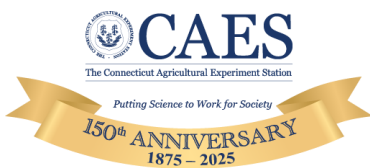


*The
Connecticut
Agricultural
Experiment
Station,
New Haven
Bulletin 1101*



March 2025



**Lake Housatonic
Aquatic Plant Survey
Report
2024**

GREG BUGBEE, SUMMER WEIDMAN,
and MADISON MANKE

Office of Aquatic Invasive Species
Department of Environmental Science and Forestry

Table of Contents

INTRODUCTION	3
OBJECTIVES	4
METHODS	4
Aquatic Plant Surveys and Mapping	4
Water Analysis	5
RESULTS	6
General Aquatic Plant Surveys and Transects.....	6
Water Chemistry.....	8
Aquatic Vegetation Management	122
CONCLUSIONS.....	12
ACKNOWLEDGEMENTS.....	133
FUNDING.....	13
REFERENCES	13
APPENDIX.....	14
Full 2024 Vegetation Maps.....	15
Plant Descriptions	33
Invasive Aquatic Plant Locations.....	38

Lake Housatonic Aquatic Plant Survey Report 2024

Greg Bugbee, Summer Weidman, and Madison Manke

Office of Aquatic Invasive Species
Department of Environmental Science and Forestry

INTRODUCTION

Lake Housatonic offers a diverse freshwater ecosystem as well as unique opportunities for fishing, boating, relaxation, and other activities (Figure 1). The lake is a 347-acre impoundment of the Housatonic River created by the Derby Dam. The dam is equipped with a hydroelectric generating facility owned and operated by McCallum Enterprises of Stratford, CT. Aquatic plants provide habitat for aquatic organisms, remove nutrients, and stabilize the shoreline. Invasive aquatic plants are non-native and often become a nuisance because they have few natural enemies to control their growth (Wilcove et al 1998). They can degrade native aquatic ecosystems (Les and Mehroff 1999), disrupt recreation, and reduce home values (Connecticut Aquatic Nuisance Species Working Group 2006). Once invasive plants are established, long term and costly management programs are often necessary.

CAES (Connecticut Agricultural Experiment Station) conducted surveys of Lake Housatonic in 2005, 2017, 2022, and 2023. The invasive plant species Eurasian watermilfoil (*Myriophyllum spicatum*), minor naiad (*Najas minor*), and curlyleaf pondweed (*Potamogeton crispus*) were observed in all years. Thirteen native species were observed in 2005, 14 in 2017, 9 in 2022, and 11 in 2023. In all years, Eurasian watermilfoil was the most common invasive plant.

Curlyleaf pondweed may have been underestimated in the 2005 survey because it naturally dies back in late spring (Catling and Dobson 1985) which was before the survey



Figure 1. Rower glides along Lake Housatonic

occurred. In the following years it may have been overestimated because of its similarities to other pondweeds such as the newly discovered native long-leaf pondweed hybrid (*Potamogeton x assidens*). The most common native plants in Lake Housatonic in 2005 were coontail (*Ceratophyllum demersum*) and eelgrass (*Vallisneria spiralis*). Overall, the coverage of both invasive and native plants in 2005 was minimal. A notable increase was documented in 2017 when Eurasian watermilfoil covered 139 acres and eelgrass became a nuisance resulting in concern that it may need to be managed. Annual herbicide applications began in 2018 targeting both Eurasian watermilfoil and curlyleaf pondweed. This resulted in a reduction in Eurasian watermilfoil to 2 acres (Bugbee and Stebbins 2023). In 2021 and 2022, small areas of eelgrass were treated with diquat as well. In 2022, CAES began pre and posttreatment surveys of Lake Housatonic to document the efficacy of the herbicides. This information can be found at the CAES Office

of Aquatic Invasive Species (OAIS) website <https://portal.ct.gov/caes-oais>.

The following report represents the fifth CAES OAIS surveillance and mapping of invasive aquatic plants and native eelgrass in Lake Housatonic with emphasis on pre and posttreatment conditions. Additionally, as part of CAES research to document long-term changes in plant communities statewide, all plant species were mapped in 2024 where they can be compared to similar mapping in 2005.

OBJECTIVES

1. Survey and map invasive aquatic plants and eelgrass in Lake Housatonic pre and post herbicide treatment and compare with past surveys.
2. Resurvey transects established in 2005 for all plants and compare with past surveys.
3. Assess current aquatic plant management strategy.
4. Survey and map all vegetation as part of a larger study of statewide changes in aquatic plant communities.

