

SPRING
2014



Vol. 49 No. 2

THE MICHIGAN RIPARIAN

www.mi-riparian.org

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Christie Lake

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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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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



By the time you receive your spring issue of The Michigan Riparian, I cannot help but wonder if the weather will feel more like spring. Currently, as I write this publisher's letter, it is snowing; the lake is fully covered with ice, and it's a balmy 22 degrees!

What a winter we have had! The anticipation of spring (that looks and feels like spring) is shared by all of us who stuck it out here in the north. There have been a lot of conversations about what effect the winter, with its extended severe cold temperatures, snow and the ice, will have on our lakes. What will it mean for our lake levels? What does it mean for the aquatic plants?

I referred the question regarding aquatic plants and the effects of our recent winter weather to aquatic scientist and The Michigan Riparian contributor, Jennifer Jermalowicz-Jones. She said, "Lake residents and practitioners are wondering what impact, if any, the winter ice will have on the growth of aquatic vegetation. There are two scenarios that could occur: 1) The winter ice conditions created a harsh environment for all aquatic plant seeds and thus both the native aquatic plant species and invasive are stunted in growth for the 2014 growing season, or, 2) The tough winter impacted seeds of sensitive native aquatic plant species chooses invasives that can withstand harsh growing conditions and thus these species get a head start early in the season and potentially displace native plants. We need to be prepared for both scenarios and not depend upon a harsh winter as a weed control method." We will have to wait to see which scenario comes to fruition.

We will continue to bring you stories and information related to relevant topics in upcoming issues of The Michigan Riparian. See the *Lake Happenings* feature in this issue for more about the impact that the winter will have on inland lakes. Also in this issue, you will find information about the dangers of toxic blue-green algae, mute swans, easements, PODs and watershed mapping. Happy Spring!

-publisher, Sharon Wagner

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Life and Times on Christie Lake

Wilma Webster

(Editor's Note: Wilma Webster has graciously shared her book, Life and Times on Christie Lake, with our readers and has allowed us to edit her stories for length.)

Christie Lake is a small, 214 acre lake, halfway between Chicago and Detroit. Approximately 1 ¼ miles long, it varies in depth up to 40 feet. Surrounded by rich agricultural fields, its shores are sandy, and with no public access, it is one of the cleanest lakes in southwest Michigan. It has long been known for its excellent fishing – large-mouth bass, bluegills, sunfish, and the occasional, 42-inch northern pike. In summer its waters are teaming with jet skis, speedboats, tubes, chariots, and skiers. Although there are many permanent residents on Christie Lake, some two-thirds of the residences are vacation cottages.



Henry Christie,
son of Robert

The Christies

One of the first long-time residents on Christie Lake was Robert Christie. Although not the first to settle on the lake, the Christies clearly influenced its early development. Robert was born in Scotland in 1793, and his family immigrated to New York.

In time, he and his wife and eight children moved to Washtenaw County in Michigan, seeking good farmland. In 1838 he purchased 411 acres in Hartford and Bangor Townships. The Christies eventually moved into a small shack on Prospect Lake that had been built by John Freeman. The shack had been intended to serve as the general store in John Freeman's new town of Van Buren Center.

Freeman was hoping to build a town on the west end of the lake. He had laid out the town, platting 285 residential lots and several streets. He set aside space for a courthouse and several other buildings and printed maps showing steamboats on the lake. He even envisioned the town becoming the county seat, but unfortunately in 1835 the state had already chosen the Village of Lawrence for the County Seat. Over the next two years Freeman successfully sold a number of lots in his new town, the last 25 lots going to Horatio Phelps. Lots were said to have been sold for up to \$150.00 each. Not long after that, the Panic of 1837 dried up all the money for new sales. Freeman had lost his gamble and had to leave.

Horatio Phelps, left with 25 parcels of a non-existent town, decided to cut his losses by erecting a tavern and stagecoach stop on part of those lots. Located at the top of the hill on the west end of the lake, it was a large, two-story structure built of

logs. Part of it was the tavern, part a dining area, and at the end was a kitchen. There were sleeping rooms upstairs. The stages running along Territorial Road found this stop, halfway between Detroit and Chicago, ideally located to rest passengers and horses. This was no doubt a successful business, but Phelps still had a whole town to dispose of.

It was at this time in 1838 that illness swept over the Christie family. They spent the winter in the shack Freeman had built, but by the end of January, 1839, Robert made a deal with Horatio Phelps. In exchange for 160 acres of his Hartford land and \$1,000.00, Robert got the 25 lots Phelps had bought including the tavern.

He moved his family into the tavern and continued running it as an inn until the stagecoaches were discontinued. He then turned the tavern into a home and lived there until his death in 1865. The home is still standing and is currently occupied.

Christie started buying up all the other lots sold by Freeman. By the early 1860's, he had turned most of the lots into farmland. At about the same time that Robert Christie was finally making a profitable homestead, Will Greenman, Jr. of Corkland County, New York, joined several other families on a wagon train headed west in pursuit of a dream to own land in this new territory of Michigan. There was much talk of good farmland available on Prospect Lake (first named Crystal Lake due to its unusually clear water) where even a post office was said to be located on the northwest shore.

Will Greenman bought 160 acres with acreage backing up to the lake. Legend has it that when the land dealer spotted Greenman's pocket watch, the dealer offered 40 more acres in trade for it. Greenman now owned 200 acres of prime, forested farmland on the southern shore of Prospect Lake where he would make his home. (Years later the lake's name was changed yet again to Christie Lake).

During the next 10 years additional land was purchased, and the homestead grew to



The Fishing Lesson

(Continued on page 6)

Christie Lake

400 acres. He became well known, and was held in much esteem by his neighbors as a landholder and as a large producer of maple sugar. By the late 1850's, Greenman was able to build a home nearer the main road with a larger barn as well.

Sleepy Hollow

The history of Sleepy Hollow is important for understanding the development of Christie Lake. Many families came here first to camp or rent, then to own, establishing roots and influencing development in other areas. Sleepy Hollow was promoted as a resort 115 years ago when it was described as 'a fun and happy place.' To follow the chain of ownership of these cottages is to see the evolution of the lakefront and the continuous family heritages on the lake.



Sleepy Hollow Then



Breezy Point/Sleepy Hollow Now

The Sleepy Hollow Resort (1900). Over 100 years later that scene has evolved into something that couldn't be imagined then.

Breezy Point

Breezy point was developed in 1919 and extends west from Sleepy Hollow. The scene today has changed considerably for these two areas from those lazy, carefree days of row boats in the water, cottages lining the shore, men and women reclining on blankets or homemade gliders under the shade trees, and ladies wearing long dresses and big hats to protect themselves from the sun. That was then; this is now: large, permanent homes, remodeled cottages, long, groomed, sandy beaches with brightly colored umbrellas and beach chairs now replacing the early 20th century Adirondacks.

Tied up to long, straight piers are beautiful, blue, green, red, and multicolored speed boats, jet skis, and pontoons. Everyone in the water is floating or splashing about or sunning on the pier. But it still has the feel of a resort. The cooling breezes blowing down Christie Lake justify its name: Breezy Point.



4th of July Parade 2012

North Cove

As the only cove on the north shore, one will find an effort here to preserve the natural habitat of plants and water life. Although it was dredged in 1959 to accommodate watercraft, stands of reeds and lily pads have been left untouched so residents can enjoy the sights and sounds of frogs, birds and other critters.

Christie Lake Bible Camp

One of the great legacies of Christie Lake, and one that most longtime residents on the lake remember with fondness is the Christie Lake Bible Camp. Founded as a Christian camp for children and later whole families, it became widely known and admired. The original idea for the camp came from Reverend Howard S. Blodgett. Reverend Eugene Marceau from the Posen Bible Church in Chicago and Reverend Blodgett teamed up and the new camp would be run under the Independent Fundamental Church of America for all denominations.

The buildings included a large dining hall with kitchen, a large recreation room with a fireplace, and a concession stand. To the west of the main building was the chapel, nurse's station, boys' dorm; and, closer to Territorial Road, was the girls' dorm. The campers could swim, canoe and swing on a rope into the lake from one of the many large trees on the shore. The residents at the west end of the lake could hear the dinner bell being rung before every meal and evening vespers by the campfire and singing well into the night.

While the camp was closed, one night in the spring of 1987, the dining hall caught fire and burned this large structure to the ground before the firefighters arrived. The hall was replaced by a much smaller one, but the camp never could quite recover and closed the same year.

One large building and the dinner bell still remain on the property, but all the cabins and surrounding buildings are gone, replaced by beautiful new homes. Residents on the lake of twenty-five years or more can still hear the echoes of those children as they sang by the campfire into the night.

Tranquil Shores

Tranquil Shores Subdivision runs along the ridge at the northwest end of Christie Lake. Most have known it as the location of the old Christie Lake Bible Camp. Old oaks and pines that once covered the property have been thinned out to accommodate the new homes. In 1924, Helen Abrams sold this property to Clyde Wilson, who resold it to Mary Blodgett in 1940. Upon Mary's death in 1957, the property was inherited by her children, Evelyn and Howard, and occupied by Howard and Reverend Eugene Marceau as the Christie Lake Bible Camp until Howard's health began to fail in 1964. The property had been platted as a subdivision in 1963, but was deeded to the Grand Rapids School of Bible and Music and a few lots to individual owners before Bill Fleetwood acquired and sold the remaining lots.

Territorial Road

Territorial Road goes back to 1835 and runs the whole width of the lake on the West end. It was the major wagon and stagecoach route that brought many folks to the lake then as well as today. Many cottages since the 1920s have been remodeled or replaced and are sandwiched between the lake and the road behind. The center cottages boast of the “longest view” of one and one quarter mile of Christie Lake.

Simmons Landing

This area at the south end of Territorial Road consists of five cottages that sit against a backdrop of large trees on a steep bank with a gravel road running between the cottages and lake. Simmons’ Landing is distinguishable from the lake by the large willow trees that have been growing along the shore for years. The cottages are privately owned, but the property is named after its landowner, Susan (Simmons) Leach, a descendant of Robert Christie.

The amazing thing is that the owner, Sue (Simmons) Leach, has a history going back to the Christie family that first settled here in 1838. Even though other Christie descendants live in the area around the lake, Sue believes herself to be the last descendant of the original Christie family to actually have a cottage on the lake today.



