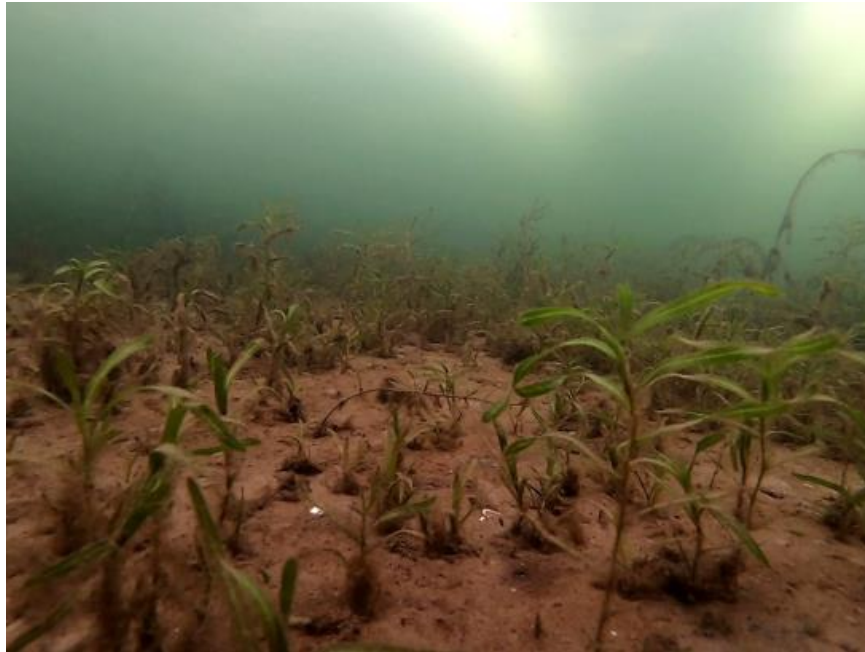




Chautauqua Current No. 6

Chautauqua Lake & Watershed Management Alliance, Inc.
May 23, 2022



Curly-leaf pondweed can be seen growing under lake ice this winter.

Early Riser

Curly-Leaf Pondweed Is Spring Priority On Lake

By Jay Young

Chautauqua Lake & Watershed Management Alliance

There is a question you may hear in conversation if you spend time boating on Chautauqua Lake during May and June: “What are these weeds doing here in the spring?” Coming up with an answer can be a bit of a challenge, but a good place to start is by looking at the many different types of plants that we have growing underwater. Since the 1930s around 50 different species of plants have been recorded in the lake, and recent lakewide surveys usually find around 25 species present. These plants interact with each other and their surrounding environment (including people) in a number of ways. Their levels of growth from year-to-year depend on lots of things like their biology, sunlight, temperature, nutrients, and weather conditions —just like the plants in your garden. There is a lot to unpack if we want to understand why certain plants are growing the way that they are, and even more information to

consider if we want to try and manage them. While we have dozens of different plants all living together, and high levels of growth are possible for several, two invasive (non-native) species draw much of our attention. Chautauqua County's Macrophyte Management Strategy explains that, "Chautauqua Lake has two non-native macrophyte species, Eurasian watermilfoil and curly-leaf pondweed, that dominate the macrophyte community to the detriment of lake users." Learning a little bit more about the second of these two invasives—curly-leaf pondweed—can help us find some answers to the question we started with. For different reasons, this plant often gets an early start in the spring and is the target of some of our first in-lake work.

The plants in your vegetable garden grow at different rates during the year, meaning that you might have lettuce that is ready to eat before you have ripe tomatoes. The same is true for the underwater plants in the lake. Curly-leaf pondweed is out of bed, dressed and ready to go in the spring before most other plants have heard their alarm clocks go off. This invasive plant, which has wavy-edged green leaves that look like lasagna noodles, can grow to significant levels early in the spring and usually dies back around late June or early July. Growing up to 15 feet long at its peak, curly-leaf pondweed can thrive in conditions other plants find difficult, like murky water. It also has an advantage over some native species when it comes time to make more plants. Curly-leaf pondweed mainly reproduces by releasing what are called turions. The Adirondack Watershed Institute explains that "These vegetative winter buds, which resemble small pinecones, are an important reproductive agent for this plant. Studies have shown that lakes with curly-leaf pondweed beds may contain up to 1,600 turions in one square yard." Curly-leaf pondweed tends to produce turions in large numbers until the middle of summer, which settle in the lake bottom and begin growing the next year's crop during the fall. While some plant species may largely die back during snowy months, curly-leaf pondweed follows a different schedule that can give it an edge up on the competition come springtime. This schedule also means that the lake may see high levels of curly-leaf pondweed growth early in the spring and summer, and potentially large amounts of plant debris when the species begins to die off in June and July.

