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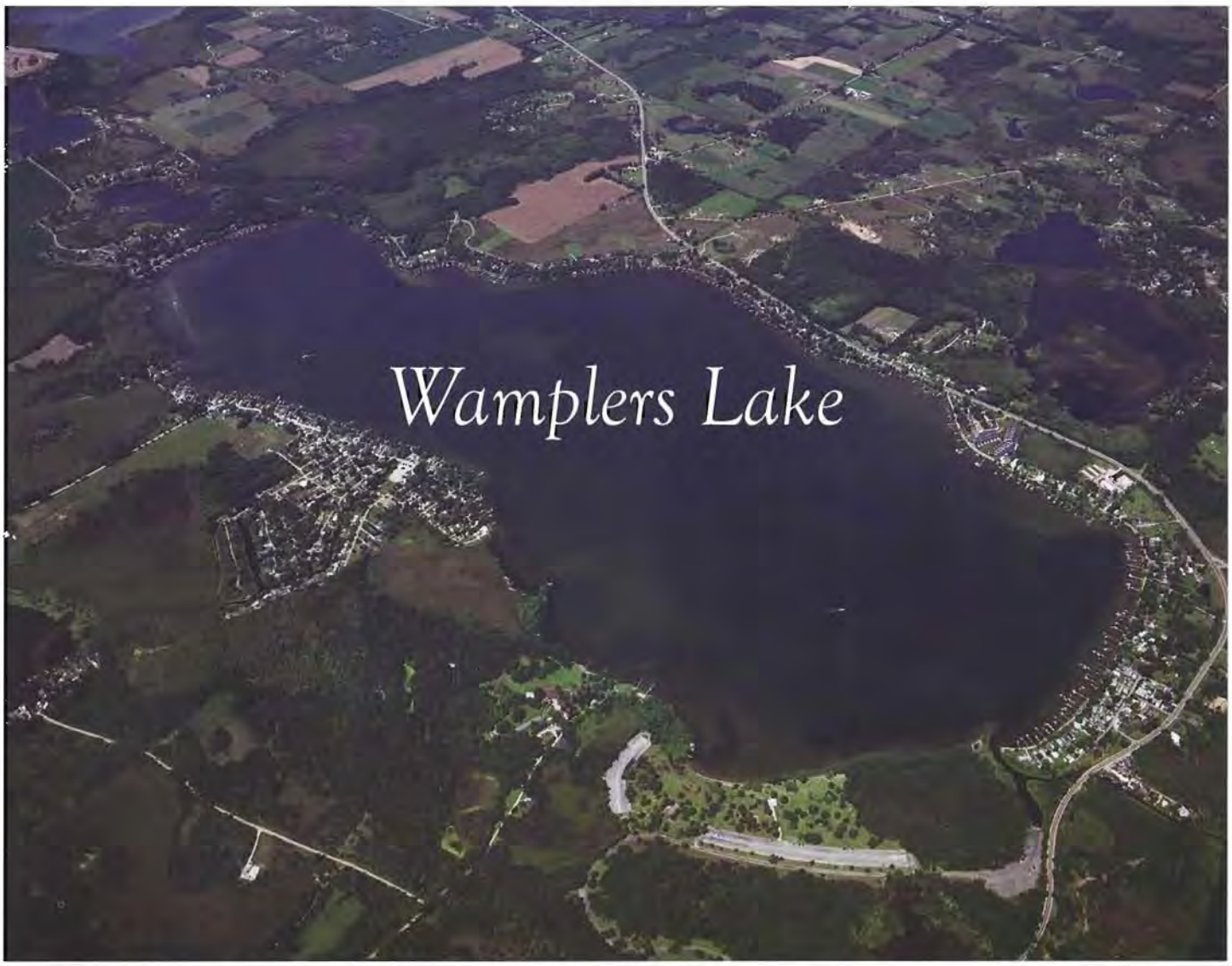
THE MICHIGAN RIPARIAN

www.mi-riparian.org

DEVOTED TO THE MANAGEMENT AND WISE USE OF MICHIGAN'S LAKES AND STREAMS

Published Quarterly – February, May, August and November

RIPARIAN (r-'per-EE-n) adj. Relating to or living or located on the bank of a natural watercourse, such as a river, or of a lake or a tidewater.



Wamplers Lake is located in Jackson and Lenawee counties

This 809-acre lake is in the heart of Michigan's beautiful Irish Hills area. The lake has a maximum depth of 39 feet, a mean depth of 9.2 feet, and contains 7,428 acre feet of water.

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FROM THE PUBLISHER


Don Winne

They're at it again

It is not enough that groups of backlot property owners ("backlotters") have lost virtually every court case in Michigan over the past few decades in their attempt to seize public road-ends at lakes and use them for their own private floating marinas. They have not stopped, even though virtually every major responsible group in Michigan has opposed them – including the Michigan Lake & Stream Associations, Inc., the Michigan Waterfront Alliance, the Michigan Townships Association, the Michigan Attorney General's office, most lake associations throughout Michigan, MUCC, etc. No, like a bunch of spoiled children, the backlotters' groups have run to the Michigan Legislature in an attempt to secure passage of special-interest legislation that would give them special rights to junk up public road-ends at lakes, maintain their own private, exclusive marinas, and further overcrowd Michigan's inland lakes. The backlotters' champion in the Michigan Legislature is Representative Joel Sheltrown of West Branch, who has recently introduced House Bills 4463 and 4464.

Every riparian property owner in Michigan (as well as Michigan taxpayers and law-abiding citizens) should be appalled by the backlotters' activities and tactics. Backlotter groups are trying to prompt the Michigan Legislature to overturn 100 years of common-sense Michigan court decisions in this area. No one is trying to close the public road-ends or thwart public access. The Michigan courts have long held that public road-ends at lakes can be used by the public for travel and certain activities such as swimming, fishing, ice fishing, and similar activities. Furthermore, on most road-ends, one public dock can be installed for picking up and dropping off passengers on boats, emergency purposes, or similar uses.

However, the Michigan courts have also held – quite reasonably and justifiably – that private individuals cannot place their own docks or shorestations at public road-ends at lakes or moor or anchor their boats at those road-ends.

The backlotter groups often use propaganda and "spin" to justify their actions. They claim that their proposed special-interest legislation and agenda are to promote public access. In fact, the opposite is true. To the extent that they are able to seize these public properties and install floating marinas on these narrow pieces of land for their own private, permanent boat moorage, they are interfering with (and often precluding) the public from using such public road-ends for legitimate purposes such as swimming, fishing, ice fishing and accessing the water.

More information regarding this important issue can be obtained by viewing MLSA's position paper on public road-ends on the MLSA web site at www.mlswa.org. At the web site, click on the phrase "MLSA Position on Road Ends" in the right-hand column under "Action Alerts."

Anyone who feels strongly about this matter should also contact both their Michigan senator and Michigan representative by telephone, mail or e-mail to express their opinion on House Bill 4463 and House Bill 4464 – or any later substitute bill supported by backlotters.

PUBLISHER DON WINNE

A new Ice Mountain bottled water controversy erupts

As most readers of *The Michigan Riparian* know, the Ice Mountain bottled water brand is a division of Nestlé. A seven-year battle has been raging over Nestlé's pumping of spring water from a site in Mecosta County near Rodney for its Ice Mountain brand. Since Nestlé is intercepting spring water before it reaches the earth's surface to rejuvenate surface bodies of water, the pumping activities have caused significant water level droppages in at least one stream, as well as nearby wetlands and area lakes. The state of Michigan did virtually nothing to protect the area's water resources, and actually facilitated Nestlé's operations. It fell to local riparians to step in to fight to protect the area's environment. The court battle against Nestlé initiated by area riparians is now before the Michigan Supreme Court. The riparians won their battle at the trial court level, but that decision was partially reversed by the Michigan Court of Appeals. The Michigan Supreme Court has not yet ruled on the matter. The Nestlé controversy also prompted the adoption last year of new Michigan water withdrawal regulations (albeit weak).

