribes. In the 1920's, a local archeologist named George R. Fox found evidence of over a



Early picture of ancient Indian mounds found in Southwestern Michigan.

(Continued on page 6)

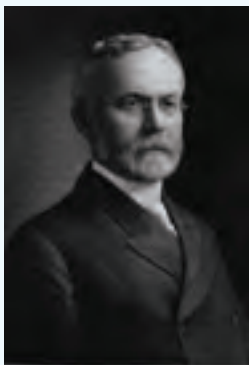
Christiana Lake

(Continued from page 5)

the French to the British to the US, and finally ended up in private hands for the first time in the 1820's when it was purchased by Dr. Havilah Beardsley. Beardsley, who is considered the founder of nearby Elkhart, Indiana, never did much to develop Christiana Lake, but development came in the way of a well-worn Indian trail that ran near the lake called Sauk Trail. The trail eventually was turned into The Chicago-Detroit Road (now US 12). Better roads connected more towns, which translated into more people and development.

In 1834 a flour mill was built on the Christiana Creek near this road by Moses Sage. Amazingly, it operated in one form or another until the 1940's, after over 100 years of near continual operations. Some of the foundations are still visible next to a dam which was later built on the site for flood control. Over the years, Beardsley sold off sections of the lake as the area developed. Elkhart, the town he founded, continued to grow.

By the 1870's the lakes in the area became a welcome relief for Elkhart citizens from the crowds, mud, and heat. One of the people who liked to escape to Christiana for weekend visits was an up-and-coming local Elkhart doctor by the name of Franklin L. Miles.



Dr. Franklin Miles

and that Christiana seemed especially restorative to one's health. He would come to the lake to relax and take family members there when he or they were recovering from illness.

Dr. Miles was a workaholic by workday and a fishing enthusiast by weekend who became enchanted by the lake's beauty, proximity, and good fishing. He also held to the belief that lakes were therapeutic



His hard work eventually paid off; and, in 1882, he patented his first remedy, "Dr. Miles Restorative Nervine". It allegedly treated all types of nervous ailments from headaches to sleeplessness to epilepsy to all out hysteria. By 1890, the sales success of this one remedy led him to develop the somewhat novel concept of mail order medicine. This, in turn, led to Miles Laboratories. It seems hard to grasp the popularity of Nervine, which contained various types of bromides. But, at the turn of the last century, Nervine and other bromides were so popular that according to Wikipedia only aspirin sold better.

As money started to flow in from the sale of Nervine, Dr. Miles started to purchase land around Christiana Lake. He bought a small farm off US 12 that bordered both Christiana Creek and lake.

Dr. Miles also bought a good portion of

the entire eastern shore of his beloved lake which contained a heavily wooded slight bluff that overlooked the lake and offered sensational sunset views. In 1882 he started the Elkhart Sportsmen Club and built a clubhouse there, holding fishing tournaments on the lake. In the days before the DNR, local newspaper articles reported some of these contestants would take over 100 Largemouth Bass each over a single weekend in the 1880's. Years passed and eventually he replaced the clubhouse with a 10 room lodge, which he used as a kind of sanitarium for some of his patients, and as a vacation home during the summer for his growing extended family. During this time, he built some cottages near the lodge which he rented out. He had a bridge built over the Christiana Creek as part of a road he had built to connect his farm to the lodge.

Time moved on, and the good doctor began spending more and more time in a remote



The Miles Bridge in 1908 that once connected Dr. Miles' farm to his lodge. The bridge and buildings are gone, but the three bridge pilings are still visible. The farm is now Four Lakes Golf Course.



Miles Lodge steps then and now.

Dr. Miles died in 1929, and this very remarkable man was buried with honors in Elkhart.

As for the lake, today the fishing is nowhere close to how it was reported in the 1880's, but it remains a beautiful lake. You can still see a few remnants of the Miles era. Steps that Dr. Miles had built from the lodge to the lake are still there due to the care of their current owners, as well as a few cottages that were part of the lodge. The pilings of the Miles Bridge can also still be seen at the mouth of the Christiana Creek

A vintage, sepia-toned photograph of a crowded beach. In the foreground, many people are swimming in the water. In the middle ground, a large, light-colored building with a flat roof and several windows is visible. To the right of the building, there is a smaller structure with a gabled roof. The background is filled with dense trees. The overall scene suggests a popular beach destination from the mid-20th century.



Christiana Lake eastern shore then and now. Note lodge steps in center and former Miles Lodge rental cottages on extreme right.

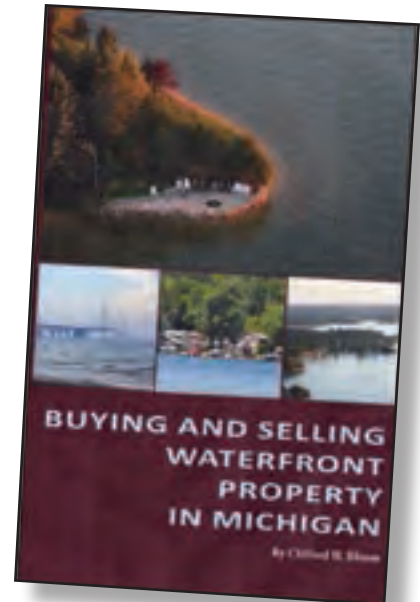
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Christiana Lake

(Continued from page 7)



Sunset and 4th of July fireworks over Christiana Lake.



Two old bottles recently found on the lake bottom near the site of the lodge.

and an occasional old medicine bottle or other lodge related item is still found on the lake bottom.

Wetlands have mercifully allowed a good portion of the lake's shoreline to remain undeveloped. The lake is accessible via a

very nice public boat launch. In fact, the DNR is considering putting a second boat launch on this relatively small body of water, which is somewhat noteworthy in light of the fact that only a handful of the aforementioned 275 Cass County lakes have any public boat launch at all. The lake also has a thriving lake association, which among other good acts, monitors lake water quality and sponsors Independence Day fireworks.

The warring Indian tribes, their mounds, the grist mill, the Gipper, and Dr. Miles and his lodge are now part of a distant past, but the sensational sunsets still remain. If you are ever in the area, come and see for yourself.

It should be noted that Martha M. Pickrell wrote a very interesting book about Dr. Miles that can still be purchased on-line.

Lake map created by John D'Ortenzio, one of my oldest son's friends, based on his many lake visits and observations.

Fireworks pictures taken by professional photographer Mike Kelly of Frankfort IL in 2014.

Stair and several old pictures provided by my great neighbors and friends Virginia and Dennis Gard who beautifully landscape and maintain the lodge stairs to this day.

Jeff Wilson ●●●

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HE “Tragedy” / “Comedy” is a well-known story of the lowering of Crystal Lake, in Benzie Co., MI. Archibald Jones founded the Benzie County River Improvement Co. in 1873, intending to improve water-lots on Crystal Lake, remove obstructions and construct slack-water canals between Crystal

Lake and Lake Michigan, and build a steamboat to facilitate shipping of settlers and goods to and from the interior of the County to the nearby port of Frankfort. Ensuing events were unique among large inland lakes of NW Lower Michigan. The dramatic lowering of a very large inland lake by 20 feet and the creation of a 21-mile perimeter of sandy beach insured the future of Crystal Lake as a prime recreational area.