Different invasive species require different types of management depending on how well-established they are in an area. A common way to visualize this is called an invasion curve—which starts small and increases over time. The US Army Corps of Engineers says that "The invasion curve illustrates that prevention is the most efficient and least costly method of combating invasive species. As a non-native species becomes more established over time, the effort and associated costs of addressing it escalate exponentially." In the early part of the curve, after an invasive species is first introduced to a new area, management actions like rapid detection and removal are recommended. In our lake and the Chadakoin River, water chestnut is often the target of these types of removal programs where volunteers hit the water in kayaks to pull invasive plants by hand. For a species in the higher end of the invasion curve that is more widespread and well-established like curly-leaf pondweed (in the lake since at least 1937), different strategies are needed. Rather than trying to detect and remove individual plants, we prioritize local control and management in order to maintain the health and usability of the lake. These local control efforts have taken the form of targeted herbicide treatment and/or harvesting of curly-leaf pondweed in recent years. In 2021, during a three-week early season curly-leaf pondweed harvesting program, Chautauqua Lake Association crews harvested around 1,210 tons of plant material from May to June. Herbicide treatment was also performed at other priority areas by some towns and villages in coordination with the Chautauqua Lake Partnership in order to manage curly-leaf pondweed across 318 acres. This year's work plan is also expected to use both types of management, with CLA crews scheduled to begin harvesting for curly-leaf pondweed this week. Herbicide treatment targeting this

species is expected to take place soon, but is ultimately subject to permitting by the New York State Department of Environmental Conservation. Typically, once permits are issued, NYSDEC also reviews target plant conditions just prior to treatment in order to determine if it is warranted.

It is helpful to remember a few points about these local control programs. Management plans aim to account for many different factors and prioritize the limited and generously contributed funds that are available each year. The Macrophyte Management Strategy notes that “It is evident that not all areas of Chautauqua Lake require the same level or type of macrophyte management.” In-lake programs are intended to improve conditions in areas where nuisance plant growth conflicts with human uses the most, while also incorporating ecological factors such as fish habitat. Areas displaying low or moderate levels of plant growth or with undeveloped shoreline may not be managed as intensely, if at all. A balanced and flexible approach, not a uniform one, is well-suited to a 13,000-acre body of water with 42 miles of shoreline.

Like so many features of natural systems shared by humans, curly-leaf pondweed is also not all bad or all good. Perspective and context are key. While it is listed as an invasive species by NYSDEC, the plant does have some positives. Curly-leaf pondweed can provide food for ducks and habitat for fish during the spring and winter. It may also release chemicals that combat cyanobacteria which can cause harmful algal blooms. However, it often out-competes native species, affects recreation, and contributes shoreline debris and nutrients to the lake when it dies off in the peak of summer. These are the conditions that management actions like harvesting, herbicide treatment, and shoreline cleanup seek to improve.

We may also want to keep some humility in mind. We do not have a crystal ball that tells us what the growth of curly-leaf pondweed will be in any given year—let alone the dozens of other plant species in the lake. It is a difficult problem to try and predict outcomes for this dynamic and complex natural system. There are many variables that determine the growth of just this one species. Recent research performed in Minnesota and published in the journal of *Freshwater Biology* tells us that natural conditions like lake productivity and snow cover appear to be important factors in curly-leaf pondweed growth. It is important to remember that there are variables both within and beyond the control of lake managers at work. Uncertainty can be reduced but not eliminated. The Alliance and other stakeholders monitor plant conditions using different survey methods, document management actions with GPS technology, and look for new lines of evidence to inform our work in the future. The more of these data we collect, bring together in useful forms, and share with one another, the better we can understand curly-leaf pondweed. That understanding is a vital part of a comprehensive management approach that aligns resources with the needs of the lake and its many users.