



Lake Waramaug Task Force, Inc.

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The Lake Waramaug Task Force is a non-profit scientific and educational organization dedicated to maintaining and preserving the ecology and water quality of Lake Waramaug and its watershed.

Fall 2022

Dear Friend of the Lake,

As I begin this message for the fall newsletter, I can't deny my concerns about the ongoing drought in western Connecticut and its effects on our Lake. We have all enjoyed a great stretch of beautiful, sun-drenched weeks at the lake this summer. Brilliant sunshine, no significant rain and thirty days of 90-degree temperatures seems like a perfect scenario for summer enjoyment. However, the summer produced good news and bad news for Lake Waramaug.

The good news: With low rainfall totals the Lake experienced a minimum amount of harmful nutrient flows. This allowed water clarity to improve over the disappointing levels in 2020 and 2021.

The bad news: Lake levels have dropped significantly and exposed greater areas of the shoreline, some of which have been uncovered for the first time. The two-acre delta at the base of Sucker Brook is an example of a large exposed area of nutrient rich sediment.

Smaller deltas have been exposed in other years but what makes this year different is the size of the delta and the excessive wave action created by wake boats and waves created by the tight circling by tubing. These waves crash over the delta, pick up nutrients and drag them back into the Lake as the water recedes. These nutrients are the primary source of cyanobacteria growth which we know is one of the greatest threats to Lake Waramaug. An increase in cyanobacteria levels could ultimately determine much of what happens to the Lake's water quality in the spring, summer and fall of 2023 and beyond. This is why we sent the urgent email concerning boating activity on August 25th.

While we continue to monitor Lake Waramaug during the drought, the Task Force continues its work in the watershed to identify erosion sites along the banks of the Lake's many tributaries. We know that these erosion sites greatly contribute to increasing sediment deposits and water quality issues. While the Task Force has mitigated some sites in the past, there are numerous additional erosion sites that need attention and they will be expensive to stabilize.

The Task Force has also been working with the three towns that surround Lake Waramaug, Warren, Washington and Kent, to open dialogue with officials to improve permitting and building procedures to be more protective of wetland and open water resources in the watershed. In Washington, we are supplying officials with Lake level and stream flow data so that they can determine the best way to manage state required Lake water outflows at the Washington dam, all in an effort to keep lake levels as constant as possible.

We know that each year will present different types of adversity for Lake Waramaug and that the "TASK OF PROTECTING AND IMPROVING THE LAKE" is an ongoing process. We believe if we work together as concerned partners, Lake Waramaug will remain the crown jewel in the Connecticut lake system.

Mike Guadagno
Chair, Lake Waramaug Task Force

WHAT HAPPENS IN THE WATERSHED, HAPPENS IN THE LAKE!

When it comes to protecting the health of Lake Waramaug, the story does not start at the shoreline. It starts miles away in the Watershed where various forms of pollution, including stormwater runoff and erosion, begin their journey to the Lake.

On an average day, Lake Waramaug contains about six billion gallons of water. More than half of that water comes from Sucker Brook in Warren, a town that encompasses 82% of Lake Waramaug's 9,200-acre watershed. At the urging of the Lake Waramaug Task Force, the State Department of Energy and Environmental Protection (DEEP) performed a comprehensive study of the water quality of Lake Waramaug and its surrounding watershed in the late 1970s. They discovered that "surface-water inflow at the northeastern corner of the Lake [via Sucker Brook] was the main source of nutrients discharged into the Lake."

Sucker Brook is still the main water source for Lake Waramaug, but other tributaries elsewhere in the Watershed also flow into the Lake from Washington and Kent, as do the many storm water drains along the roads. All are potential sources of sediment and excess nutrient pollution. To keep our Lake clean, clear and swimmable, we need to mitigate the risks that activity in the watershed create.

The DEEP describes watershed management as "the process of implementing land use practices and water management practices to protect and improve the quality of the water." As climate change brings increasingly heavy rain events, wind storms and drought, the Task Force is working on implementing greater protection strategies and protocols in Lake Waramaug's watershed.