METHODS

Aquatic Plant Surveys and Mapping

Our 2024 aquatic vegetation surveys utilized methods established by CAES to maintain consistent records of nearly 300 Connecticut lakes and ponds (CAES IAPP 2024). We recorded locations of all invasive plants and eelgrass with a Trimble R1® GNSS global positioning system (GPS) with sub-meter accuracy. Since 2022, we included eelgrass based on the concern that it was becoming a nuisance and may need management. We used a Lowrance HDS® sonar system, to determine patches near the bottom and to eliminate the need for time-consuming grapple tosses. We circumnavigated the plant patches to form georeferenced polygons. Patches covering less than one square meter were recorded as a point and assigned an area of 0.0002 acres (1m²). We measured depth with a rake handle, drop line, or digital depth

finder. Sediment type was estimated. Comparing depths from our surveys to determine changes over time is inherently inaccurate because of the wide fluctuations in the lake level caused by rainfall events and the release of water from Lake Zoar. Plant samples were obtained, in shallow water, with a rake and in deeper water with a grapple. We measured plant abundance using a visual scale of 1 to 5 (1 = single stem; 2 = few stems; 3 = common; 4 = abundant; 5 = extremely abundant). When field identifications of plants were questionable, we brought samples back to the lab for review using the taxonomy of Crow and Hellquist (2000a, 2000b). If the species was still questionable a plant sample was analyzed using DNA technology. We collected one of each plant species found in Lake Housatonic to mount for our online and physical herbarium <https://portal.ct.gov/caes/oais/herbarium>.

We post-processed the GPS data using Pathfinder® 5.85 (Trimble Navigation Limited, Sunnyvale, CA) and then imported it into ArcGIS® Pro 2.9.0 (ESRI Inc., Redlands, CA). Data was then overlaid onto recent high-resolution (1m or better) aerial imagery for the continental United States made available by the USDA Farm Services Agency. Extremely heavy rains and associated high flow rates during the summer of 2024 hindered surveillance as plants, sediment, and debris were displaced along the bottom due to strong currents.

We collected occurrence and abundance of plant information from ten transects pre and post treatment. Transect points were positioned 0.5, 5, 10, 20, 30, 40, 50, 60, 70 and 80 meters perpendicular from the shore. These transects were a subset of the 18 laid out in 2005 (CAES IAPP 2024) and contained at least one occurrence of each native and invasive plant species.

We conducted a survey for curlyleaf pondweed on May 31 and June 4-5 when it was likely in greatest abundance. The survey for all other plants occurred from August

14-15 and on October 1. These were

from 1.5 feet beneath the surface and 1.5

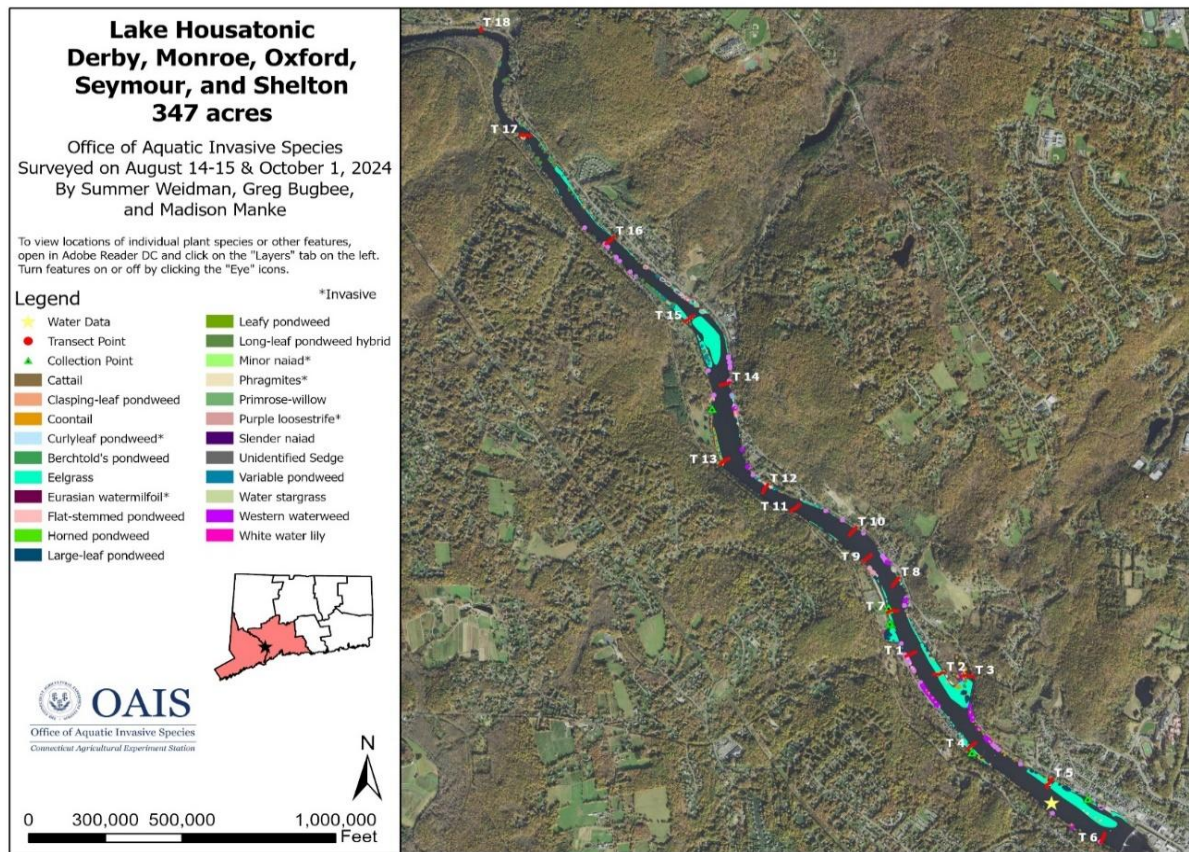


Figure 2. Map of aquatic vegetation documented in Lake Housatonic in 2024 (see appendix for detailed maps).