Sign at Simmons Landing



Sue (Simmons) Leach at family cottage in Breezy Point

Main Street

The land adjacent to Main Street originally belonged to the Christies in the middle to late 1800s and then to the Abrams into the 20th century. This land was so low that in order for it to be developed near the lake, many loads of fill dirt had to be brought in. Still the threat of flooding during high water times forced owners to build sea walls to protect their property. Surrounded by an apple orchard, the Abrams’ cottages were the first to appear on this corner of the lake around 1920, but eventually theirs and many other early cottages had to be torn down to



Sailing at West End of Christie Lake



accommodate larger, year-round homes. Nevertheless, some quaint, weekend cottages still exist. The area remains naturally protected from the prevailing westerly winds, and the vista from these east-facing homes offers a long view of Christie Lake and a spectacular view of the sunrise.

Prospect Heights

Prospect Heights No. 1 surrounds a large cove at the SW corner of the lake. It has silted somewhat over the years, and although the depth is mostly navigable, it is now home to common lake grass, milfoil and lily pads. Six houses surround it on the wooded hillside. Prospect Heights No. 2 runs along Hill Drive east of the cove which is tree-covered with an extremely steep bank down to the lake, where the beach is narrow at best. The slope continues on into the lake to a substantial depth. Cottages and homes line this high ridge with back lots as well. This area is also home to Karen Jensen, graphic designer for the book, whose family, the Fords, have a long history on Christie Lake.

Rose's Landing

On the south side of Christie Lake is a long, dusty, gravel road running through a farmer’s field and branching off in two directions toward the lake. One leads to a large forest of old oaks rising so high and thick only beams of sunlight can filter through, giving this cove area its own unique quality. To the east the ridge rises and affords the cottages there views of both sunrises and sunsets.

William Greenman’s land once extended from Prospect Heights to the east end of the lake. The property was passed down through succeeding generations of Greenmans’ until in 1910 Doris Greenman married Leo Rose. Her inherited property eventually came to be known as Rose’s Landing.

Greenman's Landing

In 1846, pioneer William Greenman settled on the south side of the lake. At one time he owned approximately 500 acres including Rose’s Landing. The sugar maples that were so important to William Greenman still cover the property; and the wide, sandy beach offers some of the best swimming areas on the lake. The breezes that blow over this west-facing shore in mid-summer give this beach the feel and appearance of a tropical resort as well as affording a spectacular view of colorful sunsets over Christie Lake.



Greenman's Beach with Living Palm

(Continued on page 8)

Christie Lake

(Continued from page 7)

Struble Land

After the Indians had moved off the property, it was purchased by Isaac Bronson in 1838. Subsequent owners of approximately 215 acres changed hands from one generation to another. By 1949 Frank and Nettie Struble owned the land, and the lakeshore with 5 cabins became a family retreat. Upon Nettie's death in 1989, Gary (Strubles' nephew) and Wilma Webster (author) acquired property to build a year-round home there. Today all lots have cottages and year round homes except for one.

Christie View Estates

This beautiful property with its high ridge and sunny, south-facing shores affords some spectacular views of Christie Lake. Seasonal and permanent homes now grace the property, but before its development the lake residents referred to it as "the cow pasture." Cattle would graze nearby and wade into the water to drink or cool off on a hot summer day. Some old deeds would even describe ownership of land into the lake "up to the cow's belly". An early 1900's picture shows a fence extending out into the water.



Boys Fishing Near Rose's Cove

Full Circle

Starting with Sleepy Hollow and ending at Christie View Estates, we have come full circle around Christie Lake telling the stories and personal histories that were shared by families on the lake. For all who have had the good fortune to have been part of Christie Lake, it can be said that their personal stories show the spirit that resides here and that has now been recorded as part of its history. ●●●

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A Simple Check for Greater Safety: U.S. Coast Guard Auxillary and U.S. Power Squadron Vessel Safety Checks



By Grant L. Jones,
Staff Officer of Public Affairs Division 31, U.S. Coast Guard Auxillary

"It was a dark and stormy night!" a line from Charles Schultz's comic strip Peanuts, would hardly be the best time to be out on a boat and find out that your safety gear was missing or not working. One of the easiest ways to improve your boat's safety is to get a Vessel Safety Check (VSC) from the U.S. Coast Guard Auxiliary or U.S. Power Squadron.

What is a Vessel Safety Check? A Vessel Safety Check ensures a vessel and its equipment comply with federal, state and local safety requirements. Vessel Safety Checks can be conducted on motor boats, sailboats, personal watercraft (jet skis) and paddlecraft (canoes and kayaks).

During a Vessel Safety Check the examiner checks the following required items (note: not all items apply to all vessels).

1. Numbering: Proper placement of the boat's registration number and registration sticker.
2. Vessel Registration Paperwork: Checks for current registration and the hull number and registration paperwork match the numbers on the boat.
3. Personal Floatation Devices: Ensures the boat has enough life jackets (1 for each person aboard and one throwable for the boat in good condition).
4. Visual Distress Signals: Checks flares for expiration and correct quantity (3) and also checks other signals such as distress flag or distress light.
5. Sound Producing Device: Checks to see if there is a sound-producing device aboard such as an electric horn, canister horn, or whistle and makes sure it functions.
6. Navigation and Anchor Lights: Checks for proper function of all navigation lights and anchor light.
7. Fire Extinguisher(s): Checks to see if extinguishers are charged and are the correct size and right type for the boat. Also checks for the correct number of extinguishers.
8. Backfire Spark Arrester: Checks that a spark arrester is mounted to inboard and inboard/outboard engines and is clean.
9. Ventilation: Looks for proper ventilation of the engine compartment
10. Overall Vessel Condition: Looks at the bilge for oil, checks whether the deck is free of hazards, and the electrical system should have both battery terminals covered.
11. A few non-required items will also be checked:
 1. First Aid Kit.
 2. Marine Radio.
 3. Bilge Pump & Backup Bailing Device.
 4. Anchor and Line for the area.

Upon passing of the Vessel Safety Check, the examiner will issue a VSC decal. If the vessel does not pass, the examiner will issue a copy of the examination form listing the items that need to be corrected. There is no penalty for not passing, and pass or not, a great opportunity to ask questions of someone experienced with boats in the community.

How do you get a Vessel Safety Check? Visit the website:
<http://wow.uscgau.info/content.php?unit=V-DEPT&category=i-want-a-vsc> and complete the online information to schedule a check with a local qualified examiner.

Example of a Vessel Safety Check Decal



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The Dangers of Toxic Blue-green Algae

Blooms and Implications for Effective Management

By: Jennifer L. Jermalowicz-Jones,
PhD Candidate
Restorative Lake Sciences

Introduction:

Algae (also referred to as phytoplankton) serve as the base of the food chain for aquatic life of a higher trophic level. They provide zooplankton with nutrients for growth, filter the water, and are consumed by macro invertebrates. The lake fishery is dependent upon macro invertebrates as a primary food source. Thus, it is critical for a healthy and robust lake fishery to access a healthy population of algae in the lake. Not all algae has equal nutritive value, with small green algae and diatoms preferred by zooplankton and filter feeders and blue-green algae being the least desirable or palatable. Green and blue-green algae can also exist in a filamentous form which tends to form dense mats on the surface of water bodies, and this form is less desirable for lake health and aquatic life (Figure 1). Blue-green algae (also referred to as cyanobacteria) have become a serious threat to water quality in many water bodies and have led to significant public health concerns since many of them release toxins upon cell death.

Although limnologists (lake scientists) have studied blue-green algae for several decades and blooms were first noted by Francis in

1878, the discovery of toxins produced by them is relatively new. In particular, the genus *Microcystis* has been problematic to inland lakes in that it usually accompanies a hyper-eutrophic (highly nutrient-rich) state where DO depletion and fish kills are prevalent, water clarity is low, and nutrients such as phosphorus (P) and nitrogen (N) are elevated. Other toxins are produced by other blue-green algae genera such as *Anabaena*, *Oscillatoria*, *Aphanizomenon*, and *Lyngbya* (Carmichael, 1997). When a lake becomes dominated by toxic blue-green algae the effects go beyond the aquatic environment (Vasconcelos, 1995; Carbis et al., 1997) and impact human health (Kuiper-Goodman et al., 1999). The toxins (specifically, Microcystin-LR, RR, and YR) are proven nerve, liver, and kidney toxins. The World Health Organization has set a drinking water limit of no more than 1 microgram per liter ($\mu\text{g/L}$) of Microcystin-LR (Chorus and Bartram, 1999). Many of these toxins can be found not only in shallow eutrophic inland lakes but also major drinking water reservoirs. The production of technologies to detect these toxins in Microcystic and other toxin-producing blue-green algae took many centuries. Within the past few decades, the development of highly sensitive (detection limits as low as 50 pg ml⁻¹) immunosorbent assays that are enzyme-linked along with sophisticated laboratory instruments (Metcalf et al., 2000; Ward et al., 1997) has allowed for toxin measurement and quantification. This area of toxin detection that is both economical and timely has become competitive among toxicology scholars.

Implications for Effective Management:

Hyper-eutrophic lakes are especially vulnerable to toxic algal blooms since the blue-green algae thrive in high nutrient waters that are warm. This is why blooms are much more prevalent in the summer months which occurs during peak lake management season. Figures 2 and 3 show widespread *Microcystis* blooms on Indian Lake (Cass County, Michigan) in August of 2011 prior to whole-lake aeration and in Spring Lake (Ottawa County, Michigan) in August of 2009, respectively. It used to be that lake managers knew only of the potential cause of these blooms (elevated nutrients such as phosphorus and nitrogen) but did not know of the consequences to the lake and human health and that there are toxins involved. The urgency to reduce these blooms has now become a critical and timely objective in the lake management field. Algaecides which are commonly used to treat nuisance filamentous algal blooms are minimally effective on toxic blue-green algae and may even exacerbate release of the Microcystic-LR toxin (Jones and Orr, 1994) since the toxin is released when the cell walls are shattered by the algaecide. Traditionally, algaecides have been used to treat nuisance algal blooms including blue-green algae blooms but the latter always re-appeared. This is because blue-green algae have evolved under substantial environmental stress and are very adaptable to high water temperatures and high turbidity, and are tolerant of algaecides. In the past, it was believed that the blue-green



Figure 1: Dense filamentous algae which compromise lake health (RLS, 2012)

algae blooms were a natural outcome of the nutrient-enriched environment and thus mitigation was not often pursued.

A new paradigm in lake management has since emerged that does not rely solely on algacides but additionally seeks to reduce nonpoint source pollution (NPS) by using alternative in situ measures. For example; aeration, ozonation and external improvements such as NPS pollution reduction through implementation of Best Management Practices (BMP's) are used to reduce sediment and nutrient loads to lakes from the surrounding land. This new paradigm would not have come to fruition if not for the discovery of the toxins produced by blue-green algae, the urgency for their reduction, and the technologies produced for in situ and watershed improvements to reduce nutrients that create the environment needed for the toxic blue-green algae.