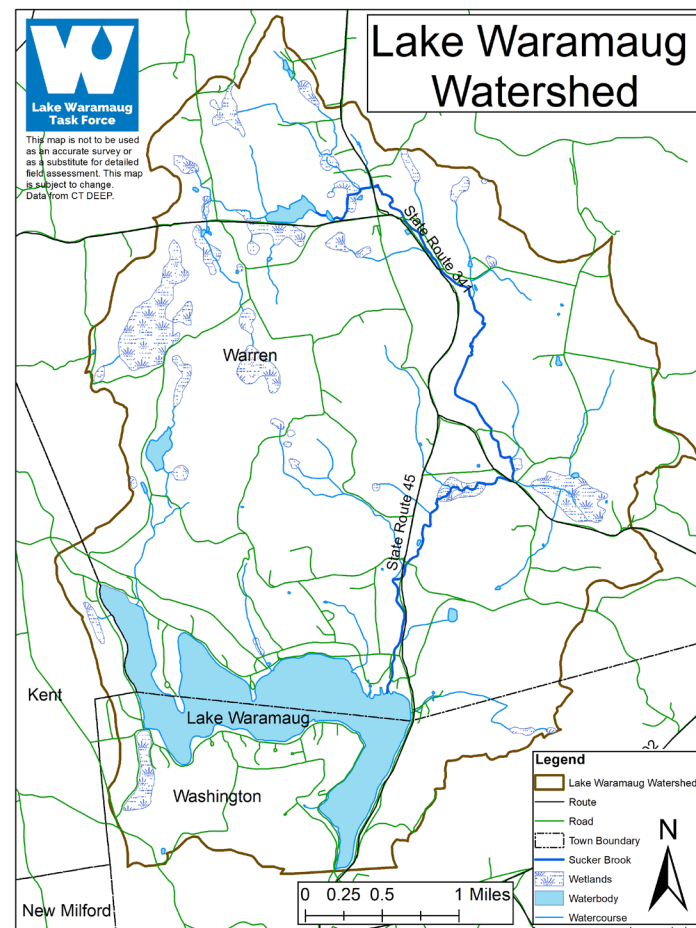
Nutrients and sediment from the watershed feed algae growth and diminish water clarity. Several years ago, we mapped multiple erosion sites on Sucker Brook and stabilized four of the most significant ones. Still, others need to be done to prevent further erosion. Currently, the delta at Sucker Brook (see photo above) which has been created by sediment from its banks up in the watershed, is more than two acres, a condition exacerbated by today's severe drought conditions.

The DEEP recommends that watershed areas remain below 10% developed, and that any man-made changes use as many Low Impact Development (LID) strategies as possible. As an increase in development, such as we have seen around the Lake and in the Watershed, introduces more impervious surfaces to an otherwise natural environment carrying pollutants to the Lake, as well as making erosion problems much worse. Advocating for LID (see accompanying box) practices remains a major initiative of the Lake Waramaug Task Force.

Four Keys to Low Impact Development (LID)

- 1. Work with the contours of the land;** minimize the need for soil disturbance, excavation and blasting.
- 2. Reduce impervious areas;** soil is the best water filter, allow it to work its magic.
- 3. Slow and treat runoff at its source;** use simple landscape features that slow down, capture, filter and scrub clean polluted stormwater runoff.
- 4. Minimize the need for fertilizer;** perform simple soil nutrient tests on your lawn, garden and agricultural fields to gauge fertilizer needs.

It costs the Task Force \$1,000 to remove one pound of phosphorus from the Lake. It's far more effective to keep phosphorus (and other nutrients) in the watershed growing trees, shrubs, flowers, food and fiber. Keeping nutrients in the watershed is where LID excels. And as if that is not enough to convince us all to employ the goals of LID, it is now common knowledge that projects designed and constructed to LID standards are cheaper to build out, more aesthetically pleasing, more beneficial to local ecology, more protective of wetland and water quality, and have a higher resale value as compared to projects using traditional/standard development techniques. The environmental benefits of employing the key goals of LID is why the Task Force continues to push towns to require this of every project in the watershed. It's a rare win-win-win.



Please go to our website to see a more detailed map of the Lake Waramaug Watershed — lakewaramaug.org/science.

LWTF CLEANS OUT PILES OF WATERSHED SEDIMENT

This August you may have seen an excavator cleaning out two sediment basins along North Shore Road in Warren. One basin is on Hawes Brook and the other is on Potash Brook. These basins, which the Task Force installed almost 20 years ago were strategically placed to capture and settle out pollution laden sediment before it reaches the Lake. Sediments (eroded soils) get trapped and settle to the bottom of the basin because the basin calms turbid running water. The Task Force has cleaned out both basins several times since their installation, thus preventing hundreds of cubic yards of polluted sediments from degrading water quality in

the Lake. It is best to do so when little to no water is running in the brooks as the heavy machinery needed to remove the tons of waterlogged sediments can really stir things up. Every time we clean out these basins we take out over 200-cubic-yards of sediment. For perspective, 200-cubic-yards of material is enough to fill over 10 tri-axle dump trucks which are the largest dump trucks allowed on state highways. These basin cleanouts are important but expensive. Trying to prevent these sediments from getting into the brooks and into the basins in the first place is key to protecting the Lake. That is why we all need to pay particular attention to what is happening in the watershed.