considered post treatment surveys as data can be compared to similar data from 2023. The August survey was interrupted by historic mid-August flooding and was not resumed until October 1. Transect data were obtained on August 5, 8, and 12.

Water Analysis

We obtained water chemistry data on August 12. A Secchi disk was used to measure transparency and a YSI® 58 meter (YSI Inc. Yellow Springs, Ohio) was used to measure water temperature and dissolved oxygen. Measurements occurred in the same deep area as previous surveys at 1.5 foot and at 3-foot depth intervals until we reached the bottom. We collected water samples from 1.5 feet below the surface and 1.5 feet from the bottom. Water samples for pH, alkalinity, conductivity, total phosphorus, and total nitrogen testing were obtained

feet above the bottom. The samples were stored at 38°F until testing. A Fisher AR20® meter was used to determine pH and conductivity, and alkalinity (expressed as mg/L CaCO₃) was quantified by titration with 0.016 N H₂SO₄ to an end point of pH 4.5. We determined total phosphorus using the ascorbic acid method preceded by digestion with potassium persulfate (APHA, 1995). Phosphorus was quantified using a Milton Roy Spectronic 20D® spectrophotometer with a light path of 2 cm and a wavelength of 880 nm.

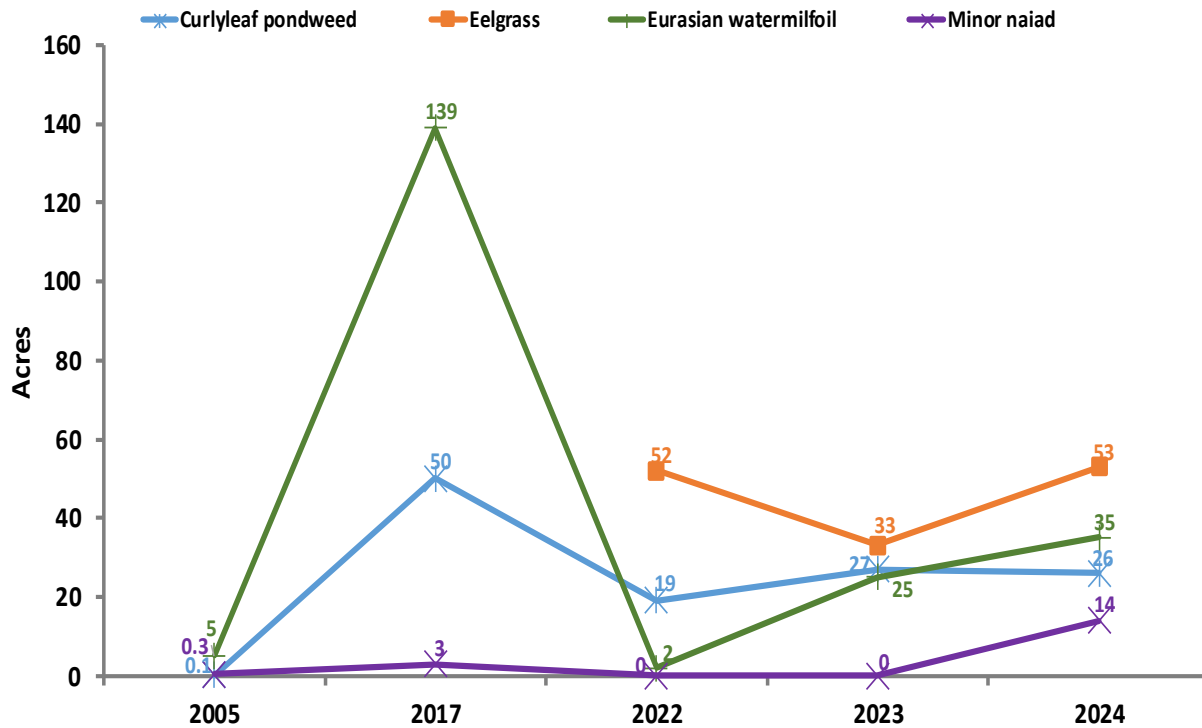


Figure 3. Coverage of invasive plants and eelgrass in Lake Housatonic.

