2019
VOL.46 | NO.1

Times & Tides

The Voice of Green Lake

A Publication of the Green Lake Association

DAKIN CREEK MOVES FULL STREAM AHEAD

ALSO INSIDE:

Get to know the GLA | Importance of Stream Restoration | Remembering Brook Trout
10 Ways to Protect the Lake | Welcome, Jennifer & Kristen

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MARK YOUR CALENDARS...

JUN. 20 GLA ANNUAL MEETING
9 to 11 am, Location TBD

AUG. 1 GLA ANNUAL GALA
4:30 to 10 pm, Location TBD

AUG. 15 LAND AND LAKE FAMILY FIELD DAY
10 am to 2 pm, Avalon Creek Farm,
W1774 Co. Rd K, Markesan, WI 53946

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FROM THE DIRECTOR

STEPHANIE PRELLWITZ I EXECUTIVE DIRECTOR

We are doing something new in this edition of *Times & Tides*. We are using an entire publication to dive deep into a single topic: stream restoration.

There are many moving parts to the Green Lake Association's growing initiatives, and we rarely take time to dig into one initiative from multiple perspectives. My hope is that, by the time you reach the final cover, you appreciate how and why the GLA is using your investment to protect the lake we all love.

Some of my favorite memories from the entire year happened on Dakin Creek. One morning, a group of volunteers gathered in a circle, dressed in chest waders and gloves, listening for instructions for the day. We were welcomed by Margaret York, a proactive landowner who allowed the GLA to underwrite the cost of a major renovation project on one of Green Lake's few trout streams.

As Margaret talked about how grateful she was that the GLA was protecting a stream running through her property to Green Lake, I was struck by how transformative our efforts were.

Of course, the stream was transformed, better protected from our day's work from the future impact of storms that pollute Green Lake with sediment and phosphorus. Our minds were transformed, filled to the brim with new knowledge, like how soft-wooded, invasive trees tip into streams and eventually force them to shift their course and erode. And, finally, our community was transformed, as we worked together to make one spot in our watershed better than we found it.

Stream restoration alone is not the silver bullet to a cleaner Green Lake, but it is one important strategy the GLA is investing in to protect the lake.

Big Green Lake is facing some big challenges: increased phosphorus levels, low dissolved oxygen, legacy phosphorus, and invasive species, to name a few. These challenges are certainly concerning, but I am filled with hope that—as we continue to understand the problems the lake is facing and invest in research to address them—we will figure out how to reach a measurably cleaner, healthier lake for future generations.

In the meantime, we will continue to invest in urgent, common sense practices—like stream restoration—to protect Green Lake, the amazing natural resource at the heart of our community.

CHANGING WITH THE CHALLENGES

A LOOK INTO THE GLA'S PAST AND ITS PATH FORWARD

In 1951, a group of proactive homeowners formed the Green Lake Association, originally called the Green Lake Property Owners Association. In the nearly 70 years since then, the GLA has seen more than just a name change.

The GLA's founders were motivated to act because of the lake's declining water quality, yet the lake's challenges have accelerated since then. The GLA is concerned about more severe rain events, eroding feeder streams, increasing weed and algae growth, encroaching invasive species, and the legacy of decades of phosphorus pollution trapped in its deepest waters.

In 2014, as a result of long-term water quality problems, the Wisconsin Department of Natural Resources classified Green Lake as an "impaired" body of water. Specifically, Green Lake has a band of low dissolved oxygen, stretched across the lake at a depth of about 30 to 60 feet, most likely caused by phosphorus pollution.

As a response to the lake's growing issues, the GLA concentrated its mission to be singularly-focused on improving Green Lake's water quality and focus our projects on protecting our beloved lake and its watershed.

