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WINTER 2025 Honeoye Lake Watershed Task Force Newsletter

A Growing Concern: European Frogbit Permeates the Honeoye Inlet

By Amy Slentz, Aquatic Invasive Species Program Manager FL PRISM, Finger Lakes Institute at Hobart and William Smith Colleges

The aquatic invasive species European frogbit (*Hydrocharis morsus-ranae*) was first observed in the Honeoye Lake inlet in 2023, just a half-mile paddle from Muller Field Station. This small, floating aquatic plant, native to Europe and Asia, is known for its

rounded, kidney-shaped leaves and white, three-petaled flowers. European frogbit can spread rapidly, forming dense mats on the water's surface that block sunlight and reduce oxygen levels. As the plant takes over, it can outcompete native species and threaten biodiversity. In 2023, a Finger Lakes Institute (FLI) Watercraft Steward observed a single individual of European frogbit while stationed at the Honeoye Lake State Marine Park. Later that season, Finger Lakes Community College's Muller Field Station staff discovered what appeared to be a small infestation of the plant in the inlet channel. In 2024, the Muller Field Station team collaborated with the New York State Department of Environment Conservation (NYS DEC), Finger Lakes Partnership for Regional Invasive Species

Partnership for Regional Invasive Species Management (FL PRISM), and a team of community volunteers to survey and manage the infested areas. Nearly eight acres were surveyed, and the crew pulled **591 pounds** of the invasive plant from the winding inlet. Efforts to monitor the growth of European frogbit and implement

European frogbit can be found in quiet, shallow, slow-moving waters including marshes, ditches, swamps, & the littoral zone of lakes. The small floating leaves tend to intermingle with valuable native species. *Photo credit: Amy Slentz*

strategies to minimize its impact will continue. In addition to ecological repercussions, the presence of European frogbit in Honeoye Lake poses a potential risk to water quality and the Honeoye Lake fishery that is enjoyed by visiting and local anglers. The Honeoye Lake community is encouraged to be vigilant and report sightings of any non-native plant to the Finger Lakes PRISM (*flprism@qmail.com*). While preventative measures are the most effective management strategy, early detection of new infestations is also key to controlling the spread of aquatic invasive species and protecting our invaluable natural spaces. By working together with local, regional, and statewide partners, we can protect the health of Honeoye Lake and the surrounding Finger Lakes region.

Honeoye Lake Watershed Task Force (HLWTF) Chairman's 2024 Project Update: Terry Gronwall

Projects to improve water quality in Honeoye Lake and its watershed

The Honeoye Lake Watershed Management Plan, the New York State (NYS) Department of Environmental Conservation's (DEC) Harmful Algal Bloom (HAB) Action Plan, and DEC's Total Maximum Daily Load (TMDL) Plan all have a common focus to implement Best Management Practices (BMPs) to reduce nutrient loading (both internal and external) and sediment reaching Honeoye Lake.

HLWTF Website: Please check out our comprehensive HLWTF website. It has regularly updated Honeoye Lake data, a summary of HLWTF completed water quality projects, information on upcoming projects, Honeoye Lake water quality planning documents, past HLWTF newsletters, and guides that lake residents can follow that will help to reduce nutrient run-off into the lake. The website also contains a weekly summer water quality blog: www.honeoyelakewatershed.org

NYS DEC Water Quality Improvement Project (WQIP) Round 16 Grant application for Honeoye Lake Aeriation System Engineering Planning

Project: Ontario County Planning Department and the HLWTF engaged a lake management consultant in 2022 to complete a grant funded detailed aeration system engineering design study required for a potential future permit application and implementation grant. A decision on whether to pursue grant funding and implementation of an aeration system will be made after the DEC completes their Alum Treatment Pilot evaluation. We are currently evaluating large lake aeration case studies. Information on this potential project is available on the HLWTF website.

Hemlock Woolly Adelgid (HWA) Projects: Ontario County Soil & Water Conservation District (SWCD) completed a grant funded HWA mitigation project in the Honeoye Lake watershed. It is very important to try and save the hemlock trees to protect critical riparian areas and prevent erosion. See article in newsletter. **European Frogbit Volunteer Removal Initiative:** FLCC Muller Field Station team and FL-PRSIM organized a volunteer effort to remove 591 pounds of European Frogbit, an invasive aquatic plant, from the Honeoye Lake inlet.

DEC Honeoye Lake Nutrient Inactivant Pilot Project: DEC Alum Treatment was completed in November 2022. We did not see the expected phosphorus reduction, algae reduction, and water clarity increase during 2023-2024 summer season. DEC is evaluating first and second year post-treatment results. Honeoye Lake Nutrient Inactivant Pilot Study (arcgis.com)

2024 HLWTF Newsletter: Our 2024 HLWTF Winter newsletter was published in February 2024. This newsletter contained information on recent HLWTF projects and lake related educational articles.

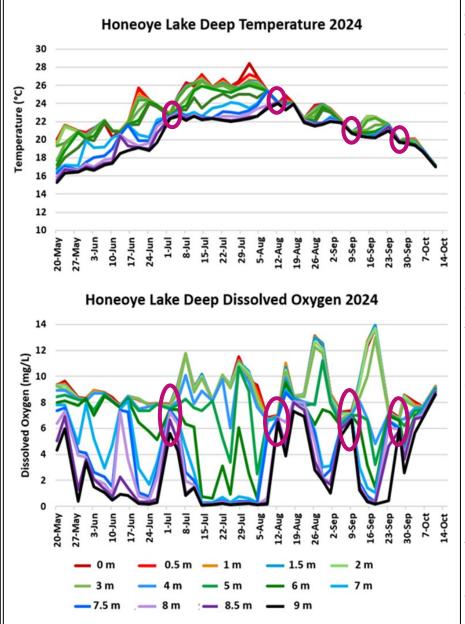
Blue-Green Algae Monitoring Project: At the request of NYS DEC, the lake surface was visually examined for blue-green algae blooms at 10 locations once a week from June through mid-October 2024. Results were shared on the DEC HABs alert web site as well as posted weekly on HLWTF web site water quality blog.

2024 Collected Lake Water Quality Data June-Sept.: HLWTF collected weekly water column temperature and dissolved oxygen profiles, and water clarity data. Water samples were collected twice a month (June-September) for lab testing for phosphorus and nitrogen. Honeoye Valley Association (HVA) citizen Secchi Disk volunteer program collected near shore water clarity and temperature data.

These projects result from a partnership among NYS DEC, Ontario County Planning Department, Ontario County SWCD, Finger Lakes Community College, Finger Lakes Institute, Finger Lakes Partnership for Regional Invasive Species Management (FL-PRISM), Cornell University, Honeoye Valley Association, lake residents, lake users, and the Towns of Richmond, Canadice, Bristol, South Bristol, and Naples. For more information, please contact Terry Gronwall, HLWTF Chairman, at watershedtaskforce@gmail.com.