After the Mecosta County water withdrawal controversy arose, Nestlé negotiated further sources of groundwater from the city of Evart. Now, Nestlé is proposing withdrawing spring water from a site in Monroe Township in east-central Newaygo County, approximately six miles north of the city of White Cloud. The Newaygo County site is at the headwaters of the White River, and is also not too far from the headwaters of the Little South Branch of the Pere Marquette River.

Two conservation groups (Michigan Citizens for Water Conservation and the Clean Water Action Committee) held an informational meeting at the Newaygo Sportsman's Club in Croton Township, Michigan, on March 15, 2007. Several hundred interested citizens attended the two-hour meeting. Some of the interesting points that were raised included:

1. It appears that there are no fewer than 20 other sites around Michigan being considered for bottled water diversion purposes.
2. There will be an attempt by conservation groups to strengthen the water withdrawal laws in Michigan. If the legislature refuses to act, conservation groups may attempt to initiate a ballot proposal to protect our water resources.
3. The growth in bottled water sales is averaging a 10% or greater increase every year.
4. Unfortunately, many Michigan legislators still have not gotten the message that the overwhelming majority of residents in Michigan want these water diversions stopped.
5. Those who oppose these water diversions are not anti-business – the negative impact upon tourism, farming, and other important business interests in Michigan greatly outweighs the miniscule benefit to the economy contributed by the water bottlers.
6. Residents should call, write, or e-mail their legislators to express their concern about this matter.

For more information, you can contact Michigan Citizens for Water Conservation (MCWC) at www.savemiwater.org (231-972-8856), or Clean Water Action (CWA) at www.cleanwateraction.org (517-203-0754).

[Editor's note: Just as this magazine was going to press, Nestlé announced that it would not pursue the Monroe Township site in Newaygo County and indicated that the area did not meet its criteria for development. It is unclear whether Nestlé is currently reviewing any other sites in Newaygo County or elsewhere.].

Big money in pier "takings" case

The Wisconsin Supreme Court has accepted review of a case involving an over-sized pier built in a pyramid-style development on Big Green Lake. The owners claim a right to compensation for damages resulting from an Administrative Law Judge's order requiring a reduction in the number of boat moorings and the size of the pier.

The Wisconsin Association of Lakes (WAL)'s Board of Directors is concerned that the court's decision could encourage other backlot owners to claim legal rights to construct or expand high-density piers and threatens the essential power of the state ot protect public waters. The case, *Hilton v. DNR*, involves a pier extended from a 77-foot-wide lot owned by a group of some three-dozen adjacent homeowners. Since the pyramid-style development was first laid out, the pier has been gradually expanded to include 22 boat slips. After a hearing, the owners were ordered to reduce the length of the 243-foot-long pier and eliminate about half of its boat slips. The owners appealed, claiming property rights valued at more than $700,000 had been illegally "taken" by the state. Their claim is now before the Wisconsin Supreme Court, who will decide whether the state must pay "just compensation" when it orders modification of a pier that interferes with navigation or other public rights in water. The Supreme Court has granted WAL and two real estate and development groups standing to file amicus curiae briefs.

WAL's board strongly supports the rights of riparian owners, but recognizes that piers are placed on publicly owned lakebeds and that the state has a duty as trustee of public waters to regulate piers that obstruct navigation or injure other public rights in waters. The court's decision is expected later this year.

Hydrilla confirmed in a lake close to Michigan

The invasive plant *Hydrilla verticillata* has been confirmed in a lake less than an hour's drive from Michigan.

As a result, Michigan Sea Grant is encouraging waterfront property owners, as well as boaters, anglers and swimmers, to search the state's inland lakes to make sure it hasn't infested bodies of water in Michigan.

Sea Grant is also asking recreational users to take precautions against transporting hydrilla and other aquatic invasive species on their gear.

Biologists from the U.S. Army Corps of Engineers recently confirmed the presence of the so-called "perfect weed" in Lake Manitou near Rochester, Indiana, 55 miles south of the Michigan border near U.S. 131, a major highway to the state.

Carol Swinehart, aquatic invasive species communication specialist for Michigan Sea Grant Extension, says it's critical to find out whether any Michigan inland lakes are infested. "The sooner we learn whether Michigan waters are infested, the better chance we have of eradicating or controlling it. Many of our lakes are already infested with invasive Eurasian water milfoil, and experts tell us that Hydrilla is even worse."

Hydrilla has many adaptive qualities that allow it to out-compete and greatly diminish populations of native species: It can grow in low-light areas; it absorbs carbon from the water more efficiently than other plants; it is very tolerant to both standing and flowing water; and can also grow up to an inch per day. And its reproductive abilities make it particularly threatening. The tubers that grow from the roots can persist, in a viable state, in the lake bottom for several years. It can also reproduce through flowers, fragments, and turions (cone-shaped growths) on its stalks.

Michigan Sea Grant Extension has spearheaded a Michigan "Hydrilla Hunt" since 2004 in collaboration with the Michigan Department of Environmental Quality Office of the Great Lakes, and offers background information and a specimen identification card through its web site. Citizens can also obtain Hydrilla identification cards and a fact sheet from Michigan Sea Grant Extension offices at Michigan State University and in Grand Haven, Traverse City, Tawas City, Mt. Clemens, Detroit and Marquette, as well as from MSU Extension offices in Barry, Benzie, Branch, Calhoun, Charlevoix, Clinton, Emmet, Genesee, Grand Traverse, Livingston, Macomb, Montcalm, Muskegon, Kent, Van Buren, Kalamazoo and Ottawa counties, as well as the Kellogg Biological Station in Hickory Corners.

"If someone thinks they've found hydrilla, we ask that they compare the plant with the image on our web site or the Hydrilla Hunt card, which provide illustrations to help distinguish it from the native aquatic plant elodea. If it has all the characteristics described there, send us a sample so that we can make sure," Swinehart says. It is illegal to possess hydrilla in Michigan (except to send it for identification) or to take the plant across state lines. Michigan residents and visitors can help prevent the spread of hydrilla by properly cleaning watercraft or other water recreation gear.

More information on invasive species prevention practices is available at www.protectyourwaters.net. Michigan Sea Grant is a collaborative program of Michigan State University and the University of Michigan, conducting Great Lakes research, education and outreach. For more information, visit www.miseagrant.umich.edu.

How to hunt for Hydrilla:

- Conduct the search early in the morning on a calm sunny day. Start with the public boating access, if available.
- Look for plant material washed up on the shore, and use a rake or other collection device to capture a specimen.
- Go slowly around the shoreline wearing polarized sunglasses to reduce glare.
- Look in water up to 20 feet deep. Pay special attention to any unusual plant growth.
- Check the lake's outlet and any flow-restricting structures, such as dams and spillways.
- Check for plants near stream inlets and in shallow bays.

Specimen collection steps:

Step 1. Collect 5 or 6 inches of the plant.
Step 2. Compare your plants features with these drawings to rule out the most often confused native plant, Elodea.
Step 3. Complete the I.D. card.
Step 4. Shake the water off your specimen. Use 2 tablespoons of rubbing alcohol to moisten a paper towel. Place both in a sealable plastic bag.
Step 5. Mail the I.D. card and sealed sample bag to the following address: **Hydrilla Hunt, Michigan Sea Grant , Michigan State University, 334 Natural Resources, East Lansing, MI 48824.**

Prevention steps:

- Inspect and remove any visible mud, plants, fish or animals before transporting your recreational equipment.
- Drain water from equipment (boat, motor, trailer, live wells) before transporting it.
- Dry equipment for at least five days.
- Dispose of unwanted live bait in the trash.
- Know the Law: Michigan law prohibits possessing or transporting any live transgenic (genetically engineered) organisms, several live nonnative fish and many nonnative aquatic plants, including entire plants, live parts and seeds, except to have them identified by a qualified expert.