The lake is a unique resource, but so is our lake association. There are 15,000 lakes in Wisconsin. Six hundred of these lakes have homeowners' associations, but the GLA is one of only three staffed lake associations in the state. We have used these essential resources to develop, among other successes:

- A robust lake study, being completed by experts at the US Geological Survey and Michigan Technological University, to diagnose the cause of Green Lake's low oxygen dead zone and high phosphorus loading,
- Various watershed management tools that identify problem areas and assist local conservation partners in working with willing landowners to install lake-protecting practices on their property,
- Conservation projects to repair areas of eroding banks on the lake's feeder streams,
- Agricultural initiatives, like field days and demonstration farms, to increase the adoption of practices that are good for farms and good for the lake's downstream water quality, and
- Annual removal of non-native carp to prevent dead fish wash-ups and to protect vulnerable wetlands from their destructive activity that pollutes the lake.

In tribute to the original founders' concerns, the GLA will continue to do what is right for the lake.

PILLAR PROJECTS

The GLA's projects are divided into three categories, known as our pillar projects. They are:

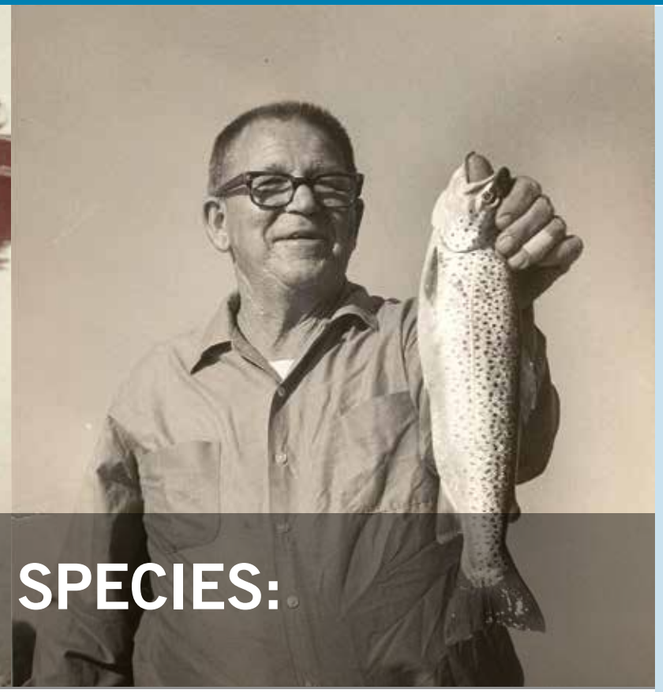
PROJECT CLEAN STREAMS
Stream and wetland restoration

PROJECT GREEN ACRES
Agricultural best management practices

PROJECT INVADER DEFENSE
Invasive species management and prevention

Every year, we complete pillar projects aimed at improving water quality in Big Green Lake. This work is important, but the GLA also recognizes that this is just the beginning of addressing the lake's problems. We will need to scale up our efforts even more in the face of environmental and human inputs that threaten its water quality.

This year, Project Clean Streams was our main focus. The GLA is excited to share news on the progress towards restoring one of Green Lake's main tributaries: Dakin Creek.



FACING THE RETURN OF A LOST FISH SPECIES:

TALES OF CATCHING BROOK TROUT ON DAKIN CREEK

It seems nearly impossible to tell of Green Lake's vibrant history without including tales of the Norton family, who came to Green Lake in the 1800s.

Among all sorts of Green Lake adventures, the Norton brothers have fond memories of catching brook trout on Dakin Creek. Their recollections are as clear as the waters that once flowed through this trout stream.

The GLA is in the midst of a major stream restoration project on Dakin Creek to reduce phosphorus loading to Green Lake, among other benefits. The icing on the cake: When we complete this major lake protection project, the GLA will work with the WDNR to restock brook trout, not seen on this trout stream since the 1950s.

The GLA caught up with two of the Norton brothers, Joe and Mike, to reflect on what it was like to grow up on Green Lake and consider the possibility of once again catching brook trout on Dakin Creek.

What did fishing mean to you and your family growing up?