2024 State of the Lake By Terry Gronwall, Honeoye Lake Watershed Task Force

Following an unusual winter with little to no ice cover, Honeoye Lake returned to a near normal seasonal temperature profile, reaching a peak of 28 degrees Celsius (~82.4 F) at the surface in late July. Heat gained at the surface was transferred downward by seiche activity (internal waves), seen from late May through early August in



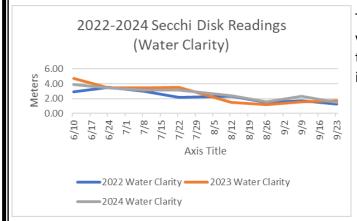
the charts to the left. It is clearly seen in the volatility of the 7 meter (23 feet deep) blue temperature lines. The lake also had four complete summer mixing events (see the dark pink circles (), the first in early July, the second in mid-August, the third in early September, and the fourth in late September. Complete mixing events are depicted in the charts where the black oxygen line (30 feet deep) converges with all other depth lines, indicating the lake depths are uniform in both temperature and dissolved oxygen. Each partial or complete mixing event will bring phosphorus (released from deep sediment when the lake was stratified) into the whole water column and potentially to the surface fueling our blue-green algal blooms. The longest period of lake stratification in 2024 occurred from mid-July to early August. It was only about three weeks of stratification. In July and early August of 2023, we had a period of about six weeks of stratification. Since phosphorus is released from the lake's bottom sediments when the lake is stratified and the bottom water is anoxic (near zero dissolved oxygen), the shorter period of stratification in 2024 contributed to lower phosphorus levels and lower algae levels in 2024 as compared to 2023.

A lake's water quality is affected by the complex interaction of physical, chemical, and biological factors. Physical factors are

water temperature, wind, and rainfall. Chemical factors are phosphorus and nitrogen levels in the lake water. Biological factors would be like the impact of zebra mussels, which eat the green algae (good algae) and spit out the blue green algae, shifting the blue-green algae to be dominant. Zebra mussel waste products are highly bioavailable nutrients for algae to use as food too. Another biological factor is Gloeotrichia, a blue-green algae that blooms from mid-June until late July. When it dies in late July, the excess phosphorus it has not used to grow is released into the water column, along with phosphorus released from the bottom sediments and rainstorm runoff to fuel our traditional late summer blue-green algae blooms. When Gloeotrichia dies, its reproductive resting cells settle on the shallow water bottom sediments, where it directly absorbs phosphorus from those sediments over a warm winter and spring; it then blooms again the next year.

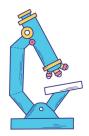
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2024 State of the Lake Continued...

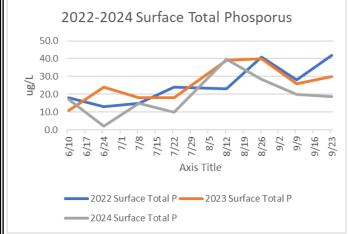


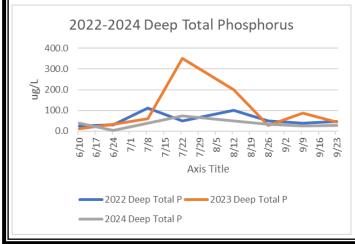
2022-2024 Chlorophll-a (Algae Levels) 150.0 100.0 ug/L 50.0 0.0 8/5 7/15 7/29 3/12 8/19 6/6 9/16 5/24 3/26 9/2 6/103/2 7/22 5/17 7 Axis Title 2022 Chl-a 2023 Chl-a _____2024 Chl-a

The Lake's Secchi Disk readings (water clarity) in 2024 were very similar to 2022 and 2023. Water clarity is affected by turbidity caused by rain storm runoff and the density of algae in the water column. See chart on the left. 1 meter = 3.3 feet



The pigment chlorophyll-a is a measure of algal abundance. The greatest amounts of algae in 2024 occurred in late August. This was shortly after the mid-August lake mixing event. The 2024 algae levels were significantly lower than in 2022 and 2023. The 2024 peak algae level was ~40 ug/L. The 2023 peak algae level was ~100 ug/L and the 2022 peak algae level was ~90 ug/L.





The highest amounts of phosphorus in the surface water occurred in early August in 2024. This was when the lake completely mixed after being stratified for about three weeks. The total peak surface phosphorus level in August for 2022, 2023, and 2024 were very similar at ~40 ug/L. However, in 2024 the total phosphorus levels were lower than 2022 and 2023 in June, July, late August, and September. Rain storm runoff can also contribute to the lake's surface phosphorus levels. In 2024 we had a normal amount of summer rain, so rain should not have been a factor in contributing to our lower surface phosphorus levels than in 2022 and 2023.

The 2024 deep phosphorus level peaked at ~75 ug/L. The 2023 peak deep phosphorus level was ~350 ug/L. The 2022 peak deep phosphorus level was ~100 ug/L. Since phosphorus is released from the lake's bottom sediments when the lake is stratified and the bottom water is anoxic, the shorter three-week period of stratification in 2024 versus about a six-week stratification period in 2023 is a factor in 2024 having lower deep phosphorus levels than 2023.

2024 Update on the NYS DEC Honeoye Lake Nutrient Inactivant Pilot Study and the Honeoye Lake Aeration Engineering Planning Project

By Terry Gronwall (HLWTF) & Betsy Landre (Ontario County Planning Department)

New York State Department of Environmental Conservation Division of Water (NYS DEC) is working towards completing its evaluation of the Honeoye Lake Nutrient Inactivant Pilot Treatment. In 2022, DEC applied a partial treatment of aluminum sulfate (alum) to portions of Honeoye Lake to trap phosphorus in the sediment and help address impacts to water quality in the lake. DEC is using this effort, along with two other pilot projects on Peach and Mohegan Lakes, located in Putnam and Westchester Counties, respectively, to inform potential guidance and permit



requirements on the use of nutrient inactivants in New York. DEC will hold a public meeting in 2025 to provide a summary of findings from the Honeoye Pilot Treatment. More information on DEC's Alum Treatment Project is available at: <u>Honeoye Lake Nutrient Inactivant Pilot Study (arcgis.com)</u>.

The first phase of the Honeoye Lake Aeration Engineering Planning Project was completed in 2022 with funding from the NYS Environmental Protection Fund as administered by NYS DEC, Honeoye Lake Watershed Task Force, and Ontario County Water Resources Council. The Aeration Engineering Planning Report and public Webex recording are available at: <u>https://www.honeoyelakewatershed.org/aeration</u>

Both DEC's Nutrient Inactivant (Alum Treatment) Study and the Aeration Planning Project are intended to address the same source of legacy phosphorus contributing to algae blooms in Honeoye Lake; legacy phosphorus is released from deep-water lake bottom sediments during periods of lake stratification (when oxygen becomes depleted in the Lake's bottom layer).