Buyer and builder beware!

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Perhaps you are considering purchasing a lakefront lot. If so, what matters should you investigate before signing a binding purchase agreement to buy the lot? Or, if you already own a lakefront lot, perhaps you are considering building a new house or cottage (or adding on to an existing dwelling). How should you plan ahead?

While there are many joys associated with owning lakefront property, there are also potential pitfalls, a number of which are unique to lakefront property. Therefore, before entering into a binding purchase agreement for a lakefront lot, the prospective purchaser should always perform adequate "due diligence." This article examines some of the key issues that should be included on a due diligence checklist for lakefront property.

Before addressing particular issues, however, it is useful to note that if you can afford to have a real estate lawyer assist with your due diligence investigations (including inquiries regarding "buildability," deed restrictions, environmental constraints, compliance with zoning and other ordinances, suitability for a septic system where applicable, etc.), hiring such an attorney to perform due diligence prior to entering into a purchase agreement (as well as negotiating the terms of any such agreement) is usually money well spent. If you cannot afford an attorney, you should be prepared to do extensive due diligence inquiries yourself.

So, what types of issues should be investigated? First, you should ensure that the lot is "buildable." Second, you should satisfy yourself that the lot has an adequate, lawful access and fully complies with local zoning requirements, the Michigan Land Division Act, and other applicable ordinances and statutes. Third, you should investigate what type and size dwelling you can build (as well as its permissible location) pursuant to the local zoning ordinance and building codes. For these first three areas of inquiry, consult with the local municipality (which is a township, city, or village). Fourth, you should determine what type of sewage disposal system is available (whether a municipal system is involved or a new private septic system will have to be installed). For a municipal system, one issue that will have to be dealt with is the buy-in cost (which can include extending a municipal sewer from its current location and all applicable fees). If a private septic system needs to be installed, you should make sure that the lot can sustain such a system and that a proper permit will be granted. Fifth, you should determine whether or not there are any lake access easements, lake road-ends, private parks, walkways, or similar items located either on the property you are considering purchasing or adjacent thereto. Such items can potentially allow public or private lake access for others, and the noise and commotion associated with such accesses can sometimes be so onerous that you may very well desire not to purchase the property involved. Sixth, you should make sure that the lot does not have any environmental contamination, settling/shifting, flooding problems, or drainage issues. Seventh, you should determine whether there is any use located close or nearby the property which would detract from its desirability or resale value such as an airport, landfill, or intensive livestock operation. Finally, look around at nearby lands to see what development potential is there. A farmer's field which is located across the street may look idyllic today, but if a shopping center is built there two years after you build your dream house on the lake, it could become a nightmare!

While this is not intended to be an all-inclusive checklist of the issues that you should investigate before signing a binding purchase agreement for a lakefront lot, a diligent inquiry into these areas should help you to uncover some of the most common traps for the unwary.

What if you already own a lakefront lot which is vacant and you desire to build a new dwelling or add on to an existing dwelling? The best advice I can give anyone contemplating a building project is that either you, your architect or your builder should see municipal officials very early on in the building design and planning process to determine what is feasible and allowable. If you wait until the last minute to consult with municipal officials (for example, waiting until your builder applies for a building permit), you could be sorely disappointed. If a problem arises, your building plans may need to be redrawn to comply with local ordinance requirements and that could increase project costs and delay the commencement of construction. In a worst-case scenario, you could find that you are precluded from building any dwelling at all, or you will have to downsize or relocate the home.

In most municipalities, there are a myriad of zoning and building code regulations that govern new home and accessory building construction, as well as additions to existing buildings. These include front, rear, and side yard setback requirements, maximum building heights, access requirements, isolation areas for septic systems, distance requirements between wells and septic systems, driveway requirements, deck and accessory building regulations, and many other potentially adverse regulations and requirements. If you do not meet all municipal requirements, you may have to seek a variance from the municipality's board of appeals. That can often be a one- or two-month process (and potentially even longer). Furthermore, variances can often be hard to obtain. There may be drainage or wetlands issues that will have to be resolved prior to the commencement of construction. If the lot has ever been altered with fill, that should be investigated and will have to be dealt with structurally.

Once all permits have been acquired and construction is commenced, make sure that your builder complies with all municipal regulations, inspections, etc. If your builder does not do so, you, as the owner of the property, are ultimately responsible. There are a number of cases in Michigan where the courts have actually ordered property owners to tear down homes, buildings, and parts of buildings that violate ordinance requirements. Be proactive!

While there are many issues to consider in planning a lakefront home, the problems are usually not insurmountable provided that you plan ahead and fully investigate before committing. If you do, you will likely find that the benefits are rewarding and well worth the effort.

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On March 20, 2007, the Michigan Court of Appeals issued an interesting unpublished opinion in the case of *DGM Land Co v Downey* (case No. 265815). The opinion gives a very good overview of determining riparian/bottomlands boundary lines (under the water), ownership issues if a lake recedes (and leaves dry land), and similar matters. You can review the written opinions of the Michigan Court of Appeals (both published and unpublished) and the Michigan Supreme Court on the internet by going to courts.mi.gov, clicking on "Michigan Court of Appeals," click on "Resources," click "Court Opinions," and then to the right, click on "Search Opinions." You can then search court opinions by case number (if you have it) or by key words and phrases (a text search).

With just a little knowledge ...

– Scott Brown, MLSA Assistant Executive Director

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"If a man empties his purse into his head, no man can take it away from him. An investment in knowledge always pays the best interest." – Benjamin Franklin

Since its inception some 46 years ago, Michigan Lake & Stream Associations has never wavered from its core belief that an "investment in knowledge" will inevitably pay the largest and longest-term dividents in terms of achieving our primary goal of preserving and protecting our state's vast and enviable freshwater natural resources.

In fact, the majority of our annual operating budget is dedicated to bringing high-quality educational programs to our membership and interested members of the general public. The MLSA Annual Conference, Cooperative Lakes Monitoring Program volunteer monitor training, Lake Leaders Institute, the newsletter, regional fall seminars, educational outreach programs, and our organizational web site (www.mlswa.org), are all dedicated to advancing knowledge and delivering timely and relevant information to our member associations and individual members, as well as to other no-less-important and diverse stakeholders of Michigan's freshwater natural resources.

It has always been our hope – indeed, our primary goal – that folks would take what they learned at our conferences and seminars and subsequently leverage their newly found knowledge in working to preserve and protect our state's freshwater resources. The MLSA is dedicated to the notion that the most effective way to preserve and protect our state's 11,000 inland lakes and thousands of miles of rivers and streams is to create an educated, well-informed and engaged legion of citizen freshwater resource stakeholders. The importance of the critical role played by informed and concerned citizens cannot be overstated in light of the fact that the resources of our Department of Natural Resources and Department of Environmental Quality have been severely curtailed due to our state government's unrelenting budget crisis.

The very fact you are reading The Michigan Riparian is a pretty good indication that you care about the future of Michigan's fabulous freshwater resources. We encourage you to continue learning about the wonderful science of freshwater and how ill-advised or poorly planned land uses and the rapid propagation of aquatic invasive species are an ever-increasing threat to the long-term viability of our state's most valuable resource.