Figure 2: A dense *Microcystis* bloom on Indian Lake prior to whole-lake aeration in 2011.



Figure 3: A dense *Microcystis* bloom on Spring Lake in 2009.

Future Concerns:

Lakes in the North Temperate Zone have already been classified as having saturated carbon dioxide (CO₂) levels (Cole et al., 1994) and actually act as sources of carbon to the atmosphere rather than sinks. In fact, Tranvik et al., (2009) demonstrates that the global annual emissions of carbon from lakes to the atmosphere are nearly equal to the carbon assimilation of the oceans. Much of this carbon was not necessarily a result of increased atmospheric carbon but likely from the partial pressure of CO₂ which is derived from both internal (respiratory) and external (import of carbon from the land into the water) processes (Kling et al., 1991). Furthermore, Sobek et al., (2005) reviewed data on 4,902 lakes and determined that increased temperatures do not necessarily lead to an increase in carbon but more likely from increased transport of dissolved organic carbon (DOC) from the land to the water. The control of carbon from the land to the lake will be critical for controlling carbon budgets given atmospheric increases. This further emphasizes the need for effective watershed management.

Inorganic carbon in the forms of CO₂ and bicarbonate (HCO₃⁻) are the primary sources of carbon that fuel submersed aquatic plant and algae growth (Wetzel, 2001). In general, lakes with a high pH will have more HCO₃⁻ and those with low pH will have more CO₂ (Stumm and Morgan 1981). The ultimate ability of a given lake to buffer against increased inputs of carbon will determine the impacts on lake biota (Wetzel and Likens, 2000). Allen and Spence (1981) noted that the macroalgae (*Chara* spp.) were much more responsive to increased HCO₃⁻ in the water column. Thus, lakes that have a high pH (and many in lower Michigan do) would expect to see even more *Chara* growth if the lake carbon concentration increased. If lakes with dense *Chara* experienced excessive biomass decay, then increased respiratory demands could result in internal carbon concentrations further increasing. Shapiro (1997) noted the ability of blue-green algae to exploit increased CO₂ levels for accelerated growth. Thus, lakes with increased CO₂ that have a strong population of blue-green algae may become further dominated by the alga as concentrations continue to increase. Feuchtmayr et al., 2009 found that an increase in nitrogen fixers is possible given increased nitrogen concentrations. Such impacts would potentially lead to a lowered

biodiversity that selects for algal species only able to tolerate unfavorable climatic conditions. ●●●

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ASK THE EXPERTS

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Question: Do artificial lakes have the same riparian rights as natural inland lakes?

Answer: In 2010, Michigan Court of Appeals in *Persell v Wertz*, 287 Mich App 576 (2010) confirmed that artificial bodies of water in Michigan generally do not have riparian rights. Please see my Attorney Writes column in the Summer, 2010 issue of the Michigan Riparian Magazine. In early 2014, the Court of Appeals addressed the issue again in *Holton v Ward*, _____ Mich App _____ (2014). The new case decision involved an artificial pond approximately 20 acres in size that was created many years ago via an earthen dam that flooded a wetlands. The Court confirmed that the owner of one half of the pond could fence his portion of the pond and keep the plaintiff off that half of the pond. Since this case is a published decision, it is binding precedent (as is *Persell v Wertz*).

It is easy to comprehend that a pond or small artificial body of water does not have riparian rights. Unfortunately, both the *Persell* and *Holton* appellate court decisions have left unanswered what they mean for larger artificial bodies of water that strongly resemble natural inland lakes and are used for the full range of riparian uses occurring on natural lakes such as swimming, boating, fishing and general recreating. What are the rights of lakefront property owners on such artificial lakes where the original developer left silent whether the lake is to be treated as a riparian lake? Unfortunately, the public will have to wait until future appellate decisions "flesh out" this area over the years or even decades. It is possible that an artificial lake that has been treated like a natural lake for a number of years could be deemed a riparian lake by the courts.

By Clifford H. Bloom, Esq.
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* * * * *

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Riparians are often troubled by lake access easements on their property or adjacent waterfront dedicated road ends, parks, walks, and alleys (whether dedicated to the public or just the owners of lots within the plat involved). Naturally, many riparians would like to rid themselves of those pesky lake access properties, as they often cause huge headaches for adjoining and nearby riparian landowners.

I have often heard riparians say that they can get rid of an easement or dedicated lake access site by simply obtaining a quit-claim deed from the local municipality (either a city, village or township), the county or the local county road commission. And, in almost all cases, that is incorrect.

Some lakefront riparian properties are bound by lake access easements that allow either members of the public, the owners of backlots within the plat or the owners of other properties to use the riparian land to access the lake. Unfortunately, in almost all cases, it is not possible to extinguish or terminate such easements. Such easements are almost never extinguished or abandoned due to mere nonuse. See *Feldman v Monroe Twp Bd*, 51 Mich App 752 (1974) and *Choals v Plummer*, 353 Mich 64 (1958). And, in general, courts will not extinguish such easements. In a few cases, the riparian property owner can extinguish an easement by adverse possession if it is a private easement and the easement has been fully blocked by fencing, a building or other obstruction for more than fifteen years. However, if the easement benefits a governmental unit or the public, adverse possession does not apply, so blocking the easement cannot extinguish it, even after fifteen years. If the riparian landowner believes that the easement is being misused, court action can definitively determine what uses the easement beneficiary or beneficiaries can make of the easement, but the court will not terminate the easement absent highly unusual circumstances.

Many lots on or adjacent to lakes in Michigan are located in plats. A plat is a formal process for the creation of lots and development of property. Please see my earlier article that discusses plats in detail in the Winter 2013 issue of *The Michigan Riparian Magazine*. Quite often, plats contain road ends, parks, alleys or walkways at or along the lakefront that are either dedicated to the use of all lot owners within the plat or the public. As with non-plat easements, such lake access sites almost never go away due to nonuse. As with private easements, a lot owner can potentially extinguish some or all of a dedicated lake access site by blockage under adverse possession, but not if the site was dedicated to the public.

Governmental units cannot extinguish dedicated properties (and transfer title thereto to adjoining property owners) simply via quit-claim deeds to adjoining landowners. The only way in Michigan to extinguish a dedicated property (and have the title thereto go unencumbered to the adjoining lot owners) is pursuant to a formal circuit court plat vacation lawsuit under

MCL 560.221 *et seq.* Such lawsuits tend to be expensive and complex as the requesting party must join in the lawsuit not only the local unit of government, but also the State of Michigan, the local road commission or authority, the country drain commissioner, and every property owner within the plat. Finally, the court has the discretion of whether to vacate (i.e., extinguish) the plat-dedicated item. Even if the property owner who brought the lawsuit to extinguish the dedicated site is successful, that landowner must then pay for a sometimes expensive replat of the area at issue.

As with so many myths associated with riparian rights or the waterfront, the old canard that easements and platted sites can be extinguished simply by a local government deeding the property to an adjoining property owner or owners is a falsehood. ●●●



Mapping and Understanding YOUR LAKE'S WATERSHED

By: Tony Groves, Pam Tynning, and Tory Meyers
Water Resources Group, Progressive AE

What is a Watershed?

A watershed is the land area surrounding a lake from which water drains to the lake. The imaginary line that defines a watershed is the watershed boundary, or is sometimes called the drainage divide (Figure 1). A watershed can be big or small, and the size and shape depends on the “lay of the land” and the number and length of tributary streams.

When precipitation (rain or snow) falls on the land, it absorbs into the ground and becomes groundwater, or it washes over the land as “runoff.” As runoff moves over the land, it can pick up pollutants that can be transported to the lake. As development in a watershed increases, there is often a concurrent increase in the amount of runoff. Lake water quality is often a reflection of land use (i.e., urban, forested, agricultural,

wetland) in the watershed. Lakes in highly developed watersheds tend to have poorer water quality than lakes in less developed watersheds.

Mapping and understanding your watershed can help identify problem areas and management opportunities, and foster awareness about watershed issues. This article examines various watershed characteristics and how these factors may influence water quality.

Watershed Mapping

A watershed boundary can be delineated by connecting points of high ground on a U.S. Geological Survey topographic map. Watershed mapping for a number of Michigan lakes was included in *Michigan Inland Lakes and Their Watersheds: An Atlas* published by Marsh and Borton in 1974.

The atlas is an excellent reference and contains information on lake and watershed size, lake to watershed ratios and other information. More recently, the Michigan Department of Environmental Quality mapped major watersheds and drainage divides throughout the state.

Most watershed analyses today are performed with geographic information system (GIS) computer software. GIS programs can be used for various types of spatial analyses and to generate high-quality maps and graphics.

Watershed Features

How water moves within a watershed is influenced by land cover, slope, soil types and other factors. The following series of maps illustrate various features of the Silver Lake watershed in Oceana County.

