Aquatic Plants in the Bolton Lakes

Introduction

Aquatic plants are a necessary and natural part of the lake ecosystem. Many plants co-exist peacefully with other species and with the people that enjoy the lakes. Some, however, are invasive. While any aquatic plant has the potential to become a nuisance, invasive species are much more likely to do so. They out-compete native plants and can proliferate explosively to disrupt the ecology and recreational use of the lakes. Reports of suspicious plants from residents and lake users are key to preventing and controlling infestations.

> *"Once established, eradication of invasive aquatic plants is extremely difficult. Preventing introductions by inspections, early detection and rapid response is critically important."*
>
> Connecticut's Aquatic and Wetland Invasive Plant Identification Guide

Below you will find information on the plants that have raised concerns recently:

1. Fanwort
2. Hydrilla
3. Water Chestnut
4. Curly-leaf Pondweed
5. Variable-leaf Milfoil
6. Mudmat
7. Broad-leaf Pondweed
8. Minor Naiad

If you spot an aquatic plant you suspect is invasive or recognize as invasive in Lower, Middle or Upper Bolton Lake, including Cedar Swamp, report it on the Suspicious Plant Reporting page on the FBL website. Sightings reported this way will go to Bolton's Lake Commissioner, Kim Welch, and to the Friends of Bolton Lakes.

The form has fields and checkboxes to report information needed to identify the plant and its location. You can access the form on an internet-connected computer or cellphone and upload up to three photos. If you are not online, the report will be submitted once you re-connect.

1. Access the reporting page at the link given above or from our website.
2. Work your way down the form entering information and choosing options as you go.
3. Take a picture or two of the plant you are reporting. Try to make the essential features of the plant visible. If possible, spread it out on a light colored, uniform background. For Android and IOS phones, you can choose the camera as the file source and snap the photos directly into the upload fields.
4. Hit the "Submit" button to send your report. It can take up to a minute to get acknowledgement that your report has been received.
5. If possible, refrigerate a sample of the plant in a zip-lock bag with a little water in case it's needed to identify the plant.

You will be notified when the plant has been identified. If further examination is needed, you will be asked to deliver the refrigerated sample to Kim Welch at 51 Vernon Rd, Bolton, CT.

Fanwort (C. Caroliniana)

Fanwort is an invasive aquatic plant that was found and eradicated from Lower Bolton Lake in 2011 and discovered in the summer of 2017 in Middle Bolton Lake. Limiting fanwort's spread within Middle Bolton and preventing its reintroduction into Lower Bolton Lake are key priorities.

In the summer of 2017, the observant detection of fanwort in Middle Bolton Lake by FBL members and its prompt reporting enabled FBL to quickly notify the Town of Vernon and New England Aquatic Research (NEAR), the limnology company hired by both Vernon and Bolton, so fanwort could be treated before the end of the summer growing season. The treatment was done on September 12, 2017 and followed up by NEAR to hand-pull small patches discovered too late to be included in the herbicide treatment. Those actions were largely, but not completely, successful. In summer 2018 NEAR searched for fanwort twice and did not find any in the main body of the lake. FBL also looked where fanwort was rooted last year and didn't find any there.

Figure 1. Fanwort has reddish stems and green fans in pairs opposite one another.

Late last summer, however, a resident reported rooted fanwort growing near the culvert at the Hatch Hill boat launch. This was hand-pulled by NEAR. Again this spring while mapping the milfoil in the middle lake, a small patch of fanwort was discovered in the same area and pulled out by NEAR.

Fanwort spreads by fragmentation. Small pieces cut off by fishhooks, boat propellers, oars, or swimming can take root and establish new beds. If you see pieces floating in the water remove them from the lake, and report your find using the steps given in the introduction.

If you see rooted fanwort, don't try to remove it. Pieces could break off and spread within the lake or even escape into Lower Bolton Lake. Take care to avoid disturbing rooted fanwort in any way. If you see fanwort growing in the lake, report it as given above.

Figure 2. Rooted fanwort near the culvert at Hatch Hill reported by a resident in August 2018.