You don't need an advanced college degree in natural resources management or limnology to become a knowledgeable and effective advocate for a balanced and stewardship-oriented approach to managing our freshwater resources. A little knowledge goes a long way in a state where the majority of the people who sit on local planning commissions or township boards have had little or no formal training on either land-use planning or freshwater resource management. Your informed input at a township board meeting could very well have a positive impact on shaping and implementing an effective ordinance that benefits your favorite lake or stream ... and just imagine the impact you could have if 10 of your well-informed and like-minded neighbors accompanied you to that Tuesday night board meeting!

Don't allow un-informed and uneducated public officials to make freshwater resource or land-use decisions that run contrary to preserving and protecting the freshwater quality of our great state. The Michigan Lake & Stream Associations encourages everyone to learn as much as they can about our state's awesome natural resources about what they can do to protect these priceless treasures for our kids, grandkids and beyond.

Aquatic mosses: are they in your lake?

by Jennifer L. Jermalowicz-Jones
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INTRODUCTION

Aquatic mosses (division: Bryophyta) are an often overlooked component of inland lakes and streams. Their distribution is scattered throughout the world as they inhabit large lakes such as Lake Tahoe in Nevada and smaller, remote lakes in Antarctica. Many of the north temperate region lakes also contain significant populations of aquatic mosses. They are also dominant in other aquatic systems, such as bogs and fens. The genus Sphagnum, also known as "peat moss" (*see photo below*) is most common in bogs or acidic habitats, and the genus Drepanocladus is common in rich alkaline fens and lakes. The presence of Sphagnum in a bog is critical for the survival of other plants such as pitcher plants (Serracenia purpurea) and sundew (Drosera rotundifolia) that must grow on the Sphagnum mat to obtain moisture without becoming saturated in the underlying water. The Sphagnum maintains an acidic pH in the bog by taking magnesium (Mg+2) and calcium (Ca+2) cations out of the water and releasing acidic H+ ions. Aquatic mosses differ from the larger aquatic plants in that they lack vascular tissue, are much smaller in size, have a relatively slow growth rate, and usually do not grow in dense macrophyte stands due to competition from the larger, faster-growing plants. All mosses lack true roots that aquatic plants possess, and instead contain rhizoids which are thread-like structures that function in anchorage. The modified leaves in mosses are the sites of nutrient uptake.

HABITAT SENSITIVITY

The majority of aquatic mosses that inhabit lakes are found at the edges of the lake or at the lake bottom. In general, they will grow in habitats where there is minimal competition from larger aquatic plants for light and space. Furthermore, aquatic mosses are able to withstand low water temperatures and light quantities due to their slow growth rate and lower metabolic needs. In fact, the ideal temperature for an abundant growth of aquatic mosses is significantly lower than that of aquatic plants. In addition, aquatic mosses are able to withstand freezing temperatures as low as -10 C. An abundance of aquatic mosses at the lake bottom or at lake margins signifies a healthy and stable ecosystem. Therefore, aquatic mosses may be reliable indicators of lake ecosystem stability. Perturbations such as overdevelopment of shorelines, dredging, and non-point and point source pollution may limit the successful reproduction, growth, and colonization of these delicate plants. The presence of exotic species such as purple loosestrife (Lythrum salicaria) and Yellow-flag iris (Iris versicolor) can displace sensitive shoreline moss communities. Aquatic mosses that inhabit the littoral zone of some lakes may be vulnerable to displacement from exotic submersed aquatic plants such as Eurasian milfoil (Myriophyllym spicatum) and curly-leaf pondweed (Potamegton crispus).

ROLE IN AQUATIC ECOSYSTEMS

Aquatic mosses serve as ideal habitat for macroinvertebrates in lakes and streams. The macroinvertebrates are an important food source for the fishery in an aquatic system. Furthermore, the aquatic mosses possess strong anti-herbivory (secondary) compounds that help to protect them from being consumed by herbivores. There is some evidence in freshwater systems that aquatic mosses may play a role in nutrient cycling and dynamics. Some aquatic mosses such as Fontinalis sp. have been used in stabilization of weir structures in Pennsylvania.In addition, the aquatic mosses function as reservoirs for fine particulate organic matter and many species of algae. In some large, oligotrophic lakes such as Lake Tahoe and Waldo Lake in Oregon, the biomass of benthic mosses can exceed those of some smaller aquatic plants in the littoral zone. In comparison to aquatic plant studies, there is a relative scarcity of information on aquatic moss ecology. The abundance of aquatic mosses in lakes and streams may serve a substantial role in the balance of aquatic ecosystems. Protection of these delicate mosses and their habitat is needed to ensure their survival and studies of relevance in the future.

MSU & Michigan Lake & Stream Leaders Institute announced

Michigan Lake & Stream Associations, Inc., and Michigan State University are organizing the Lake & Stream Leaders Institute Class of 2007. Earlier Institute classes were held in 2002 and 2005.

The Institute provides an educational experience that will improve participants' understanding of local water resource management planning and program implementation. Past participants have included property owners, concerned citizens, drain commissioners, organization representatives, and local government personnel. The Class of 2007 will be limited to 30 participants.

The Institute is conducted in five seminar sessions. The first seminar session will be Saturday, May 19, at the Ralph A. MacMullan Conference Center on Higgins Lake. The next three sessions will be held together on August 2, 3 and 4 at the Kellogg Biological Station near Kalamazoo. The last session, and graduation dinner, will be held Friday, September 14, at the Bengel Wildlife Center in Bath, just north of Lansing.

Registration fee is $245 ($150 for students). Meals and lodging are provided as part of the registration fee, but participants will have to pay their own travel cost to attend the sessions and should anticipate some expense for their chosen applied project. Applications are available online at www.mlswa.org and www.msue.msu.edu/waterqual/lakeleaders.html. Do NOT send your registration fee with your application. Participants must commit to attend all sessions, prepare an applied project and complete assigned homework.

Applications will be evaluated as they are received and acceptance notices mailed out within two to three weeks of submittal. If you have any questions, please contact: Howard Wandell, Dept. of Fisheries & Wildlife, 332 Natural Resources Bldg., MSU, East Lansing, MI 48824-1222.

Low-impact development concepts

by Tony Groves, M.S. and Craig Hondorp, ASLA
Water Resources Director, Director of Landscape Architecture, Progressive AE

In recent years, the federal government has placed a strong emphasis on the need for proper stormwater management. The focus on stormwater was prompted, in large part, by the recognition that improperly managed stormwater represents a major source of pollution to the nation's water resources. This fact, coupled with the enormous cost resulting from flood damage, has brought the issue of stormwater management to the forefront at all levels of government. Stormwater management issues can be viewed within the broad context of the hydrologic cycle. The hydrologic cycle is the process by which precipitation (both rain and snow) falls to the ground and either runs off to lakes, streams, and other water bodies, or infiltrates into the ground. This water, in turn, is returned to the atmosphere via evaporation or transpiration (directly from plants), where the cycle of condensation and precipitation is repeated. To protect the environment, stormwater should be managed in a way that will not substantially alter the natural hydrologic regime, especially as it relates to the quantity of runoff versus infiltration.

As communities become more urbanized, rooftops, roadways, parking lots, and other impervious surfaces replace natural ground cover. As impervious surfaces increase, runoff increases and infiltration into the ground decreases.

With the decrease in infiltration, groundwater supplies also decrease which diminishes flow in area streams. In some instances, rivers and streams that once had stable base flows slow to a trickle during dry-weather periods due to lack of water infiltration to the water table. During rainstorms, these same streams can become raging torrents due to the increased rate of stormwater runoff and conveyance. In these streams, the fishery cannot be sustained due to the warming of water and degraded habitat during low-flow conditions and, during high-flow conditions, stream bank erosion and flooding are common. With an increase in imperviousness and the quantity of stormwater runoff, there is generally a concurrent increase in the quantity of pollutants transported, as well. Stormwater runoff often contains high concentrations of oil and gasoline residues, nutrients, sediment, trace metals, fecal bacteria, oxygen-consuming wastes, and a variety of other contaminants. If untreated, stormwater runoff can cause siltation, nutrient enrichment, bacterial contamination, and severely degrade water resources.