RESULTS

General Aquatic Plant Surveys and Transects

Our 2024 survey confirmed the presence of three invasive aquatic plants: Eurasian watermilfoil, curlyleaf pondweed, and minor naiad (Figure 2). These species were also present in all our previous surveys. Curlyleaf pondweed coverage change little in 2024 (26 acres) compared to 2023 (27 acres). This is a considerable reduction from 2017 (50 acres) but a large increase from 2005 (0.1 acres) (Figure 3). Eurasian watermilfoil coverage increased in 2024 (35 acres) from 2023 (25 acres), and 2022 (2 acres). Compared to the 139 acres found in 2017 – prior to herbicide treatments – the recent coverages represent a significant reduction. A small amount of minor naiad had been found in 2005, 2017 and 2024, but not in 2022 or 2023.

Plant species on our transects give an indication as to how the plant community has changed over time. A total of 13 native

species were found on transects in 2024 compared to 11 in 2023, 9 in 2022, 14 in 2017, and 13 in 2005 (Table 1). Native species present in all five survey years were clasping-leaf pondweed, coontail, eelgrass, long-leaf pondweed hybrid, and western waterweed. The long-leaf pondweed hybrid was newly identified in 2023. It was most likely present in previous years but was misidentified as curlyleaf or a different pondweed. It was only through DNA analysis and correspondence with Dr. Barre Hellquist that it was confirmed. Interestingly, the hybrid has never been documented in other waterbodies in the northeast and is only known to occur in few other locations in North America. Other species present in 2024, but not in 2023 were horned pondweed, large-leaf pondweed, primrose-willow, slender naiad, and variable pondweed. Species present in 2023, but not in 2022 were flat leaf pondweed and arrowhead. Plants present in 2017 but not in 2022 or 2023 were bur-reed, large-leaf pondweed, and southern naiad.

Table 1. Total Number of Invasive and Native Species transects in Lake Housatonic 2005 - 2024.

	2005	2017	2022	2023	2024
Number of Total Species	16	17	11	13	16
Number of Native Species	13	14	9	11	13
Number of Invasive/Non-Native Species	3	3	2	2	3

Table 2. Frequency of occurrence (FOQ) of aquatic plants on transects in Lake Housatonic 2005 -2024.

Native Species	2005	2017	2022	2023	2024
Arrowhead (<i>Sagittaria</i> species)	—	1%	1%	—	—
Bur-reed (<i>Sparganium</i> species)	—	2%	—	—	—
Clasping-leaf pondweed (<i>Potamogeton perfoliatus</i>)	0%	3%	10%	4%	1%
Coontail (<i>Ceratophyllum demersum</i>)	9%	33%	5%	14%	15%
Eelgrass (<i>Vallisneria americana</i>)	8%	25%	22%	26%	29%
Flat-leaf pondweed (<i>Potamogeton zosteriformis</i>)	—	19%	—	1%	4%
Great duckweed (<i>Spirodela polyrhiza</i>)	—	7%	—	3%	—
Horned pondweed (<i>Zannichellia palustris</i>)	0%	—	—	—	1%
Illinois pondweed (<i>Potamogeton illinoensis</i>)	—	—	1%	4%	—
Large-leaf pondweed (<i>Potamogeton amplifolius</i>)	—	3%	—	—	0%
Leafy pondweed (<i>Potamogeton foliosus</i>)	—	—	—	5%	3%
Long-leaf pondweed hybrid (<i>Potamogeton x assidens</i>)	0%	3%	7%	5%	10%
Pondweed species (<i>Potamogeton</i> species)	—	4%	—	—	—
Primrose-willow (<i>Ludwigia</i> species)	—	—	—	—	2%
Slender naiad (<i>Najas flexilis</i>)	—	—	—	—	3%
Small pondweed (<i>Potamogeton pusillus</i>)	0%	37%	19%	13%	—
Southern naiad (<i>Najas guadalupensis</i>)	0%	4%	—	—	—
Variable pondweed (<i>Potamogeton gramineus</i>)	1%	—	—	—	1%
Water stargrass (<i>Zosterella dubia</i>)	—	25%	18%	10%	8%
Western waterweed (<i>Elodea nuttallii</i>)	3%	23%	15%	14%	6%
Invasive Species	2005	2017	2022	2023	2024
Curlyleaf pondweed (<i>Potamogeton crispus</i>)	0%	17%	19%	21%	1%
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	6%	52%	12%	17%	4%
Minor naiad (<i>Najas minor</i>)	1%	9%	—	—	2%

^a "—" = Species not found in Lake Housatonic; 0% indicates found in the waterbody but not on any transect points

Not present in 2017, but present in 2005 were horned pondweed and variable pondweed (Table 2). These differences are likely overstated because of the relatively small number of transects.