More information:

CT Agricultural Experiment Station (CAES) Aquatic and Wetland Invasive Plant Guide: Fanwort Page
2017 FBL Middle Bolton Fanwort Status Report
2011 Fanwort specimen from Lower Bolton Lake
May 2018 FBL Fanwort Presentation

Hydrilla (H. Verticillata)

Hydrilla is perhaps the most worrisome invasive plant of all. It thrives and propagates even in conditions where other aquatic plants cannot. Although it is not known to be present in the Bolton Lakes, Coventry Lake is fighting an ongoing infestation. With the proximity of Coventry Lake, the chance of transport into the Bolton Lakes is high. We urge all lake users to inspect, clean, and dry boats, trailers, fishing gear, and anything else that could carry fragments between lakes.

> *"… [Hydrilla] is one of the most troublesome aquatic weeds in the world. It rapidly outcompetes other plant species and forms dense masses, which may completely fill the volume of water bodies. Consequently, the often-multifunctional use of canals, rivers and lakes becomes seriously hampered by infestations of the weed."*
>
> The Centre for Agriculture and Bio-Sciences International

Fragments of hydrilla were discovered at the Coventry Lake boat launch in September 2015. In October a survey identified a single nine-acre cove with several modest-size patches of hydrilla. Targeted herbicide treatments were done in 2016 and 2017 but they were ineffective. Benthic barriers, essentially weighted tarps on the lake bottom, also failed to prevent the plant from spreading. Starting in 2018 a regimen of three whole-lake treatments annually was instituted. The most recent treatment was done on July 18th, 2019. Coventry has budgeted $130,000 for 2019 lake remediation.

Hydrilla is similar in appearance to some native waterweeds (Elodea) and to invasive Brazilian Waterweed. The foliage appears in whorls along the stem. Hydrilla typically has five leaves per whorl but that can vary from four to eight. The leaves have toothed edges. Hydrilla spreads by fragmentation, turions, tubers, and seeds.

According to the New York Department of Conservation, "Hydrilla can grow up to an inch a day, producing dense mats of vegetation that initially grow along the bottom of lakes and rivers. As they grow up to the water's surface, these mats become several feet thick…"

Our best defense is prevention, or failing that, early detection by people using the lakes. It is critically important to report any potential sightings of hydrilla using the process given in the introduction.

Figure 3. Hydrilla is among the most hardy and prolific invasive aquatic plants known.

More Information:

[CAES Hydrilla Information Page]
[CAES Hydrilla Specimen]
[CT DEEP Press Release September 2015]
[January 2018 Coventry Lake Hydrilla Management Update]
[New York Department of Environmental Conservation: Hydrilla Fact Sheet]

Water Chestnut (T. Natans)

Figure 4. Surface leaves occur in rosettes with stems radiating from a central node.

European water chestnut is an invasive plant now established in the northeast. It has been found in the Connecticut river and its tributaries, notably the Mattabasset in Middletown and, in Vernon, in the Tankerhoosen, Dobsonville and Talcottville ponds. Water chestnut has not been seen in the Bolton Lakes, but because of its presence in nearby ponds, we urge vigilance.

Water chestnut has leaves floating on the surface rooted in the sediment by long stems. The surface leaves occur in the form of a rosette. The leaves on the underwater stem are feathery. The plant produces a small white flower in the center of the rosette which eventually results in a seed pod that drops into the water where currents spread it within the lake. Seeds can be viable for up to twelve years, though most sprout within two. Water chestnut also spreads by fragmentation, within and between water bodies.

Figure 5. Three faces of water chestnut: rosette, seed, dense mat. (Photo: Alfred Cofrancesco, U.S. Army Corps of Engineers, Bugwood.org)

Water chestnut can form extremely dense mats on the surface that interfere with recreational use of the lake and can stop sunlight from penetrating the surface. This causes damage to other plants, many of which are beneficial to the lake. Because it is an annual, the plant dies off each year, sinks to the bottom and decays. The decay process lowers the level of oxygen in the water, which can result in fish-kills.