While county drain commissioners often play a key role in stormwater management, local units of government also have an important role to play–especially in promoting "source" controls. Source controls are preventative measures designed to reduce the volume of stormwater generated on-site, and eliminate initial opportunities for pollutants to enter a stormwater drainage system. Typical source controls could include the following: preservation of existing natural features that perform stormwater management functions, such as depressions, wetlands, forest land, and vegetative buffers along lakes and streams; reducing impervious surface area through site planning that makes efficient use of paved and developed areas, and maximizes open space; directing stormwater discharges to open grass areas, swales, and bioretention facilities rather than allowing stormwater to run off impervious surfaces directly to stormwater conveyance systems. The manner in which land is developed, along with the attendant infrastructure, begins with the developers and their design engineers and planners. While state and county permits are required for most developments, townships can be key partners in stormwater management. In fact, townships may be best suited to encourage land development practices that address stormwater issues, especially source controls.

A method of managing stormwater that is gaining prominence and acceptance is a concept called Low Impact Development (LID). In *The Practice of Low Impact Development* (NAHB Research Center, Inc. 2003), LID is defined as an approach to land development that uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts. Essentially, LID's promote source controls of stormwater and maintain the natural hydrological cycle by: preserving open space and minimizing land disturbances; protecting natural features and natural processes; reexamining the use and sizing of traditional infrastructure (lots, streets, curbs, gutters, and sidewalks); integrating natural site elements (wetlands, stream corridors, mature forests) into site designs; and decentralizing and managing stormwater at its source. With an LID, the development process includes a detailed site analysis that identifies natural drainage patterns and key natural features. This information is then used to help

define development opportunities and constraints, and areas requiring protection. The site analysis is followed by an evaluation of alternatives to minimize development impacts. Alternatives to accomplish these objectives could include minimizing clearing and grading, reducing impervious surfaces, clustering development, limiting lot disturbance, and preserving permeable soil types. An attempt is then made to slow the conveyance of stormwater from the site by dispersing (rather than concentrating) drainage. Where feasible, natural flow paths are maintained, and vegetated swales are used to convey water (as opposed to pipes). A key element of an LID is to treat stormwater at its source, rather than conveying water to a centralized stormwater basin.

In The Practice of Low Impact Development, it is noted that developers who have used LID practices and technologies have indicated that one of the keys to a successful project is to invest additional time and money in the initial planning stages of development. While this idea may be unpopular because of increased up-front costs, the expenditures are often recouped in the form of reduced infrastructure costs, rapid home sales, enhanced community marketability, and higher lot yields.

A graphic representation of a conventional development versus an LID is shown on the next page. The example is a 40-acre residential site on sandy, well-drained soils served by on-site septic systems and individual water wells. In the LID, lot sizes were reduced, roads were narrower with no curb and gutter, open swales were used to convey/infiltrate stormwater, and all roof drainage was conveyed to on-lot infiltration trenches. In comparing the two development approaches, the LID resulted in substantial reductions in effective imperviousness, storm sewer pipe and drainage structures. In addition, the LID would result in five-fold increase in open space on the development site (Table 1).

In addition, estimated costs associated with clearing, grading, and stormwater infrastructure were significantly reduced in the LID when compared to the conventional development approach (Table 2). It should be noted that these are estimates, and that the relative cost comparison between conventional development and LID should be evaluated on a site by site basis. The potential cost difference will vary dependent on site specific conditions.

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TABLE 1
Conventional vs. Low Impact Development

	Conventional Layout	LID Layout	% Change
Impervious Surface:			
Road Area (s.f.):	93,706	97,952	
Roof Area (s.f.):	60,800	0*	
Total Area (s.f.):	154,506	97,952	-36.6%
Stormwater Management Infrastructure:			
Storm Sewer Pipe (l.f.):	3,753	1,486	-60.4%
Drainage Structures:	39	13	-66.7%
Open Space Preservation:	6.7%	32.7%	5-fold

**No roof top runoff is calculated since it is conveyed to infiltration trenches at the rear of the properties.*

TABLE 2
Estimated Construction Cost Comparison

	Conventional Layout	LID Layout
Grading	$255,400	$188,600
Clearing	10,000	2,000
Roads	281,010	195,900
Storm Sewer Pipe	174,510	55,730
Drainage Structures	78,000	26,000
SWM Ponds	17,000	---------
Bioretention/Micro	--------	12,600
Total	**$815,920**	**$480,830**
Unit Cost	**$21,470**	**$12,330**
Lot Yield	**38**	**39**

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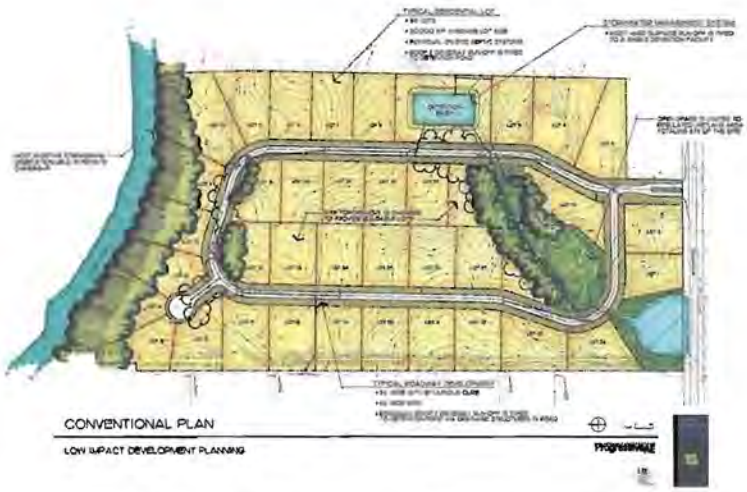
Practical Considerations

A key element in a typical LID is to provide for the infiltration of stormwater at or near its source. This approach may not be feasible in areas with a high water table or soils with poor infiltration capacities such as clays. To avoid the potential for failure of infiltration facilities, care must be taken to ensure the facilities are properly designed, constructed, and maintained. Drainage easements may be appropriate to help ensure proper maintenance over the long term.

Infiltration of stormwater in residential developments generally does not pose a pollution problem. However, in the case of industrial, commercial, and concentrated parking facilities, pretreatment of stormwater may be required to prevent groundwater contamination.

The LID approach embodies many of the design principles required to mitigate stormwater impacts and can help communities comply with federal National Pollution Discharge Elimination System (NPDES) Phase 2 stormwater mandates. If site conditions are suitable, LID should be considered as an alternative to conventional development approaches. A properly designed LID can be a win-win for the developer, the home buyer, the community, and the environment.

For more information visit: www.lowimpactdevelopment.org www.epa.gov/owow/nps/urban.html www.raingardens.org.



LOVE MY LAKE ...

"Love My Lake" is a new feature of The Michigan Riparian. In each issue, we invite subscribers and readers to tell us why they love their lake and to share one or two photographs. If you'd like to feature your lake in a future issue, please follow the format you see below to answer the seven sets of questions and submit them via e-mail to editor@churchill3c.com or via "snail mail" to: Love My Lake c/o Jennifer Churchill, P.O. Box 44, Carson City, MI 48811. Please also e-mail a large-format (300 dpi) jpg or tiff photo of your lake, or snail mail a regular photo. Photos will not be returned, so please mail us a copy. We look forward to hearing about your lake!