Joe: My family has been in Green Lake since the 1850s. We were boat and fishing people. My dad fished when he was a little boy and, growing up, I remember hearing all of his fishing stories. My mom loved fishing, too. As kids, as soon as we could walk, we were at the lake, and as soon as we were proficient on a boat, we were out on the lake.

Mike: Fishing was a way of life for my family. It was what we did and it was our lifeblood. Everything surrounded fishing and the ability to make a living. My whole childhood was immersed in fishing, and even our family vacations revolved around fishing. When we'd share our pictures of our trips, people would often tease us and ask, "Where are the pictures of your kids?" because we'd just have a whole collection of pictures of fish.

What do you remember about brook trout on Dakin Creek?

Joe: I remember one day all of us were going fishing. We loaded the whole family in the car and went down to Skunk Hollow. We got there and dad says, "This is it." We might have been fishing with something as simple as a cane pole and we just loaded up on brookies! They were so plentiful in Dakin Creek and so easy to catch. Even little kids could catch them! We had a big feast that night on brook trout. That day on Dakin Creek was unbelievable.

How do you feel about the possibility of brook trout coming back to Dakin Creek after being gone for so long?

Joe: It's very exciting that they may be coming back! These childhood memories I have, even though I'm 72, still burn bright in my memory. I will guarantee you, if there's brookies around to catch in Dakin Creek, I will have my grandkids there right away.

Mike: Truly the fish are the barometer of the lake and indicate changes in water quality. The brook trout are the barometer of water quality in Dakin Creek, so I think bringing back the brookies is a good thing.

How have you noticed Green Lake's water quality change over the years?

Joe: I remember swimming in the lake as a kid. In the 1950s and 1960s, the water was crystal clear. You could take a quarter, throw it off the end of the dock, watch it sink to the bottom and then dive to go get it.

When I was 16, I was the marine mail boy. I'd ride on the bow of the boat and from my elevated position I could see schools of minnows and fish and sunken boats. That's the water clarity that I remember.

"I REMEMBER ONE DAY ALL OF US WERE GOING FISHING. WE LOADED THE WHOLE FAMILY IN THE CAR AND WENT DOWN TO SKUNK HOLLOW…WE JUST LOADED UP ON BROOKIES! THEY WERE SO PLENTIFUL IN DAKIN CREEK AND SO EASY TO CATCH EVEN LITTLE KIDS COULD CATCH THEM!"

– Joe Norton, Green Lake Resident

From about the time I was in college, 1965 and onward, the lake started to change. My dad was a fisherman and was very aware of these changes. He would talk about how he felt like there was something wrong with the lake, but he didn't know what was causing it. As an ice boater, I'm also very aware of the lake's freezing and thawing patterns. I've been taking records on it since I was a kid. It really has changed.

During my college years as a fishing guide, whenever we'd cook out on the boat, we'd make coffee just using water we scooped up from the lake. That's not something you would do anymore.

There's also more weeds and algae now. The type of weeds have changed too and the algae is awful.

How do you feel about the future of Green Lake?

Joe: I'm very concerned about the lake at all times, but the work you're doing, keep it up, because the lake means a lot to a lot of people.

Mike: I'm optimistic about what you're doing. We're on the right track, but we have to stay vigilant and keep working on taking care of the lake.

WELCOME JENNIFER AND KRISTEN

This year, the GLA welcomed two new additions to its team: Jennifer Fjelsted and Kristen Rasmussen.

Jennifer Fjelsted joined the Green Lake Association in January as the GLA's Communication and Project Manager. She holds two Bachelor of Science degrees, in Biology and General Science, and a Master's in Environmental Studies from Virginia Commonwealth University in Richmond, Virginia.

While at VCU, she taught undergraduate biology labs as an adjunct professor, conducted research on amphibian development, and worked as an administrative assistant and undergraduate advisor within the Biology Department. Upon her return to Wisconsin, she worked as an aquatic invasive species technician, where she assisted with lake surveys and coordinated outreach events to help others understand the importance of keeping Wisconsin's waterways healthy.