Basin Before Clean Out



Pile of Sediment Extracted from Basin



Basin After Clean Out

HELPING TO EDUCATE FUTURE ENVIRONMENTAL MANAGERS



WCSU Final Limnology Class Lab on Arrow Point

One of the items in the Task Force's strategic plan is to educate our future Lake and Environmental Managers on what is involved with taking care of a lake. This year we have certainly had a lot of fun tackling this goal. To kick things off we had the entire Warren Elementary School join us on Arrow Point so we could teach them about all the science that has been employed to clean up, restore and preserve Lake Waramaug. Then we had the Limnology Class from Western Connecticut State University (WCSU) conduct their final lab class on Arrow Point so they could learn about the Zooplankton Farm, and see how we collect our weekly sampling data. We also had the Soils Systems Class from Naugatuck Community College out to the Warren Town Beach for a lecture on understanding how healthy soils and vegetated buffers are key to excellent water quality. And we held Lake Science Education events at both the Washington Club's Holt Beach and the Lake Waramaug Country Club's lake facility this summer. To all, we stressed the importance of protecting the Lake and its watershed to preserve water quality.

WASHINGTON GARDEN CLUB LEARNS ABOUT LWTF WORK

The Washington Garden Club gathered at Arrow Point for an educational program hosted by the Task Force to gain a better understating of our mission and the science behind it. Featuring a presentation by Maria Rodriguez-Hernandez, our Graduate Student Intern, members of the club learned about cyanobacteria and algae formation, the control of which has been one of our main concerns for the past five decades.



Washington Garden Club Members on LWTF Research Boat



Maria shows the WGC how she cares for the Zooplankton Farm

The program included a tour of the Lake on our research boat, giving participants a taste of what it is like to perform field work: water sampling, Secchi disk clarity reading, and invasive weed harvesting, to name a few. By far, the greatest number of questions proposed by members of the Club revolved around climate change, and its resultant more extreme weather

events, namely drought and heavy rain and wind events. Last summer's rains and watershed stormwater runoff resulted in relatively poorer water clarity. While water clarity overall was better this year, it appears the warm water temperatures and lots of sunlight during this summer's drought led to green algae blooms. Admittedly, these green algae mats do not create a fantastic aesthetic. But they are not a health concern and there is a positive: they use up the nutrients that toxic cyanobacteria needs to thrive.

Although our limnologists in the field can hypothesize about the ramifications of the drought, clarity readings in the fall will give us a better idea of how to try to mitigate such dry extremes in the future. With other environmental groups such as the Garden Club willing to partner with the Task Force, we can continue to maintain the ecology and water quality of the Lake, so that future generations can continue to enjoy it.

KEEP IN-THE-KNOW. IT'S EASY TO LEARN MORE ABOUT LWTF ACTIVITIES:

- Visit our website at www.lakewaramaug.org
- Join our mailing list on our website or email us at info@lakewaramaug.org
- Follow us on Facebook (LakeWaramaugTaskForce) or Instagram (lwtaskforce)



CLIMATE CHANGE CORNER

Drought and Green Algae

Green algae growth increases exponentially with an increase in water temperature. Growth can be up to ten times higher with every degree increase in water temperature. Another drought feature that favors green algae growth is a decline in the time incoming water from the watershed enters the lake to the time it flows out. This "Residence Time" increases during drought. Slower moving water, along with increased temperatures, gives algae more opportunity to grow. On average it takes a drop of water entering the Lake one year to flow over the dam. However, during times of severe drought, the one year residence time can be greatly protracted allowing green algae ample time to grow exponentially.



Green Algae Mat Forming on Sediment



WE LOST A TRUE LAKE HERO THIS SUMMER

Paul Frank, who served 25 years on the Lake Waramaug Association Board of Directors, was a staunch advocate for the restoration of Lake Waramaug. Paul passed away on July 23rd, 2022 after a long battle with Parkinson's Disease. With shared sorrow and gratitude, we would like to thank his family and friends for the generous contributions made in his name to the Lake Waramaug Task Force.