Effie Aylmer loves living on Big Crooked Lake

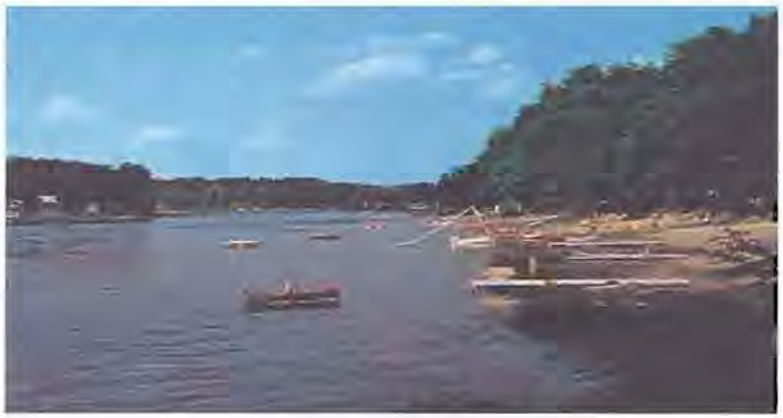
1 What is your name and MLSA affiliation (association you belong to)?
Answer: Effie Aylmer. We belong to the Sister Lakes Association. I'm 88 years young.

2 What is the name of your lake and where is it located (county and general region of Michigan)?
Answer: The name of our lake is Big Crooked Lake in Van Buren County.

3 How long have you lived on lakes? How long have you lived on this particular lake?
Answer: We're not right on the lake. A wonderful Aunt Evlynn has allowed us to use her beach since 1986.

4 How would you describe your lake? Very rural? Developed? A village or town feeling, or more remote?
Answer: It has a small town feeling. Our granddaughter came to the lake when she was three months old. She tells everyone spending time here was the happiest time of her life.

5 What do you love most about living on a lake? What do you love most about this particular lake that you now live on?
Answer: When I enter my cottage I say "I love it." It's so tranquil. No city noise, just clean fresh air. Wonderful friends as neighbors. My husband of 62 years was a beautiful swimmer. Our lake is so clear you could drop a dime in it, and tell if it was heads or tails. From the year 1946 to 1972, we vacationed at lakes in Indiana, Wisconsin and Michigan. We found Crooked Lake met all of our desires.



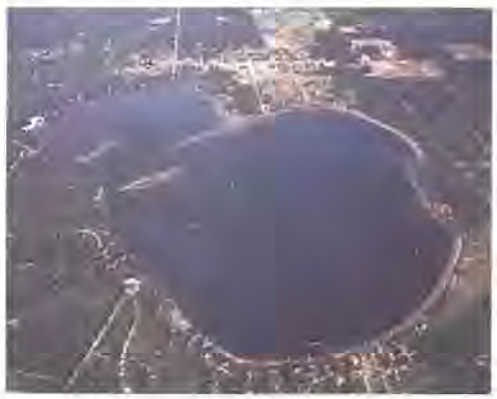
6 What types of activities do you and family members do on your lake? Kayaking? Fishing Birding? Answer: I love the pontoon. My daughter loves her speed boat to pull the skiers.

7 Do you find that family members visit more frequently when you live on a lake than when you don't? Do you have any funny anecdotes to share?
No, I came from a large family. They came only to celebrate a birthday or anniversary. Our darling granddaughter and her husband are enjoying Laguna Beach, California.

Crooked Lake, part of the Sister Lakes in Michigan is pictured above from an old postcard owned by Sister Lakes resident Effie Aylmer. Below is another postcard from Effie's collection, which states on the back, "The Midway at Sister Lakes: Michigan is the hub of activity for this fabulous vacation area. Round, Crooked, and Little Crooked Lakes are clustered in the foreground. Magician and part of Dewey and Cable Lakes can be seen in the distance.

Attacking lake sediment build-up

by Gregory Bator
East Twin Aeration Association, LLC, and
Twin Lakes Property Owners' Association, board member



East Twin Lake is a shallow lake in Montmorency County. The lake, along with its Association sister West Twin Lake, form the heart of Lewiston's determined return to the glory days of its timbering heritage at the turn of the last century.

East Twin covers about 900 acres of surface area with 9,300 perimeter feet of shoreline. The lake contains roughly 192 million gallons of water. Lewiston's timbering times gave this bucolic area its identity, and perhaps more. After almost 100 years from the fires which destroyed the lumbering mill housed on the banks of the East Twin Lake, lake users confronted the timbering past as water levels receded in 2000. Boaters were frequently surprised by the sudden bump as they glided boats across the water. The bump was from the remaining upright pillars that supported a small gauge railroad track that extended far into the lake. A community project removed over 90 dangerous timbers from the lake in 2002. In clearing the lake from these obstructions, discussion turned to the noticeable levels of sediment in East Twin Lake, primarily concentrated at its west side. Was this sediment a sawdust gift from our timbering forefathers that was stored on our sandy-bottomed lake? In 2002, we were determined to come to the aid of our upper mesotropic lake. We were not satisfied seeing our lake filled with unsightly and increasing sediment.

The Problem

East Twin is relatively a shallow lake. Depths range four to eight feet, with some areas no deeper than about 26 feet. The lake bottom is primarily a hard sandy surface. During a period of low water levels, the high sediment level at the western end of our lake became more prominent. The sediment occupied as much as 6 of the eight feet of depth in many locations. These levels were unacceptable to boaters, water enthusiasts, and fishing aficionados.

Our problem area is located at the western end of our lake. This area consists of 160 acres of surface area. An existing island on our lake and a sand bar, which traverses from the island to the northern shoreline, roughly contains it. How could we rid our lake of this unacceptable sediment? Once we confronted this question, our goal developed. We are determined to improve water quality/clarity, improve property values, and increase lake enjoyment, by decreasing the sediment level.

Studying Our Sediment Problem

Our suspicions that the sediment was submerged sawdust from the timbering operations were unfounded. One of our initial tasks was to determine the composition of our sediment. There were two primary reasons for this work. First, we wanted to ensure that the material was not toxic or harmful if we disturbed the substance. We also recognized that removing a dangerous substance could be very costly, and perhaps beyond a volunteer reach. Second, we wanted to learn the sediment composition in order to design an effective decomposition program.

We engaged the services of a water testing company who analyzed samples of our muck. The sampling study revealed that our sediment consisted of natural organic material including, but not concentrated with sawdust. Armed with this information, we turned to removal the selection of removal options.

Determining our Options

Undesired sediment could be removed by dredging. We learned that dredging involves two costly steps: the removal process and the disposal process. While removing the sediment could be achieved at considerable expense, securing nearby elevated land to store the material posed a financial burden beyond our means.

Adding biologic agents, tiny bug-like microbes, was another possible solution. The prospect of dumping drums of biologic agents into the lake and charging these agents with the task of eating our muck, was cast aside. This also is an expensive process that must be continually repeated. A certain risk that we might be introducing an unknown harmful agent to our waters also dissuaded us from this approach. We chose to use an aeration method. Adding oxygen to our lake would act similar to a bubbler in our childhood fish tank. Bubbles would circulate water, aerobic activity would thrive, water clarity would improve, and water quality would be enhanced.

Organizing Our Resources: People & Money

The initial study and project determination was made by a small core group of lake supporters, spearheaded by Alan Kiriluk, an ardent lake supporter. This group formulated a proposal to identify, fund, and solve our lake's sediment issue. The issue was publicized through our lakes' association newsletter and presented in an hour-long forum at our association's annual meeting in 2003.