Using her background in science, her love of teaching, and her experience in outreach, Jennifer is excited to be a part of the GLA's mission to keep Green Lake healthy and clean.

Jennifer enjoys volunteering and has worked with organizations, such as the Chesapeake Bay Foundation, the James River Association, and The Nature Conservancy. When she is not in the office, Jennifer spends her time reading, volunteering, tutoring and mentoring students, and traveling to new places.

Kristen Rasmussen joined the GLA team in April 2019 as a Digital Content Strategist. Kristen has a BA in Public Relations & Advertising from DePaul University and an MBA in International Management. Her communications background ranges from social media marketing for national clients like Miller Coors and Farmer's Insurance, to content strategy and public relations for non-profits like Shedd Aquarium and California Academy of Sciences.

As a Board Member for South Woods Park Association in Ripon, a digital volunteer for the American Red Cross of Wisconsin, and former Vice-Chair for UNICEF's Next Generation in Chicago, Kristen is dedicated to making a positive impact with her skills.

Originally from Chicago, Kristen now lives in Ripon with her husband Steve (originally from West DePere) and their yellow lab, Rangi. They moved to the area for Steve's role as a family doctor with Thedacare after spending the previous year living and working in New Zealand. Kristen loves exploring and getting outside whenever she can. In the area, you'll likely find her paddle boarding on Big Green or walking Rangi on any one of the area's beautiful trails.

WHY STREAM RESTORATION IS IMPORTANT

HELPING CLEAN WATER FLOW DOWNSTREAM

A vast network of over 140 miles of stream flows to the lake, yet decades of neglect and more intense rainstorms have caused considerable damage to them. The GLA estimates over 11 miles of Green Lake's main stream channels are in immediate need of repair.

As more intense rainstorms flood these streams, already-crumbling streambanks erode even more, carrying phosphorus-filled sediment and water to the lake.

Phosphorus is a fertilizer. The same fertilizer that causes plants to grow big and green on land also has the same effect in the lake—causing our weeds and algae to grow similarly big and green. Preventing nuisance levels of weeds and algae requires keeping phosphorus on the land and out of our lake.

When phosphorus-filled sediment from eroding streams makes its way into Big Green Lake, it pollutes the water and fuels weed and algae growth. Just one pound of phosphorus is enough to fuel the growth of 500 pounds of weeds and algae.

When aquatic weeds and algae naturally die, it uses up dissolved oxygen that aquatic life needs to survive. Plus, excessive phosphorus pollution increases the risk of harmful algal blooms, which negatively affects aquatic and human life, and has been fatal to pets.

The GLA and our partners are making urgent repairs to streambanks—a practice known as "stream restoration"—in an effort to limit phosphorus pollution to Green Lake.

As part of one of the GLA's Pillar Projects—Project Clean Streams—we aim to repair a mile of eroding streambank each year. Since degraded streams are direct sources of lake pollution, the GLA is restoring these areas back into healthy streams, so that the water that flows to Green Lake is as clean as possible.

This can be a difficult task. Stream restoration is incredibly important for the health of our lake, but it is also incredibly expensive. It costs approximately $80,000 to restore one mile of stream, meaning it will cost close to 1 million dollars to repair all 11 miles that we have currently identified as eroding.

Changing weather patterns are also posing another challenge to stream and lake health. The last three years (2016, 2017, and 2018) have been the wettest on record since rainfall measurements began in our area in the 1990s. More intense rain events produce bursts of rushing stormwater runoff that overwhelm local streams. This runoff increases streambank erosion and ultimately phosphorus pollution to Green Lake.

More intense storms mean increases in the amount of phosphorus pollution making its way to the lake, which reaffirms the need to scale up our efforts to protect the lake's water quality.

CHANGING WEATHER PATTERNS ARE ALSO POSING ANOTHER CHALLENGE TO STREAM AND LAKE HEALTH. THE LAST THREE YEARS (2016, 2017, AND 2018) HAVE BEEN THE WETTEST ON RECORD SINCE RAINFALL MEASUREMENTS BEGAN IN OUR AREA IN THE 1990s.

