



# A SUMMER OF CYANO

**Our changing climate as well as other physical, biological, and chemical factors have an adverse effect on Lake Winnepesaukee.** Cyanobacteria are photosynthetic microorganisms that can produce Harmful Algal Blooms (HABs). These HABs have the potential to produce toxins at differing rates with varying health impacts.

In June 2022, the University of New Hampshire released the NH Climate Assessment report. The report's key predictions for years to come include a regional increase in precipitation, a significant decline in the snowpack, and a new normal of high temperatures. A forecasted increase in precipitation events means more runoff, which equals more potential for nutrients such as nitrogen and phosphorus, to enter our waterbodies, and feed plant and algal growth.

A few of the physical and chemical factors that contribute to the formation and persistence of cyanobacteria blooms in freshwater systems are; light availability, water temperature, nutrient loading, and vertical mixing/lake turnover. These factors likely have an important role in determining HAB composition and toxin production.

This summer saw a higher number of cyanobacteria observations, alerts, and advisories on Lake Winnepesaukee, than in previous years. The table shown does not include the 2 advisories on Lake Kanasatka or other alerts/observations for other waterbodies that are within the Lake Winnepesaukee watershed.

Summary of Cyano Reports on Winnepesaukee			
	2018	2019-2021	2022
Observations		14	18
Alerts	0	0	3
Advisories	1	0	4

Advisories are issued by NHDES when samples are collected and cell counts exceed the threshold of 70,000 cells/mL. Alerts are issued by NHDES for lake-goers to be on the lookout for developing conditions, especially those nearshore with high recreation potential. Observations are cyanobacteria sightings that have been visually confirmed. It is difficult to say for certain if more blooms are occurring, or if people are getting better at recognizing and reporting. Either way, cyanobacteria are present in the Big Lake, and it is up to all of us to keep a watchful eye out for this increasing threat.

LWA is dedicated to tracking cyanobacteria findings throughout the Winnepesaukee watershed, Check out our weekly report and Winni Bloom Watch map to see where cyanobacteria have been observed.



# THE CYANOBACTERIA GUIDANCE DOCUMENT

This summer, we received a record number of calls and emails asking "Could this be cyanobacteria?". To help people understand what cyanobacteria looks like and how to report a suspected bloom, the LWA created a guidance document, pictured to the right. LWA is one of many groups coordinating with NHDES to monitor, sample and confirm the presence of cyanobacteria. It is very important to note that the guidance document is not meant to identify the type of cyanobacteria present, but rather to show examples of what potential blooms could look like.

The other side of the document (not pictured here) shows what steps to take if you see a bloom, how advisories are determined and who else you should contact for your waterbody in addition to NHDES. This guidance document is available for download on the cyanobacteria monitoring page on LWA's website.

## CYANO FOUND IN LAKE WINNIPESUAKEE

**Anabeana**  
**Dolichospermum**  
**Gloeotrichia**  
**Microcystis**  
**Oscillatoria**  
**Picocyanobacteria**  
**Planktothrix**  
**Stigonematales**  
**Snowella**  
**Tolypothrix**  
**Woronichinia**

## IS THAT CYANOBACTERIA? PLEASE HELP US IDENTIFY POTENTIAL BLOOM FORMATIONS IN OUR WATERBODIES!



Stigonematales



Dolichospermum



Microcystis



Oscillatoria



Woronichinia



Gloeotrichia

Are you seeing something different than the pictures above? Filamentous algae, pollen and didymo can sometimes be confused with cyanobacteria.



Filamentous Algae



Pollen



Didymo/Rock Snot

Please note that not all cyanobacteria blooms look alike and are often mixed in with pollen or other algae. This document is to be used for general guidance only. If you suspect a bloom please stay out of the water. NHDES advises lake users and their pets to avoid contact with the water in areas experiencing elevated cyanobacteria cell conditions.



