



Deer Tales

Deer Lake Improvement Association Newsletter
Holiday 2016



President's Message

What an incredible fall season we've had! Record warm temps in November really stretched our fall season this year. But now, winter is banging on the door, I hope we are all ready for it! I say, bring it on!

As most of you know by now, Zebra Mussels were discovered in Deer Lake late this summer. Nothing past the initial discovery was found as docks were removed from the lake. That is encouraging, but realistically there is very little known about how to limit the spread of this invasive species. Please look for an article in this issue that will update you on the situation. If you have questions, please send them to any DLIA board member and we will do our best to insure that we find an answer and deliver it back to you.

Also in this issue is an article regarding Time Saving Waterfront Landscapes. These are rules and guidelines that can help you, as a homeowner, do the best you can for the health of the lake. Please review the information and do whatever you can to follow the suggestions there.

Recently, the Deer Lake Conservancy purchased the Werner property that allows Rock Creek to enter the lake. This is a key strategic purchase for the Conservancy as it allows us to control the final mile of Rock Creek prior to entering the lake and insure that the water flowage is filtered as well; allowing very clean water to enter the lake through the creek and surrounding aquifers.

With that I wish you all a very happy holiday season and a joyous new year!

Tom McBride, President
Deer Lake Improvement Association

2017 Event Calendar

| | | | |
|--|-------|-----------|---------|
| Neil McKenzie Youth Fishing Tournament | Sat | June 10th | All Day |
| Light up the Lake | Sun | July 2nd | 9:45 pm |
| Fireworks | Sun | July 2nd | 10 pm |
| <i>(Storm date)</i> | | | |
| Light up the Lake | Mon. | July 3rd | 9:45 pm |
| Fireworks | Mon. | July 3rd | 10 pm |
| Boat Parade | Tues | July 4th | 1 pm |
| Music on the Lake—Hungerford Pt <i>(leeward side)</i> | Tues. | July 4th | 7 pm |
| Pontoon Party <i>(off Hungerford Pt.)</i> | Fri. | July 7th | 6 pm |
| Annual Meeting <i>(Trollhaugen)</i> | Sat. | July 8th | 9 am |
| Flagstad Farm Family Picnic | Sat. | July 29th | 6 pm |
| Music on the Lake—Hungerford Pt <i>(leeward side)</i> | Sat. | Aug. 5th | 7 pm |
| Festival Theatre night | Sat. | Aug. 19th | 7:30 pm |

Schedule updates and additions available at
www.deerlakewi.com



Environmental Report

By Joan Leedy

Zebra Mussel Found on Deer Lake: Update

A single adult zebra mussel was found on the northeast corner of Deer Lake late this summer. The good news is that, so far, we have not found any more. While the initial zebra mussel was officially identified, this lack of confirmation with a second specimen is good news.

Thanks to all of you who checked docks, boats, and equipment as you pulled them out of the water this fall. The more eyes we have out there looking the better. Thanks also to service providers who remove docks and lifts. They also helped with zebra mussels monitoring.

Please don't give up on looking for zebra mussels yet. In addition to a visual inspection, feel smooth surfaces of equipment to check for juvenile zebra mussels. They may result in a "sand-paper like" feel and are often invisible to the human eye.

If you suspect that you have found a zebra mussel(s) please do the following:

- Take a digital photo of it in the setting where it was found. Then collect up to five specimens of varying sizes. Place them in a jar or plastic bag with water; put on ice and put in your refrigerator.
- Label the container with the address where it was found using a black sharpie or other waterproof marker.
- Contact John Wright (651-442-5598 or skishop@trollhaugen.com) to let him know you found something. John may direct you to leave the specimen on your dock or at your front door for pick up.
- John will confirm identification with Jeremy Williamson or other county or WDNR staff.

There are also specific laws lake property owners and contractors must follow to prevent the spread of aquatic invasive species. Prior to removing equipment from the water Wisconsin law requires that you:

- **INSPECT boats, trailers, boat lifts, piers, rafts and equipment.**
- **REMOVE all attached aquatic plants and animals.**

- **DRAIN all water from boats, vehicles, and equipment.**

Are there more zebra mussels in the lake?