The role of Archibald Jones, “the man who (allegedly) pulled the plug at Crystal Lake”, involved travels of a typical American family in the 1800’s, searching for opportunities, experiencing adventures, and facing vicissitudes posed by the opening of the American Midwest. A “tragedy” depicts a protagonist overcome by superior force or circumstance; a “comedy” depicts a laughable person involved in a blunder without pain or disaster. The lowering of Crystal Lake has elements of both - a serious beginning with a happy ending with perceived foibles of human nature and realized unintended consequences of bold venture.

It is this author’s intent neither to disparage the “Tragedy” nor to exalt the “Comedy”. The “Tragedy” occurred during 1873 and its “tragic” aspects were felt well into the early 1900’s. The transition into the “Comedy”, with its “comedic” aspects, is of more recent interpretation and still continues. The former remains forever indelibly inscribed in our collective memories; the latter only embellishes upon its virtues.

The “Comedy” of Crystal Lake, is a continuation of the “Tragedy” of Crystal Lake.

Part I. The Lowering of Crystal Lake is a critical review of recorded legends, contemporary accounts, and historical records that include: the original Stock Certificate, the Articles of Association, the Map of Proposed Improvements, and the Court Proceedings for the Benzie County River Improvement Company from the 1870’s.

Part II. The Biography of Archibald Jones is an accounting of the accomplishments of an entrepreneur and “bootstrap engineer” enjoined in the settlement of a new territory filled with challenges and opportunities.”

– Dr. Stacy L. Daniels, 2015

- ABOUT THE AUTHOR -

STACY LEROY DANIELS, a native of Benzie County, MI, and a long-time littorian of Crystal Lake, read the “Tragedy” of Crystal Lake as a young boy. After becoming a professional environmental engineer, he came to wonder more about the uniqueness of Crystal Lake: What caused the lowering of the Lake? Who was Archibald Jones – a scapegoat to be blamed for an ill-conceived project, or a “bootstrap engineer” to be celebrated as a hero?

Dr. Daniels attended Midland High School, and the University of Michigan, where he studied both chemical and environmental engineering. He obtained his PhD in chemical engineering from the U of M in 1967. He was associated with The Dow Chemical Company in Midland, MI, from 1955-1993, where he managed a variety of environmental projects and issues associated with water/wastewater treatment research; health/environmental science; hazardous waste management; and regulatory assessment. He has been a member or chair of several national environmental peer review groups and science advisory committees.

As a volunteer professional, Dr. Daniels has been involved with the myriad environments of Crystal Lake since the early 1960’s. He has observed, participated, and directed many independent and cooperative environmental studies concerning the Lake and its Watershed with the ad hoc Committee of the Benzie County Department of Public Works, the Crystal Lake Clean Water Committee, the North Shore Property Owners’ Association, the Crystal Lake Watershed Fund (CLWF), and the Crystal Lake Watershed Association (CLWA).

He has served as Committee Chair of Education & Communications and Co-Chair of Water Quality for the Crystal Lake & Watershed Association (CLWA) formed in 2004 upon the merger of the Crystal Lake & Watershed Fund (CLWF) and the Crystal Lake Association (CLA). He has also edited the CLWA newsletter, “Crystal Whitecaps”, and its webpage www.CLWA.us. “The CLWA, together with governmental, academic, and professional partners, develops and supports initiatives for water quality monitoring, septic system control, sustainable development, and land conservancy, through education, for watershed management.”

He has been an active runner in the Crystal Lake Team Marathon, enjoys reading environmental history, and writing serious (and humorous) environmental poetry. His long-time interest in local history motivated him to research the story of Archibald Jones and then write the “Comedy” of Crystal Lake. Besides his immediate family, the author is not related to anyone else within the Crystal Lake Watershed or Benzie Co., except perhaps in spirit to his alter ego, Archibald Jones.

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Dear MWA members and lake association members,

Looking forward to 2015, your Michigan Waterfront Alliance is in good health financially. We have the best lobbying firm that we have ever had, and we have more lake association members than ever before. My wish as president is: To get the word out to the thousands of The Michigan Riparian magazine readers who do not belong to the MWA, that their membership in the MWA could, indeed, not only protect their lake or stream but also protect their riparian rights and is the best investment they could ever make to ensure the future of the waterfront lifestyle they have come to know and love.

As MWA continues to help pass legislation that helps fund the battle of controlling the spread of aquatic invasive species, an old problem seems to be getting worse in many of Michigan's lakes:

Swimmers Itch

According to the Michigan Department of Environmental Quality "Swimmer's Itch in Michigan" report, swimmers itch predates the logging era. There are over 600 articles published on the subject. The MDEQ report states that from the 1930's through the 1970's, the Michigan Bureau of Water Management conducted a swimmer's itch control program annually from June to August. Currently the program is limited to providing technical bulletins and the issuance of permits to treat the waters for snail control. That program focused on the use of copper sulfate to control the snails that host part of the life cycle of the flat worm that burrows into the skin of swimmers. The other host in that flatworm life cycle is waterfowl. Extensive research on Higgins Lake and a number of other large lakes has shown that the Common Merganser duck is the duck of choice for the swimmers itch flatworm.

The swimmer's itch (SI) threat is so serious that representatives from Higgins Lake are leading

efforts to bring together a partnership of lake associations (currently ten lakes, including Higgins and Leelanau) to focus on SI. The partnership is sharing best practices, working to quantify the economic impact of SI and developing a survey that will enable prompt reporting of cases of swimmer's itch to facilitate the gathering of data to determine the scope of the problem on the ten member lakes. For more information about the newly formed partnership, contact Jim Vondale (jvondale57@gmail.com) or Ken Dennings (kt dennings@charter.net). For more information about the survey, contact Wayne Swallow (wayneswallow@charter.net).

The MWA will be ready to help in any way it can and will keep all members posted on the progress of the Michigan Swimmer's Itch Partnership and other efforts to make swimming in our lakes itchless!

Sincerely,
Bob Frye, President
Michigan Waterfront Alliance

Hybrid Milfoil: Management Implications and Challenges

By: Tony Groves, Paul Hausler, and Pam Tynning
Water Resources Group, Progressive AE

Background

Millions of dollars are spent annually on programs to combat invasive aquatic plants in Michigan. A primary focus of many of these programs is the control of Eurasian milfoil (*Myriophyllum spicatum*), an aggressive-growing exotic plant introduced into the United States from Europe and Asia.

Eurasian milfoil is not the only type of milfoil found in Michigan. There are several native milfoil species, such as northern milfoil (*Myriophyllum sibiricum*). Some native species closely resemble Eurasian milfoil and are commonly mistaken for it. However, the native milfoils rarely form dense, impenetrable plant beds like Eurasian milfoil often does. In some lakes, hybridization between exotic Eurasian milfoil (*M. spicatum*) and native northern milfoil (*M. sibiricum*) is occurring. Genetic testing has found milfoil hybrids to be widely dispersed across the northern portion of the United States and hybrid milfoil appears to be widespread in Michigan. The documentation of the presence of hybrid milfoil is important because hybridity in plants is often linked to invasive traits. In fact, hybrid milfoil may be more invasive than Eurasian milfoil. There is concern in the scientific community that hybrids could have a competitive advantage over, and ultimately displace both northern milfoil and Eurasian milfoil.