## PAUGUS BAY MONITORING

In May of 2022, LWA received funding to monitor for cyanobacteria in Paugus Bay through a NHDES Cyanobacteria Monitoring Grant. In collaboration with the Laconia Water Department and the Laconia Conservation Commission, LWA sampled 3 stations, bi-weekly, from June to September. After collecting the samples, LWA used a Fluorometer to measure chlorophyll-a and phycocyanin values. Chlorophyll-a is a measure of the microscopic plant life within a waterbody and phycocyanin is a pigment found within cyanobacteria. Although research is still ongoing to predict algal blooms, monitoring the growth behavior of phycocyanin and chlorophyll-a values is important to do for a drinking water source, like Paugus Bay. The monitoring results will be compiled and analyzed this winter. Stay tuned for updates!



# BE WINNI BLUE & LAKESMART PROGRAM

Last year, LWA partnered with NH LAKES to kick off the Be Winni Blue & LakeSmart program. This is a FREE, voluntary, non-regulatory program that educates property owners on how to live in a lake friendly way. **To date, the LWA has completed over 80 Winni Blue & LakeSmart visits.**

How does it work? If interested, a homeowner completes an online self-assessment which can be found on the Take Action page on LWA's website. The self-assessment provides the homeowner with general information on actions that can be taken to reduce polluted runoff from reaching the lake or leaving their property. Next, LWA will contact the homeowner to schedule a property visit.

Properties are evaluated in 4 categories: driveway and parking areas, structures and wastewater treatment, recreation and yard areas, and the shoreline/shorefront area, if applicable. A report with property specific recommendations needed to be implemented in order to be lake friendly will be sent to the homeowner.

Homeowners can achieve 'Winni Blue and LakeSmart status by implementing the best management and lake friendly recommendations found in the report.

Not a shorefront property? That's ok! All properties in the Lake Winnepesaukee watershed have the potential to contribute to the amount of pollution that reaches the lake. We can all do our part to **Keep Winni Blue!**

The photos in the top right are courtesy of Judy Stoessel, who has worked for the past 2 years to revegetate her property on Lake Kanasatka.



Prior to her lake friendly actions, the bank was practically bare. The previous owners had added a sandy beach to the area, which presented a challenge for Judy when selecting plants that would tolerate full sand, wave action and be flood tolerant.

During the reclamation project Judy planted many native shrubs such as Aronia/Chokeberry, Sweet Fern, Buttonbush, Elderberry and Clethra. Once the plantings mature, their vegetated buffer will be about 25 feet wide. In addition to the plantings, Judy leaves the pine needles in place and adds wood chips to help stabilize the soil.

These vegetated areas along the shorefront, known as buffers, help stabilize the shoreline, provide wildlife habitat, and help slow down and infiltrate stormwater runoff.