In 2005, very little plant growth occurred on transects with total invasive species having a frequency of occurrence (FOQ) of only 14% and total native species having an FOQ of only 7% (Figure 4). Eurasian watermilfoil accounted for 6% and minor naiad 1% of all invasive species. Curlyleaf pondweed was not found on a transect in 2005 but was found elsewhere in the waterbody. In 2005,

the dominate native plants were coontail (9%), eelgrass (8%), and western waterweed (3%). In 2017, a large increase in total invasive (68%) and native (58%) FOQ's was documented. This was largely due to the increase in Eurasian watermilfoil (Figure 5). In 2017, the dominant native plants were coontail stargrass (25%), and western waterweed (23%). In 2022, there was a notable decrease in the total invasive (23%) and native (42%) FOQ's largely due to decreases in Eurasian watermilfoil (52% to 12%) and minor naiad (9% to 0%). Some notable reductions in the FOQ's on transects

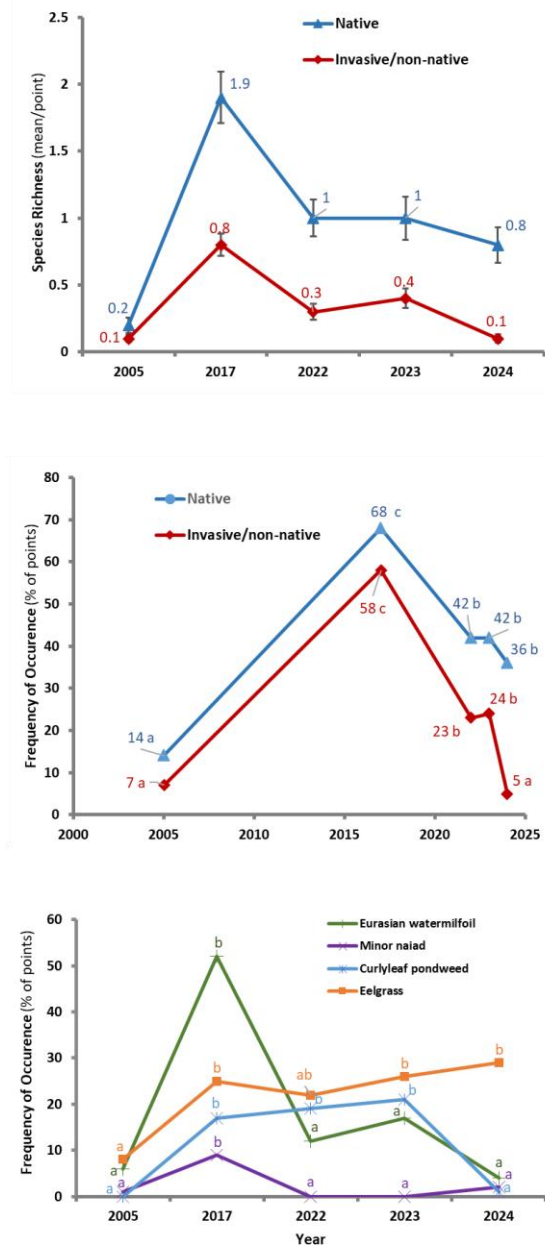


Figure 4. Species richness (top), frequency of occurrence natives/invasives (middle), frequency of occurrence three invasives (bottom).

from 2017 to 2024 include Eurasian watermilfoil (52% to 4%), coontail (33% to 15%), small pondweed (37% to 0%), water stargrass (25% to 8%), flat-leaf pondweed (19% to 4%) and western waterweed (23% to 6%). Eelgrass FOQ was stable from 2017 to 2024 (25% to 29%) while curlyleaf pondweed decreased (17% to 1%) (Table 2).

With the recent discovery of long-leaf pondweed hybrid in 2023, which is difficult to differentiated from curlyleaf pondweed, the previous year's curlyleaf pondweed data may be erroneous.

Species richness refers to the average number of species per transect point. In 2024, a mean of 0.8 native species and 0.1 invasive species were found per transect point. In 2023, a mean of 1.0 native species and 0.4 invasive species were found per transect point. The values from 2023 were nearly identical to 2022 when 1.0 native and 0.3 invasive species were documented. This is significantly less than the 1.9 native and 0.8 invasive species observed in 2017. In 2005, the native (0.2) and invasive (0.1) species richness was at its lowest (Figure 4). The species richness and FOQ data indicates a reduction in both native and invasive species after 2017 which is when herbicide applications began. Still, Lake Housatonic continues to host a robust plant community.

Water Chemistry

When nutrients are taken up by plants or when plants decay the water chemistry may be altered. The excess nutrients not utilized by plants can support unwanted algal blooms. *Lyngbia* was seen in dense mats especially near the boat launch prior to the August flooding. Chemical water testing is conducted once a year during each lake survey to compare conditions between lakes and to assess trends over time. Since the water tests are conducted only once a year the results may not be reflective of conditions during other times in the year. The identification of sources and quantities of nutrients reaching Lake Housatonic from the watershed are beyond the scope of this report and will not be discussed.