While the Alum Treatment is evaluated by the DEC, the Aeration project committee continues to review the effectiveness and reliability of existing aeration systems in use in North America. Practical, first-hand knowledge from managers of aeration systems, along with the findings of the Honeoye Lake Aeration Engineering Planning Project, will assist local decision-making regarding the risks and potential benefits of using aeration to control legacy phosphorus in Honeoye Lake.

The overall goal is to reduce the negative impacts of algae blooms. Tools like an aeration system and/or alum treatment (should DEC approve permitting for alum applications in NYS lakes) would require significant community investment. State grant funding may be available to meet a portion of the cost, but local leaders must have a high level of confidence in any tool to commit resources needed for such a project. Key factors that

contribute to algae growth are nutrients (phosphorus and nitrogen), high temperatures, and calm wind. Two studies agree Honeoye Lake's primary source of phosphorus fueling algae blooms comes from deep-lake bottom sediments. However, data emerging from other Finger Lakes provide confounding evidence that algal blooms can and do happen in lakes with far less phosphorus available than Honeoye Lake. Other factors that we are evaluating over the next year are the role zebra mussels play, the warming climate trend, and characteristics of Gloeotrichia, a blue-green algae, that can act like a phosphorus pump from shallow water sediments. Lakes are very complex ecosystems. See the State of the Lake article on page 3 for more information.



Honeoye Lake Watershed Task Force Newsletter

\$640,000 Awarded in WQIP Grant Funding to the District for Projects in Ontario County

By Ontario County Soil & Water Conservation District (SWCD)

Governor Kathy Hochul recently announced more than \$225 million awarded to 165 projects to significantly improve water quality across the state. The grants support projects that will help protect drinking water,

update aging water infrastructure, reduce contributors to harmful algal blooms, and improve aquatic habitat in communities statewide. Through the New York State Department of Environmental Conservation's Water Quality Improvement Project (WQIP) grant program, these projects will directly improve water quality or aquatic habitat, promote flood risk reduction, restoration, and enhanced flood and climate resiliency, or protect a drinking water source.

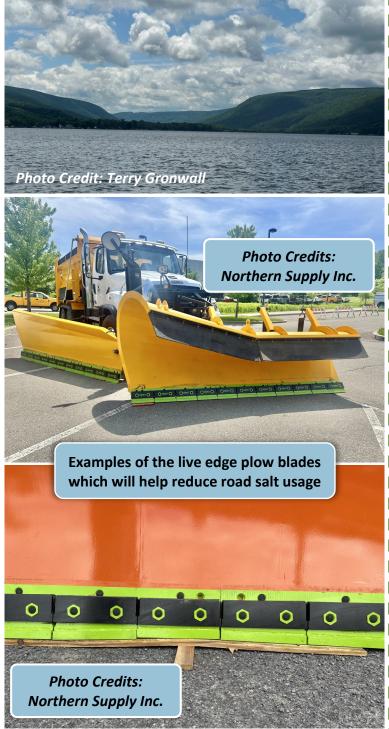
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We were excited to receive news that three of our water quality projects received funding through the Water Quality Improvement Project Program Round 20. Congrats to all who were awarded funding!

One of the projects involves road salt reduction. Ontario County Soil & Water Conservation District will work with municipalities in Ontario and Yates Counties to purchase live edge plow blades, weather monitoring equipment, and sanding equipment to reduce road salt application. The project will protect water quality within the Canadice, Honeoye, and Canandaigua Lake watersheds.

The second funded project involves roadside stabilization throughout Ontario County. The District will implement a county-wide roadside stabilization program utilizing hydroseed to stabilize road ditches to prevent erosion and support roadside stabilization projects such as using flexi-mat to protect roadside drainages from erosion. The program will reduce sediment and nutrient loading in the Canadice, Honeoye, and Canandaigua Lake watersheds.

The third project is a planning grant for a future Naples Creek Streambank Restoration Project. The District will create a design report to inform



stabilization of eroding streambanks along two miles of stream. The report will create a project design to implement natural stream channel design concepts to reduce erosion and restore aquatic habitat along Naples Creek. For more info on the WQIP grant funding and awards, <u>click here.</u>

Water Workshop Held by Ontario County SWCD

By Ontario County Soil & Water Conservation District

Photo Credits: Intario County SWC



We held a free Water Workshop on November 21, 2024 that was packed with information on septic systems, wells, groundwater & surface water basics, stormwater best management practices, and much more. We had 45 attendees and we plan to hold more of these workshops next year, so stay tuned! The attendees were real estate professionals, code enforcement officials, planning and zoning board members, municipal employees, and community members.

Page

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Thank you to all of our sponsors who covered food expenses, our amazing speakers for sharing their expertise, and for the attendees who were engaged and asked great questions. You all made this event such a success.

We are all so lucky to live and work within the Finger Lakes region and to be close to the Great Lakes. With all of these amazing waterways comes an even bigger responsibility to preserve and protect our freshwater resources. Do you know how to manage your well? Do you know how your septic system functions and how to maintain it? Do you know about wetlands and the regulations you need to follow to protect them? Do you know all about stormwater and how construction and development effect the flow of rainwater and snowmelt? These are all topics we cover at the training.

For more information on our septic programs, check out our website at <u>www.ontswcd.com/onsite-wastewater-treatment</u>.

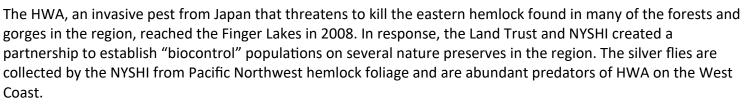
For specific regulations, best management practices, and information specific to the Honeoye Lake Watershed, check out the <u>Stormwater Toolkit</u> on the HLWTF webpage.

Partnership Addresses Threats to the Eastern Hemlock

By the Finger Lakes Land Trust

In March, the Land Trust partnered with the New York State Hemlock Initiative (NYSHI), a project of Cornell University, and Ontario County Soil and Water Conservation District to release roughly 800 silver flies (*Leucotaraxis argenticollis* and *Leucotaraxis piniperda* species) at the Wesley Hill Nature Preserve in Ontario County to combat the hemlock woolly adelgid (HWA).

Silver flies feed on HWA and show promise as potential biological controls when used with other methods.