In terms of physical appearance, hybrid milfoil is difficult to distinguish from Eurasian milfoil. For positive identification, genetic testing is required. Further, not all hybrid milfoils are the same. There is considerable genetic variability within hybrids.

Herbicide Treatments

Herbicide applications are the most commonly-used method to control Eurasian milfoil. However, in some lakes, herbicide treatments have become less effective. Dose rates that historically provided good control of milfoil are sometimes only partially effective, and plant die-back is incomplete and/or regrowth occurs more rapidly.

Recent research indicates that hybrid milfoils may exhibit increased tolerance to some herbicides. On average, hybrid milfoil is less susceptible to control with the commonly-used aquatic herbicide 2,4-D in comparison with Eurasian milfoil. The decreased sensitivity to 2,4-D appears to be common across different hybrid lineages. Lakes that have been treated historically with 2,4-D have a higher incidence of hybrid milfoil than non-treated lakes. This research suggests that use of certain herbicides may inadvertently allow tolerant hybrid milfoil to gain dominance.

With the aquatic herbicide fluridone (Sonar®), hybrid tolerance appears to be limited to fewer hybrid lineages. While hybrid resistance to fluridone has been observed in a small percentage of lakes, hybridity does not necessarily infer fluridone tolerance.

Management Implications

Management of hybrid milfoil presents new challenges. Fortunately, there are some new tools available to document the presence of hybrid milfoil and to evaluate the potential for herbicide resistance.



Eurasian milfoil (*Myriophyllum spicatum*)



Hybrid milfoil (*Myriophyllum spicatum* x *Myriophyllum sibiricum*)

Genetic Testing: As discussed in an article in the Summer 2014 issue of the Michigan Riparian, genetic testing is now commercially available and can be used to determine the presence and distribution of Eurasian versus northern versus hybrid milfoil in a given lake. This data can, in turn, be used to inform management decisions.

Herbicide Susceptibility Screening: Another approach that is being used is herbicide susceptibility screening in which milfoil samples are collected from various locations in a lake and exposed to typical herbicide dose rates to evaluate plant response. If plant response is diminished, it may indicate the presence of hybrid milfoil and the need for reevaluation of a treatment approach, before substantial resources are committed to a treatment protocol that may not be very effective.

As with most invasive species, early detection and rapid response is key to effective control. Annual monitoring of the type and abundance of aquatic plants is an essential first step in this endeavor. In areas of the lake where milfoil is found, plant samples can be collected for further analysis.

In general, the use of herbicides with different modes of action, rather than using the same type of herbicide year after year, may help stem the spread of hybrids that are showing resistance to a particular herbicide or class of herbicides.

Given the potential management implications, genetic testing and herbicide susceptibility screening may soon become standard practices for lake managers. Additional research is ongoing to better evaluate the distribution of hybrid milfoil, its biological characteristics, herbicide treatment impacts, and its susceptibility to control measures.

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Question: Can lakefront property owners in Michigan still construct sea walls?

Answer: The short answer is yes. However, Part 301, Inland Lakes and Streams of the Natural Resources and Environmental Protection Act, 1994, PA 451, as amended, mandates that the lake or stream property owner (or the company performing the work on their behalf) must first apply for a permit from the Michigan Department of Environmental Quality (DEQ) before proceeding with construction of any type of shoreline stabilization structure such as a sea wall, bulkhead, revetment or bio-engineering project which occurs at or below the ordinary high water mark of a lake or stream. Due to the fact that shoreline protection structures can negatively impact aquatic resources, shoreline protection structures should only be installed when they are necessary to mitigate erosion problems. Vertical sea walls, in particular, have the potential to negatively impact fisheries, wildlife habitat and the water quality of inland lakes and streams. Accordingly, the DEQ highly recommends exploring the use of alternative methods of shoreline erosion control such as bio-engineered structures that involve the use of native plants and natural stone that maintain the natural slope and the important transition habitat between upland areas and the water's edge.

For more information about Michigan Department of Environmental Quality Inland Lakes and Streams Programs and required permits, point your internet browser toward http://www.michigan.gov/deq/0,4561,7-135-3313_3681_28734--,00.html

To find out more about the **Michigan Natural Shoreline Partnership** and lake and stream ecology friendly methods of protecting shorelines visit <https://sites.google.com/site/mishorelinepartnership/home>, or simply Google Michigan Natural Shoreline Partnership.

Scott Brown, ML&SA Executive Director

* * * * *

Our experts include our riparian attorney, a biologist, a limnologist, an engineer, a college professor and a state agency official. They look forward to responding to your question.



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What To Do About A freeloader

By: Clifford H. Bloom, Esq.
Bloom Sluggett Morgan, PC
Grand Rapids, Michigan
www.bsmlawpc.com



Many voluntary lake associations collect dues for services such as aquatic weed treatments, 4th of July events, boat safety courses and similar matters, but typically not all property owners on the lake will join the lake association or pay dues. Along many private roads in Michigan, some of the property owners contribute moneys for the snowplowing, upkeep and maintenance of the private road, but others do not. In such cases, the paying land owners subsidize those who do not contribute, yet those who do not contribute funds still receive the benefits of those who do. Some might call the non-paying parties “freeloaders.” In such cases, what are the lake association members or land owners along a private road who do contribute funds to do?

Typically, property owners who refuse to join a lake association or to pay private road maintenance costs have a million excuses. For example, they claim that the lake association wastes money or does not spend money the way the non-contributing property owner desires. Or they claim that the snowplow driver for the private road has not done a good job of snow removal in the past. Or, the property owner is philosophically opposed to chemical treatments for aquatic weeds in the lake involved. Sometimes there is a perception by some property owners that they were somehow slighted by the lake association or the other lot owners along the private road in the past.

The refusal by some property owners to pay lake association dues, aquatic weed treatment costs or private road maintenance expenses is particularly perplexing given that their lake or other properties are often worth hundreds of thousands of dollars or more. Typically, annual lake association dues, aquatic weed treatment payments or annual private road maintenance and snowplowing costs per property are a pittance. Furthermore, funds utilized for such purposes usually enhance the value of all properties involved.

In general, in Michigan, absent deed restrictions or restrictive covenants, a lake property owner cannot be forced to join a lake association or pay dues for that purpose. And, in most cases, the greatest monetary expenditure for lake associations is aquatic weed treatment costs. If the majority of lake property owners wish to force non-participating property owners to pay their fair share of aquatic weed treatment costs for the lake, there are three general options available. However, not all of them are always practical.

First, Michigan has several ancient statutes whereby a group of property owners can force all land owners within a certain area to become members of a summer resort association or the equivalent. These include the Summer Resort and Assembly Associations Act of 1897 (Public Act No. 230 of 1897) MCLA 455.1 et seq., the Summer Resort and Assembly Associations Act of 1889 (Public Act No. 39 of 1889) MCLA 455.51 et seq., and the Suburban Homestead, Village Park, and Summer Resort Association Act (Public Act No. 69 of 1887) MCLA 455.101 et seq. However, the most commonly utilized statute is the Summer Resort Owners Act of 1929 (Public Act No. 130 of 1929), MCLA 455.201 et seq. A Michigan summer resort association (or the equivalent) under statute has broad powers and could, in most cases, force all members to pay aquatic weed treatment costs. Nevertheless, this option is rarely pursued due to the legal expenses incurred in setting up such an association, their unwieldy governing procedures and the fact that the Michigan courts could eventually hold such associations to be unconstitutional and void given that they are accorded city-like powers. Please see my other article in this issue of the magazine regarding a recent court decision involving a summer resort association.