As with all invasive aquatic plants, prevention is the best cure and we urge everyone to inspect, clean, and dry boats, trailers, fishing gear, and anything else that could carry fragments or seeds between lakes. Our best defense is keeping it out of our watershed and if it comes in, detecting it and removing it quickly.

More Information:

New York Invasive Species Information: Water Chestnut
CAES Water Chestnut Specimen
CAES Water Chestnut Page

Curly-leaf Pondweed (P. Crispus)

Figure 6. Curly-leaf pondweed has narrow leaves with wavy edges.

Invasive Curly-leaf Pondweed in Lower Bolton Lake was treated in 2017. The treated areas were primarily along the eastern shore in the northern part of the lake. In 2018 NEAR identified a dozen small patches around the lake's perimeter.

Curly-leaf pondweed sprouts in early spring giving it a head start on other plants. It generally subsides by mid-summer but can rebound in autumn. It propagates via turions, runners, and to a lesser extent, seeds. Turions are pieces of the plant that become quite durable, remaining viable for up to twelve years, and take root to produce clones of the original plant.

If you see fragments floating in the water, remove them. If you spot rooted plants, let them be. Report your finds using the steps in the introduction.

More information:

[CAES Curly-leaf Pondweed Page]
[June 2017 Treatment Information and Map]
[CAES Curly Leaf Pondweed Specimen]
[NEAR 2018 LBL Curly-Leaf Map]

Variable-leaf Milfoil (M. Heterophyllum)

Variable-leaf milfoil, native to the Southeastern United States, is an invasive plant found in all three of the Bolton Lakes. Its presence is limited in Lower and Upper Bolton Lakes, but it has been a persistent nuisance in Middle Bolton Lake over the years. As with many invasive plants, it spreads by fragmentation, so the advice is similar: remove floating fragments, leave rooted plants alone, stay clear of rooted beds to avoid creating fragments, and report all finds.

Figure 7. Variable-leaf milfoil is considered invasive throughout New England.
(Photo Washington St. Noxious Weed Control Board.)

Fanwort is known to grow along with variable-leaf milfoil and the milfoil can obscure the fanwort in its midst. The plants look similar when seen in the water from above but there are differences. In milfoil, feathery leaves occur in whorls of four to six spaced at short intervals along the stems. The foliage is green but often with a brownish tint. The stems are often brownish. Fanwort is brighter green, and the foliage occurs in distinct pairs along reddish stems. Variable-leaf milfoil foliage collapses out of the water while fanwort foliage holds its shape.

A chemical treatment against milfoil was carried out in Middle Bolton in August 2017 and again on July 18th this year. The herbicides required to treat fanwort and milfoil differ and are specific to their target species. When the milfoil was treated and died off in 2017 the fanwort growing along with it became more apparent and this may be the case in 2019 as well.

More Information:
[CAES Variable-leaf Milfoil Page]
[July 2019 MBL Treatment Poster]
[CAES Variable Milfoil Specimen]

Mudmat (G. Cleistanthum)

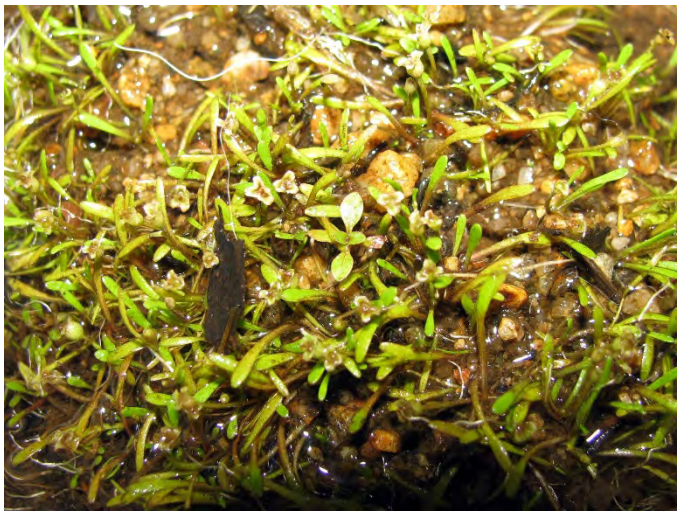

Figure 8. Mudmat is a low-growing plant that can grow to densities of more than 25,000 plants per square meter.