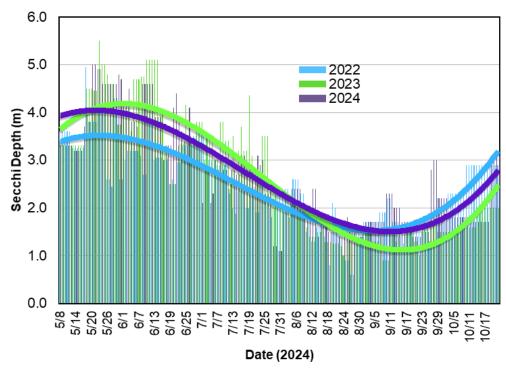






2024 Honeoye Lake Secchi Disc Program

By Linda Vanderbeck, HVA Secchi Disk Volunteer Program Coordinator



2022-2024 Secchi Trend

The Secchi Disc Program is one of the many lake monitoring activities that take place on Honeoye Lake. The program objective is to measure and monitor water clarity by using an instrument called a Secchi disc. Volunteers took 123 Secchi measurements during May-October while also noting water temperature, weather conditions and several subjective parameters regarding the lake's potential for recreational enjoyment.

For Honeoye Lake, water clarity is primarily a function of algae concentration and to a lesser degree, turbulence from runoff during heavy rainstorms. The Secchi Disc Program has been collecting data for about 8 years

providing data for accurate year-over-year trend analysis. The trend analysis from 2022-2024 is especially interesting because it is a good indicator for the effectiveness of the NYS DEC's alum treatment applied to Honeoye Lake in November 2022.

The graph above shows the three-year Secchi trend lines: the blue line represents 2022, the summer prior to the alum application; the green and purple lines represent 2023-2024, the two summers following the alum

application. All three years follow Honeoye Lake's typical pattern of clear water in spring and early summer when water temperatures are relatively low, then gradually becoming less clear through summer and early fall as water temperatures increase. Notably, there are no significant differences in the pattern or intensity of water clarity during the past three years indicating that the alum treatment of 2022 had limited effect on water clarity.

The Secchi Disc Program will continue monitoring the Lake's water quality in 2025 and beyond, contributing to the understanding of lake dynamics and the factors that influence them.



2024 Finger Lakes Institute Watercraft Steward Update

By Tabitha A. O'Brien, Watercraft Steward Program Coordinator at the Finger Lakes Institute at Hobart & William Smith Colleges

Watercraft inspections are one of several preventative measures used to help combat the spread of aquatic invasive species (AIS), which often travel through human vectors during boating, fishing, and other recreational activities. At Honeoye Lake State Marine Park (HLSMP), the primary goal of watercraft stewards is to conduct voluntary inspections of all launching and retrieving watercraft, including kayaks and canoes. Stewards from two different Watercraft Inspection Steward Programs (WISP) operated at HLSMP in 2024. Those organizations are the Finger Lakes Institute (FLI) and the State University of New York College of Environmental Science and Forestry (SUNY ESF) in combination with the New York State Office of Parks, Recreation, & Historic Preservation (NYS OPRHP). Coverage for stewards was coordinated between the two programs to ensure comprehensive and complimentary steward coverage throughout the 2024 season.

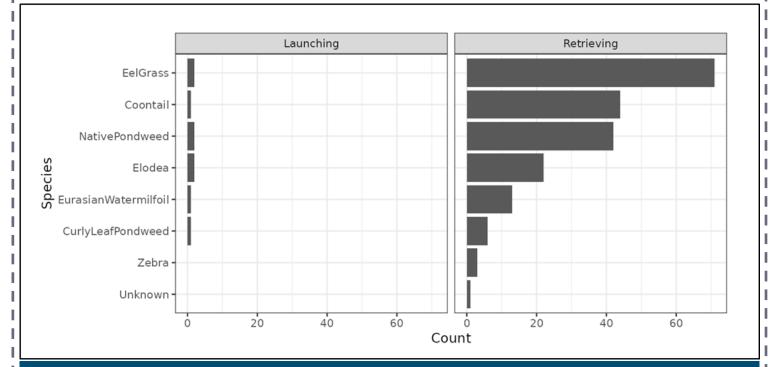


Figure 1. Total detections of native and invasive species separated by launching and retrieving at Honeoye Lake State Marine Park in 2024. Stewards are most likely to detect AIS on retrieving watercraft, a common trend throughout the Finger Lakes region

This year, FLI watercraft stewards provided coverage to HLSMP from June 21 to August 26. In 2024, the number of days covered by an FLI steward decreased from the 2023 season. In total, FLI stewards provided 19 days of coverage. This is due in part to FLI steward availability and increased steward coverage from SUNY ESF and NYS OPRHP programs. This impacted some of the results below when comparing steward activities to previous years.

During watercraft inspections, stewards collect data on several variables such as group size, number of watercraft, average watercraft per day, boater activity, organisms detected, and more. At HLSMP, FLI stewards inspected 298 watercraft for an average of 16 watercraft per day. The most commonly reported boater activity at I the launch was angling, followed by recreation (**Figure 2**). Of the 298 watercraft inspected, 34% (n=91) had organisms detected, and 26% (n=24) had invasive species detected. However, on some watercraft, both native and invasive species were detected. The most common AIS found during inspections at HLSMP were

Honeoye Lake Watershed Task Force Newsletter

Watercraft Stewards Update Continued...

Eurasian watermilfoil (n=14), curly-leaf pondweed (n=7), and zebra mussel (n=3) (**Figure 1**). The most common AIS observed across the Finger Lakes in 2024 were Eurasian watermilfoil (n=1630), curly-leaf pondweed (n=1122), and zebra mussel (n=567).

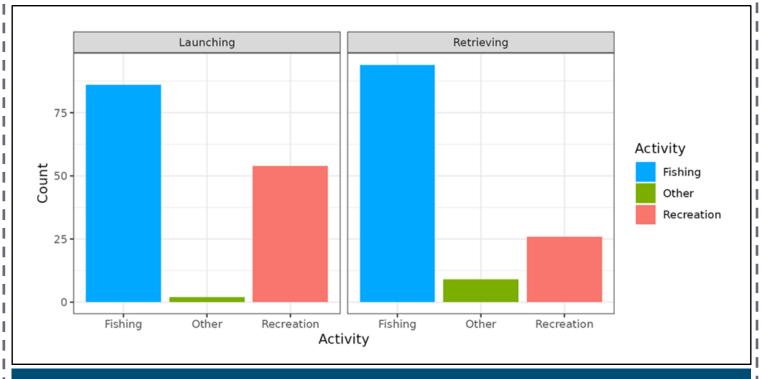


Figure 2. Total boater activity separated by launching and retrieving at Honeoye Lake State Marine Park in 2024. The main activity was angling followed by recreation, a common trend at HLSMP.

Another primary goal of watercraft stewards is to disseminate information and educate boaters, anglers, other launch users, and community members to encourage early detection and prevention of AIS threats. FLI stewards interacted with 576 boaters and community members at HLSMP this season. Stewards try to maintain a positive impression with the community, which is important as boat inspections are voluntary. Nearly all launch users (97%) allowed stewards to conduct inspections.