A second option is for members of a lake association to pursue a special assessment district for the lake for aquatic

weed treatment purposes through the local township, city or village that has jurisdiction over the lake. Given that most lakes are located in townships, Public Act No. 188 of 1954 (MCL 41.721 et seq.) can be utilized. An aquatic weed treatment special assessment district can be set up pursuant to that statute, and in that case, if the entire lake is within the district, all property owners within the district must pay the assessments on their property tax bills. For more information about such special assessment districts, please see my article entitled, “Weed Whacker” in the Winter 2009 issue of the Michigan Riparian Magazine.

The third and final option is to establish a Michigan statutory lake improvement board pursuant to MCL 324.30901 et seq. All such lake improvement boards constitute a semi-independent local governmental agency and have the authority to establish special assessment districts.

For private roads where no recorded private road maintenance agreement exists, there are also at least two alternatives available for forcing everyone with property fronting on a private road to pay their fair share of the snowplowing, maintenance and upgrade costs of the road. First, a special assessment district can also be created by the local municipality for that purpose. Second, unlike voluntary lake associations, all property owners along a private road have a common law duty to contribute to the maintenance and snowplowing costs of that private road. Unfortunately, that common law duty can only be vindicated by a lawsuit. In such cases, one or more property owners along the private road who contribute to the snowplowing and maintenance costs would have to sue those other property owners along the private road who refuse to pay such costs.

In all of these situations, it would, of course, be easier if everyone involved would simply pay their own fair share. ●●●

MICHIGAN LAKE & STREAM ASSOCIATIONS, INC.

ML&SA NEWSLETTER



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Proposed Legislation Would Allow Local Units of Government to Collect Boat Launch Fees at Some Public Boat Launch Facilities

By Scott Brown
ML&SA Executive Director

In an effort to authorize local units of government to impose "fees for activities such as prevention, control or eradication of aquatic invasive species, using a boat launch or a boat washing station, or parking a motor vehicle and trailer used to haul a boat", Michigan State Senator Tom Casperson (Escanaba) will re-introduce Senate Bill 1091 in the new session of the state legislature which will begin in early January, 2015.

The proposed legislation would authorize local units of government to pass ordinances to collect boat launching fees at municipality and township owned public boat launch facilities. Launch fees under the new law could not exceed \$10.00 per day for each boat or \$45.00 per boat annually. Fees collected under local ordinances would be restricted to funding activities associated with the prevention, control or eradication of aquatic invasive species. Lake managers, pesticide applicators or others engaged in aquatic invasive species management would be exempt from paying the local launch fees.



The proposed legislation would not allow local governments to impose fees at Michigan Department of Natural Resources owned public boat launch facilities.

To download and read Senate Bill 1091 as it was originally introduced in the State Senate, go to <http://www.mymlsa.org/wp-content/uploads/2014/11/2014-SIB-1091.pdf>

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Marrone Bio-Innovations Receives Final EPA Approval to Use Zequanox® in Open Waters

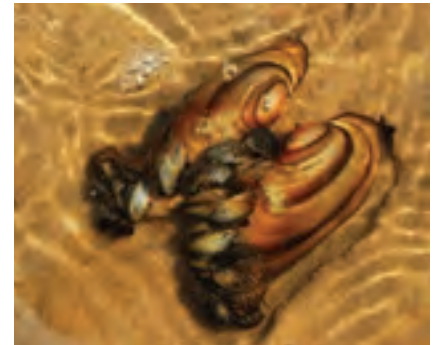
Michigan Department of Environmental Quality Approval Pending Final Review Outcome

By Scott Brown
ML&SA Executive Director

After many years of intensive research and field testing, Marrone Bio-Innovations has gained United States Environmental Protection Agency (EPA) approval for the use of Zequanox, a bacteria-based molluscicide, in open waters to combat infestations of invasive zebra and quagga mussels in lakes, rivers, and other open bodies of water.

Zequanox, the only selective and aquatic ecosystem compatible molluscicide in existence, was first approved by the EPA in 2012 for invasive mussel control in enclosed hydro-systems and infrastructure for energy producers and manufacturing companies. Final EPA approval allows Marrone Bio-Innovations, pending Michigan Department of Environmental Quality authorization, to offer Zequanox to lake managers as a potentially effective solution for controlling existing infestations of invasive mussels in limited applications, such as eradicating the pesky species from swimming areas. Zequanox is formulated from a strain of the bacteria known as *Pseudomonas fluorescens*. The naturally occurring bacteria has been utilized by the agricultural community for decades to help prevent fruit crops from freezing.

Invasive mussel populations are now prevalent in major waterways throughout the United States, including the Great Lakes Region as well as the Mississippi, Arkansas, Tennessee and Colorado rivers. Lake Huron and Lake Michigan are known to host astronomical populations of quagga mussels which are capable of surviving and reproducing in depths of up to 100 meters. The rapidly reproducing mussels have had a significant economic and environmental impact on recreational water use throughout the Great Lakes region. Colonies of invasive zebra and quagga mussels negatively impact native mussel populations and disrupts aquatic food chains. Invasive zebra and quagga mussels first appeared in Michigan waters in the late 1980's and have since caused hundreds of millions of dollars in damage to water related infrastructure.



Zebra Mussel

A successful test of Zequanox involving an early stage infestation of zebra mussels was conducted earlier this

fall by Marrone Bio-Innovations and the Minnesota Department of Natural Resources in Christmas Lake near Shorewood, Minnesota. The Michigan Department of Environmental Quality is expected to finish its review of Zequanox during the spring of 2015, pending the completion of a pilot study in Lake Erie by Marrone Bio-Innovations as well as the results of a U.S. Geological Survey (USGS) study "Evaluating the Safety and Efficacy of *Pseudomonas fluorescens* Strain CL145A to Control Dreissenid Mussels"

For more information regarding the product, visit the company's product dedicated web page at <http://www.marronebioinnovations.com/products/brand/zequanox/>.

To view the USGS study information go to http://cida.usgs.gov/gli/projects/invasive_species/zm_control.html

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Plagued by Plastics: Microbeads in the Great Lakes

By Jennifer McKay
Policy Specialist
TOMWC

Sometimes it is the small things that can have the biggest impact. Unfortunately for the Great Lakes, a big impact is coming from a barely visible threat - microbeads. Microbeads are tiny particles of plastic used in hundreds of cosmetics and personal care products such as facial scrubs, soaps, and toothpaste. These microbeads, typically used as abrasives and exfoliants, are flowing by the billions into the Great Lakes and other waterways. When you wash your face or brush your teeth, you may be unknowingly discharging these tiny pieces of plastic into our Northern Michigan waterways.