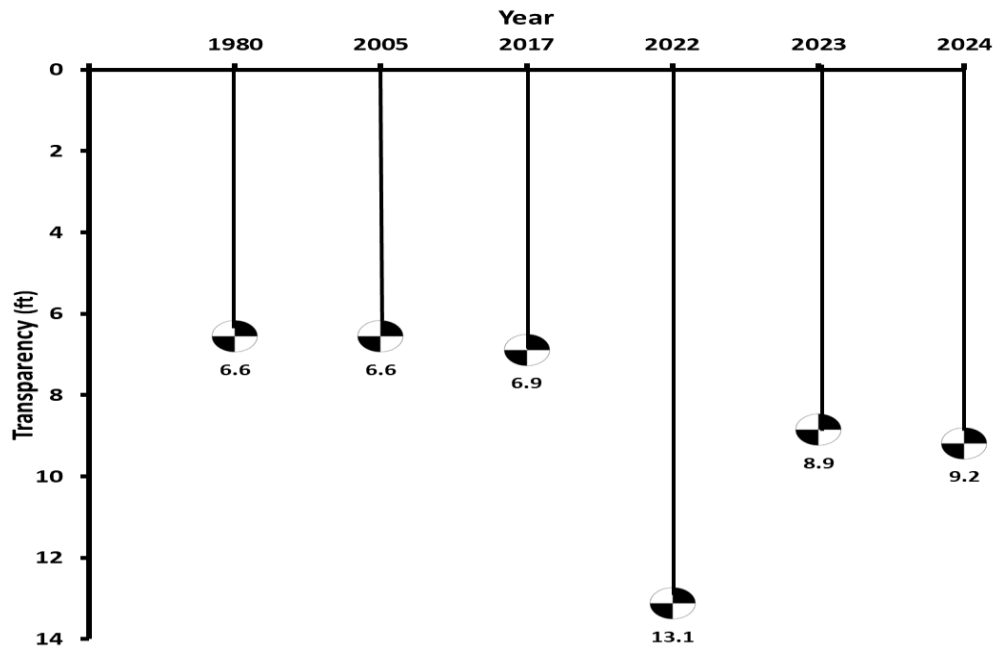


Figure 5. Transparency measured with a Secchi disk in Lake Housatonic 1980 - 2024.

The presence of invasive plants in lakes as found by CAES OAIS can be linked to specific water chemistries (June-Wells et al. 2023). For example, lakes that exhibit higher alkalinities and conductivities are more likely to support populations of Eurasian watermilfoil, minor naiad, and curlyleaf pondweed compared to lakes with lower values that support populations of fanwort and variable watermilfoil. Also, found within Lake Housatonic are invasive zebra mussels that are supported by high alkalinities and conductivities.

In 2024, the water transparency of Lake Housatonic was 9.2 feet and was similar to the 8.9 feet in 2023 (Figure 5). This is greater than the 6.6 feet documented in 1980 and 2005 and the 6.9 feet in 2017 but considerably less than the 13.1 feet in 2022. The water transparency in Connecticut's lakes ranges from 2 feet to over 20 feet with an average of about 10 feet (CAES OAIS 2024). Therefore, the water transparency of Lake Housatonic is near the Connecticut average. Water transparency in Connecticut lakes tends to decline as the summer progresses.

The water temperature in Lake Housatonic varies from year to year depending on weather, mixing events and flow. Temperature profiles ranged from the mid-sixties in 2022 to the low to high seventies in the other years. Temperature changes from the surface to bottom were minimal indicating little stratification likely due to substantial mixing. Dissolved oxygen remained high throughout the water column in all years with a range of 4.8 $\mu\text{g/mL}$ near the bottom to 8.7 $\mu\text{g/mL}$ at the surface (Figure 7). Lake Housatonic's pH has remained relatively constant throughout the years with a range of 7.2 – 7.6. Little change occurs with depth indication mixing. Between 2005 and 2023 there was very little change in alkalinity with both surface and bottom water levels falling in a range of 70 - 86 mg/L CaCO_3 (Figure 6). A substantial increase occurred in 2024 with alkalinity levels of 197 and 190 mg/L CaCO_3 in the surface and bottom water, respectively. Because the water samples were obtained prior to the August flooding the extreme weather event cannot be the cause. Future tests will be needed to determine if the alkalinity increase indicates a trend.

