

Stream monitoring reveals progress!



Dylan Kersten, a volunteer stream monitor, collects aquatic insects to use as indicators of water quality conditions. Photo credits: J. Scherer

Twenty years. That’s how long since Lake Ripley’s inlet stream was last formally evaluated. Back in 1993, a comprehensive *Water Resources Appraisal* found the stream to be in very poor health, largely due to agricultural runoff, eroding stream/ditch banks and degraded wetlands. It was described at the time as “dark and septic,” often devoid of oxygen, and with high phosphorus and sediment concentrations and “abundant slime growths.”

Starting this past summer, a number of monitoring protocols from the 1993 investigation were repeated. The goal:

re-examine stream conditions that affect Lake Ripley, and see if years of management action are starting to pay off. This includes the purchase and restoration of the Lake District Preserve, repair of eroding farm ditches, and improvement of area wetlands. So far, the results have been encouraging:

- ☼ Using aquatic insects as indicators of stream health, biotic index scores now rate mostly as “fair” to “good.” This compares favorably to 1993 when the stream mostly supported species that can tolerate water quality conditions rated as “poor.”
- ☼ Summer phosphorus concentrations now average 113 ug/L (micrograms per liter). This compares favorably to 1993 when average concentrations were 354 ug/L.
- ☼ Dissolved oxygen concentrations ranged from 1.7 to 10.9 mg/L (milligrams per liter). This compares favorably to the very low 0-1.8 mg/L recorded in 1993.

Additional grants are now being sought to be able to expand upon this evaluation in 2014. Let us know if you would like to help as a volunteer stream monitor. ♦

RETURN SERVICE REQUESTED

Lake Ripley Management District
N4450 County Rd. A
Cambridge, WI 53523

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Ripples



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Winter 2013-14

FROM THE HELM

Full and early winter are always a time of peace and tranquility at the lake. It’s a time to regenerate until the ice is thick and we can all enjoy the winter activities, like ice fishing and skating. And it’s a time for giving thanks as we celebrate the holidays with friends and family.



It is also time for the Lake District to give thanks. I am thankful for Board members who donate their time far beyond the monthly meetings. We are thankful for staff who go above and beyond the call of duty. Finally, we are thankful for those individuals who donate time, energy and funds to the many programs that are vital to accomplishing our mission of protecting and preserving Lake Ripley.

Over the years, the scope of our work has expanded as different needs and opportunities have arisen. We are thankful for the volunteers who work in the Lake District Preserve, and in special programs like lake and stream monitoring and ‘Clean Boats, Clean Waters’. There is still much work to be done, so the opportunity to volunteer is still available for individuals with the time and energy to help.

All your efforts big and small make a difference. I know of several walkers who collect trash as they exercise along Ripley Road. Others join groups, like the Friends of the Preserve and Friends of the Glacial Heritage Area, or contribute as student interns and volunteers from UW-Whitewater and our local K-12 schools. We can never say thank you too often, but it seems particularly appropriate at this time of year.

John Molinaro, Chair

Take the pledge for a chance to win!

Do you own property in the Lake Ripley Management District or Watershed? If yes, then your household is eligible to participate in this one-time opportunity. Only in 2014 can you win redeemable project coupons and other prizes by just agreeing to take action. To enter the prize drawing, simply sign an official **Ripley Rewards** pledge to complete one or more lake-friendly project activities before the end of the year. It’s that easy!



As incentive to act quickly, a limited number of prizes in each project category will go to our early pledge signers. Many prizes will be in the form of coupons that can be redeemed for project-related products and services from our participating business partners.

Continued >>

Here's how it works:

STEP 1

Watch for **Ripley Rewards** promotional materials and official pledge forms to be distributed in March. Meanwhile, follow us on Facebook, visit our website, or subscribe to our Lake Ripley E-Bulletin for updates.

STEP 2

Sign and submit your pledge form by June 2, 2014. You will be pledging to complete one or more projects in 2014. Each action enters you into a prize drawing relevant to that specific project category. The more boxes checked, the more chances to win!