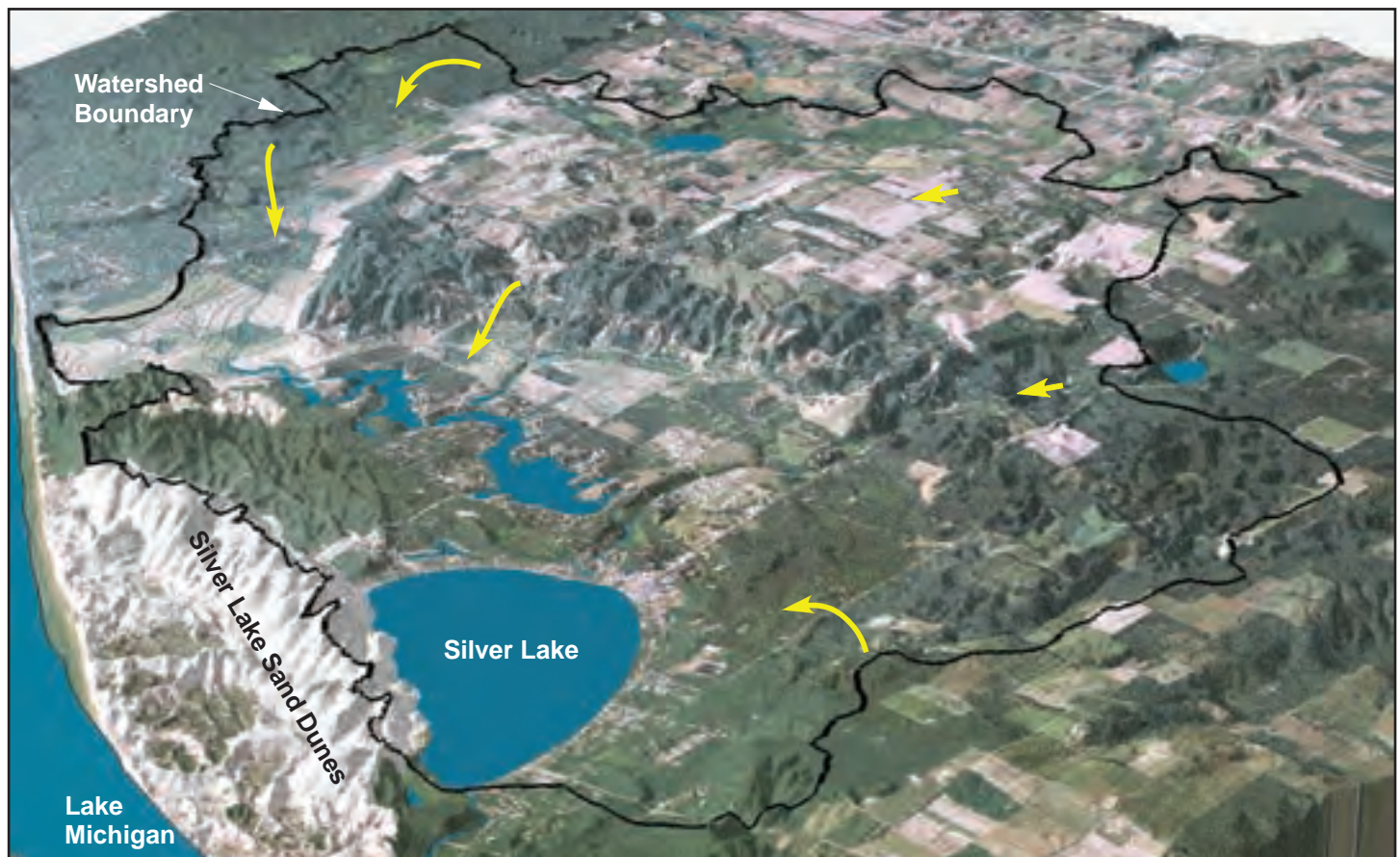


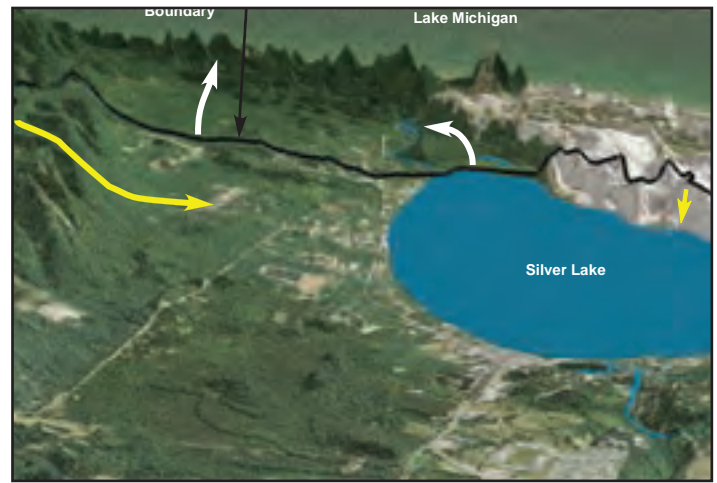
Figure 1. Watershed map. Precipitation that falls within the watershed boundary eventually drains to Silver Lake. Yellow arrows show direction of flow. Three-dimensional modeling software was used to create this map. The vertical axis was exaggerated to show elevation differences.

Mapping and Understanding YOUR LAKE'S WATERSHED

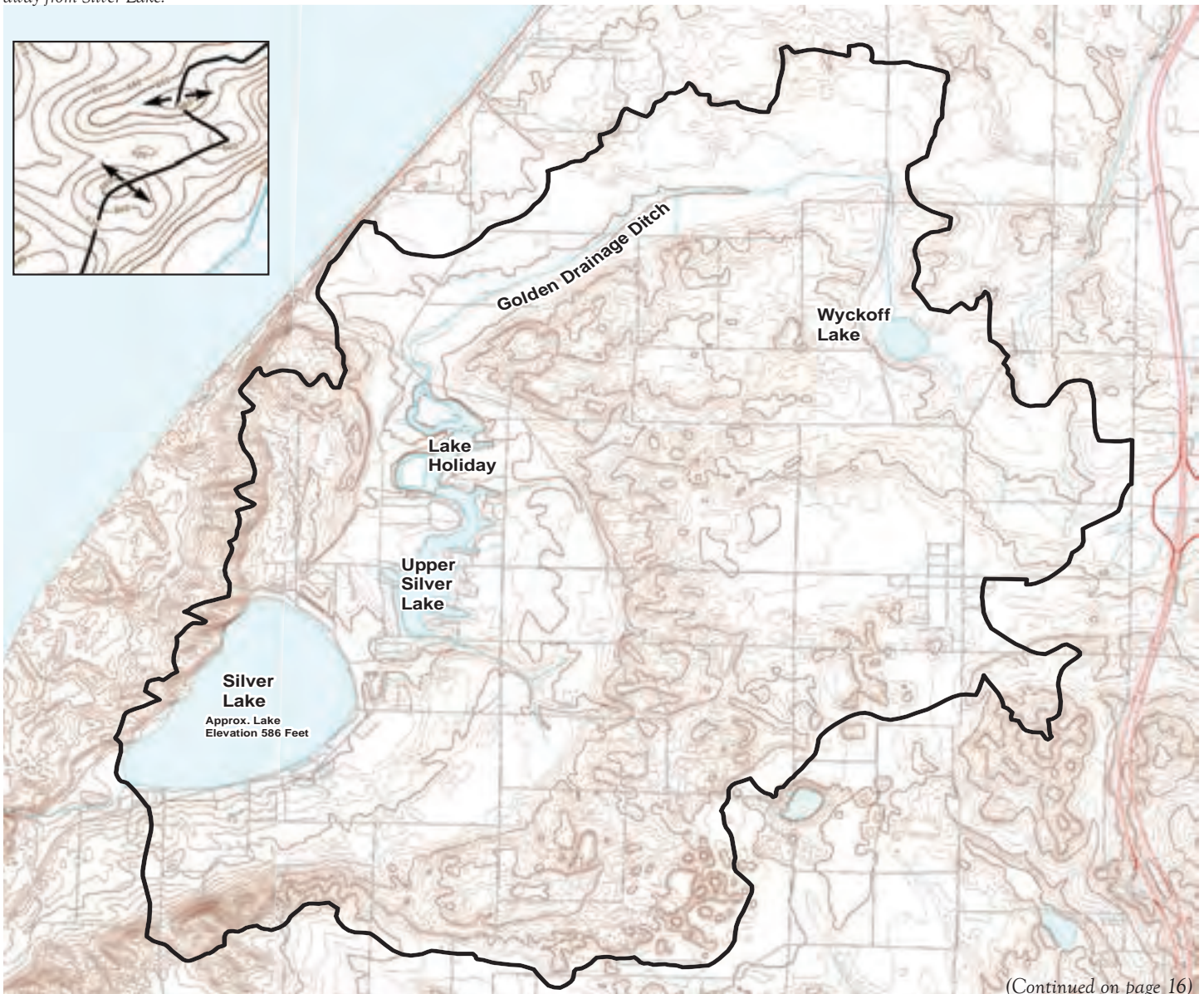
Topography U.S. Geological Survey topographic maps are often used to delineate watershed boundaries. Each line on the map represents an elevation, and a line can be drawn through areas of high ground to define a watershed boundary. Computer software can be used to view a watershed in three dimensions. By exaggerating the vertical scale on a three-dimensional image, topographical features are readily apparent and much easier to visualize. The Silver Lake watershed is about 22 square miles (14,108 acres), a land area 21 times larger than the lake itself.

Below: A two-dimensional topographic map uses contour lines to show changes in elevation. In this case, brown-colored contour lines are drawn at 10-foot elevation intervals. Dark brown lines show the 50-foot contours. Water flows over the land from higher elevation to lower elevation in a direction perpendicular to the contour lines. This principle is used to delineate the watershed boundary on a two-dimensional map.

Inset: Detail of two-dimensional topographic map. In this example, water flows in all directions away from the peaks at the 640-, 650-, and 660-foot elevations. The watershed boundary passes through these peaks to demarcate runoff toward and away from Silver Lake.



Above: A three-dimensional watershed map can be used to help delineate the watershed boundary. Arrows show the direction of runoff. Yellow arrows show flow within the watershed and toward Silver Lake; white arrows show flow outside the watershed away from Silver Lake.



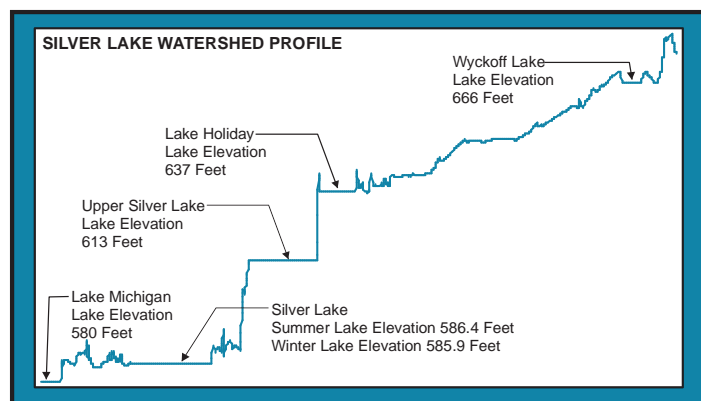
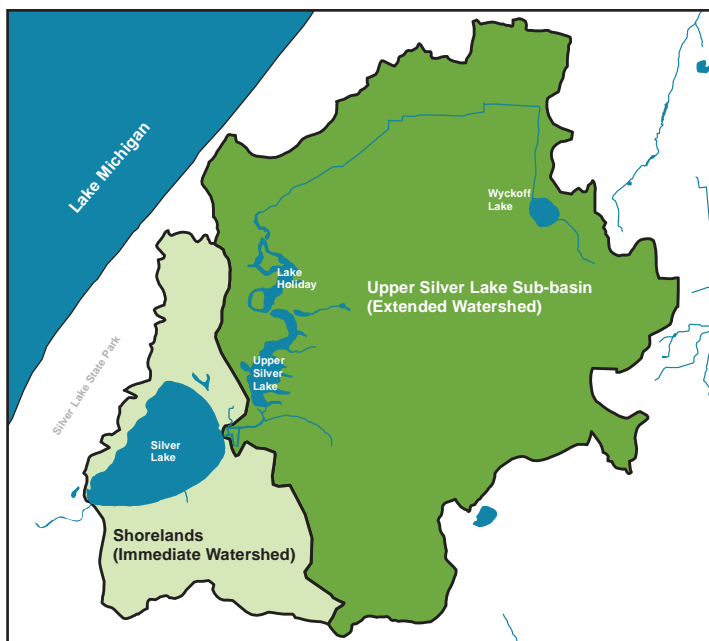
(Continued on page 16)

Mapping and Understanding YOUR LAKE'S WATERSHED

(Continued from page 15)

Water Features: The portion of a watershed that drains directly to the lake is referred to as the “immediate watershed.” The “extended watershed” includes areas that drain to the lake through tributary creeks and streams. Often, immediate watersheds are referred to as “shorelands” and the extended watershed areas are called “sub-basins.”