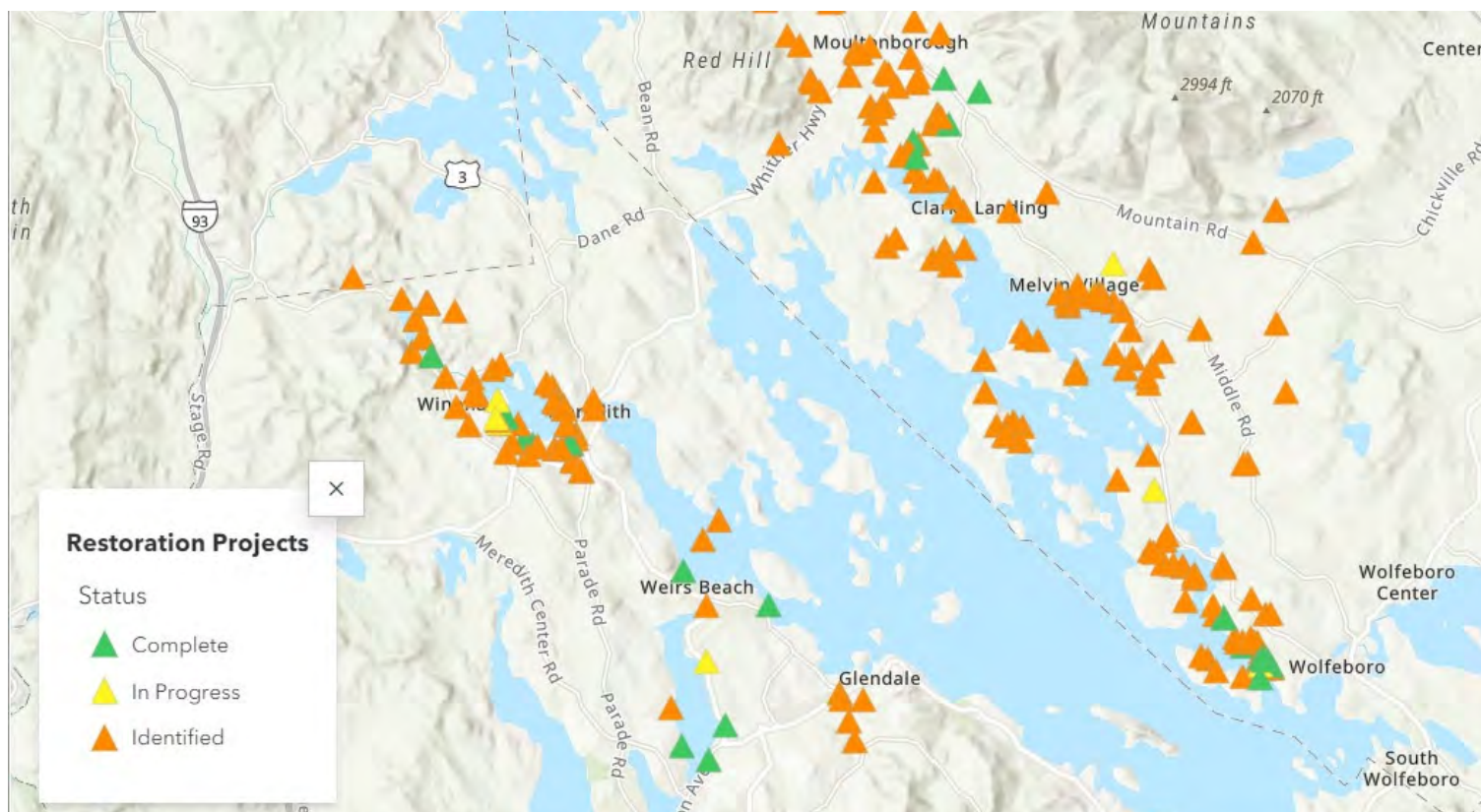
## TRACKING AND MONITORING SUCCESS

For the past 12 years, the LWA has been developing watershed management and restoration plans at the subwatershed level. Focusing on smaller sub-sections of the lake can tailor management recommendations to individual communities and water quality concerns. This stakeholder-driven process has proven successful not only in assisting communities in the Winnepesaukee watershed understand how land use and development impacts their local water quality, but also in focusing their efforts as well as ours where it's needed most. Each plan contains measurable milestones to help us track progress, and success criteria, such as monitoring data, assist in evaluating whether or not implementation of the action plans are improving water quality.

We measure and track our success in a number of ways; at the municipal level this might be adoption of measures to protect water quality, and dedicated budget items for water quality projects. For our organization, success is measured in the number of best management practices installed in the watershed, and the nutrient load reduction achieved annually.

We have completed lake and watershed studies for 6 of the lake's 10 bays, identifying 255 sites in need of mitigation/restoration. **The LWA, in partnership with NHDES, private foundations, municipalities, businesses, homeowner associations, and property owners, has secured funding and/or assisted in the completion of 48 restoration projects, resulting in nutrient loading reduction to the lake of 67 tons sediment, 108 pounds of phosphorus, and 681 pounds of nitrogen annually. These restoration projects have come at a cost of \$881,609, with grants contributing \$163,308, and local match contributing \$687,301 in funding.**

You can check out these projects by visiting our website at [www.winnepesaukee.org/how-we-protect-winni/restoration](http://www.winnepesaukee.org/how-we-protect-winni/restoration). Click on a rectangle to learn more about the issues with that particular site.