Key Dates

March: Pledge forms are mailed
June 2: Signed pledges are due
July 5: Prize-drawing ceremony
Dec. 31: Completion deadline for pledged actions

Options for Pledging Action

Lake District & watershed landowners:

- ☐ Redirect roof downspouts to your lawn or garden.
- ☐ Install a rain barrel.
- ☐ Plant a native tree (1-inch trunk diameter).
- ☐ Create/expand a rain garden (50 sq. ft.).
- ☐ Replace water-impervious surfaces with water-permeable alternatives (50 sq. ft.).

Lakefront owners:

- ☐ Create/expand a lakeshore garden (100 sq. ft.).
- ☐ Partner with the Lake District to create a treefall habitat at the water's edge.

When you receive your pledge form, you also will be invited to nominate an individual or group for a Lake Ripley Stewardship Award. Be sure to let us know of anyone who you believe has demonstrated exceptional service or action to benefit Lake Ripley.

STEP 3

Take action to complete your project before the end of 2014. Remember to request your free, on-site project consultation before getting started. And don't delay! Any redeemable project coupons you may win will allow you to accomplish even more. They can even be transferred to other Lake Ripley-area property owners wishing to take action.

STEP 4

Attend the **Ripley Rewards** prize-drawing ceremony at Ripley Park on July 5, 2014 (you do not need to be present to win). In addition to prizes, special awards

will be presented to our major program partners, financial sponsors, and citizen lake stewards. Interactive lake-education booths and fun, family-friendly activities will also be on hand. ♦

Become a Business Partner or Sponsor

Want to become a *Ripley Rewards* business partner or sponsor? We are looking for businesses willing to donate or discount their products and services for our prize drawing. In exchange, you will receive free promotional advertising, recognition at the July 5th award ceremony, and a chance to secure an exclusive contracting agreement for services related to the pledged actions. It's a great way to market your business and help the lake at the same time.

Join us in welcoming **SetterTech, LLC** as the first to join our team of business partners!



Based in Cambridge and a frequent Lake District advisor, SetterTech offers a broad range of multi-disciplinary consulting services, including those related to stormwater management, erosion control, natural sciences, land-restoration planning and permitting.

Donate to the Cause

Thank you to the Jacobsen-Brown Fund for its \$4,000 charitable endowment donation! Plans are to dedicate these funds to support various demonstration efforts around the lake. The donors hope this and another \$100 gift made in memory of Clarence Mahle will inspire others to take their own action—either by donating or pledging to take action to benefit Lake Ripley.

If you wish to make your own tax-deductible donation, please send a check payable to the Lake Ripley Management District to N4450 County Rd. A, Cambridge, WI 53523. Write "*Ripley Rewards*" in the memo section if you want your contribution to specifically support this initiative.



"I never worry about action, but only inaction." -Winston Churchill

Clean Boats-Clean Waters

This past summer, nearly 300 hours were logged at the public landing as part of a boater-education and watercraft-inspection initiative. The goal of the program, called "Clean Boats- Clean Waters," is to raise awareness about aquatic invasive species and the steps that should be taken to prevent their spread.



With the help of local volunteers and a \$2,025 Wisconsin DNR grant, several hundred boaters completed surveys and received free demonstrations on how to identify, remove and dispose of unwanted aquatic hitchhikers. One-third of these boaters claimed to have recently used their boats on other waterways, greatly increasing the odds of spreading invasive species from one lake to another.

Although awareness of applicable laws and precautions continues to improve, it takes a single uninformed individual to make a bad decision that can impact the entire lake. Plans are now underway to apply for additional funding so this initiative can be extended into the 2014 boating season. Volunteers are essential to the success of this effort, so please let us know if you're willing to lend a hand.

Monitoring finds spread of invasive aquatic species may be slowing

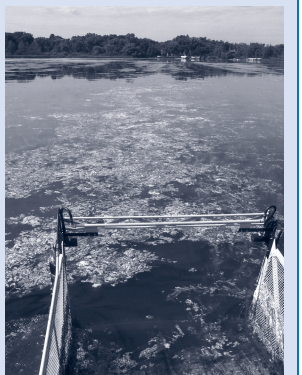
Preliminary results from systematic monitoring of Wisconsin lakes for aquatic invasive species indicate that the spread appears to be slowing and that the majority of lakes are still free of the most problematic invaders. Findings also confirm that boaters, not ducks or other birds, are spreading the invaders around.