Water draining from the upper portions of the Silver Lake watershed (i.e., the extended watershed) flows through Lake Holiday and Upper Silver Lake before discharging to Silver Lake which, in turn, flows to Silver Creek and Lake Michigan. There is an approximate 80-foot elevation difference between Wyckoff Lake in the upper portion of Silver Lake’s extended watershed and Silver Lake, and an approximate 6-foot elevation difference between Silver Lake and Lake Michigan. The levels of Lake Holiday, Upper Silver and Silver Lakes are controlled by dams, and Lake Holiday and Silver Lake have court-ordered lake levels.



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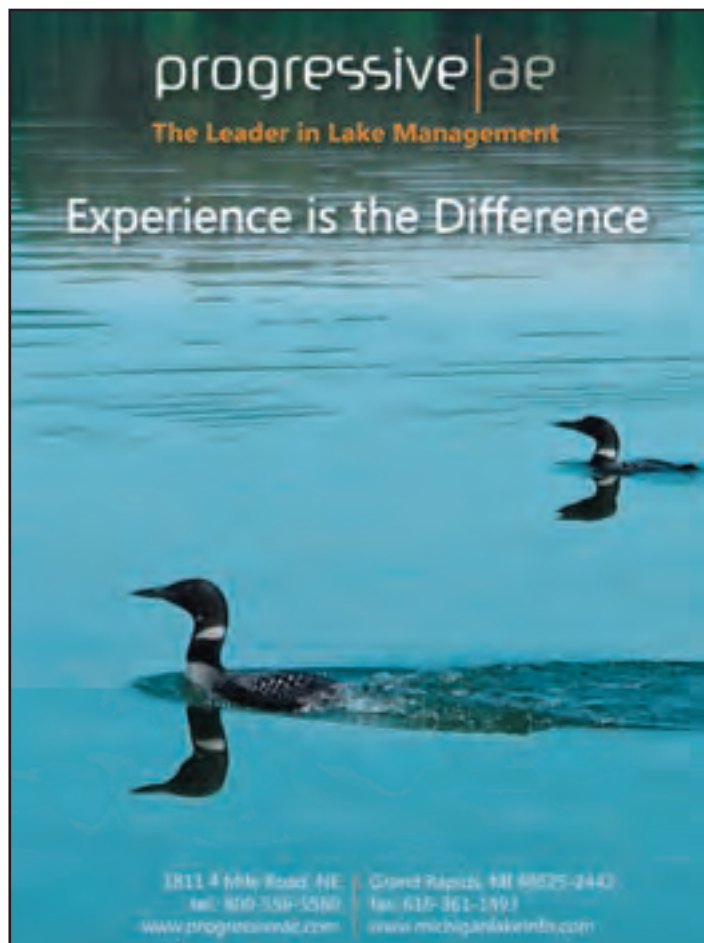
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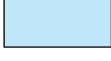


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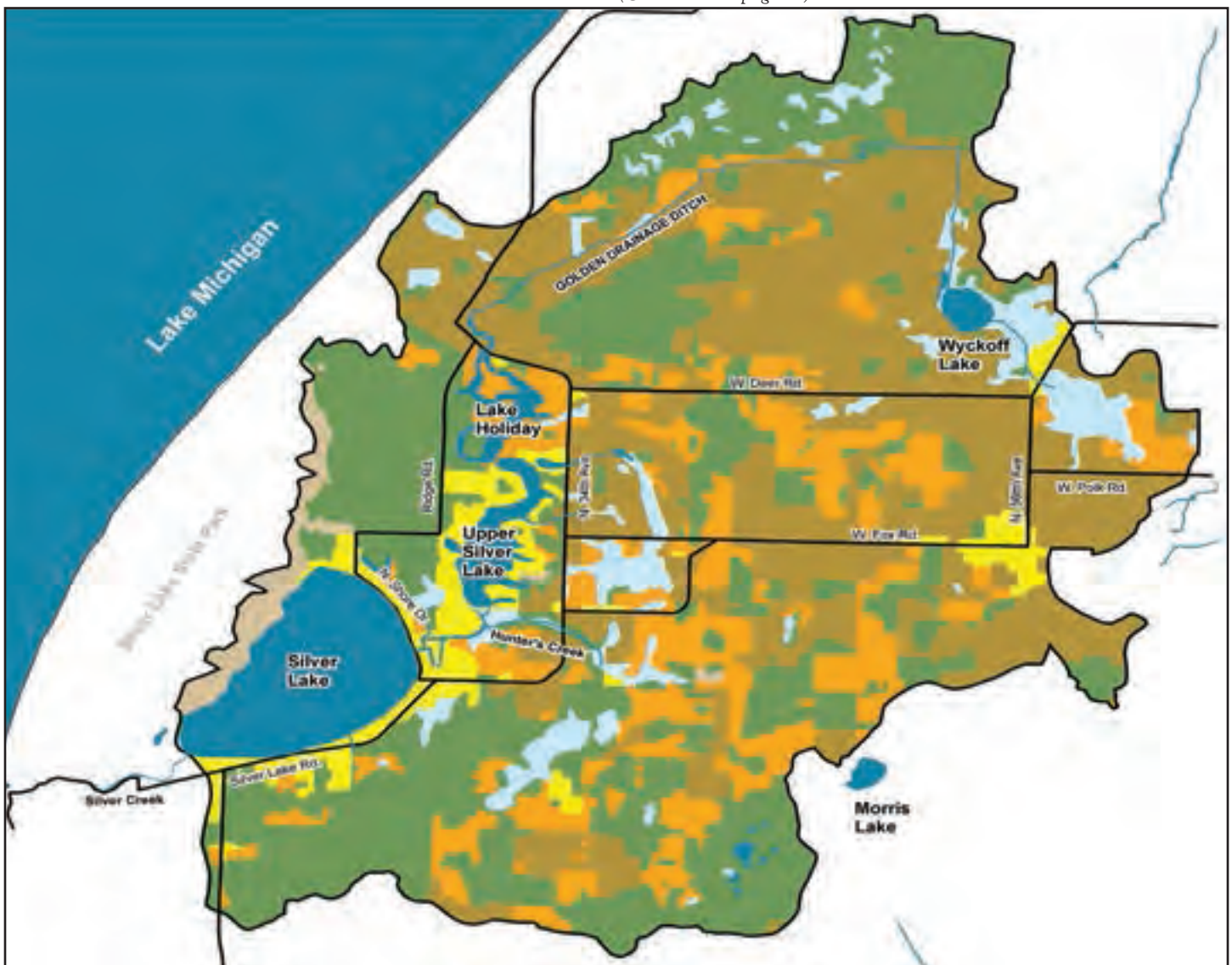
Land Cover: Land cover data derived from aerial photography (Michigan Resource Information System, MIRIS, 1978) is available for the entire state through the Michigan Geographic Data Library. With this data set, various land use classifications can be combined to show the generalized land cover in a watershed. The historical land cover data can then be compared to more recent aerial photography to evaluate changes in land cover over time. In the Silver Lake watershed about half of the land is forested and wetland, about one-third is agricultural and the remainder is urbanized, with most of the development concentrated around the lakes in the watershed. Most of the agricultural land in the watershed is located within the extended watershed and does not drain directly to Silver Lake.

One type of land cover that is often given special attention is wetland. In addition to fish and wildlife habitat, wetlands help filter pollutants, minimize flood potential and perform other important functions. Wetland inventory maps are available for much of the state through the Michigan Geographic Data Library. These maps were created by combining information from the U.S. Fish and Wildlife Service National Wetland Inventory, MIRIS land cover, and hydric soils data from the U.S Department of Agriculture Natural Resources Conservation Service. These maps can be used to identify the generalized location of wetlands throughout a watershed. Over 2,000 acres of the Silver Lake watershed is classified as wetland.

(Continued on page 18)

Land Cover Map Legend

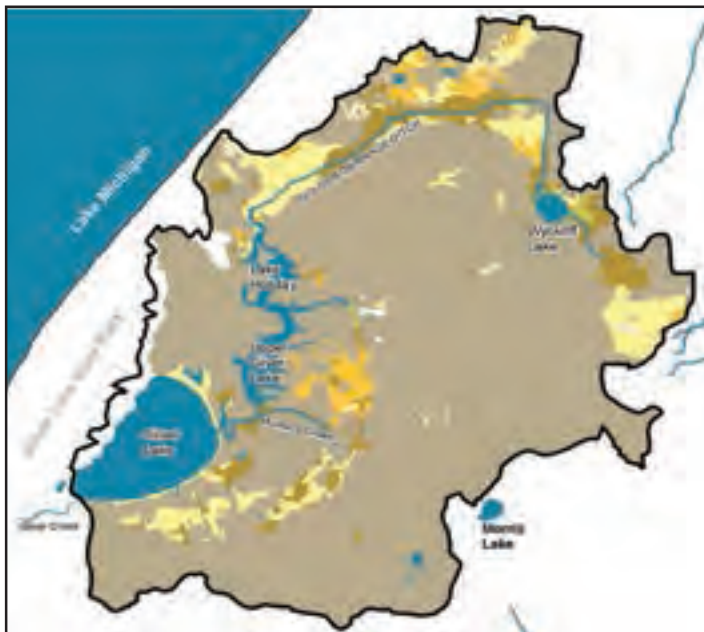
	Residential
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	Agriculture
	Forested
	Wetland
	Barren
	Water



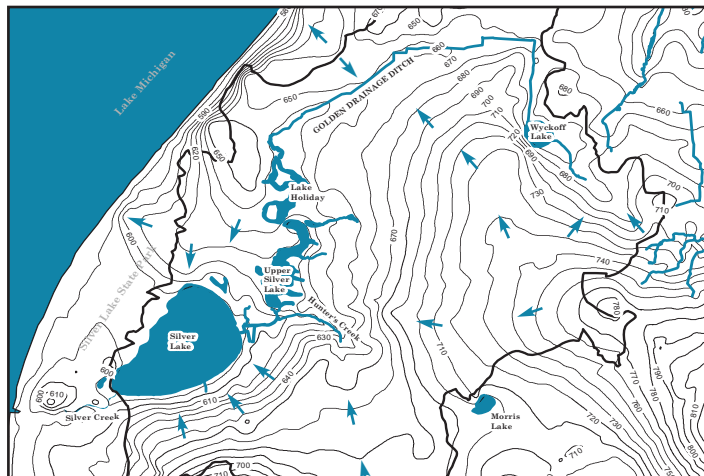
Mapping and Understanding YOUR LAKE'S WATERSHED

(Continued from page 17)

Hydrologic Soil Groups: Hydrologic soil classifications can be useful in evaluating runoff potential in a watershed. Soils that are predominately sandy tend to have a high infiltration rate and low runoff potential. By contrast, loam and clay soils tend to have a low infiltration rate and a higher runoff potential. Most of the soils in the Silver Lake watershed are sandy and have a high infiltration rate and low runoff potential.