Agencies such as Polk County, the National Park Service, United States Fish and Wildlife Service, and the Wisconsin Department of Natural Resources are also concerned about the potential spread of zebra mussels and are our partners in this effort. They will continue to look for additional specimens. Polk County biologist, Jeremy Williamson reports "We will coordinate with NPS, DNR, and FWS to get a plan in place for monitoring to make sure that we do not duplicate efforts and get good coverage on the lake to monitor all suitable habitats." They will again take water samples looking for zebra mussels in their larval form and look in the water on hard surfaces for adult zebra mussels. A water sample taken as part of aquatic invasive species monitoring by the National Park Service in July 2016 found no zebra mussel veligers (the larval form).

Why be concerned about zebra mussels?

Aquatic invasive species (AIS) are non-native plants and animals that threaten Wisconsin's lakes and river systems by causing environmental and economic harm. Zebra mussels can clog water intakes and pipes, encrust piers, boats, and motors, and their sharp shells can cut the feet of swimmers. Zebra mussels have been found in less than 5% of Wisconsin lakes predicted to be suitable for zebra mussels.

Are zebra mussels likely to spread in Deer Lake?

We aren't sure yet. Calcium levels are at the low end of concentrations where zebra mussels thrive, so that may limit their growth and spread.



Zebra mussels are small, two-shelled clams typically $\frac{3}{8}$ to $\frac{3}{4}$ inches long with light and dark bands. This photo shows the zebra mussel discovered in Deer Lake. It is attached to a rock.

Are control efforts available? If so, why isn't the lake association taking action right now?

Zebra mussel control efforts have met with limited success. We are investigating control measures available and likely results. In any case, we need to know where they are present before any control measures are initiated.

To learn more about zebra mussels or Wisconsin aquatic invasive species regulations visit: dnr.wi.gov keyword "invasive species".

Time Saving Waterfront Landscapes

By Cheryl Clemens

Deer Lake water quality is enhanced when stormwater runoff from homes, driveways, roads, and lawns is encouraged to soak into the ground rather than running directly into the lake. This is because runoff carries nutrients and sediment to the lake. Native plantings and runoff reduction/infiltration landscaping projects improve water quality by reducing runoff. We are grateful for the many lake residents who have completed these projects and are helping to protect the lake!

However, with time and (perhaps) money in limited supply, adding a landscaping project at your waterfront property may be the last thing you are considering. You can help meet our water quality goals without taking a lot of time or reaching deeply into your pocket. There are many simple options for reducing runoff and improving lakeshore habitat. Your biggest investment is likely to be changing your mindset rather than your bank balance.

The Basics

To reduce runoff from waterfront property, consider how water flows and where nutrients, sediment, and water flow originate. More vegetation reduces erosion and slows water flow – reducing pollutants carried to the lake.

Eliminate Nutrients

The nutrient of greatest concern in most lakes is phosphorus because it is the missing ingredient for algae growth. The most obvious source of phosphorus is fertilizer. According to Wisconsin regulations, fertilizer with phosphorus may not be used on lawns. However, it is still a good idea to check the label. Fertilizer labels have an N-P-K value listed, and phosphorus is the second number. So, a label with 6-0-6 has 0 phosphorus. Even simpler, don't fertilize your lawn at the lake. If grass growth is poor, test your soil. If the pH is low, add lime as a soil amendment.

Divert Water

Water flowing in channels causes erosion and carries sediment and nutrients to the lake. Simple diversions can make a big difference. Roof downspouts are frequently the source of water channels. Add flexible plastic downspout diverters to direct water to a flat, well vegetated area, or even better, to ground that slopes away from the lake. Be careful not to send the water to your neighbor's property. This can be a challenge on lake lots!

Slow Runoff Flow

Slowing runoff flow reduces erosion and sediment carried to the lake. If slopes are gradual, water flow may be slowed enough to allow water to soak into the ground. The simplest way to slow runoff flow is to allow vegetation to grow. Tall stems of grasses and other vegetation provide more resistance to flowing water. A very minor change is to set your mower blade higher (or ask your mowing service to), perhaps to 3 or 4 inches. To get greater water quality benefits, choose to not mow certain areas near the lake. Greatest benefits to the lake result if you choose to designate no-mow areas where water flows, on steep slopes, and areas closest to the water. It really is good for your lake home landscape to be more wild – both for the lake and animals that live nearby. With less time spent on lawn maintenance, perhaps there will finally be some time for boating or taking that evening stroll.