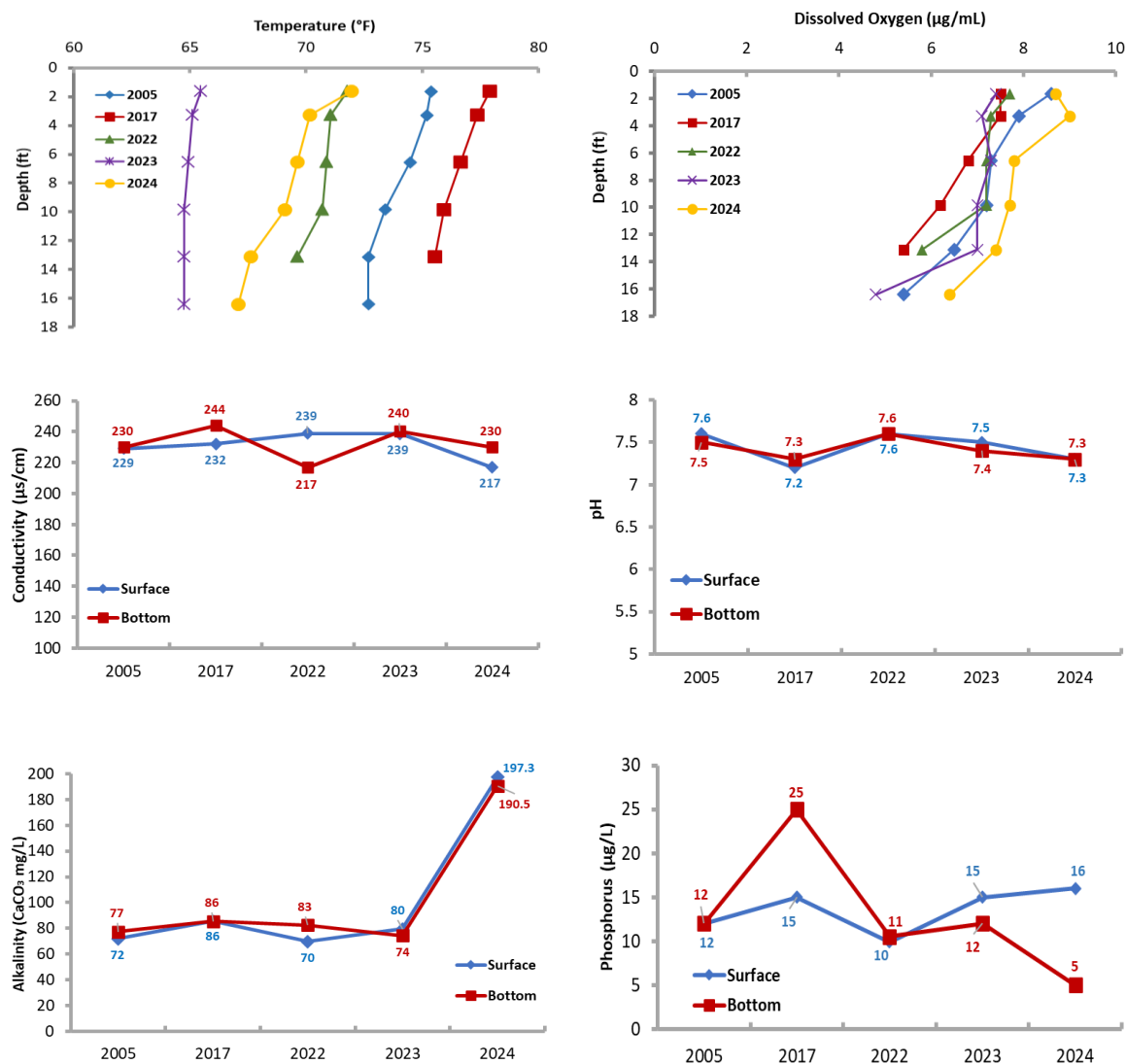


Figure 6. Water chemistry in Lake Housatonic 2005 - 2024.

The conductivity of Lake Housatonic in 2024 ranged from 230 µs/cm at the surface to 217 µs/cm at the bottom (Figure 6). Since 2005 the conductivity has remained relatively consistent with values between 217 µs/cm-239 µs/cm at the surface and 217 µs/cm-244 µs/cm at the bottom.

Conductivity is an indicator of dissolved ions that come from natural and man-made sources such as rainfall, mineral weathering, organic matter decomposition, fertilizers, septic systems, and road salts.

The concentration of phosphorus is a key parameter used to categorize a lake's trophic state. Lakes with phosphorus levels from 0-10 µg/L are nutrient-poor or oligotrophic. When phosphorus concentrations reach 15-25 µg/L lakes are moderately fertile or mesotrophic and at 30-50 µg/L they are fertile or eutrophic (Frink and Norvell, 1984). Lakes with phosphorus concentrations over 50 µg/L are extremely fertile or hypereutrophic. The phosphorus concentration in Lake Housatonic in 2024 was 16 µg/L at the surface and 5 µg/L at the bottom which classifies Lake Housatonic as

Table 2. Herbicide treatments performed in Lake Housatonic 2018 - 2024.

Year	Product	Active Ingredient	Target Species	Acres
2024	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf Pondweed	79
2024	Harpoon®	Copper-Ethylenediamine	Eelgrass	10
2023	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf Pondweed	120
2023	Harpoon®	Copper-Ethylenediamine	Eelgrass	8.5
2022	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf Pondweed	120
2022	Harpoon®	Copper-Ethylenediamine	Eelgrass	18
2021	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf Pondweed	120
2021	Harpoon®	Copper-Ethylenediamine	Eelgrass	18
2020	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf Pondweed	120
2020	Harpoon®	Copper-Ethylenediamine	Eelgrass	18
2019	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf Pondweed	171
2018	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf Pondweed	157



Figure 7. Areas of Lake Housatonic treated with diquat (top) and Harpoon® (bottom) herbicide in 2024. Maps courtesy of Solitude Lake Management, Shrewsbury, MA.

meso-oligotrophic. Phosphorus levels have been generally consistent in lake Housatonic from 2005-2024 except for in 2017 when they rose to 25 µg/L (Figure 6).