Groundwater Contours: Generalized mapping of groundwater elevations in the state has been compiled by the Michigan Department of Environmental Quality in collaboration with the U.S. Geological Survey, Michigan State University and others. Groundwater flow within Silver Lake's extended watershed is intercepted by the Golden Drainage Ditch, while much of the groundwater in the immediate watershed flows directly toward the lake.



Similar to the topographic map, this map uses contour lines to show groundwater elevation. Arrows were added to show the direction of groundwater flow.

Hydrologic Soils Map Legend

-  **A** Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
 -  **B** Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
 -  **C** Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
 -  **D** Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.
 -  **A/D** If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.
 -  **B/D** If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.
 -  **Unclassified**
- Low
Runoff
Potential
↓
High
Runoff
Potential



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Mute Swans – What are Your Options?

By David Marks, Wildlife Biologist, USDA Wildlife Services



People live on the water for many reasons including the appeal of being close to nature. Mute swans are beautiful animals, and many people appreciate having a family group to watch. But it is an invader to Michigan waters that may potentially threaten the natural value of the places you care about. And as the mute swan populations have grown, people are beginning to experience their negative effects on the environment, native wildlife, and even

human safety. Destruction of native habitat is the primary concern about mute swans. Feeding on aquatic vegetation, a single bird can eat up to eight pounds per day. Thus, a large group of swans in an area can drastically affect the habitat that other wildlife species depend on. Additionally, the mute swans out-compete native species for resources, both food and breeding habitat. If your lake is highly developed and lacks native habitat and wildlife, you may wonder why mute swans should concern you. Consider the bigger picture: the mute swans on your lake will continue to be a source of more mute swans, which will spill over into high-quality wildlife areas.

Individual mute swans can also become hostile towards humans and pets. This usually occurs in older male mute swans that are protecting their nests and cygnets. As years go by, an individual male may become more and more assertive. Aggressive behavior may begin as simply hissing and swimming around a person to deter them. But sometimes the behavior escalates to flying at people when unprovoked or actually making contact with people, and the birds become a significant threat to human or pet safety. If this situation does occur, a special permit can be issued to remove that particular aggressive swan.

Basically, two options exist for mute swan population control: removing the birds or treating their eggs so they will not hatch. Removing the birds is more effective as far as reducing the numbers of swans both on the site itself and the overall mute swan population in Michigan. However, some local residents may find it unacceptable because the birds will be killed. Egg treatments may be the only option acceptable to residents, and will gradually reduce the local mute swan population if conducted annually and will help reduce aggressive behavior towards humans during the summer. Relocation of mute swans is not an option because they are an invasive species and will just cause damage at another location or even fly back to the original site.

Since 2006, USDA Wildlife Services has been working cooperatively with the Michigan Department of Natural Resources in controlling the mute swan population throughout Michigan with support from a broad range of stakeholders. These include the US Fish and Wildlife Service, several Native American tribes, Ducks Unlimited, the Michigan United Conservation Clubs, the Michigan and National Audubon Society, and the Michigan Lake and Stream Associations to name a few. Wildlife Services conduct mute swan management through funding provided by a Great Lakes Restoration Initiative grant at no cost to the landowner(s). In 2013, Wildlife Services conducted management and resolved mute swan conflicts at 76 sites throughout Michigan.

If you would like to learn more about mute swan impacts and what options you have, you can turn to several resources. The best resource is the state's website at www.michigan.gov/muteswans, which has the facts about mute swans including a list of peer-reviewed scientific literature, as well as the laws and regulations and permit applications. To discuss the specific issues of your mute swan situation, you can contact your local MDNR biologist (online list) or a USDA Wildlife Services biologist (517-336-1928). USDA Wildlife Services works with the local parties to resolve their conflicts with mute swans and only conducts management actions at the request of the locals from that lake or river.



Most Wanted Aquatic Invasive Plants

Be on the lookout for these invasive species!

Michigan Natural Features Inventory and the Michigan Department of Natural Resources are collaborating on the development of an Early Detection Rapid Response program. The program seeks to locate and eradicate occurrences of the following priority aquatic invaders.

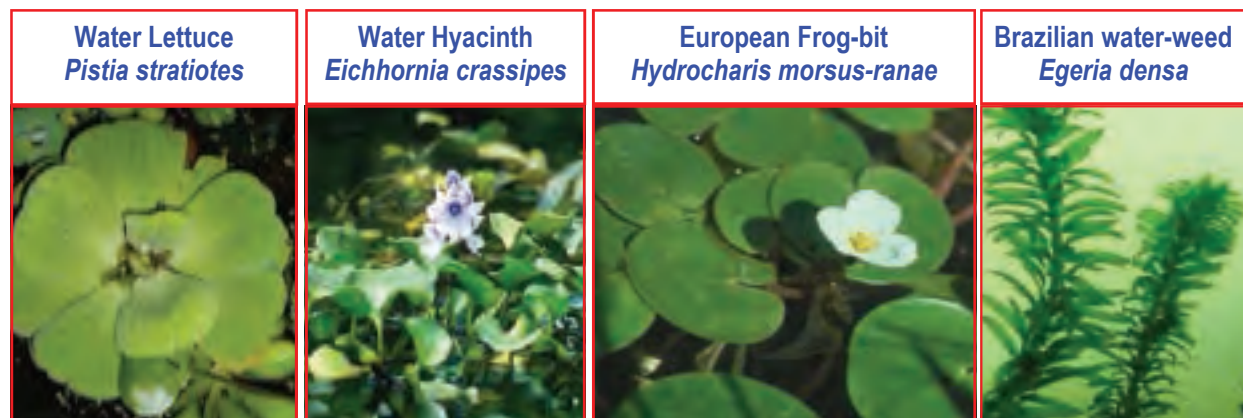


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www.aquaweed.com

www.invasive.org

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www.dnr.wi.gov

www.graysharbor.wsu

If you have seen any of these aquatic invasives, note their location and extent and contact:

Matt Ankney
 Early Detection and Rapid Response Coordinator
 Michigan Department of Natural Resources
 Phone: (517) 641- 4903 ext. 260, Email: ankneym2@michigan.gov

This winter's heavy ice and snow cover may result in fish kills on inland lakes

MDNR warns of potential for fish kill after hard winter. Dead fish may not appear until weeks after ice-out.

Posted on March 6, 2014 by Jane Herbert, Michigan State University Extension

A recent press release from the Michigan Department of Natural Resources (MDNR) reminds lake enthusiasts that this winter's heavy snow and ice cover may increase the potential for fish winter kill.

Readers may be familiar with the phenomenon of summer kill, but according to the MDNR, winterkill is the most common type of fish kill and occurs during especially long, harsh winters - similar to the one experienced this year. The press release goes on to say that "shallow lakes with excess aquatic vegetation and mucky bottoms are particularly prone to this problem. Fish and other aquatic life typically die in late winter, but may not be noticed **until a month after the ice leaves the lake** because the dead fish and other aquatic life are temporarily preserved by the cold water."

Once the lake is sealed off by ice, there is no more opportunity for oxygen from the air to mix with lake water. Dissolved oxygen concentrations begin to slowly decrease due to utilization by fish and other aquatic organisms. Plants produce oxygen through photosynthesis which is driven by light. So when sunlight penetrates the ice, aquatic plants can offset the process by producing oxygen under the ice. Alternatively, in the darkness under heavy ice and snow cover the plants begin to respire - removing oxygen from the water. An excess of aquatic plants put the lake at higher risk for dangerously low dissolved oxygen concentrations during periods of heavy snow cover.

This article was published by **Michigan State University Extension**. For more information, visit <http://www.msue.msu.edu>. To contact an



Photo credit: Jane Herbert, MSU Extension

expert in your area, visit <http://expert.msue.msu.edu>, or call 888-MSUE4MI (888-678-3464).

Late winter ice and snow cover on Gull Lake viewed from Kellogg Biological Station's Shoreline Management Demonstration Area.



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History by the Box

by Dick Magee

A while back, I raised my hand to scratch my nose at a Klinger Lake Association meeting and found that I had volunteered for the "history" job. I was to become an archivist-in-training. The first thing I did on my new assignment was to plow through three big boxes crammed full of records, letters, newspaper articles, announcements, poetry, stories and minutes of meetings – wow!

There it was – right in front of me – our history – stuffed in three nondescript, slightly worn white boxes. Over the years they had been stowed in a variety of places, out of sight in a basement, behind stuff in the back of a garage, in an empty corner in an attic. Seldom did they see the light of day – or entertain visitors. They just sat there.

So, they were a treasure trove in waiting. The files shoehorned into each box tell the story of both Association and lake. They chronicle crusades, travails, celebrations, high points and low. The documents, some faint and turned brown with age, go back generations. They chart history from near a hundred years ago until just yesterday. It's all there – in the boxes.

I read everything. My eyes blurred and my back ached. I found that being an archivist is addictive. You keep looking for more. In the end, what struck me most was the impact that a select group of people have had over the years in making the lake what it is today. Association volunteers all, they are my heroes. Oh, not in the sense that they faced danger on my behalf, but that they committed to a vision of the lake that is mine – and then worked hard and long to make it real. I'm sure this is the same for other lake associations throughout the state.

If the Klinger Lake Association had an office, I'd inscribe their names on a plaque to hang on a wall. If it had a flag, they'd be its stars. Maybe the best I can do now is to offer this tip-of-the-hat tribute, hoping it too will find its way into a box. And from time to time, somebody will fall upon it and add to my thanksgiving. Better yet, we ought

to have an Association Appreciation Day that acknowledges the contribution of like volunteers statewide.