Microbeads, while extremely small, are used in large quantities. One product alone can contain over 300,000 microbeads. A 200 ml bottle can contain as much as 21 grams of microplastics, roughly a tenth of its weight. Because of their small size and buoyancy, wastewater treatment plants are not able to filter them out, and they are discharged directly into our rivers and lakes. Once discharged, there are no known methods to effectively remove these microplastics or microbeads from the environment.

Beginning in 2012, a research team that included scientists from the State University of New York (SUNY) at Fredonia and The 5 Gyres Institute began sampling the Great Lakes to better understand plastic pollution in our most treasured resource. The research results are alarming. Lake Michigan had an average of 17,000 microbeads per square kilometer. The levels were much lower in Lake Huron and Lake Superior, but much higher in Lake Erie and Lake Ontario. Lake Ontario's levels are highest, with counts of up to 1.1 million plastic particles per square kilometer!

Why are these tiny microbeads a big problem for the lakes? The microbeads have the potential to cause harm to Great Lakes aquatic species. The microbeads are about the same size as many fish eggs, which means that they can look like food. Fish, turtles, and waterfowl are unable to distinguish between food and microbeads and, therefore, feed on microbead plastics. If fish or birds eat the inert beads, the material can block their digestive systems depriving them of nutrients from real food. Researchers are already finding these tiny plastics in the stomach of some Great Lakes fish species, such as perch.

Additionally, the microbeads are not biodegradable and the petroleum in the plastic serves as a magnet for other pollutants in the environment like DDT, PCBs, flame-retardants, and other industrial chemicals. Because microbeads easily attract and absorb toxins, the beads are potentially toxic to any wildlife that eats them. The toxins from the beads can also accumulate in fish and wildlife, potentially reaching humans who eat wildlife around the Great Lakes region.

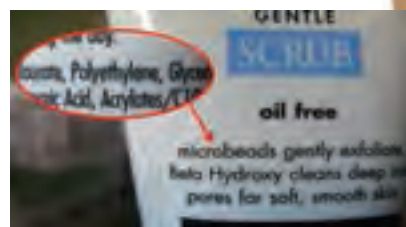
The only way to stop the threat from microplastics is to prevent them from entering the ecosystem in the first place. This means we need to stop the use of the plastic microbeads in consumer products. Since plastic microbeads are not an essential ingredient in personal care products, this can be achieved voluntarily by companies choosing to

replace plastic abrasives with alternatives or through a law prohibiting the sale of products containing microbeads. Your actions can help both of these become a reality.

How can you help? First, avoid personal care products that contain microbeads by checking the product ingredient list for "polyethylene" or "polypropylene" microbeads. Instead, look for products that are using alternatives such as ground almonds, oatmeal, sea salt, and pumice. The 5 Gyres Institute created a free app, Beat the Microbead, which can scan a product's bar code and tell if it contains the beads. You can download the app at www.beatthemicrobead.org. If you currently have any products containing microbeads, stop using them and properly dispose of them at any local POD Drop-off location. Drop-off locations throughout Northern Michigan can be found at www.pillsinthepods.com.

Next, support a ban on microplastics and microbeads in consumer products. Bills have been introduced in the Michigan legislature. Public support is critical to get a ban on microbeads in Michigan. Contact your elected officials today and tell them you want the Great Lakes protected from these tiny plastics that are plaguing our waters.

While these small microbeads are causing a big problem for our Great Lakes, small actions from you can make a big difference in stopping this plastic pollution. With your help, we can protect our precious, yet vulnerable, Great Lakes from the threat of microbeads. ●●●




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Readers' Perspective:

CRYSTAL LAKE — Commonality and Uniquity

Publisher's note: see The Michigan Riparian summer 2012 issue in the Love My Lake feature about the 200th Anniversary of Archibald Jones Day.

By Dr. Stacy L. Daniels

"Crystal Lake will always be something special for me, because it symbolizes an emotion that goes beyond time and space." ... "It (Michigan) is wood and water, golden sand and blue lakes, emptiness and memories and the sort of isolation which it is hard for a city man to come by, these days." ... "This is good country to come from and it is even better to go back to. It is a land of memories and also a land of escape; a place where you can be utterly idle in more pleasant ways than any other place I know." ~ Bruce Catton, *The Real Michigan*, Holiday Magazine 22(2), 26-39 (Aug. 1957);

Why write about a singular esoteric event the "Tragedy" / "Comedy" of Crystal Lake? All northern Michigan lakes share commonalities of geological histories, physiological features, hydrological behaviors; climatic influences, visual beauties, and recreational pursuits. Our visions are of clear waters and bright sunshine glittering from gentle waves lapping against pristine beaches ringed by wooded hillsides, scented of pine, exuding a spirit of place. We escape the congestion and "hustle-bustle" pace of our cities by vacationing at our special lake to experience carefree living, roughing it, returning to the simple life, and communing with nature.

Peculiar to Michigan were needs to improve the land-locked entrances of drowned river mouths along the eastern shoreline of Lake Michigan (the West Coast of Michigan) by creating "harbors of refuge" for shipping, and inland waterways to access the interior of the state. Other "improvement projects" included canals, dams, locks, docks, and/or other appurtenances for transporting timber, powering saw and grist mills, and irrigating newly cleared fields. Many natural river outlets were straightened and new channels dredged to navigable depths to connect nearby inland lakes by "slack-water" canals to Lake Michigan. These included: Saugatuck, Holland, Grand Haven, Muskegon, White Lake, Pentwater, Ludington, Manistee, Portage, Frankfort, Charlevoix, and Petoskey. The attempt to connect a canal from Frankfort Harbor to Crystal Lake proved to be the most ambitious of all *sui generis*.

One lake's uniqueness is an object lesson to be extrapolated to other lakes. Uniqueness of opportunity brought Archibald Jones to Crystal Lake. The Benzie County River Improvement Company improved upon

nature, and increased both uniqueness and commonality for Crystal Lake. This two-part tale is directed toward young adults and mature audiences, who have surmised that a special and unique "spirit of place" exists for Crystal Lake and its watershed.

In 1873, the level of Crystal Lake was dramatically lowered in an attempt to construct a slack-water canal between it and Lake Michigan. Most other canals had differences in level of only a few feet. The original level of Crystal Lake was 38 feet above Lake Michigan which made it especially attractive for a canal. Unfortunately, the whitecap waves of Crystal Lake washed out a temporary dam before a permanent canal could be completed. The level of the lake dropped precipitously by 20 feet and 68 billion gallons of water poured down its outlet. Although a canal system was never realized, the lowering of the lake exposed a 21-mile perimeter of sandy beach where none had previously existed. This made possible the founding of the Village of Beulah, the coming of the railroad, installation of telegraph and telephone lines, development of lakeside resorts, construction of 1,100 cottages, all connected by an infrastructure of perimeter roads and trails. This epochal event is unsurpassed compared to all other large inland lakes in Michigan history. Its unintended consequences make this story worthy of telling to a wider audience.

"And so it was - that this one time beautiful Crystal Lake was quickly shorn of her glory and became for a time at least, just a desolate looking common inland lake or mill pond." ~ William L. Case, *The Tragedy of Crystal Lake*, 1922.

"The event was so epochal in its nature and has such a permanent bearing on the subsequent development of Benzie County that it is rightly considered as one of the major incidents of the county's early history." ~ Leonard L. Case, *A Bicentennial Reader*, 1976.