FLI watercraft stewards interact with thousands of boaters and community members each season and detect hundreds of AIS across the Finger Lakes region. Active interceptions of AIS, education, and outreach are invaluable in preventing the spread of AIS on Honeoye Lake and the surrounding Finger Lakes. The continual detection of invasive species within Honeoye Lake and the surrounding region highlights the importance of continuing WISP coverage for future seasons.

Partial funding for watercraft stewards on Honeoye Lake is provided by the Canandaigua Lake Watershed Council.

Honeoye Lake Receives a New Tool to Fight Aquatic Invasive Species

By Betsy Landre, Ontario County Planning Department

The Honeoye Lake community has a new tool to fight the spread of aquatic invasive species that severely alter and damage lake environments. A waterless, boater-operated cleaning system developed by CD3, a Minnesota-based company (the land of 10,000 lakes), recently arrived! The cleaning station will be conveniently located at the New York State Honeoye Lake Marine Boat Launch in the spring of 2025, and will be free for all to use.

CD3 stands for "Clean, Drain, Dry and Dispose." The CD3 cleaning station will complement the work of the watercraft stewards who inspect boats and trailers and provide education about invasive species to launch users. The standalone, self-service unit offers an air blower, wet-dry vacuum, and hand tools to help boaters remove and

dispose of water, weeds, and debris, including leftover bait.





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The cleaning station is made possible through the New York State Department of Environmental Conservation Finger Lakes Watershed Grant Program to Ontario County with matching contributions from the Town of Richmond, Town of Canadice, and Ontario County Water Resources Council.

Starting next spring, the CD3 System will help the boating community take an active role in stopping the spread of invasive species (like Eurasian watermilfoil and zebra mussels) *from* Honeoye Lake as well as *to* the lake (such as starry stonewort and hydrilla, which are present in other Finger Lakes but have not been identified in Honeoye). A free, self-service boat cleaning system will make it easier for day-boaters to do their part to protect local lakes and fisheries.

More information is forthcoming in 2025. For more information on the cleaning system visit <u>www.cd3systems.com</u>.

Honeoye Lake Big Panfish Initiative

By Peter Austerman, New York State Department of Environmental Conservation



The Big Panfish Initiative (BPI) was developed to create destination fisheries for larger size panfish (pumpkinseed, bluegill, black crappie) in select waters. The BPI is an experimental program that is being conducted to determine the impacts of lower harvest and minimum size limits

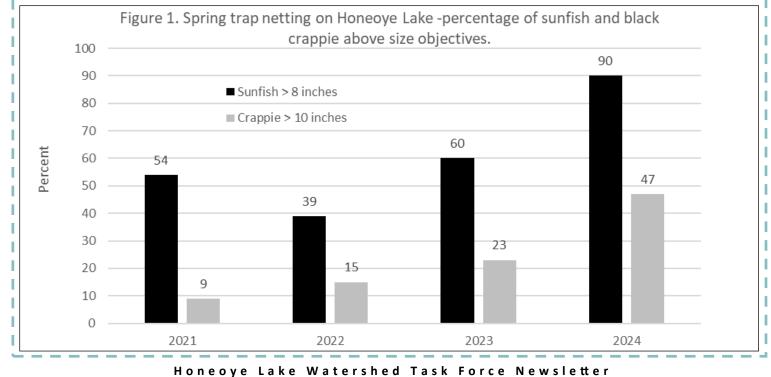


on sunfish size structure in select lakes throughout New York. It also includes an assessment of crappie population age and growth characteristics in select waters to determine if those waters have the potential to yield larger fish under more conservative harvest regulations.

Honeoye Lake was included as one of the study lakes that will be managed for large panfish. Special fishing regulations for sunfish (bluegills and pumpkinseeds) on Honeoye Lake (and other BPI waters) began on April 1,

2022. The new sunfish regulations are: 8-inch minimum size limit and a daily possession limit of 15. In addition, the statewide minimum size limit for crappie was increased from 9 to 10 inches beginning on April 1, 2022. One of the objectives of these regulations is to increase the number of 8-inch sunfish and 10-inch crappie.

All BPI lakes are being sampled for five years to track any changes in panfish populations and to determine if
regulation changes result in improved size structure. Our fourth year of sampling was completed in April 2024
using Oneida style trap nets. The sampling conducted in 2021 and 2022 took place before regulation changes
could potentially impact panfish populations and these two surveys are used as a baseline to compare against.
The proportion of 8-inch sunfish and 10-inch crappie in our sample has increased since the new regulations were
put in place in 2022 (Figure 1). While there are many environmental factors that could influence panfish size
structure, if appears that these new regulations are having a positive impact on size structure in Honeoye Lake.
We plan to complete our five-year sampling plan in spring 2025. For more information on the BPI, see the <u>New</u>
<u>York State Department of Environmental Conservation (NYS DEC) website.</u>



Constructing Historic Land Use/Land Cover Patterns for the Honeoye Lake Watershed & Exploring their Relationship to Modern Lake Condition

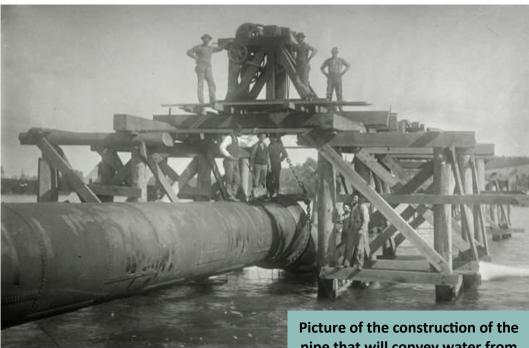
By Bruce Gilman, Science Advisor, Honeoye Lake Watershed Task Force & Kyle Ritts, Planning Aide, Ontario County Planning Department

Today Honeoye Lake is surrounded by a largely forested landscape that minimizes watershed erosion. Forest cover intercepts rainfall, reducing the direct impact of rainwater on the ground and instead allows for leaf drip and stem flow long after a storm has ended. Based on recent studies, large areas of the upland watershed support successional northern hardwood forests, Appalachian oak-hickory forests, hemlock-hardwood ravine forests and conifer plantations, while silver maple-ash swamps dominate the lowlands.

Our work with modern aerial images, extensive fieldwork, and LiDAR elevation data have produced an accurate picture of land use and land cover for the watershed (see page 17). For this map, we followed the plant community classification system of the New York Natural Heritage Program. It is a hierarchical classification system and is a widely used and accepted method of ecological community classification in the State. At the highest level, the Honeoye watershed can be broken down into four major systems: riverine, lacustrine, palustrine, and terrestrial. These can be further broken down into ten subsystems that capture natural processes or cultural uses. Finally, 38 specific community cover types are recognized. Because the New York Natural Heritage Program also ranks each cover type for its rarity, we can identify communities such as silver maple-ash swamp, floodplain forest, shale talus slope woodland and maple-basswood rich mesic forest that have statewide significance.