Despite the challenges Big Green is facing, the GLA and our partners are committed to this important lake protecting work. Foot by foot, stream by stream, we will continue working to repair all of Green Lake's eroding streams.

Stream restoration is not possible without the support of many partners. The GLA would like to recognize and thank the Wisconsin Department of Natural Resources and Patagonia for grants given to support this project. Thank you also to the following organizations for funding and technical support: Natural Resources Conservation Service, Green Lake Sanitary District, Green Lake County Land Conservation Department, and the Fond du Lac County Land and Water Conservation Department. Last, but not least, thank you to all of the GLA members, Project Clean Streams donors, community members, and volunteers who donated time and money toward supporting this important lake protecting work.

DID YOU KNOW...

It costs approximately $80,000 to restore one mile of stream.

One pound of phosphorus is enough to fuel the growth of 500 pounds of weeds and algae.

The GLA and our partners have restored 4.8 miles of stream so far!

GREEN LAKE'S STREAMS

The Green Lake watershed has 141 miles of streams. There are eight named streams that flow into the lake. For better or for worse, everything flowing through them ends up in Green Lake. If these streams are damaged, the water flowing from them to the lake will continue to negatively affect water quality.

1
Assembly Creek
0.2 miles long

2
Dakin Creek
6.2 miles long
Restored: 3,600 feet

3
Hill Creek
1.8 miles long
Restored: 9,470 feet

4
Roy Creek
7.2 miles long
Restored: 9,689 feet

5
Silver Creek
34 miles long
Restored: 842 feet

6
Spring Creek
2.5 miles long

7
Wuerches Creek
4.4 miles long
Restored: 892 feet

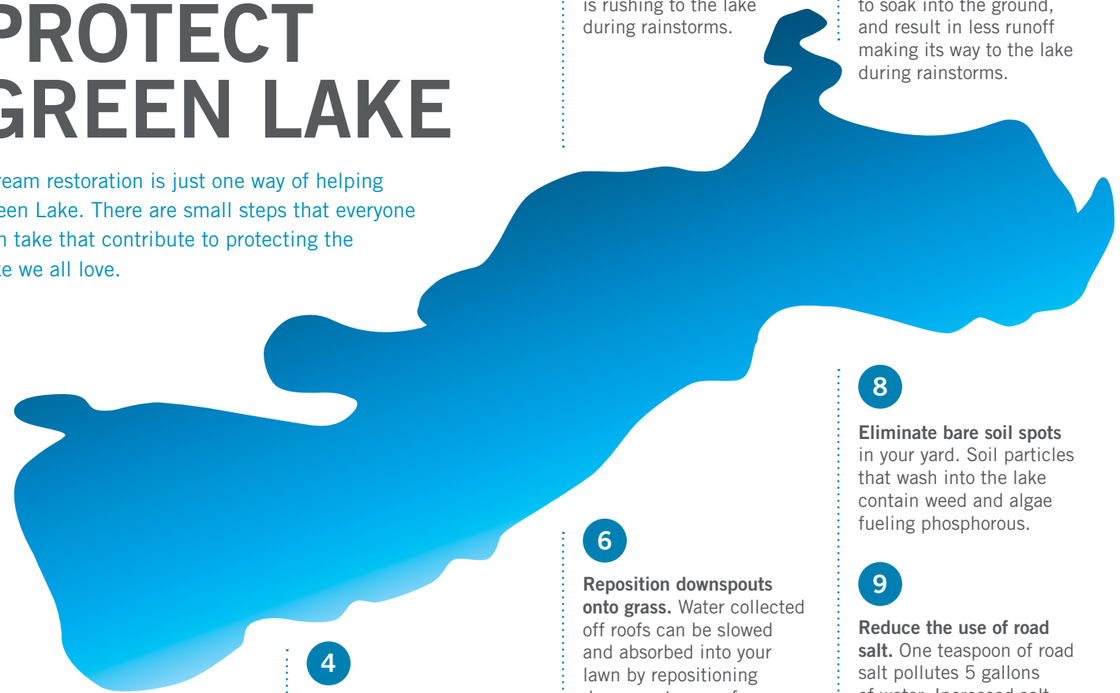
8
White Creek
1.1 miles long
Restored: 520 feet