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School Section Lake Stone Pavilion Restoration Project

History of the Park Property and Stone Pavilion

By Linda Howard and Friends of School Section Lake Veterans Park

Prior to the 1830's, School Section Lake and surrounding land was home to the Ojibwa Indians. In the 1870's, Isaac Berry bought the clear-cut land from a lumber company; the land included a tract set aside by the township for education reserved as its "School Section" and the Little River one-room school house was built. The Berry family owned and operated a farm on the land until the Depression of 1929 hit the area.

In 1930, the farm was purchased by Mecosta County and a WPA project to build the stone pavilion was started in 1931 near the beach. The area was used by everyone as a public park, and a campground was added. The Stone Pavilion provided a concession area, a place to eat and a positive place for young people to gather. It has been a ritual throughout the years to go to School Section Lake on the third Saturday of August annually for the Old Settlers Reunion. This year was the 80th year of attendance for the reunion commencing Saturday, August 16, 2014.

Family reunions, 4th of July events, baseball games, business and employee picnics, the 4-H campground, and the main campground were in constant and ongoing use throughout the years. About 1970, a usage fee system was introduced for day use and camping, which has been the revenue source to this day.

The Pavilion originally had an open porch area on all sides. In the early 1940's, windows were added – probably at the same time that electricity was added. This allowed for extended use of the porch, and games were added. The park itself has historical significance as the official gathering place for the Old Settlers' Reunion which has occurred annually since the 1890's. This earned the site a spot on the State's Registry of Historical Places in 1970, and a plaque recognizing the early Negro settlers was erected in 1971. In 2013, another Michigan Historical marker was placed near the one-room school house.

Even though major repairs are needed, the structure of this Pavilion building is extremely sound and was verified by contractors and stone masons, who examined it this year. A group of Mecosta County residents, who have fond memories of School Section Lake, and wanted to assure that the Parks Department proceeded with needed repairs, started to meet informally in the spring of 2014. By summer, they realized a viable fundraising group was needed to help the Parks Board raise sufficient funds for this project. Meetings with Park Board members and the new park superintendent were frequent and beneficial. A "Friends of School Section Lake Veterans Park" group was formed.

Because of the time and money needed to set up a 501c3 organization, it was decided to ask the Remus Area Historical Society (RAHS) to be the fiduciary and oversee fundraising efforts. RAHS immediately accepted the challenge as this project meets the goals and mission of that organization.

So, in the fall of 2014, three organizations came together with a common goal of saving and renovating the Stone Pavilion. The basic timeline is to raise funds starting now through the summer of 2015. Roof repairs would be done in April before the park opens on May 1. Window replacements and other repairs would be done over the summer of 2015. The park closes about October 1, and all the renovations are planned to be completed by then. All final payments and reports will be completed by December, 2015. Upon completion of the renovation project, the Friends group



The original Stone Pavilion



The Stone Pavilion today

will disband. The responsibility of ongoing maintenance will be the Mecosta County Parks Department.

We believe this noble building is too valuable to be allowed to fall into ruin. For all who have childhood memories of their families splashing in the water, or drifting around with a fishing pole hanging over the side of a boat, or just watching the sun setting over the lake, this beautiful building should be preserved.

Please contact Linda Howard, Friends of School Section Lake Veterans Park, at 989-560-8305; or visit www.schoolsectionlakepavilionproject.org to help preserve this piece of Mecosta County's heritage.



Apply now for the 2015 Lake and Stream Leaders Institute

Caring for Michigan's lakes and streams through education, leadership and citizen action.

By Dr. Jo Latimore, Michigan State University

Each of us has a role to play in protecting Michigan's magnificent lakes and streams. Are you ready to play your part? If so, the Michigan Lake and Stream Leaders Institute is looking for you! The Institute is an outstanding experience for people who are willing to step up in their communities and within their organizations as volunteers, leaders, or professionals. We invite you to apply for the Class of 2015!

Since 2002, the Institute has developed local water resource leaders who are familiar with current lake and stream science and management practices and have the leadership skills to work through challenging issues with their communities. Participants gain an understanding of the regulatory landscape, organizations, and agencies that guide water resource protection and management in Michigan and learn how to develop productive partnerships. The Institute is a partnership program of Michigan State University Extension,

Michigan Lake and Stream Associations, Inc., and the Michigan State University Department of Fisheries and Wildlife.

"I feel far more confident taking proactive steps in my lake community and providing information to persuade or motivate others," wrote a 2013 Institute graduate who is a lake association board member. "I am more prone to speak up, even to a less than receptive audience. I feel more connected and vested in my own lake."

The Institute combines classroom and small group learning, field experiences, and independent work. Instructors are leaders and experts in their fields including university faculty, extension educators, state and local agency professionals, leaders from non-profit organizations, and Institute alumni. Participants attend Institute sessions, complete homework assignments and conduct an independent project which is shared with their peers and Institute

alumni during a Poster Symposium on graduation day. After graduation, participants can engage in an Institute Alumni Program that promotes continued opportunities for learning and service.

"You will meet enjoyable, good-spirited people who are kindred to your own care and concern for our lakes and streams," says a 2013 Institute graduate. "Spending time with such kindred spirits is energizing, motivating, and promotes hope and courage and stamina to keep trying to be a positive force for our beautiful Michigan water wonderland. And an added bonus is spending time at the delightful locations of the meetings. It is balm to a nature lover's soul and a true educational retreat."

Past participants have included natural resource agency staff, lake association and non-profit organization leaders, natural resources students, drain commissioners, educators and interested citizens. Today



Collecting plants to assess lake health
(Photo credit: Jane Herbert)



Learning about invasive species control at the
Boat Wash Station on Higgins Lake
(Photo credit: Paige Filice)



Surveying the Higgins Lake shoreline
(Photo credit: Paige Filice)



Collecting insects, indicators of stream health
(Photo credit: Paige Filice)



Aquatic insects, like this juvenile dragonfly, are indicators of water quality
(Photo credit: Paige Filice)

nearly 100 Institute alumni are hard at work for Michigan's lakes and streams in a variety of ways, such as leading lake associations, working within state and local natural resource agencies, serving on planning commissions and monitoring water quality.

Make plans to be a part of the Class of 2015! The first session will take place May 15-16 at the DNR's Ralph A. MacMullan (RAM) Conference Center on Higgins Lake. The second session will be held July 31-August 1 at Kellogg Biological Station (KBS) near Kalamazoo. The final one-day session, including the Poster

Symposium and Graduation, will take place in October in the Lansing area. The application deadline is March 30, 2015. Tuition for the 2015 Institute is \$375 and includes all instruction, materials, meals, field trips, boats, and overnight lodging at the RAM Center and KBS. Limited scholarships are available.