I The events that allowed the development of a historic land use and land cover map began years ago. In 1852, a

I cholera epidemic swept I through the City of Rochester, I creating the need to replace neighborhood wells with a cleaner, safer water supply. The City decided to use two Finger Lakes as upland water sources. From these lakes, water could be conveyed by buried pipeline to Rochester reservoirs, but project construction was delayed by the Civil War. In 1872, a Watershed Commission formed and in 1876, a distribution system finally went on-line, taking water from Hemlock and Canadice Lakes. By 1880, 4.5 million gallons per I day were being supplied to the City. By the 1920's, it was



v0000032.jpg Rochester City Hall Photo Lab

Picture of the construction of the pipe that will convey water from Hemlock Lake to the City of Rochester

I apparent that a larger water supply was needed. Honeoye Lake was
 I considered as a possible, additional water source; aerial photography of the

Honeoye Lake watershed and adjacent downstream areas commenced. Eventually Honeoye Lake was rejected
 in favor of water withdrawal from Lake Ontario, but the 1929 aerial photographs had already been _____Continued

Historic Land Use/Land Cover Patterns Continued...

taken and they captured the historic human land use and natural land cover patterns at that time for the region.

While it was lucky to have these historic photographs, their interpretation was challenging for several reasons. Unlike the modern images, these were taken during the summer when vegetation was in full leaf-on condition, and the photographs were black and white. Also, they were low resolution, limiting the ability to magnify them without blurring them. Lastly, they were compiled from multiple plane flights, meaning they were nonorthographic. Regardless, all 17 photographs were scanned to produce digital images, then the images were georeferenced to known landmarks, (a tricky procedure due to modern-day relocation of some major highways). Finally, images were merged to construct one historic image for the lake and its watershed using ArcGIS software. Then, to the best of our abilities, we created polygons that represented the apparent natural land cover or human land use across the 1929 watershed imagery. Each polygon was attributed with a plant community cover

type. As a disclaimer, a decision tree was created for assigning some cover types based on the historic photographs. Broad, generic assignments (e.g., forested vs. open lands) were easy to distinguish and produced excellent results. Recognizing smaller, specific community cover types (e.g., pasture vs. old field) required more careful examination. Other historic records were very helpful, especially the 1939 base maps for soil types that showed barns, pastures, orchards, and vineyards.

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Let' discuss some take-aways for comparing our historic versus modern watershed land use and land cover. There was an excellent match at the total watershed scale. In 1929, our calculated watershed size was 25,303 acres. In modern time,

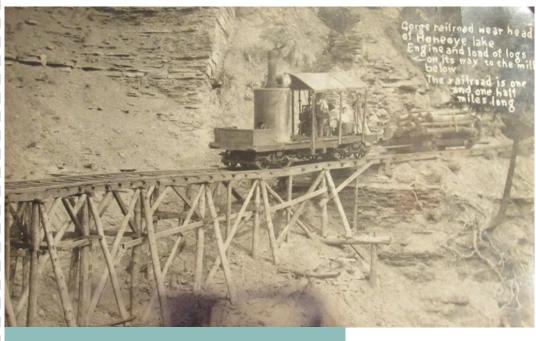
Picture of the sawmill at the southeast shoreline of Honeoye Lake. Photo from the Canadice Historical Society

our calculated watershed size is 24,498 acres. This represents a very small difference of 805 acres (i.e., about 3%), providing confidence in our techniques. At the system level of classification, there are some telling changes. The riverine system only slightly changed due to a minor increase in manmade canals in modern time. The lacustrine system increased by 108 acres. In modern times, people have a fascination with building ponds. We only detected 6 ponds in 1929 while in modern time we noted 239 ponds! That likely accounts for the increase in lacustrine acreage. The palustrine system declined by 348 acres, likely due to the loss of wetlands over time. Drainage, filling, and conversion to agriculture are the culprits. Finally, the terrestrial system declined over time by 576 acres. This is likely caused by errors in fitting the watershed boundary to the 1929 photographs which was particularly challenging where notable landmarks had changed significantly south of the lake.

Next, we will describe changes in the lacustrine subsystem categories. First, we were quite pleased with the close lake size comparison. In 1929 we mapped the lake as 1,815 acres and in modern time, our map has the lake as 1,830 acres! There was a small increase (15 acres) in eutrophic ponds over time, probably resulting

Continued

Historic Land Use/Land Cover Patterns Continued...



from historically drained lands reverting back when the marginal farmland was abandoned. Vernal pools increased slightly (2 acres) as a result of their creation as a wildlife management strategy for amphibians.

Now let us compare the palustrine (wetland) subsystem cover types. Here one of the biggest changes was in shallow emergent marshes which saw a decline of 79 acres, about a two thirds reduction in their coverage. We suspect they have gone through natural succession

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Picture of the logging trellis built up Briggs Gully. Photo from the Canadice Historical Society

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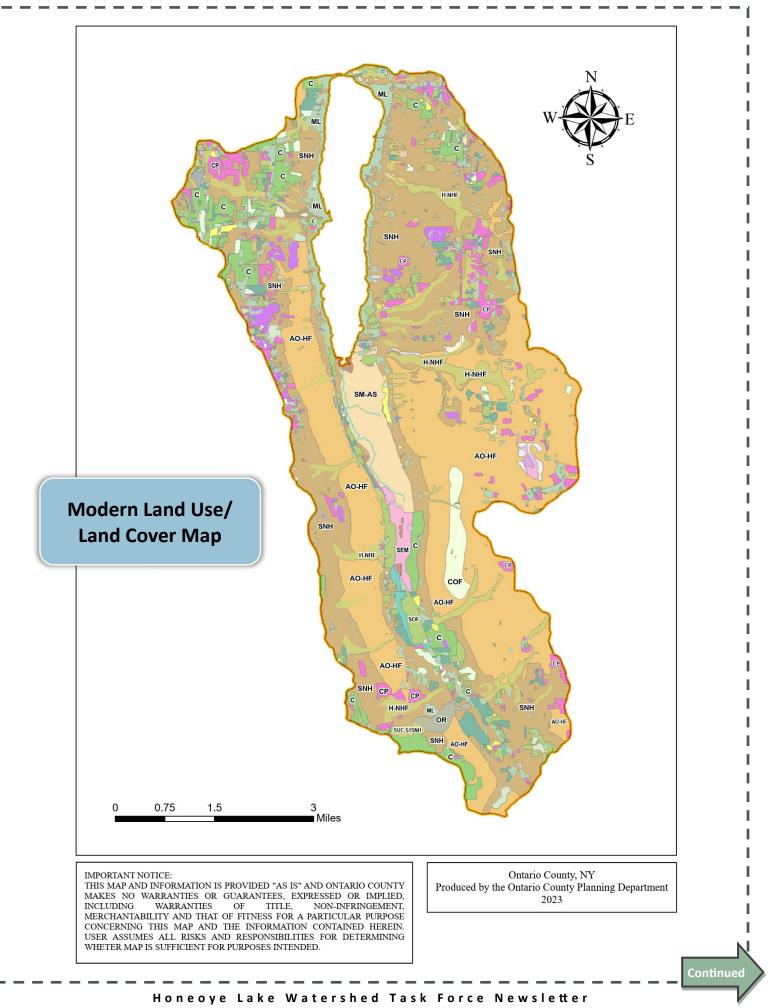
to form more silver maple-ash swamp in the southern I Honeoye Valley. We detected an increase of 166 acres (about 28%) in the silver maple-ash swamp cover type. Floodplain I

forest acreage remained essentially unchanged over time while the hemlock-northern hardwood swamp forests declined, probably a result of logging activities.