"These preliminary results suggest that the outreach and watercraft inspections done by DNR, our county partners and lake associations are working to slow the spread," says Bob Wakeman, aquatic invasive species coordinator for the Department of Natural Resources. "Second, these results confirm that boat traffic is the biggest threat, and that boaters are significantly reducing that threat by cleaning their boats, draining their live-wells and bilge water, and following bait rules."

Summer Weed Harvesting Report

Lake Ripley's Eurasian watermilfoil infestation reached crisis proportions back in the late 1980s, prompting the formation of the management district and the launching of a mechanical harvesting program. The good news is that milfoil has declined since the program began, and the native aquatic plant community has improved. The bad news is that a number of factors have conspired to put high demands on our one-machine harvesting operations. More extreme weather events (i.e., cycling between record flood and drought conditions); zebra mussel impacts that favor plant growth; an aggressive resurgence of our native Sago pondweed; and the challenges associated with aging equipment are among those factors.

In 2013, the year began with a major overhaul of our 20-year-old harvester, buying some more time before it must be replaced. The plant-growth season then got off to an anemic start because of a cool and wet spring. It was a short reprieve that ended around the first of July as temperatures soared and decent water clarity returned. Dense and expansive colonies of the wiry Sago pondweed—a beneficial plant normally avoided when harvesting—proved that even favorable species can pose problems from time to time. Sago not only wraps nicely around boat props, but has a propensity to naturally uproot, forming large mats of floating vegetation that blow into shore.



By mid-September, 87 dump truck loads of both cut and floating plant material had been removed from the lake. This compares to a recent high of 168 loads removed during the drought of 2012, and a much tamer 40-load seasonal average over the last 12 years. We thank our hard-working and mechanically-inclined crew for their diligence in keeping the machinery running while responding to a daunting plant-growth situation.

In 2014, the Lake District will be pursuing a grant to help pay for equipment replacements authorized at the Annual Meeting. If successful, these new acquisitions will be made as early as 2015.

Love it, hate it...winter has arrived. It's easy to see winter's effects on land, but a lot is going on in Lake Ripley, too.

During summer, a deep waterbody like Lake Ripley divides into three distinct layers defined by temperature and dissolved oxygen content. Its warmest waters are found in a layer at the surface called the epilimnion. Below that is the thermocline, or a layer of water where the temperature quickly falls due to lack of sunlight. The coldest temperatures are in the bottom layer called the hypolimnion. Dissolved oxygen is highest in the epilimnion, where it is replenished by the atmosphere and photosynthesizing algae, and lowest (or even absent) in the hypolimnion. In the hypolimnion, respiration from bacterial decomposition combines with a lack of sunlight and photosynthesis to deplete oxygen levels.

As daylight lessens and it grows colder, Lake Ripley also starts to cool. Warmer water at the surface begins to chill, becomes denser, and sinks. This starts the process of lake-wide mixing, called turnover, in which temperatures and oxygen levels equalize from the surface to the bottom. Also around this time plants begin to die off or go dormant. Some will fall to the bottom and rot, but others like wild celery (*Vallisneria americana*) can uproot and float to the surface.

By winter, the warmest water will be at the bottom of the lake. This is due to a unique property of water molecules in which density actually starts to decrease just prior to freezing. Water then starts to freeze from the top down, but the ice acts like an insulating blanket that prevents deeper lakes from freezing solid.

Some plants continue releasing oxygen that then gets trapped under the ice. This can cause fish to behave erratically and appear "drunk" from being exposed to too much oxygen. The opposite effect may occur in shallower lakes, where biological respiration combined with smaller, ice-locked water volumes can lead to oxygen starvation and fish kills. To survive, a fish's metabolism slows down in the winter so it needs less food and oxygen. Some fish, like catfish, even nuzzle into the lake bottom and go into a hibernation-like state. Frogs also have their unique winter-survival strategies. They use a natural antifreeze, glucose, to stay alive in spite of freezing temperatures.