# LAKE RESTORATION FEATURE PROJECT

## STATE'S LANDING: A SUCCESS STORY

The State's Landing project site was identified in the 2017 Moultonborough Bay Inlet Watershed Restoration Plan as in need of extensive stormwater runoff improvements to reduce pollutant loading to Lake Winnepesaukee. The town-owned beach has frequently experienced high levels of E.coli, increased sedimentation, plant growth, and erosion along the beach, making the site virtually unusable as a recreational area.

In June 2020, the town of Moultonborough approved the expenditure of \$350,000 to begin making the necessary improvements to the beach area. This multi-phased project included restoration, stormwater improvements and enhancements to the recreational areas as listed below:

- Reconstruction of the boat launch
- Dredging for beach restoration
- Regrading the road to direct runoff into vegetated areas
- Construction of rain gardens to capture runoff from the road and parking areas
- Installation of drainage swales
- Childrens play area, horseshoe pits, volley ball court, and a paved trail system around the wetland complex

LWA assisted with the rain garden piece of the project. Rain gardens utilize plants and other natural materials to capture, absorb and treat polluted stormwater runoff. In addition to reducing the amount of pollutants entering the lake, they also help to recharge groundwater. Native plants such as Low Bush Blueberry, Clethra, Blue Flag Iris, Phlox and Cardinal Flower fill in the rain gardens offering a treatment that is not only functional but aesthetically pleasing too! This project was completed in June 2022 with funding from the Town of Moultonborough, the Samuel P. Hunt Foundation, and contributions from Miracle Farms Landscape Contractors.

**The rain gardens are estimated to remove 818 lbs of total suspended solids, 1.3 lbs of total phosphorus and 20.2 lbs of total nitrogen from Lake Winnepesaukee annually.**





# BUILDING CONNECTIONS & ENGAGING COMMUNITIES

In addition to our cyanobacteria education and 'Be Winni Blue/LakeSmart' outreach, the LWA is available to make presentations to communities and homeowner associations. Presentations are a great way for people to have their specific questions or concerns addressed in a smaller and less formal setting. This year, the LWA attended the Lake Kanasatka Watershed Association, Cedar Cove Association, Krainewood Shores, and Sandy Cove annual meetings to discuss the importance of LWA's work and answer water quality questions. If your association is interested in having LWA present or come to your annual meeting, please contact us.



In addition to homeowner association's presentations, LWA delivered two cyanobacteria presentations in collaboration with the Town of Moultonborough, the Waukegan Watershed Advisory Committee, the University of New Hampshire and other local lake protection associations. These presentations were aimed to **educate the public** on the threat of cyanobacteria to our lakes and the actions everyone can take to help prevent algal blooms.



## Aquatic plants of Winnepesaukee: Beware the hitchhiker

By JACKIE BELLEFONTAINE  
LAKE WINNIPESAUKEE ASSOCIATION

If you frequently recreate on Lake Winnepesaukee, at some point you've pulled some mysterious slimy plant off of your boat and probably put it back in the water not thinking much about it or if you're a little mischievous like me, throw it at an unsuspecting friend for a laugh!

Lake Winnepesaukee is home to many aquatic plant species that can be found on and below the water's surface. These emergent and submersive species are surely loaded around the lake with the greatest concentration of aquatics being found in the northernmost portion of Moultonborough Bay. Emergent vegetation found in Winnepesaukee includes



BELLEFONTAINE

yellow and white water lily, pickerelweed, and water shield; submersives include pondweed, bladderwort, quillwort, and pipewort. These species are all native and an important part of the lake's ecosystem. However, Lake Winnepesaukee is also home to invasive species that threaten the lake's health.