There were notable changes at the terrestrial subsystem level. Collectively, forested uplands increased by 6,126 acres and today cover 72% of the terrestrial landscape! Terrestrial cultural uses decreased by 5,534 acres, despite more residences along the shoreline and today only account for 18% of the terrestrial landscape! These changes are largely brought on by abandonment of farming in the watershed and we suspect abandoned farmlands have become successional northern hardwood forests today, about 95 years later! These forests accounted for 2,543 acres in 1929 but expanded to 10,800 acres in modern time. We note a slight decline in Appalachian oak-hickory forest which was historically preferentially logged for its high timber value and seems to not have fully recovered. Acreage of hemlock-hardwood ravine forests remains virtually unchanged. It has always been difficult to develop on steep slopes.

The final subsystem categories to compare are the cultural terrestrial cover types. How has the human fingerprint in the landscape changed over time? Today there are about 650 residences along the lake shoreline compared to less than 50 in 1929. This accounts for most of the increase in the mowed lawn cover type. There has been a significant increase in conifer plantations, 16 acres to 1,132 acres; most were planted after 1929 during the Civilian Conservation Corps days of the Great Depression period. Cropland fell from 4,794 acres to 985 acres, which is about an 80% decline! Similarly, pasture fell from 4,055 acres to 105 acres; that is a 97% decline. Without question there has been a large loss in agricultural activities in this rural watershed.

Although the modern watershed is largely forested, 95 years earlier it was not, helping us to better understand the significant watershed erosion that would have occurred followed by the transport of nutrients that ultimately were deposited in the lake. Today these legacy nutrients drive the internal loading that supports late season harmful algal blooms, but that's another topic for a future newsletter.

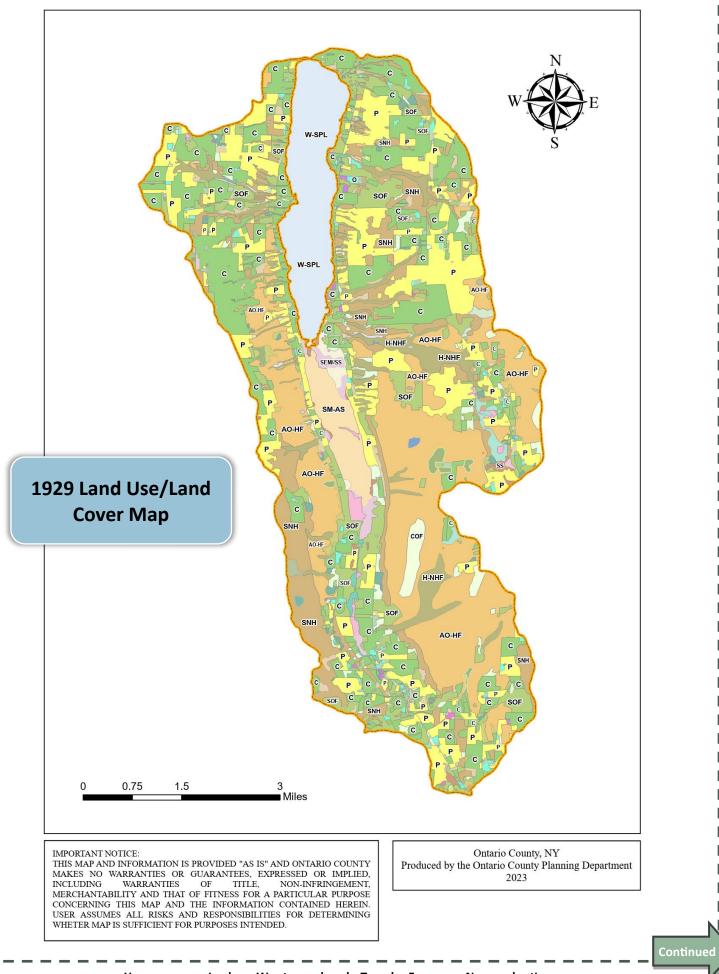


Modern Land Use/ Land Cover Legend

Appalachian Oak- Hickory Forest		Outdoor Recreation		Successional Old Field//
Appalachian Oak- Pine Forest		Pastureland		Successional Shrubland
 Cropland		Pitch Pine-Oak Forest		Successional Red Cedar
Construction/		Parking Area		Woodland//
Road Maintenance Spoils		Perched Swamp White Oak Swamp		Appalachian Oak- Hickory Forest Successional Red
CANAL		Red Maple-		Cedar
Chestnut Oak Forest		Hardwood Swamp		Woodland// Successional Northern
Conifer Plantation	558	Riverside Sand - Gravdel Bank		Hardwoods
Conifer Plantation//		Rural Structure Exterior		Shrub Swamp Shrub Swamp//
Successional Northern		RSL-F		Successional Northern
 Hardwoods		Sand Mine		Hardwoods
Confined River		(abandoned) Sand Beach		Successional Southern
Deep Emergent Marsh		Successional		Hardwoods Sewage
Eutrophic Pond		Blueberry Heath		Treatment Pond
Flower/Herb Garden		Shallow Emergent Marsh		Shale Talus Slope Woodland
Floodplain Forest		Shallow Emergent		Successional Shrubland
Farm Pond/ Artificial Pond		Marsh//Shrub Swamp	_	Successional Shrubland//
 Gravel Mine		Silver Maple-Ash Swamp		Conifer Plantation
Gravel Mine (Abandoned)		Successional Northern		Successional Shrubland//
Hemlock- Hardwood Swamp		Hardwoods Successional Old Field		Successional Northern
Hemlock- Northern Hardwood Forest		Successional Old Field//Conifer		Hardwoods Urban Structure Exterior
Maple-Basswood		Plantation Successional Old		Vineyard
Rich Mesic Forest		Field//Shallow		Vernal Pool
Mowed Lawn		Emergent Marsh		Winter-Stratified
Mowed Lawn With Trees		Successional Old Field// Successional		Polymictic Lake
Orchard		Northern Hardwoods		

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The Search for American Columbo (Frasera caroliniensis) in the Honeoye Watershed

By Bruce Gilman, Science Advisor, Honeoye Lake Watershed Task Force and Curator, Finger Lakes Herbarium, Finger Lakes Community College

My first encounter with American columbo was May 19, 2024, on a New York Flora Association field trip to the Sonyea State Forest in Livingston County. It was a wildflower that I had read about, but I had never seen in its natural habitat. And suddenly there it was, covering the crest and upper slope of a young oak-hickory forest overlooking a stream. It is a monocarpic perennial, meaning it only flowers once after multiple seasons of vegetative growth, then dies.