Lake Ripley in winter. Photo credit: Jenna Neumiller

Aquatic ecologists tend to avoid the term "weeds" when referring to a lake's macrophytes – those rooted plants that many swimmers and boaters disdain. These plants not only provide food for waterfowl and habitat for fish, but are also critical in maintaining water clarity.

Nutrients (primarily phosphorus) contained in the water play an important role in determining the balance between rooted plants and the suspended phytoplankton (algae) that contributes to turbidity ("muddiness" of the water). At lower nutrient levels, clear water prevails and the rooted plants win. That's because the plants get their nutrients from the lake bottom, and they are able to get plenty of sunlight to support their growth. At high nutrient levels, the free-floating algae win and effectively shade out the rooted plants below.

Lakes with intermediate nutrient levels can be pushed in one direction or the other – sometimes inadvertently. Additional phosphorus (such as from urban and agricultural runoff) can push an intermediate lake past its threshold and result in a "catastrophic transition" to a muddy and algae-dominated state. When this happens, it can be very difficult to restore water clarity and rooted plant communities.

Overly-aggressive weed management can also push a lake over its threshold point. Rooted plants prevent mucky bottoms from being stirred up by wind-driven currents, boating activity, and other disturbances. They also suppress algae growth by mining nutrients contained in the bottom sediment. Some plants even release chemicals that further impede algae. When rooted plants are destroyed, mucky bottoms get stirred up and re-suspend nutrients. Competition with algae ceases and foul blooms occur.

If you are concerned about water clarity, be wary of large-scale vegetation control programs, especially on shallow lakes. In other words, be careful what you wish for.



Rooted plants help clear up the water while providing food and shelter for fish and other aquatic life. Removing too many plants can lead to bigger algae blooms and cloudier water. Photo credit: Gretchen Hanson

-Dan O'Keefe
Michigan State University Extension

-Jeanne Scherer

✓ Redirect roof downspouts

Did you know that a one-inch rainstorm falling on a 1,000-sq.-ft. roof will produce 623 gallons of runoff? That's just from one roof! Factor in every rooftop across our nearly 8-square-mile watershed, and we're talking about a huge volume of storm runoff that can erode soil, carry pollutants and cause flooding.

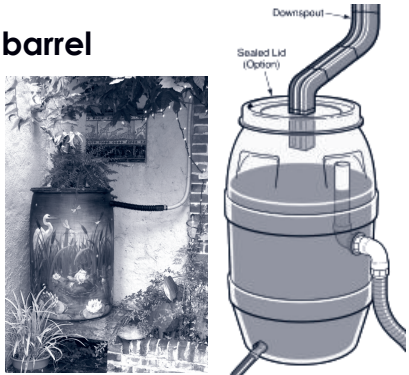


Photo credit: reducerunoff.org

Downspouts are useful for moving roof water away from our homes. That's good for preventing structural water damage, but not so good for Lake Ripley if all that rainwater can't soak into the ground. The best way to protect both your home and the lake is to point downspouts so they send water to permeable areas of the yard. By turning downspouts to face an absorbent rain garden or lawn (versus a driveway or parking lot), imagine the reduction in runoff that's suddenly possible. Not a bad return on investment for a \$10 flexible downspout extension.

✓ Invest in a rain barrel

Rooftops supply runoff every time it rains. Instead of treating rainwater as a waste product, why not put it to good use?



No-Hassle Benefits

- ☀ A convenient way to store chlorine-free "soft" water to use on thirsty trees and gardens.
- ☀ Save at least 1,300 gallons of tap water during the summer. Lawn and garden watering accounts for 40% of household water use in the summer.
- ☀ Reduce flooding and erosion by capturing water otherwise destined to become runoff.

For under \$200, even the fanciest rain barrels offer an affordable way to collect and store water for later use. Today's mosquito-proof barrels connect directly to your roof downspout, and they come in many different colors and designs. Prefabricated units generally include devices called "diverters" that direct water into the barrel until full. Any additional water then bypasses the barrel and exits the downspout, preventing water from overflowing near your foundation. Later, when rain is scarce, just turn the spigot and start tapping into that plant-friendly water supply.