The approximate 90 lake supporters received a detailed proposal describing the method of attacking the sediment issue and the level of financial support needed to begin the project. The financial projection assumed that monetary support of all lakefront owners would not be received. The financial targets were built based upon participation of only 30% of lakefront owners and a small group of

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lake access users. We determined that we would gladly confront the issue of having raised too much money, rather than not enough. The lake association endorsed the project. Mailings were distributed to all lakefront and lake access property owners requesting their financial support of $5.14 per lineal feet of lakefront owned or for back lot owners a flat amount of $257.

Most importantly, we indicated that if our target of $50,100 was not raised by a date certain four months later, the project would be stopped and all funds would be returned. Coupling this deadline with a specific proposal and solid information were critical to the project's success. Through personal solicitations, newsletter articles, and direct mailings approximately $60,000 was raised within a four-month period to meet the project's deadline.

Engaging Professional Services

We determined that an aeration system must be professionally installed and maintained. Several methods of artificial aeration exist. Air can be introduced to a lake by injecting air in the lake, mechanically mixing the water, or agitating the water with paddles or fountains. We chose to inject air into the lake through the use of submerged diffusers that are fed air pumped by shoreline compressors through heavy tubing resting on the lake bottom. A national company skilled in aeration systems for industrial and large residential projects, Vertex Company, was chosen to assist our efforts through their local affiliate Tri-County Aquatics, Inc. Further study and design worked was performed. Our aeration effort is concentrated to the lake's west end where the sediment problem was most prominent. We contracted for the purchase and installation of four land-based compressors that would each feed six diffuser units. Each diffuser unit consists of four rubberized membranes containing multiple tiny holes. In total, the four compressors would feed 24 diffuser units consisting of 96 membrane bubblers.

Our total project cost was $44,000 in 2004 with an anticipated six to seven thousand dollar professional maintenance and utility expense annually.

Legitimizing the Organizational Effort

The East Lake Aeration Association, LLC was formed with the State of Michigan. Insurance coverage was obtained in the unlikely event unforeseen problems developed. Three property owners and our local township were solicited to house the compressor units on the shoreline of their property. Arrangements were made to bring electrical supply to each compressor unit. Application was made with Michigan's Department of Environmental Quality (DEQ).

Securing the permit to conduct the aeration program was an extensive process. We were required to establish the authority to place the aeration units within the riparian interests of adjoining property owners. We were also required to present the detailed locations of the proposed units and their impact on the lake and its fish population. The DEQ conducted additional study in coordination with the DNR fishery experts, before approving the permit. The permit was granted. Installation was completed in July 2004 when the aeration units were turned on.

See the August 2007 issue of The Michigan Riparian for Part II of this article, which answers: How Does Aeration Work? What Does it Accomplish?

Lake Julia stewardship project in 5th year

by Terry Rutlin,
Lake Julia Stewardship Project Manager

Lake health and ways to preserve and enhance it became central to the Lake Julia Lake Association four years ago when it launched the long-term Lake Julia Stewardship Project.

Situated along the 238-acre clear-water lake, just south of Rhinelander in Oneida County, the association has tackled one major project a year to study various aspects of the lake's ecosystem.

To do this, the association partnered with Nicolet College (which sits along the lake) with the DNR with funding from its Lake Planning Grant program, and with the environmental consulting firm of White Water Associates.

"The whole idea was to take a broad look at the lake ecosystem, determine what's there and how well the various components are working together," said Harry Helwig, lake association president.

Phase One of the project studied 20 different wetlands surrounding the lake. Phase Two mapped and evaluated the aquatic vegetation in the lake. Phase Three studied the base of the fish food chain with particular attention paid to small fishes and invertebrates. Phase Four was a Clean Boats, Clean Waters campaign to educate lake users about aquatic invasive species.

> "The whole idea was to take a broad look at the lake ecosystem, determine what's there and how well the various components are working together."
> – **Harry Helwig**
> ***LAKE ASSOCIATION PRESIDENT***

"Along with the scientific assessment and collection of baseline information about the lake, the project has also helped association members better understand the lake ecosystem and what they can do to help Lake Julia," said Terry Rutlin, Lake Julia Stewardship Project manager.

"We talk a lot with our members about each phase and that alone has gone a long way in helping them appreciate how the different pieces of the ecosystem need to work together to keep the lake healthy," Rutlin said.

"Many more members are realizing that it's a lot easier to keep an ecosystem healthy than it would be to restore one that has problems."

Stewardship project partners are currently putting the pieces together for Phase Five, which would assess fish spawning habitats around the lake, identify prime spawning areas, and provide recommendations for what lakeshore property owners could do – or not do – to enhance spawning habitat.

News From Lakes Around the State

Ballast water

Devils & Round Lakes Preservation League
Manitou Beach
Kathy Miller, Newsletter

Michigan's new ballast water control law went into effect January 1, requiring shipping companies to have ballast water control permits issued by the DEQ in order to use Michigan ports. Ballast water is the water a ship takes in to stabilize ti when traveling without cargo; it is released in port when cargo is loaded. Invasive species causing environmental problems have been introduced into the Great Lakes through ballast water and billions of dollars have been spent trying to control them. Shipping companies must not discharge ballast water, or they must use one of four approved discharge methods. Invasive species have made their way into many inalnd lakes by way of boats being put in and taken out of other bodies of water.

Minnesota shoreline restoration

Osterhout Lake Peoples Organization
Grand Junction
Chuck Pugh, Newsletter

Minnesota is working very hard to restore and maintain natural shorelines. In a recent "The Confluence" – an electronic newsletter from the Minnesota Lakes Association – there were several articles on this subject. One was about grant money to restore shorelines and another was about a recommendation for the Minnesota DNR to update their shorelines requirements.

Sewer project update

Fisher Lake Association
Three Rivers
Eric Shafer, President

The membership at the annual meeting again urged the board to continue to pursue a sewer for Fisher Lake. At the time of this newsletter (Feb. 2007), there is really no update on the sewer. There is still a possibility that the city of Three Rivers, the village of Constantine, and the townships of Fabius, Lockport and Park may get together to form a sewer authority. If this were to happen, then Park and Lockport townships would still have to decide whether or not they wanted to pursue sewer to Fisher Lake. Both townships would hold public hearings and more polls would be taken.

2006 fish stocking overview

Silver and Marl Lakes Area Homeowners Association
Fenton
Tom Murphy, Newsletter

Last autumn, $1,100 was spent on stocking our lakes with some nice-sized pickeral (walleye). This stocking occurred through the generosity of a couple of our fish-loving lake residents – Jerry Eisenbeis and Jason Russo – and a match from the lake association. We will continue to monitor the fish population on the lakes and to take actions which maintain the health and viability of this wonderful natural resource. Let us know how your fishing on our lakes goes in 2007!

Land development issues

Magician Lake Improvement Association
Dowagiac
Dick Morey, Membership

Land development is one issue (brought up at the Region 3 MSLA annual fall meeting), as more and more pressure is put on townships by real estate developers to develop land that borders lakes and wetlands. It is important that individuals take an interest in local governments. All of us need to attend township, planning and zoning commission meetings – and be aware of lake issues – to protect our interests. We must make sure our local government officials know of our concerns over the environment, especially around our lakes and not sacrifice it for revenue. Other new issues include the problem of boat density and public access to lakes; this issue also comes with a new twist – the creation of "garage condos" constructed near public access sites. In these, individuals are able to store their boats next to the lakes, spend their days on the water, and then leave them during the night. More people, more boats, using limited lake water! Also the question of large houses being built on small lakefront properties where roofs and paving almost cover the entire lot, and gutter rainwater is going directly into the lake. There is no permeable area for rainwater to be filtered by the ground before it becomes part of the lake aquifer. Pollution is much higher without rainwater being filtered by natural means.