ALL HANDS ON DECK ON DAKIN

Stream restoration work can't be done without willing landowners and a lot of help from volunteers. Property owner Margaret York graciously hosted volunteers on her private property during four recent GLA workdays in order to complete this important stream restoration work. Volunteers completed 250 hours of heavy lifting and were able to restore natural stream flow paths, remove obstructions, stabilize eroding streambanks and create wildlife habitat.

10 THINGS YOU CAN DO TO HELP PROTECT GREEN LAKE

Stream restoration is just one way of helping Green Lake. There are small steps that everyone can take that contribute to protecting the lake we all love.



1 **Use rain barrels.** Rain barrels help capture and slow the amount of storm water (and any pollution flowing with it) that is rushing to the lake during rainstorms.

2 **Install a rain garden** in your yard using native plants. Rain gardens can slow water flowing off the landscape, encourage it to soak into the ground, and result in less runoff making its way to the lake during rainstorms.

3 **Limit fertilizer** use on lawns and fields. Fertilizer on land helps things grow, but it also does the same in the water. Just one pound of phosphorus can fuel the growth of 500 pounds of weeds and algae. Limiting fertilizer use on your yard, garden or field directly helps the lake's water quality.

4 **Don't mow right down to the lakeshore.** By leaving a taller grass buffer strip at the edge of the shoreline, it helps slow pollutants from making their way into the water, and can help prevent geese from making your yard their favorite summer hangout spot.

5 **Clean up after your pets.** Pet waste contains nutrients like phosphorus. If not cleaned up properly, those nutrients make their way to the lake during rainstorms where it fuels weed and algae growth.

6 **Reposition downspouts onto grass.** Water collected off roofs can be slowed and absorbed into your lawn by repositioning downspouts away from driveways and toward grass. This helps prevent excess nutrients from washing into Green Lake.

7 **Don't flush anything besides waste and toilet paper.** The Ripon Wastewater Treatment Facility cleans wastewater before it is discharged back into Silver Creek. Keep that water even cleaner by never flushing medication, synthetic chemicals, or anything else besides waste and toilet paper.

8 **Eliminate bare soil spots** in your yard. Soil particles that wash into the lake contain weed and algae fueling phosphorous.

9 **Reduce the use of road salt.** One teaspoon of road salt pollutes 5 gallons of water. Increased salt concentrations can hurt aquatic life. Use salt sparingly in the winter and look into other methods to reduce slippery surfaces.

10 **Don't rake leaves into the road or lake.** Leaves raked into the road can act like a brewing cup of phosphorous tea. Water that makes its way through those leaves carries weed fueling phosphorous that flows directly into the lake through storm drains.

SNEAK PEAK AT DAKIN CREEK

FULL STREAM AHEAD TO PROTECT BIG GREEN

Dakin Creek is one of eight named streams in the 107–square mile Green Lake watershed (the surrounding area of land that drains towards the lake). It is a six-mile-long, designated class II trout stream that flows into Green Lake near the County Highway A bridge on the lake's east end. It is also the creek that the GLA focused its "stream restoration" efforts on this year.

Dakin Creek once supported a thriving brook trout population, but the native fish disappeared from the creek in the mid–1950s because of poor water quality and a loss of adequate habitat.

A series of two culverts also create issues for brook trout on the creek:

- A perched culvert at Skunk Hollow Road (above) creates a barrier to fish and aquatic organism migration. The energy from this waterfall effect has created a four-foot-deep scour hole. Brook trout need to swim upstream to spawn, but they cannot make the 6-inch jump at Skunk Hollow Road.
- Just 140 feet downstream, an undersized culvert on Maug Road is eroding the roadbed and causes high stream velocities that brook trout cannot navigate.