✓ Plant a native tree

Trees can intercept several hundred to several thousand gallons of rainfall per year! Rain drops cling to leaves and branches where they can evaporate before reaching the ground. Water that trickles through and down the tree canopy slowly makes its way to the ground where it can be absorbed by the soil. Tree roots make soil more porous, channeling water downward to replenish groundwater aquifers.



Image credit: www.mortimerladas.com

Other benefits of trees include privacy screening, summer shade that lowers home-cooling costs, and increased wildlife. Going native improves the odds of attracting your favorite birds while reducing care and maintenance hassles. Native trees, once established, are better able to withstand summer heat and drought, reducing the need for extra watering.

✓ Create a rain garden

Few other "green" homeowner practices have received more attention in *Ripples* than rain gardens. Why? Because they work! They're also fairly easy to build. Start by digging a flat, shallow depression in a spot that sees a lot of water every time it rains. Then, add your favorite native plants—ones that tolerate both wet and dry conditions—and presto! That's it!

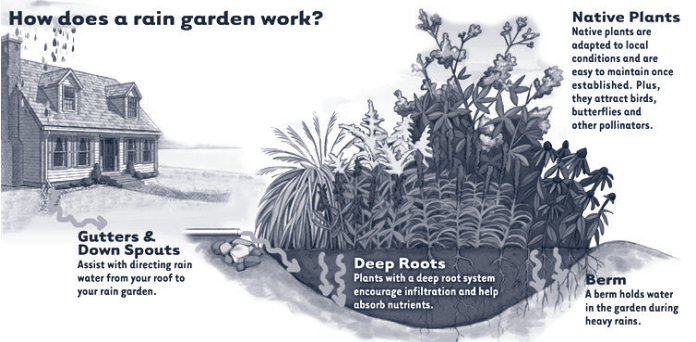


Image credit: Tip of the Mitt Watershed Council

Rain gardens make stunning additions to any yard. If properly constructed, they will not pond water (except right after a big rain) or breed mosquitoes. While they may look like typical flower gardens, you'll be amazed by the amount of water they soak up every time it rains. Even the smallest rain gardens can make a big difference, so find a good spot and start planning that garden. Look for design tips at: <http://learningstore.uwex.edu/assets/pdfs/GWQ037.pdf>.

Continued >>

Plant a lakeshore garden

Resource managers and restoration specialists call them "shoreline buffers." That's because planting native grasses, wildflowers and shrubs at the water's edge helps protect (or "buffer") both the health of the shoreline and the lake.



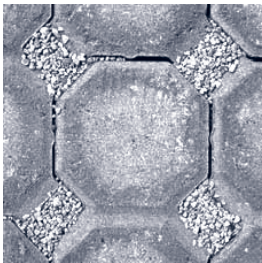
A lush oasis awaits!

- ☀ Attract more turtles, frogs, butterflies, songbirds, and even fish to your lakeshore.
- ☀ Discourage geese from taking over your yard.
- ☀ Add more natural beauty to frame those lake views.
- ☀ Create a place to filter and absorb storm runoff before it gets to the lake.
- ☀ Put those deep roots to work holding soil in place and preventing shore erosion.
- ☀ Get rid of those water-wasting sprinklers, noisy lawnmowers, and polluting lawn chemicals.

Although the golf course look can appear tidy, maintaining turf down to the lake edge is a recipe for problems. Shore erosion, geese invasions, and the disappearance of interesting wildlife are just a few of the likely consequences. Instead, consider replacing part of that lawn with some native sedges and prairie flowers. By doing so, you will improve your shoreline's natural beauty, help guard against runoff and lakeshore erosion, and create a refuge for all those frogs and turtles we enjoy seeing.

Convert hard surfaces to water-permeable alternatives

Our landscape is increasingly becoming impervious to water. Every additional square foot of roof, driveway, parking lot, patio, storage shed or deck creates another impenetrable surface that sheds rainwater. The result: more storm runoff, more flooding, more soil erosion, less groundwater recharge, and, ultimately, sicker lakes.