EWM problem expensive

Long Lake Property Owners Assoc.
Watersmeet
Arny Domanus, Secretary/Treasurer

As lake surveys were done, it was realized that the cost of control for Eurasian watermilfoil (EWM) far exceeded our budget. ... We hope that the Michigan Legislature will wake up to the fact that we have a statewide problem that needs funding. Various organizations have been lobbying for assistance, but we do not see any funding appropriations pending. The Upper Peninsula depends on tourism and healthy lakes to sustain our economy, as does the rest of Michigan. Lake property values in Watersmeet Township continue to increase by 10% a year. A lake infested with exotic weeds will have property values and owner's equity depreciate rapidly.

Water quality team visits MSU

Three Lakes Association
Bellaire
Bob Bagley, President

Dean Branson and Norton Bretz accompanied members of Elk Skegemog Lake Association (ESLA) as they presented the ESLA grant proposal draft to the DEQ in Lansing for the next phase of the watershed modeling project. TLA has been mentoring ESLA in this process with the expectation that our modeling protocol will be continued downstream to Elk and Skegemog Lakes during 2007. Gary Kholhepp, DEQ grant reviewer and project officer, gave the team positive feedback and much encouragement. He was enthusiastic to see the TLA modeling format spreading to other lake associations. Grant awards will be announced this spring. If ESLA is awarded a grant for 2007, TLA will continue to support their project by loaning equipment and expertise. Michigan State University recently established the "Center for Water Studies" and Professor R. Jan Stevenson, our friend and colleague, is the new director. The water quality team attended a mini-seminar on water quality issues and presented an overview of the TLA

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News From Lakes Around the State

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modeling project for Torch, Clam and Bellaire lakes. The MSU professors in attendance were quite amazed at the scientific accomplishments made by TLA in the last three years. Building an ongoing relationship with water quality experts at MSU has been one of our long-term goals. Thank you, Dean and Norton, for your hard work and continued commitment.

Maintaining lake water levels

Lake Margrethe Property Owners Assoc.
Grayling
Joe Porter, President

Maintaining lake water levels at the court order levels will be the subject of a major LMPOA project in 2007. As we have reported previously, we have reason to believe the gauge being used at the Portage Creek Dam may not be a valid measuring device. In addition, a natural build-up of sand and aquatic plants is reducing the outflow of water into the creek. The DNR and the road commission have agreed to assist us in identifying the cause of the problem and will support (or approve) certain corrective actions that are under consideration in 2007.

Latest news on invasive species

Elk-Skegemog Lakes Association
Elk Rapids
Dean Ginther, President

It seems that several new animal or plant invasive species are discovered each year. Some appear to be harmless, but others immediately cause great problems for our lakes. All of these problems arrive in the Great Lakes in the ballast tanks of foreign port freighters. When the bilge is flushed, out comes the new arrival. We understand that this dumping of the bilge is illegal both in U.S. and Canadian Great Lakes waters. But the laws are not enforced often, if at all. We must remember that anything in Lake Michigan waters will probably be in Elk and Skegemog soon. We need to step up the fight against these threats. The latest is a new one called the Hermimysis anomala, a small shrimp found in December near Muskegon. Scientists chart this as invasive species #183. Other arrivals over the years include the zebra and quagga mussels, along with the shrimp that thrive on various plankton, the basic source of food for our native fish. In addition, other arrivals are plant-like and have the capability of covering a lake with weed-like growth. Two good sources of more information on all invasive species are on the Internet; the Grat Lakes Environmental Research Lab (www.glerl.noaa.gov) and www.miseagrant.umich.edu. These web sites, and many others, have pictures and detailed information on all invasive species. In addition, our partner - Tip of the Mitt Watershed Council - can also supply this information.

ON THE COVER: Details about this month's feature Wamplers Lake

Wamplers Lake is an 809-acre natural moderately hard water kettle lake located in Norvell Township, Jackson County, and Cambridge Township, Lenawee County, in the heart of the beautiful Irish Hills, Michigan. The lake has a maximum depth of 39 feet, a mean depth of 9.2 feet and contains 7,428 acre feet of water. The length of the shoreline is 31,499 feet. There are no islands in the lake. The elevation of the lake is 967 feet above sea level.

The lake has several inlets. The Iron Lake inlet, which flows into Wamplers Lake on the south side next to Jerry's Pub, drains not only the Iron Lake watershed, but also the Sand Lake drainage basin. Water from the Sand Lake drainage system flows through a pipe installed about 17 feet under U.S. 12 to Iron Lake. The total acreage of the Sand Lake/Iron Lake drainage system is 1,804 acres.

The inlet from Round Lake on the east end of the lake drains 583 acres. The Timber Lake inlet on the west end drains 432 acres. The Honey Lake/Jordan Lake (Ladd Drain) inlet which flows into the lake on the north side drains 1,071 acres. The inlet from the girl's camp on the northwest corner drains 538 acres.

The size of the watershed, which includes all the lands that contribute water to the lake, but does not include the lake, is 5,036 acres and includes all of the inlet drainage areas listed above, plus the immediate 608-acre Wamplers Lake watershed area. The drainage area, which includes the watershed(s) and the lake, is 5,845 acres. The watershed to Lake Ratio is 6.22 to 1, which is on the high side of normal for a Michigan inland

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lake. Because of this, the lake flushes fairly rapidly, about once every 1.41 years on average.

The lake basin was formed by a block of ice that broke off the retreating glacier. As the glacier continued to melt, debris from it surrounded the block of ice (that same debris formed the Irish Hills). Finally the ice block melted, forming the lake basin. Lakes formed from glacial ice blocks are called kettle lakes.

The Wamplers Lake Property Owners Association, Inc., began in October 1946 as Wamplers Lake Protective Association. This was then and still is today a totally voluntary organization of riparian owners and those with legal access to Wamplers Lake. In June 1955, the name was changed to Wamplers Lake Property Owners Association and then in June 1997 the association took the present name of Wamplers Lake Property Owners Association, Incorporated.

The purpose of the association is to do the following:

1. Promote the maintenance of water quality in the lake clean enough for swimming.
2. Provide equal opportunity for all riparian property owners and property owners with legal access to Wamplers Lake to be represented in decisions affecting the lake.
3. Promote the renewal of fish population of the lake.
4. Protect the investment people have made in their property through coordination with township, county, and state government activities.
5. Promote water safety.
6. Preserve the scenic beauty of the lake and its environment.

To promote these guidelines, some of the projects successively undertaken by the WLPO have been the installation and maintenance of the Emory C Jonas Dam on the northeast side of the lake. This project was completed in 1993 and allowed the association to control the water levels in the lake. This was essential to the next project the association undertook, which was the establishment of a sewer district around the lake. The Wamplers Lake sewer system was successfully completed in 1996. All of the homes around the lake and the majority of the surrounding watershed are now connected to the sewer system. This has resulted into a much cleaner lake and has spawned a building boom on what used to be unsuitable lots. With the increase in property values, and more available building options, we see a trend from part-time cottages to full-time residents.

Wamplers Lake is surrounded by approximately 590 homes and cottages, both riparian and back lot. Some of the highlights on this all-sports lake include Walter J. Hayes State Park, which has a large bathing area, a public boat ramp and a large camping facility; Judson Collins Methodist Camp, which brings the sounds of carillon bells and sometimes band practice across the lake on warm summer nights; a Girl Scout Camp which brings sounds of laughter across the lake at all hours of the day and night. We also are fortunate to have the World Famous "Jerry's Pub" located on the South Shore of our lake. Residents and guests enjoy boating to Jerry's to enjoy lunch, dinner and maybe an adult beverage or two. While each of these attractions offer individual challenges to the association and riparian alike, they add to the character of Wamplers Lake and make this a great place to live and or vacation.

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