Encourage Native Growth



Leaving rather than cutting trees near the water holds soil in place and acts like an umbrella to intercept strong rainfall. If you put away your mower and allow plants to grow, you are likely to find that native flowers and grasses will sprout. This will be a great time to learn more about the local flora and see what nature has to offer. Learn about some of the non-native invasive plants,

so you are not encouraging their growth. Buckthorn, purple loosestrife, and Japanese knotweed are a few to look out for and remove.

Tell Your Story

We would love to hear about how you made changes on your property using your ingenuity rather than the cash in your wallet. Send your stories and photos to our consultant Cheryl Clemens, harmonyenv@amerytel.net.

Free Visits

The Deer Lake Conservancy has grant funding available to provide technical assistance to reduce runoff from your property. Our consultant will work with you to further investigate low cost options and additional landscaping methods for the good of the lake! Over 1/3 of lake residents have already taken advantage of this service!

Frozen Fractals: A Lesson in Winter Limnology

(this article was shared by Bob Spinner)



Frozen fractals of ice begin to form in moving water. OUTDOOR U STAFF

As we prepare for the ice cover and cold with our yearly traditions, the lakes we so treasure in Minnesota are preparing in their own ways. Under their surface, lakes undergo dramatic but predictable changes between fall and the winter freeze, changes that are often missed while we are busy with our own winter preparation.

Summer

Lakes that are deep enough spend their summers stratified, or in layers. When lakes are stratified during the summer and early fall, this temperature gradient is stable because of the density of the different temperatures of water. Water is at its maximum density at 4°C. Any warmer than 4°C and the H₂O molecules are moving more quickly, spreading themselves out and becoming progressively less dense until the boiling point — 100°C. Water in the deepest parts of the lake is coldest and densest and warmer, less dense water sits on top. The deepest, coldest, densest part of the lake is called the *hypolimnion*. The warmer, less dense water sitting on top is the *epilimnion*. Sandwiched between the two is the *thermocline*, which represents the depth where the temperature change is the steepest, separating the *hypolimnion* from the *epilimnion*.

Within a lake mixing occurs in two main ways. The first is as an effect of wind. As wind blows across the surface it pushes and pulls water with it, mixing the epilimnion on a small scale. The second way water can be mixed, on a much larger scale, is through *lake turnover*. Lake turnover occurs when the temperature of the hypolimnion and the epilimnion become close enough that the different densities of the two are no longer large enough to keep them separated. Without the harsh stratification that exists in summer, the water in the epilimnion and hypolimnion are able to mix completely.

Autumn

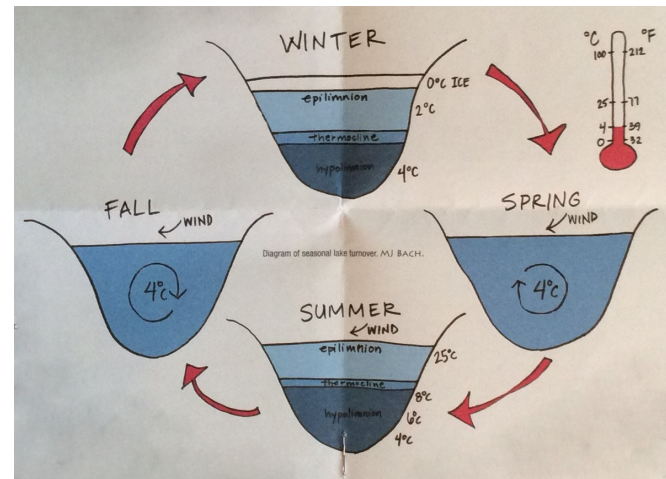
In the fall as the days shorten and the air gets colder, the water on the surface of the lake cools. Fall winds mix the new cold water throughout the epilimnion, cooling the entire upper portion of the lake. As the epilimnion gets colder it also thickens, pushing the thermocline deeper. Eventually, the epilimnion will be so cool that the temperature (and thus density) difference between the epilimnion and hypolimnion will no longer be strong enough to resist mixing. When this happens the lake is in an isothermic state meaning the entire water column mixes, making it the same temperature in the entire lake.

The isothermal lake begins to undergo fall turnover and prepare for the long winter months. As the days shorten and the air becomes cold, the surface water of the isothermic lake becomes cold too. Because there is no resistance to mixing, the surface water is immediately mixed into the lake and replaced with new water from below. Slowly, this process lowers the temperature of the entire lake. As the surface water is mixed, it also distributes dissolved oxygen to the entire water column.