Invasive species are organisms that thrive in ecosystems that they did not naturally develop in and can cause harm to the environment, people and the economy of the region from costly removal efforts to lowering property values. Large growths of invasive species in water bodies can make recreating in them dangerous. Lake Winnepesaukee currently has one

See next page



Pipewort is a species native to Lake Winnepesaukee, and an important part of the lake's ecosystem. (Courtesy photo/Peter Dziul)

## SPREADING AWARENESS

LWA began a **new educational outreach strategy** to reach the public with important lake protection topics through a collaboration with the **Laconia Daily Sun**.

This summer, LWA hired Jackie Bellefontaine, as Conservation Outreach Manager. Jackie's responsibilities involve managing LWA's social media, and educational and outreach activities. A great new outreach activity that Jackie began is the writing weekly of articles on **"Ways to Love the Lake"** lake protection pieces in addition to other engaging lake-related topics, such as how Lake Winnepesaukee was formed, in the Laconia Daily Sun's boating section. With a circulation of 18,000, this has proven to be an effective way to reach the public and educate on how they can help to "Keep Winni Blue".

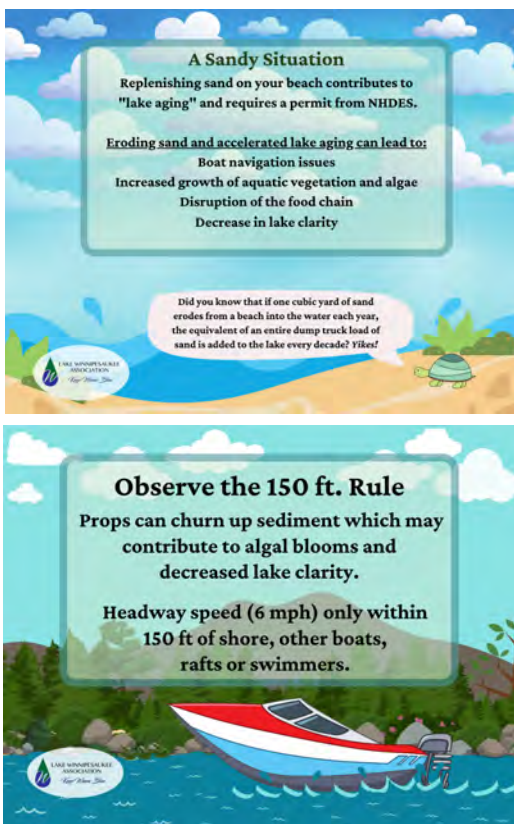
**One of LWA's "Ways to Love the Lake" articles published in the Laconia Daily Sun. Check out all previously published LWA articles in the Laconia Daily Sun's boating section at [www.laconiadailysun.com](http://www.laconiadailysun.com)**



# BOOKMARKS, POSTCARDS, T-SHIRTS AND MORE!

"Ways to Love the Lake" and "Keep Winni Blue" educational materials have been distributed to businesses, organizations, libraries, and community centers around the lake. The information included in these materials promotes safe boating, the protection of water quality and wildlife, and the usage of phosphorus-free fertilizers.

As of now, **48 retailers and other organizations** have agreed to display these educational materials to the public. If your business or homeowner association is interested in receiving any of these materials, please contact LWA.



LWA has launched a new line of merchandise! LWA "Keep Winni Blue" hats and t-shirts are now available for purchase at the Gilford Country Store. All proceeds from your purchase will help benefit our mission to "Keep Winni Blue".

## Thank you to the following retailers for participating in our Phosphate Free Fertilizer Campaign

- Alton Home & Garden Center
- Alton True Value
- Aubuchon Hardware
- Bradley's Hardware
- E.M Heath Hardware
- Heath's Ace Hardware
- Moulton Farm
- Osborne's Agway Winnisquam
- Spider Web Gardens
- Tractor Supply Co.





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*Keep Winni Blue*

Nonprofit Org  
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Permit No. 20.

**Join us for LWA's  
Annual Meeting!**

**November 15th  
7-8 PM via Zoom**

Visit LWA's website at  
[www.winnepesaukee.org](http://www.winnepesaukee.org)  
for the Zoom link.  
See you there!

## THANK YOU TO OUR 2022 SPONSORS!



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