Products like permeable pavers and porous concrete give water a chance to soak through. Photo credit: NRDC

Fortunately, there are viable, cost-effective and more permeable alternatives to these more traditional surfaces. First, consider ways to reduce your existing or planned hardscaping foot-

print. Do you need such a large patio or parking area, or would smaller options fit your needs just as well? If these areas are due for repair or replacement, try using more water-porous surfaces, such as permeable pavers placed on top of a crushed-gravel base. While runoff won't be eliminated, it will be reduced... and every drop counts. Plus, they often look better and last longer than their stormwater-generating cousins.

Share your shore with a treefall habitat

For eons, trees grew and died along our lakeshores. These near-shore "treefalls" lined shorelines and functioned as important fish and wildlife habitat, supporting entire food webs. Turtles used them as loafing structures so they could bask in the sun while maintaining a quick escape route. Aquatic insects feasted on their decaying woody corpses. Frogs and small fish came to feed and find refuge from predators. In turn, great blue herons and larger fish, like bass and pike, moved in to search of their own meal.



Turtles and fish are among the diversity of aquatic life that are attracted to treefalls. Photo credits: New Hampshire Fish and Game (left) and E. Hilts (right)

Lake Ripley's lakeshore looks much different today: more developed, less wooded, tidier beachfronts, and, of course, fewer treefalls. So what does this mean for our fish and shore-dependent wildlife? Research has shown that the impacts can be significant, and efforts are underway to re-naturalize shorelines to recover these lost habitat features. Those who have preserved natural treefalls, or even installed their own, commonly point to better fishing and more turtle and frog sightings as a result.

If you own waterfront, reserving space for a treefall will help return an important type of habitat that is becoming increasingly scarce. A tree that may need to come down due to disease or death makes good candidates, or it can be brought in from an off-site location. While certain permit standards need to be followed, Lake District staff is available to guide you through every step of the process. ♦

Remember: The real winner of all these projects is Lake Ripley itself. Thank you for doing your part.

	2013	Long-term average	Mgmt. Goal	Goal status (2013)
LAKE WATER QUALITY (Jul-Aug average)				
Water Clarity (ft.) – Depth of visibility from lake surface	7.1	6.2 (1973-Present)	>6.5	☺
Total Phosphorus (µg/L) – nutrient that causes excess algae growth	20.6	20.9 (1986-Present)	<24.0	☺
Chlorophyll-a (µg/L) – indicator of amount of algae in the water	9.4	8.6 (1986-Present)	<7.3	☹
Swim Advisory Days – E. coli bacteria greater than EPA advisory level of 235 cfu/100mL	2	3 (2005-Present)	0	☹
INLET STREAM QUALITY (May-Oct average)				
Total Phosphorus (µg/L) – nutrient that causes excess algae growth	113	354 (1993 appraisal)	▼	☺
Dissolved Oxygen Range (mg/L) – needed to sustain fish and aquatic life	1.7-12.5	0-1.8 (1993 appraisal)	▲	☺
FISHERY (Fall electrofishing results for select sport fishes only)				
Largemouth Bass (average length – inches) – average size is one of multiple metrics used to assess overall population health	8.4	9.4 (1992-Present)	▼	☹
Walleye (average length – inches) – average size is one of multiple metrics used to assess overall population health	16.8	14.5 (1992-Present)	▲	☺
Bluegill (average length – inches) – average size is one of multiple metrics used to assess overall population health	4.3	5.1 (1992-Present)	▼	☹
PLANT HABITAT QUALITY				
Floristic Quality Index – indicator of lake health based on type and variety of aquatic plants	23.8	17.8 (1976-Present)	20.0+	☺
RECREATIONAL FACTORS				
Harvesting Loads – indirect indicator of the density and extent of near-surface plant growth within navigable boating areas	87	40 (2002-Present)	Not Applicable	
Piers	186	174 (2003-Present)		
Parked or Beached Watercraft	488	479 (2003-Present)		
Boat Lifts	287	234 (2003-Present)		
Ice Cover Duration (days)	109	97 (1989-Present)		