The vegetative growth is stunning, a large basal rosette of leaves often approaching two feet in diameter (see image to the right). It is unlike any other native wildflower of our region. After many years of growth, the plant will produce a tall, branched flower stalk containing up to 100 green-yellow flowers with purple speckles. By fall, half inch long, brown, oblong seed capsules form (see bottom right photo). Seeds are shed to the ground as the flower stalks die. The seeds persist in the seed bank for many years, germinating when environmental conditions are just right. Seeds will initiate a small root that eventually forms a thick, fleshy taproot system.

The conservation status of American columbo is precarious. Although it may live up to 30 years on the forest floor, it is threatened by invasive plant species that may takeover the habitat before the plant has opportunities to set its seeds. Additionally, deforestation may be destructive to the plant as they rely on the partial shade produced by a young forest tree canopy.

The New York Flora Atlas

(www.newyork.plantatlas.usf.edu) lists American columbo as a threatened species in our State, known to grow in only five counties based on vouchered herbarium specimen records. My interest was piqued when I saw there were records for Ontario County and all of them were from areas in and around the Honeoye Lake watershed. All the records were historic, dating from 1928 to 1941. I quickly researched the label
information on the vouchered herbarium specimens,
hoping to find specific details about locations where the plant was previously known to grow. I revisited two of the three sites during this past summer, accompanied by



Photo Credit: Bruce Gilman



Search for the American Columbo Continued....

fellow botanist Fred Haynes. Although we spent many hours atop the major gullies that drain to Honeoye Lake, our search efforts did not rediscover American columbo. We did encounter and document many plants and some significant County records, but that story will have to wait for a future newsletter.

Next, our attention turned to other sites adjacent to the Honeoye Lake watershed that might be suitable for American columbo. We searched around Naples, New York and although



we found some interesting plants, we did not find American columbo. At this point, the growing season was just about done, and we Photo Credit: Stephanie Brundage; Photo Courtesy of the Lady Bird Johnson Wildflower Center

thought any more searches would have to wait until summer 2025.

On November 13, I was working in the plant collections at the Finger Lakes Herbarium on the Community College's campus. Although retired from full-time college teaching, I still curate the plant collections and share information with my professional colleagues still teaching in the Conservation Department. That afternoon one of my colleagues, Rob Wink, was returning from a day in the field. He had been introducing a student to forest inventory techniques at the College's East Hill Campus in Naples. That is a beautiful, forested property donated to the College Foundation by the late George Fraley. It contains an impressive number of regenerating stems of American Chestnut. I had visited the East Hill Campus many times, but had not seen the newest property addition. I said to Rob, "What's new at East Hill other than the American Chestnut trees?"

Much to my surprise he replied, "I think we found American columbo on the new property addition. It was a
 plant I had noticed a couple years ago and this summer our Department Technician, Cody Wilkes, tentatively
 identified it."

Imagine how my jaw dropped when I heard Rob's reply! Quickly I contacted Fred Haynes and we made plans to visit the site the next day. With snow on the ground and the plants gone dormant for the year, we managed to find several dead flower stalks. This discovery represents a previously unknown location for American columbo, the easternmost site in the State, and the eighteenth extant population statewide. Plans to inventory population size next summer have been made, working in coordination with the Canandaigua Botanical Society. *Of course, the search for American Columbo at other Ontario County sites will continue!*

Senator Helming Presents New York State Senate Commendation Award to Terry and Dorothy Gronwall of Honeoye

By New York State Senator Pamela Helming, published October 20, 2024



Senator Pam Helming recently presented a New York State Senate Commendation Award to Terry and Dorothy Gronwall of Honeoye. The couple are longtime active members of the Honeoye Valley Association who have worked for more than two decades on the protection of Honeoye Lake.

Their contributions include conducting extensive sampling of Honeoye waters, helping develop the macrophyte management plan and a program to identify the intensity of weed growth in Honeoye Lake, supporting the development of an aeration system for the lake, and playing an important role in changing the Honeoye Inlet from a man-

made straight path stream to a meandering stream that has reduced sediment deposition in Honeoye Lake.

Terry has also served in numerous leadership roles, including President of Honeoye Valley Association and Chairperson of the Honeoye Lake Watershed Taskforce.

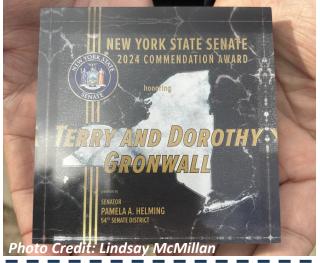
Senator Helming said "Terry and Dorothy are two exemplary citizen-scientists who have worked with great diligence and passion to monitor and protect Honeoye Lake for its residents, visitors and future generations.

They have been at the forefront of citizen engagement for more than two decades. Terry and Dorothy are incredibly deserving of the Senate Commendation Award, which honors individuals who exemplify the spirit of community,

philanthropy and leadership. Thank you to the Gronwalls for their many contributions to their home lake and community, and the health of our Finger Lakes."

The award presentation was made during the New York State Federation of Lake Associations Western NY conference held October 26 at The Woods in Naples.

<u>See original article here on Senator Pamela Helming's</u> <u>website.</u>



The Honeoye Lake Watershed Task Force was formed in 1998 by:

Town of Richmond

Town of Canadice

- **Town of Bristol**
- Town of Naples
- Town of South Bristol

Honeoye Valley Association

To Protect and Improve the Water Quality of Honeoye Lake.

Voting Members Include:

Terry Gronwall, Councilmember, Town of Canadice (Chairman) Steve Barnhoorn, Councilmember, Town of Richmond Lauren Bolonda, Councilmember, Town of Bristol Ann Jacobs, Representative, Town of South Bristol Mark Adams, Representative, Town of Naples Jerry Elman, Representative, Honeoye Valley Association



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NYS Department of Environmental Conservation Finger Lakes Community College The Nature Conservancy Finger Lakes Institute Cornell University Cornell Cooperative Extension of Ontario County Ontario County Water Resources Council Princeton Hydro Consulting Services

Further Information may be obtained by contacting: Chairman Terry Gronwall at watershedtaskforce@gmail.com