Mudmat, another invasive plant, native to New Zealand, has been known to be present in Lower Bolton since 2011. At the March 2018 Lake Forum at Bolton Town Hall, NEAR advised that it has become a potential concern for Lower Bolton. Mudmat is a small bottom-growing plant that is found in shallow water and can cover the bottom like a mat. Because it is a small plant growing in shallow water it is unlikely to interfere with recreational use of the lake. In their 2018 survey of Lower Bolton Lake, CAES found the amount of mudmat to be much reduced compared to their 2011 survey. Nonetheless mudmat can grow to extreme densities and threaten the ecological balance in the lake and the consultant advises that we be watchful of it.

More information:
[CAES Mudmat Information Page]
[CAES Herbarium LBL Mudmat Specimen]
[CAES 2011 LBL Mudmat Extent]
[CAES 2018 LBL Mudmat Extent]

Broad-leaf Pondweed (P. Amplifolius)

Several residents have provided information and expressed concerns about beds of pondweed along the southern shore of Lower Bolton Lake. Please note that the broad-leaf pondweed reported in the Lower Lake is not an invasive species. Pondweed is generally beneficial to the lake eco-system, providing oxygen, habitat, and consuming nutrients that might otherwise lead to more troublesome plants. It spreads by seeds and runners. According to iNaturalist.org (link below) the growing season runs from March well into the fall, depending on climate. Their data indicates the plant peaks in July.

Figure 9. Broad-leaf pondweed is a native plant found in many lakes and ponds in North America. (Photo Edward Voss, USDA)

CAES identified small patches of broad-leaf pondweed in their 2005 survey of Lower Bolton Lake. In the 2011 survey, the plant had expanded significantly near the shore in the southern half of the lake and established a smaller presence along the dam with Middle Bolton Lake. By the 2018 survey the small patches of the plant could be found nearly

everywhere along the perimeter of the lake. Comparisons, between 2011 and 2018 are difficult because in 2011 Lower Bolton was during the infestation of Southern Naiad. We thank residents for reporting their observations and we will continue to be mindful of the pondweed. But unless the plant begins to proliferate explosively, it is unlikely to be treated.

More information:
iNaturalist.org Broad-leaved Pondweed Page
CAES 2005 LBL Survey Broad-leaf Pondweed
CAES 2011 LBL Survey Broad-leaf Pondweed
CAES 2018 LBL Survey Broad-leaf Pondweed
CAES Broad-leaf Pondweed Specimen

Minor Naiad (N. Minor)

Minor Naiad is an invasive plant that was identified in Middle Bolton Lake by CAES in their 2010 survey. Only a small number of plants were observed, mainly along the north shore of the point that divides the northern and southern sections of the lake. CAES coded the density as “common,” meaning more than a few plants but not enough to be labeled “abundant.” The plant is relatively small and low-growing and has not created problems to date. Still, as with all invasive plants, continued monitoring is warranted.

More Information:
CAES Minor Naiad Information Page
CAES Herbarium MBL Minor Naiad Specimen

Conclusion

To report suspicious plants or algae, use the reporting page on our website. If you have concerns, input, thoughts, or comments regarding aquatic plants or any other lake or watershed issues please contact us at friendsofboltonlakes@comcast.net or through the contact page on our website. All feedback, pro or con is welcome.

A table of link URLs referenced in this document is available on request.

Thank you for your interest in the Bolton Lakes and for any monitoring assistance that you can provide.

The Friends of Bolton Lakes
friendsofboltonlakes@comcast.net
www.friendsofboltonlakes.org

More Information:
Aquatic Plants: The Good, the Bad, the Ugly
CT DEEP Invasive Aquatic Species Information for Boaters and Fishermen
CT Aquatic and Wetland Invasive Plant Identification Guide
NEAR LBL Invasive Plants Primer 2016
CAES Lower Bolton Lake Presentation 2018