For application forms and more information about the 2015 Institute, visit the website: <http://goo.gl/zec62q>, or visit MSU Extension (<http://msue.anr.msu.edu>) and search for "LSLI". You can also contact the Institute director, Dr. Jo Latimore, at (latimor1@msu.edu or call 517-432-1491). ●●●●

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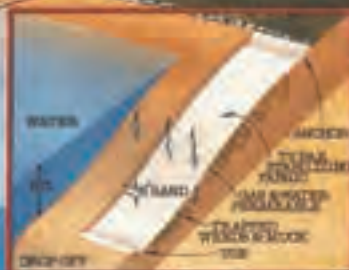
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The Paradise Lake Case Study for Milfoil Control: A Lesson in Community-Driven Management Philosophy

Jennifer L. Jermalowicz-Jones, Water Resources Director
Restorative Lake Sciences



Figure 1

Introduction and Overview

Paradise Lake (Figure 1) is located in Emmet and Cheboygan Counties. The lake surface area is approximately 1,878 acres and it has a maximum and average depth of 15.1 feet and 3.9 feet, respectively. The shoreline length is about 14.3 miles and the watershed is approximately 16,685 acres, which is nearly nine times larger than the lake. Primary land uses in the watershed include wetlands (nearly 50%), followed by forested lands (nearly 21.4%). Paradise Lake contains one inlet (Mud Creek) and one outlet (Carp River). The Carp River outlet drains Paradise Lake into the Straits of Mackinaw.

In recent years, the lake has become colonized with Zebra Mussels (*Dreissena polymorpha*), which has resulted in increased light transparency of the lake water and has caused accelerated growth rates of all aquatic vegetation, including the exotic submersed aquatic plant, Eurasian Watermilfoil (*Myriophyllum spicatum*). Invasive milfoil had become a significant threat to the native aquatic vegetation communities within Paradise Lake, severely impeded navigation and recreational activities within the lake,

and created a swimming hazard in areas of dense canopy growth (Figure 2) over the past decade. A scientific study by Halstead et al. in 2003 demonstrated the decrease in lakefront property values as a result of lake milfoil invasions. Previous surveys of Paradise Lake by aquatic scientists during July of 2009, consisted of 609 sampling locations located throughout the lake and determined that approximately 497 acres of milfoil colonized the entire lake.

The community of Carp Lake, which partially resides around Paradise Lake, desired to implement a non-chemical approach to potentially reduce the milfoil problem. So, during the summer of 2012, scientists recommended an integrated management approach with weevil implantation in areas not previously stocked with the weevil *Euhrychiopsis lecontei*, along with the use of laminar flow aeration and bio augmentation in the West Basin. The latter management method was recommended for the West Basin because most of the basin was colonized by a large canopy of invasive milfoil and the 400-acre area would have required an unknown and potentially unaffordable quantity of weevils

to effectively reduce the dense milfoil growth.

The laminar flow aeration approach was also recommended because it would likely not interfere with the weevil life cycle and may have provided a favorable habitat for the weevil until milfoil food limitation was a limiting factor for weevil sustainability.

Milfoil Reduction from Weevil Activity

The aquatic weevil, *Euhrychiopsis lecontei* naturally exists in many lakes; however, the lack of adequate populations in these lakes requires that the populations be augmented or enhanced for successful control of milfoil. The Paradise Lake Association and Paradise Lake Improvement Board have been stocking the lake with weevils consistently since 1998. The weevils have had adequate time to establish a robust population that continues to decrease milfoil stem density in many areas of the lake. Peer-reviewed scientific research by Newman and Biesboer (2000) demonstrated that the requirements for weevil stocking density to obtain adequate control of milfoil may be as high as 150-300 weevils per square meter. It is important to note that this number refers to a “stocking density”, which implies the number of weevils that should be added in a stocking area for ultimate population growth. To accomplish the observed mortality of milfoil



Figure 2

(Continued on page 28)

stems in Paradise Lake, a similar stocking density to that recommended by researchers has been implemented in Paradise Lake with measured success.

The weevils feed almost entirely on Eurasian Watermilfoil and will leave native aquatic species unharmed. The weevils burrow into the stems of the milfoil and remove the vascular tissue, thereby reducing the plant's ability to store carbohydrates (Newman *et al.* 1996). Eventually, the milfoil stems lose buoyancy and the plant decomposes on the lake bottom. The weevil life cycle consists of larval, pupae, and adult life stages, which all are involved in the destruction of the milfoil plants. In the initial stages of biological control, larvae are applied to the apical (top) portions of stems and destroy the vascular tissue (Creed and Sheldon 1993, Newman *et al.* 1996), which significantly hinders stem elongation. During the pupation stage, stem vascular tissue is further destroyed during the construction of the pupal chamber. During the adult phase, mature weevils feed on the milfoil leaves and stems.

Recent research has shown that the weevils require a substantial amount of aquatic plant biomass for successful control of Eurasian Watermilfoil. In addition, the weevils require adequate over-wintering habitat since they over-winter within shoreline vegetation. Lakes with sparse milfoil distribution and abundant metal and concrete seawalls are not ideal candidates



Figure 4

for the milfoil weevil. There is a favorable amount of overwintering vegetation of high biotic integrity around the Paradise Lake shoreline to support sustained weevil populations. The presence of this riparian vegetation along with good water quality and dense beds of milfoil may explain the efficacy of the weevil on the Paradise Lake milfoil population reduction in the eastern, northern, and southern regions of the lake.

Milfoil Reduction from Laminar Flow Aeration and Bio Augmentation

A primary objective of the laminar flow aeration system is to reduce the organic matter layer in the sediment so that a significant amount of nutrient is removed from the sediments and excessive muck is reduced to yield a greater water depth or more desirable substrate. Additionally, scientists have discovered that the use of this aeration technology along with microbial supplementation (bio augmentation) can effectively reduce ammonia nitrogen which is an essential nutrient for some rooted, submersed aquatic plants such as milfoil (Jermalowicz-Jones *et al.*, 2015). This occurs as the aerated sediments are oxidized and nitrogen is converted from the reduced (ammonia) and bioavailable form to the oxidized (nitrate) form that is less utilized by rooted aquatic vegetation. This finding is supported by rigorous peer-reviewed research and more is being actively pursued. 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 mesocosms with a relative mean of 2.6 ± 0.80 mg N g dry wt day⁻¹ for aerated mesocosms and 0.48 ± 0.20 mg N g dry wt day⁻¹ in controls.

A lake sediment sampling study in 2011 revealed that sediments in the West Basin of Paradise Lake are rich in organic matter (muck) and the sediment depths are more than four meters thick in many areas (Figure 3). The soft organic muck layer throughout the lake closely overlaps with the presence of large milfoil beds. A comparison of the original milfoil biomass cover in (Figure 4) to the bottom hardness map created by scientists in 2014 demonstrates that the majority of the milfoil is located in areas with soft, organic sediments. These sediments are measurably high in nutrients such as phosphorus and nitrogen. Although much of the lake sediment is of glacial origin, the immediate watershed around Paradise Lake also contributes an estimated 5,598 kg year⁻¹ and 308 kg year⁻¹ of nitrogen and phosphorus, respectively. Potential loads from shoreline septic systems alone for nitrogen and phosphorus were estimated to be 2,657 kg year⁻¹ and 232 kg year⁻¹, respectively.

A laminar flow aeration system was retrofitted to the 400-acre West Basin of Paradise Lake during the summer of 2012. The aeration system is derived from



Figure 3

several components which consist of in-water components such as 57 micro-porous ceramic diffusers, 77,000 feet of self-sinking airline, and bacteria and enzyme treatments for sediment nutrient and muck reduction. On-land components consist of three locally-sourced sheds, one 10.0 horsepower compressor, and two 11.5 horsepower compressors along with cooling fans and ventilation.