Winter

When fall returns to winter lakes begin to settle into their subtle yet stable winter stratification. During this time a seemingly-small property of water becomes incredibly important. As mentioned earlier, water reaches its maximum density at 4°C and freezes at 0°C. Any colder than 4°C, and the molecules begin arranging themselves in a way that allows for ice formation. Water is unique in this way; most substances will continue to become more dense as they cool, but due to the nature of hydrogen bonds, water forms a lattice structure that is less dense as a solid than a liquid. To put it simply; ice floats.

This peculiar property of water is integral in the formation of winter lake structure. The first freezing days of winter leave lakes with a layer of ice floating on



their surface. The water directly below the ice is almost always 1°C. Any colder and it would freeze, any warmer and it would become more dense and sink to the bottom of the lake. At the lake bottom, the water is almost uniformly at 4°C. Away from the sun it has no opportunity to warm, but if it became colder than four degrees it would become less dense, rise and mix. Because of this, water under frozen-over lakes is in another state of stratification, though only separated between 1°C and 4°C. Again, the hypolimnion is the most dense water at 4°C and above the small thermocline in the epilimnion, the less dense water that sits on top is warmer than 1°C but cooler than 4°C.

(continued on page 5, Frozen Fractals)

Aquatic Plant Management Plan Update

The Deer Lake Improvement Association is seeking volunteers to assist in the update of the Aquatic Plant Management plan. Volunteers would serve on an advisory committee in a series of 3 – 2 hour meetings likely to be held on Saturday mornings in December and January.

The aquatic plant management plan guides important Lake Association activities such as control of curly leaf pondweed and prevention and management of other invasive species such as zebra mussels. In fact, developing an ongoing strategy for managing curly leaf pondweed and developing a coordinated response to the discovery of zebra mussels in the lake are important tasks for the advisory committee to address.

If you are interested in helping out, please contact Environmental Committee Chair, Joan Leedy: joan@dyneusa.com or 651-230-1177.

(Frozen Fractals continued from page 4)

Spring

Since winter stratification is not nearly as dramatic as it is during the summer — the condition on its own is not as stable— the resistance to mixing is not incredibly strong. However due to the ice on top of the lake, the wind does not contribute to any mixing. Without the wind this subtle stratification stays in place all winter long until spring ice-out and warming temperatures bring a new season of turnover.

Perhaps we can find comfort in knowing that as we settle in to the long winter months, our beloved lakes around us are doing the same.

This article was written by Natalie Stoneburner. Natalie is a senior environmental studies major and Outdoor U student naturalist. She is a true Minnesota girl who wouldn't pass up an opportunity to enjoy our lakes no matter the season.

Frozen Fractals Vocabulary:

Epilimnion: Layer of water on the surface of a lake. “epi-” upon; “-limnion” lake

Hypolimnion: Layer of water at the bottom of a lake. “hypo-” under; “-limnion” lake

Lake Turnover: Seasonal mixing of the top (epilimnion)

and bottom (hypolimnion) of a lake

Limnology: study of inland waters, including lakes, wetlands, streams, and groundwater

Thermocline: Thin but distinct layer in a large body of water, separating the epilimnion and hypolimnion “thermo-” temperature; “-cline” gradation.

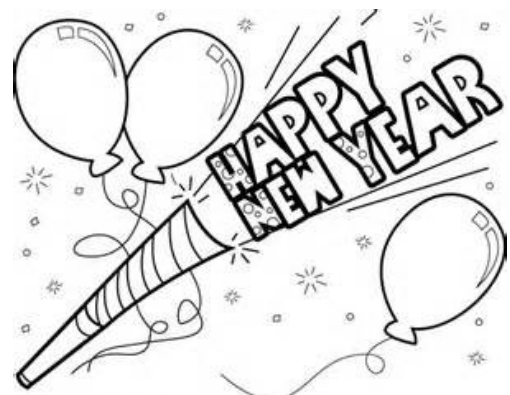
Deer Lake Tales— A Look Back at Deer Lake:

If you have pictures, stories, memories, etc. that you would be willing to share with others please feel free to email me, send me mail, or phone me. Any stories/information would be appreciated.

Send Information, questions, and corrections to:
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Shakopee, MN 55379
Phone: **612-810-8832** (cell)

Deer Lake Tales— A Look Back at Deer Lake:

The article has been removed because of the length of the newsletter, it will be in the next newsletter.



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