A newcomer might ask, "What's the big deal – what's so grand about what they do"? Well, at Klinger, here are some examples. For a start, they instituted a proceeding that not only established the legal level of the lake, but also led to the construction of a proper outlet dam. Lakers now had some say with Mother Nature as to the rise and fall of waters. Folks can count on getting their boats to the dock, slipping under the outlet bridge, and working on seawalls during the off season. Try to imagine some of the stultifying bureaucracy our champions had to wade through (pardon the pun) to achieve all this.

Then there was the construction of the sewer system. This made the dam project look like child's play. I liken it to the building of the pyramids, except the Pharaoh didn't have to fuss with permits, inspections, hearings, assessments, complaints – or be assaulted by a deadly combine of doctors, lawyers, Indians and chiefs – experts of every persuasion flailing away with papers, petitions and proposals. Nor did he bother with long term financing or placating a minority of people who were against the whole idea right from the very start. This went on for years. I grow numb just reading about it. A mere "thank you" to the dedicated people who saw it through is simply not enough. They saved a dying lake.

And that's not all. They helped write and pass zoning and land use ordinances which protect the ambiance of the lake, the purity of its waters, and the value of our property. They continue a rigorous check on the quality of the water and the incursion of harmful plant growth. They work with the County Sheriff to maintain a safe environment. They commissioned the writing of a Klinger Lake history book that tells of the past. And they created a web site that speaks to the future. These are the hallmark projects that I salute.

I'm sure neighboring lakes and their volunteer groups can attest to comparable achievements. The rest of us are ever in their debt.

When our association came into being four score and more years ago, most of the "cottages" were of a sensible, hardscrabble design – nothing fancy – built strictly for summer fun. The year-round "mansions" of today would have been unimaginable to the half dozen neighbors who gathered around the kitchen table to play cards and hear what my Uncle Perce thought about forming a group that would represent the interests of property owners. Back then, he was thinking ahead. The card players voted "aye" – elected officers – and then got back to the Saturday night game. Although they didn't recognize the long-term impact of their decision, they had just become the "founding fathers" of the Klinger Lake Association.

And from there the association grew – and prospered. Nobody has to join the association, but the great majority of property owners do. Dues are less than a dinner out. And in return, members get peace of mind knowing that knowledgeable people are on the job watching over their interests. A yearly town hall meeting focuses on an annual report, deals with any unfinished business, and plans for the future. In short, the association, effective in bringing a group of people together, is a "cooperative" that works. And we're lucky to have it. And oh yes, those boxes of history now rest in the local library for all to see and enjoy.



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Dear Michigan Riparians,

The Michigan Waterfront Alliance has helped achieve a number of important goals including legislation that prevents seasonal wet storage at public road ends. To further clarify this legislation, we are now lobbying for passage of Senate Bill 680, introduced by Senator Mike Kowall (R-White Lake Township). This bill prohibits county road commissions from exercising authority over seasonal docks at road ends. The legislation will clarify that a "local unit of government" is defined as the city, village or township where the road end is located.

Also in the works is Senate Bill 444. Besides streamlining many aquatic permitting processes, it states:

A LOCAL UNIT OF GOVERNMENT MAY ADOPT AN ORDINANCE FOR THE PREVENTION, CONTROL, OR ERADICATION OF AQUATIC NUISANCES IN A WATERBODY, OTHER THAN A GREAT LAKE OR CONNECTING

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WATER, THAT LIES IN WHOLE OR IN PART WITHIN THE BOUNDARIES OF THE LOCAL UNIT OF GOVERNMENT.

(2) AN ORDINANCE UNDER THIS SECTION MAY REQUIRE THE PAYMENT OF A FEE FOR THE LAUNCHING OR USE OF A VESSEL IN THE WATERBODY ...

Many thanks to the MWA members who have contacted their legislator to support this effort - your feedback to your Senators truly has made a difference. Senator Casperson's office is hopeful that discussions with colleagues and the DNR will lead to action on the bill in the near future. If you have yet to contact your Senator to ask him or her to support Senate Bill 444, please do so as quickly

as possible! Contact information for all Senators is available at www.senate.michigan.gov.

If you are able to attend the Michigan Inland Lakes Convention, May 1-3, 2014, at Boyne Mountain Resort in Boyne Falls, please be sure to attend the session hosted by MWA, "Michigan Waterfront Alliance Participation in the DNR Good Neighbor Policy and Senate Bill 444". Our lobbyist, Matt Kurta from Karoub Associates, will be the presenter.

Sincerely,
Bob Frye, MWA President



Preparing to collect discharge data at Rogers Road on the Jordan River.

What's Happening Upstream in the Lake Charlevoix Watershed?

Kevin Cronk
Tip of the Mitt Watershed Council
Current Reflections newsletter



"One-point three meters per second" Kevin bellowed out across the dark turbulence of the Boyne River. Dan, whose figure was barely a shadow on the far bank in the early hours of a late autumn eve, jotted the current velocity down on the datasheet while using his foot to hold the measuring tape taut across the river. With cold, wet, scarlet-flushed hands gripping the fiberglass tape, Kevin lifted the icy, steel wading rod out of the water, all the while precariously balancing the kayak to keep the nose facing upstream. Allowing the front end to turn too far in either direction could easily and quickly end in disaster; if turned sideways to the swift current, brought on by a river swollen with record amounts of runoff from an enormous rainstorm that had just passed through, the boat would certainly capsize. And then all within; supplies, equipment and passenger, would spill into the dark, frosty, and unforgiving waters of the Boyne.

Inch by inch, Kevin pulled the kayak along the tape line, until reaching the next station a few feet over, where he again dropped the wading rod to rest on the stream bottom. Struggling to keep the kayak properly positioned in the tempest of the raging river while maintaining the wading rod upright with its attached sensor facing upstream, he adjusted the sensor depth to get an accurate reading. After a few minutes anxiously waiting, Kevin trained his headlamp on the flow velocity meter resting between his legs to view the output and again relay the information to Dan. He repeated the procedure more than a dozen times until reaching the other side of the river. Dan steadied the kayak while Kevin climbed

out, thankful to get out of the boat, off the river, and be done with the 2013 monitoring season.

November 18th at around 6:30 p.m. on the Boyne River in Boyne City marked the end of yet another long and extremely productive water quality monitoring season for Tip of the Mitt Watershed Council. The season started with a deluge of monitoring in April when staff collected water quality data from 60 lakes and streams in the Northern Lower Peninsula, including Lake Charlevoix and its tributaries. The first round of monitoring was part of the Watershed Council's Comprehensive Water Quality Monitoring program, which has been done on a triennial basis since 1987. Thanks to a Clean Michigan Initiative grant from the Michigan Department of Environmental Quality (DEQ), monitoring continued on the Lake Charlevoix tributaries right up through that last harrowing day in November.

The tributaries of Lake Charlevoix can be thought of as an aquatic circulation system that conveys water from the landscape to the lake. Agricultural operations, urban stormwater runoff, road maintenance, and construction are among many sources of nonpoint source pollution that wash into streams and are transported into the receiving water body. The goal of the DEQ-funded Lake Charlevoix Tributary Study is to assess such nonpoint source pollution impacts from the sub-watersheds of Lake Charlevoix by monitoring water quality of all the major tributary streams. As spelled out in a recommendation from the Lake Charlevoix Watershed Management Plan (that was approved by DEQ and United States Environmental Protection Agency in 2012), the tributaries should be monitored "to determine relative pollutant loadings from each stream," but also "to evaluate the overall effectiveness of the nonpoint

(Continued on page 27)



Kevin Cronk measures flow velocity at Rogers Road on the Jordan River.



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What's Happening Upstream in the Lake Charlevoix Watershed?

(Continued from page 25)

source watershed management plan and assess changes resulting from specific implementation activities.”

Watershed Council staff monitored 13 sites on the Lake Charlevoix tributaries six times during 2013, including sites on the Boyne and Jordan Rivers, as well as on Birney, Brown, Deer, Horton, Loeb, Monroe, Porter, and Stover Creeks. At each site, water samples were collected to send to the laboratory for analyses of nutrient, suspended solid, chloride, and E coli bacteria concentrations. The Lake Charlevoix Association is a partner in the project, providing assistance by delivering water samples to laboratories. Physical parameters such as dissolved oxygen, pH, and conductivity were measured at the site with a multi-parameter probe. Stream discharge (i.e. volume of water passing through a point in the stream per unit time) was measured as described above in the Boyne

River scenario, though usually by wading across the stream rather than in kayak, which is only necessary during extreme high-flow events.

Results thus far? We have not yet calculated pollutant loads from the different streams and their watersheds, but concentrations of some pollutants are higher in some streams than others. For example, total nitrogen concentrations are much higher in the Jordan River, Horton Creek, and Stover Creek than in the other streams, which may be caused by agricultural operations in those watersheds. E. coli concentrations were found to be highest in the smaller creeks, including Stover, Monroe, Loeb, and Birney, though the source of bacteriological

contamination is still unknown. We will know much more after we complete the six remaining monitoring events in 2014, after which we will compile all data, calculate pollutant loadings, assess the information, and write a report detailing our findings. At project end, all data and the report will be made available on the Watershed Council web site and shared with the Lake Charlevoix Association. If you would like to know more about the project or see any specific data, please contact Kevin Cronk at 231-347-1181 x109. ●●●



Kevin Cronk collects discharge data at M32 on Deer Creek.



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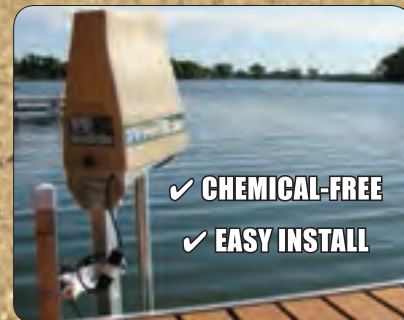
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Pharmaceuticals in Our Waters

Written by Jennifer McKay, Policy Specialist for Tip of the Mitt Watershed Council

Medicines are produced and prescribed in increasing volumes every year. Thousands of tons of pharmaceuticals are used across the globe, and Americans alone fill more than three billion prescriptions a year. Considering that four out of five people leave a doctor's office with a prescription, one can imagine how much of that medication potentially is being thrown away improperly; especially when twenty to sixty percent of prescription medications go unused and are eventually disposed.

With more than 30 million people living around the Great Lakes, an untold number of them flush unused and expired medications down the toilet every day. These medicines end up at sewage treatment plants or in septic systems that are not designed to remove them. We have more than 1,400 wastewater treatment plants in the U.S. and Canada that discharge 4.8 billion gallons of treated effluent into the Great Lakes basin every day. Only about half of the prescription drugs and other newly emerging contaminants in sewage are removed by treatment plants—the rest end up in our waters.