During the summer of 2014, scientists studied the reduction of milfoil in the West Basin of Paradise Lake and noted that the milfoil canopy had not re-surfaced, was significantly reduced and had disintegrated in many areas of the basin (Figure 5). In 2011, there were approximately 220 acres of milfoil in the West Basin. Estimates from 2014 indicate that the milfoil cover in the West Basin has been reduced by 73% to 59 acres. Another study by Turcotte et al. (1988) analyzed the impacts of bio augmentation on the growth of milfoil and found that during two four-month studies, the growth and re-generation of this plant was reduced significantly with little change in external nutrient loading.

Conclusions

Aquatic plant management method(s) must satisfy the needs of lake residents through the enhancement of recreational activities such as boating (navigation), swimming, and

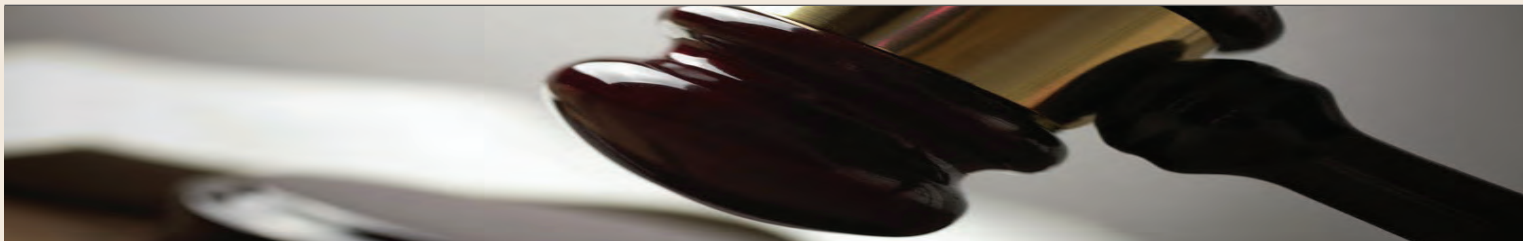
fishing, and in the protection of riparian property values. Management options had to complement the socio-economic climate that influenced riparians and individual components of the Paradise Lake ecosystem. The Carp Lake community emphasized their philosophical needs for a solution to the milfoil problem that was holistic and did not utilize herbicides. This approach may not be possible for many lake communities since lake sediment types and responses to nutrient reduction with aeration can differ significantly among aquatic ecosystems. Additionally, the efficacy of biological control (weevils) may be hampered or compromised by the lack of proper overwintering emergent aquatic vegetation, necessary stocking densities or lack of data to determine adequate stocking densities, or other ecological factors. This case study represents the use of two natural strategies for milfoil reduction that one community implemented with a successful outcome. The co-determination of management objectives between lake managers and communities must also incorporate social and environmental philosophies and may require strong patience in observation of outcomes as long as the implemented strategies are compatible with both the lake ecology and the community dynamics.



Figure 5

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THREE INTERESTING NEW MICHIGAN COURT OF APPEALS DECISIONS

By: Clifford H. Bloom, Esq.
Bloom Sluggett Morgan, PC | Grand Rapids, Michigan | www.bsmlawpc.com

The *Michigan Riparian* magazine constantly strives to keep its readers informed of new legal developments regarding lakes, streams and riparian matters in Michigan. This issue of the magazine is no different, as we report on three recent Michigan Court of Appeals decisions of interest.

In *Hogg v. Four Lakes Association, Inc.*, _____ Mich App ____ (2014), the Michigan Court of Appeals dealt with issues regarding a Michigan summer resort association pursuant to MCL 455.201, et seq. As discussed briefly in the Attorney Writes column elsewhere in this issue, Michigan has four relatively ancient statutes that deal with summer resorts. Those statutes allow property owners within a given area to incorporate and create a super authoritative private property owners association that mimics a local municipality. In this case, the plaintiff alleged that the summer resort association (the Four Lakes Association) no longer existed because the statute under which it was incorporated limits the corporate existence to 30 years in total. The Court of Appeals noted, however, that another statute, MCL 450.371, allows a corporation in Michigan to exist forever if so stated in its articles of incorporation. Given that the articles of incorporation for the Four Lakes Association contain language indicating that the corporation would last forever, the Court held that MCL 450.371 governs and the Association's corporate existence could last forever. Interesting, the case also contains language implying that the summer resort association statutes are generally constitutional, notwithstanding past concerns by some Michigan courts that those statutes improperly delegate local government-like powers to private property owners associations.

Wiemann v. Randall, an unpublished decision by the Michigan Court of Appeals dated October 14, 2014 (Case No. 315398; 2014 WL 5163835), involved a platted way entitled "private parkway" dedicated to the use of the lot owners in the Locklin Beach subdivision or plat. In that case, a back lot property owner maintained his own dock and boat moorings at the termination of the parkway at the lake. When adjoining riparian property owners objected, the back lot property owner sued them. The Court of Appeals found the parkway to simply be another type of road or drive. The Court noted that, normally, dockage and boat moorage could not occur on the parkway at the lake, as lake access easements and road ends at lakes normally cannot have dockage or seasonal boat moorage. For that proposition, the Court of Appeals cited *Dyball v. Lennox*, 260 Mich App 698 (2004), among other appellate cases. What makes this case somewhat unusual, however, is that before the first lot was sold, the developer inserted a deed restriction in a deed indicating that the parkway could have one private dock and the moorage of non-motorized row boats. The Court held that such deed restriction expanded the scope of usage rights to the parkway. The appellate court decision also addressed a number of other tangential issues. Nevertheless, this decision is yet another in a long line of cases that holds that road ends at lakes and private lake access easements normally cannot be utilized for a private dock or seasonal or overnight boat moorage.

Apportioning bottomlands and shoreline ownership can be difficult, particularly where one of the Great Lakes is involved, as was shown in *Plastow v. Higman*

(unpublished decision by the Michigan Court of Appeals dated September 2, 2014; Case Nos. 313653 and 313740; 2014 WL 4337872). This case is fairly technical, however, and probably does not offer any widespread guidance to Michigan Great Lakes riparians. This case involved two subdivisions and a dedicated park on Little Traverse Bay (a part of Lake Michigan) where there was a "gap" between the lake and the plat when it was created. Without holding a trial, the trial court judge held as a matter of law that the park is riparian and that a particular method should be used to allocate the lake shoreline to the various lots involved (i.e., the so-called *Stuart* method). On appeal, the Michigan Court of Appeals in essence held that the trial court acted prematurely. There would need to be a trial regarding whether or not the dedicated park had water frontage when it was originally created. Whether or not that park was or is riparian or waterfront will affect the formula to be used by the trial court to determine the shoreline of the park as well as what portions of the shoreline should be allocated to various adjoining lots. Accordingly, the decisions by the trial court judge were reversed and the case was remanded back to the trial court for a trial regarding the various issues. This case demonstrates the highly technical nature of the processes used by trial courts in Michigan to determine the allocation of shoreline areas and the fact that different apportionment formulas will have to be used by a trial court depending on the circumstances in the case involved.



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