This culvert at Maug Rd., along with a second culvert at Skunk Hollow Rd., will be replaced in early 2020 as part of a larger stream restoration project.

Both of these culverts cause sediment disruption, which clouds the stream water, smothers fish eggs, and sends phosphorus pollution downstream to Big Green—fueling excess algae and weed growth.

To address these issues on Dakin Creek, the GLA is in the progress of:

1) Completing 3,600 feet of streambank repairs by creating gently-sloping banks, armoring the soil with native plants, and using reclaimed Christmas trees to secure areas of stream erosion.
2) Replacing two culverts—one perched culvert that blocks fish migration, and a second culvert that constricts stream flow and is contributing to erosion. The GLA is coordinating these culvert replacements in early 2020.
3) Restoring fish habitat and re-establishing brook trout in Dakin Creek. Brook trout are a native fish species that indicate clean water, so their ability to survive in Dakin Creek will show encouraging progress towards cleaner water in the stream, and cleaner water making its way to Big Green Lake.

The benefits of the Dakin Creek stream restoration project also flow downstream. The project will improve the water quality of Green Lake by reducing phosphorus pollution and preventing 20,000 pounds of weeds and algae from growing in the lake.

Before and after photos, using the same root wad as reference, demonstrate in-stream improvements on Dakin Creek. Fallen trees and debris obstructed the flow of Dakin Creek, contributing to stream bank erosion. Volunteers and staff removed these obstacles and helped re-establish the stream's natural flow and path.

BALSAMS FOR BROOKIES

Last January, the GLA collected Christmas trees to be used for the "Balsam for Brookies" project. This fall, those trees were taken to Dakin Creek where they found a new home.

Green Lake area students and community volunteers transported the repurposed evergreens to Dakin Creek where they were strategically placed to help reduce erosion on the streambanks and create habitat for fish.

Repurposed Christmas trees were baled with eco-friendly twine and anchored in place with vertical wooden stakes (left and right banks) to provide streambank stability and aquatic habitat on Dakin Creek.

GREEN LAKE ASSOCIATION
CARING FOR OUR LAKE FOR GENERATIONS
PO Box 364, Green Lake, WI 54941

CARP REMOVAL IS CRITICAL

TO THE HEALTH OF OUR WETLANDS AND OUR LAKE

Every spring, the GLA joins forces with our partners to remove invasive carp that harm the health of the lake. In 2018, commercial anglers removed 80,000 pounds from the County Highway K Marsh, located at the southwest end of Green Lake. This year, with similar efforts, only 2,500 pounds of carp were caught, which means there were fewer to catch!

This massive drop—in addition to a noticeable decrease in carp activity by fish biologists—demonstrates that we are putting a significant dent in the marsh's carp population, and that means good news for Green Lake's water quality.

Carp destroy important native vegetation, stir up the lake bottom, fuel algae growth, and muck up the water. Removing carp protects the marsh and protects Green Lake. (Not to mention, it results in fewer dead fish washing up on shore.)

This promising carp decline demonstrates that your contribution makes a measured impact on the health of the lake. Of course, carp removal is only one part of our larger lake strategy to improve Green Lake's water quality. We also work to reduce lake pollution from urban and agricultural sources, fund university research, and conduct water quality monitoring, just to name a few.

Now is the time to make a splash for the lake! Thank you for being a lake supporter by sending your tax-deductible gift in the provided donation envelope. You can also donate online at www.greenlakeassociation.com or by calling our office at (920) 294-6480.

ARE YOU 70-1/2 OR OLDER?

If you are 70-1/2 or older, talk to your IRA plan administrator about how you can easily satisfy your IRA's required minimum distribution for the year with a tax-free transfer of up to $100,000 to the GLA. Make a gift that is not subject to the 50% deduction limits on charitable gifts and help lead the way to cleaner water.