What exactly does that mean for you and me? It means we have widespread contamination of our waterways by pharmaceuticals. Over 80% of waterways tested in the United States show traces of common medications such as acetaminophen, hormones, blood pressure medicine, codeine, and antibiotics, according to a study by the U.S. Geological Survey. Next, we learned from a 2008 investigation by the Associated Press that there were drugs in the drinking water supplies of 41 million Americans.

Although these emerging contaminants are being found at very low levels – in parts per trillion – we don't know their long-term effects. Science knows what the benefits of these drugs are to those who need them, but we don't know the long-term effects to populations that were never intended to ingest those compounds over long periods of time. Many animals get a daily dose of drugs at their local watering hole and, even worse, fish and other aquatic animals live

in a pharmaceutical brew. Some of these chemicals interfere with or mimic natural hormones and disrupt reproduction, development, and behavior of fish and other organisms.

With trace amounts of all those pharmaceuticals showing up in the planet's largest source of fresh surface and drinking water, it is time we dispose of medicines in a different way.

Pouring them down the drain is basically the same as flushing them away. No good. Throwing them in the trash isn't good either. Children or pets might get to them accidentally or adults with drug abuse problems could get to them on purpose. Not to mention that throwing medicine in the trash only delays the pharmaceutical chemicals from reaching groundwater or rivers and lakes. Leachate from landfills is collected and piped or trucked to wastewater treatment plants before it is discharged into nearby rivers and lakes. So regardless of the pathway – effluent from treatment plants, septic systems, and runoff and groundwater from uncontrolled landfills – medicines are still entering our waterways.

So, what should you do with unwanted and unused medications? The best solution is to dispose of old and expired medications through Northern Michigan's Prescription and Over-the-Counter Drug Drop-off (POD) Program.

The POD Program is a multicounty-wide medication drug take-back initiative to provide a convenient and environmentally sound way for residents to properly dispose of medications. Currently, the POD Program includes community collection events in Antrim, Charlevoix, Cheboygan, and Emmet Counties. The POD Program also includes over 20 permanent collection drop boxes at law enforcement agencies throughout Northern Michigan. Residents may safely dispose of prescription, over-the-counter pharmaceuticals, and personal care products for free and the POD Program is the only



Using a POD Box for disposing unwanted or expired medications keeps our lakes, rivers, and drinking water clean and our communities and families safe.

program in Northern Michigan that can accept and dispose of controlled substances. For a list of drop-off locations and other information about the program, visit www.PillsInThePOD.com.

By using the POD Program and properly disposing of unwanted pharmaceuticals and drugs, you will help us keep our waters clean and our communities and families safe.

Tip of the Mitt Watershed Council: Tip of the Mitt Watershed Council speaks for our members including full-time and seasonal residents, lake associations, and businesses. We work to maintain the environmental integrity and economic and aesthetic values of lakes, streams, wetlands, and ground water in Northern Michigan, as well as statewide and throughout the Great Lakes Basin. As the lead organization for water resources protection in Antrim, Charlevoix, Cheboygan, and Emmet Counties, the Watershed Council is working to preserve the heritage of Northern Michigan – a tradition built around our magnificent waters. For more information about the Watershed Council, visit www.watershedcouncil.org.



POD Program Coordinator, Jennifer McKay (far right) works with local law enforcement and staff from McLaren Northern Michigan hospital during the one-day POD Collection Event.



A LEGAL PRIMER

By: Clifford H. Bloom, Esq.

Bloom Sluggett Morgan, PC | Grand Rapids, Michigan | www.bsmlawpc.com

Lay people are often confused about what constitutes the “law.” Given the historical evolution of our legal system and the various layers of government, it is not surprising that there is some confusion. The “law” in the context of government can take a variety of different forms including the common law, constitutions, statutes, court cases, and administrative regulations.

The ultimate law in our country is the United States Constitution. That federal constitution regulates the actions of all levels of government in the United States – federal government, states, and territories. All state governments (and political subdivisions within states such as counties, cities, villages, and townships) are regulated by state constitutions. A constitution is essentially a binding master plan. It is the source of all laws within the jurisdictional area bound by that constitution. It also places limits on the actions of governmental officials, units of government, and courts.

In general, constitutions tend to be broadly worded. Rarely does a constitution specify a criminal or civil penalty for violation of that constitution; rather, in most cases, the penalty for an official or action violating the constitution is invalidation of that law or action. However, there are some statutes that can make the violation of a constitution a criminal or civil offense and can also sometimes serve as the basis for a civil damages lawsuit.

Perhaps the most common source of binding law is a statute passed by a legislature. In the federal government, the legislature that enacts statutes is Congress, while in states, it is the state legislature. Statutes are mandatory codes that must be followed or a penalty will normally ensue. While the violation of many statutes is a criminal matter, that is not always the case. There are some statutes that are not by their

nature criminally based, and the violation of such statutes could involve civil penalties, the invalidation of an act in violation of the statute, or serve as the basis for a civil damages lawsuit. Statutes tend to be more “nuts and bolts” in their language than constitutions.

In most states, local units of government can enact and enforce ordinances, which are similar to statutes enacted by legislatures at the state level. As with statutes, the violation of a local ordinance can constitute a criminal offense or subject the violator to civil penalties.

To further complicate matters, another type of law is an administrative or regulatory agency regulation. An administrative or regulatory agency is usually created by statute and resides within the executive branch of the government involved (for the federal government, that would be the President and the President’s administration, and for state governments, administrative or regulatory agencies are normally under the jurisdiction of the governor). Quite often, the statute that creates an administrative or regulatory agency also gives that agency the ability to adopt formal rules and regulations that have the force of the law. Sometimes, such agencies can enact rules and regulations on their own, while in other situations, the rules and regulations cannot be effective until affirmed by the legislature or the chief executive of the governmental unit involved. Violation of such a regulatory rule or regulation can sometimes involve criminal or civil penalties.

What is the common law in Michigan? The common law is the sum of all published court decisions issued by appellate courts dating back to the creation of Michigan’s judiciary (i.e., courts) when Michigan became a state in 1837. In Michigan, the common law consists of decisions by the

Michigan Supreme Court and the Michigan Court of Appeals (and occasionally by federal courts when deciding Michigan law). Generally, such written court opinions can be found online or in official law books containing appellate court decisions for the jurisdiction. Typically, the common law only operates in the absence of statute. That is, there are many areas where statutes have not been enacted for a particular topic such that the “judgment calls” made by appellate courts in that jurisdiction govern. For example, much of the law regarding contracts consists of common law. Or there may be applicable statutes with “gaps” which must be “filled in” by appellate court decisions. In most situations, a violation of or noncompliance with the common law is a civil matter, but, in a few situations (such as with common law crimes where they still exist), a violation could constitute a criminal offense.

What is the difference between civil and criminal law? The obvious answer is the correct one. Criminal law is penal in nature and its violation normally carries with it criminal penalties (i.e., imprisonment, fines, forfeiture of property, etc.). Civil law is the umbrella term given to all other types of statutes and court cases. Generally, if a lawsuit is civil in nature, it does not involve criminal penalties, but often includes recovery of damages or remedies such as injunctions (i.e., court orders) to prohibit parties from engaging in unlawful or prohibited behavior.

Hopefully, this summary will assist the reader when pondering the “law” related to waterfront properties.

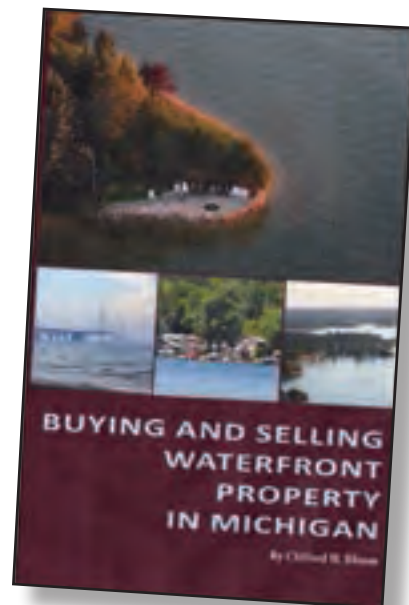
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The Lake Management division of EnviroScience not only leads the way in biocontrol for the invasive plant, Eurasian watermilfoil, but also is staffed with experts in watershed and lake management. Our biologists specialize in comprehensive evaluations to identify and solve problems in lakes, ponds, reservoirs and watersheds.

HOLISTIC MANAGEMENT APPROACH

Problems associated with lakes and bodies of water are often a result of nearby land use. For example, nuisance aquatic plant growth is often caused by excessive nutrients entering the lake from failing septic tanks, lawn fertilizers and/or agriculture runoff. It's our job to find the source of the problem, not just treat the weeds.

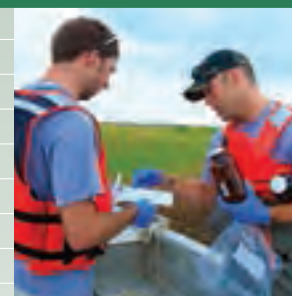
EnviroScience is also the exclusive provider of the Milfoil Solution® process, a natural, non-chemical alternative for controlling the growth of Eurasian watermilfoil. Using a native insect, the milfoil weevil, we are able to provide long-term control while encouraging natural lake habitat.

LAKE MANAGEMENT SERVICES

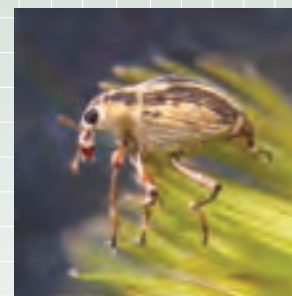
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REPRESENTATIVE CLIENTS

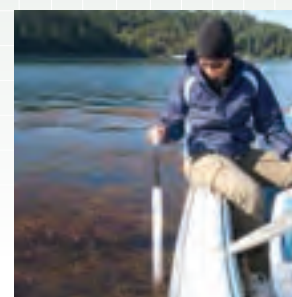
- Private Organizations: Lake Associations, Lake Improvement Boards, Homeowners Associations
- Local Agencies: Townships, Conservation Districts, Park Districts, Watershed Districts
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The milfoil weevil is smaller than a grain of rice



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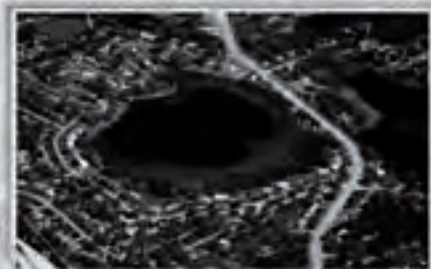
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