Aquatic Vegetation Management

Aquatic vegetation in Lake Housatonic has been managed with herbicides since 2018 (Table 2). Efforts in 2018, 2019, and 2024 targeted Eurasian watermilfoil and curlyleaf pondweed with diquat dibromide. From 2020 – 2023 eelgrass was also targeted with copper-ethylenediamine. After the initial 157 and 171 acres of Eurasian watermilfoil and curlyleaf pondweed treated in 2018 and 2019, respectively, the treated acreage has been reduced to 120 acres since. Eelgrass was not targeted in 2024 after 8.5-acre treatments from 2020 – 2023. The 2024 treatment occurred on July 18 (Figure 7). Because diquat is a quick acting contact herbicide, the effects would have been completed well before the extreme flooding in August. The flooding; however, may have affected regrowth. Overall, 2024 showed a slight increase in nuisance vegetation. The area likely needing the greatest attention is in and around the State beach. Here, native eelgrass and largeleaf pondweed make swimming into areas over six feet deep difficult and could pose a hazard (Figure 8). Alternatives to herbicides in this area are short term benthic barriers or one or two mechanical harvests. Assistance from CT DEEP may be available for these procedures. In other areas of the lake, pockets of native pondweeds, eelgrass and to a lesser extent Eurasian watermilfoil could be nuisance to shoreline residents. Communications with those residents would help with plans for herbicide application sites or other management practices. Each year the cove along the eastern shore southeast of the State boat launch is choked with invasive and native vegetation as well as matt forming algae (Figure 2, transect 3). The cove is very shallow with a deep muck substrate. It has no shoreline residents.

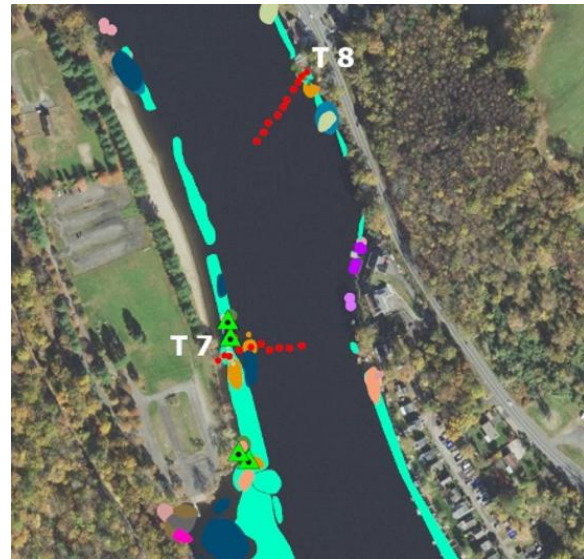


Figure 8. Nuisance Eelgrass (turquoise) and largeleaf pondweed (navy blue) in swim area.

Managing vegetation here may be an inefficient use of resources.

CONCLUSIONS

Lake Housatonic was surveyed for aquatic vegetation by CAES OAIS for the fifth time in 2024 with previous surveys occurring in 2005, 2017, 2022, and 2023. Severe flooding interrupted the survey in August delaying the surveys completion until October 1. Unexpectedly, the plant community seemed little affected. Eurasian watermilfoil increased from 25 acres in 2023 to 35 acres in 2024. Eelgrass increased from 33 acres in 2023 to 53 acres in 2024. Curlyleaf pondweed, however, remained relatively unchanged with 27 acres in 2023 and 26 acres in 2024. Minor naiad was not found in 2023 but covered 14 acres in 2024. The newly discovered hybrid pondweed increased in occurrence from 5% in 2023 to 10% in 2024.

Thirteen native species were found in 2024 compared to 11 in 2023, 9 in 2022, 14 in 2017, and 13 in 2005. This suggests recent plant management with herbicides may be having a positive effect on native species. This could be related to the opening up of the littoral zone as Eurasian watermilfoil is reduced. The dominant native plants

documented in 2024 were coontail, eelgrass, and the long-leaf pondweed hybrid which was most likely misidentified as curlyleaf or another pondweed in previous years. If the new hybrid becomes a nuisance, it will likely require a new management approach.

Lake Housatonic is classified as a meso-oligotrophic and moderately alkaline waterbody that has experienced very little change since 2005.

ACKNOWLEDGEMENTS

The assistance of Jim Olsen from Lake Housatonic Authority and Riley Doherty and Raffaella Nastri from CAES is gratefully acknowledged.

FUNDING

This project was funded through the CAES Office of Aquatic Invasive Species, the Lake Housatonic Authority, and the United States Department of Agriculture under Hatch CONH00792.

REFERENCES

- American Public Health Association. 1995. Standard methods for the examination of water and wastewater. 19th ed. American Public Health Association, 1015 Fifteenth St. NW Washington, DC 20005. 4:108-116.
- CAES OAIS. 2024. The Connecticut Agricultural Experiment Station Office of Aquatic Invasive Species (CAES OAIS). Retrieved January 22, 2024. <https://portal.ct.gov/CAES-OAIS>.
- Catling PM, Dobson I. 1985. The biology of Canadian weeds. *Potamogeton crispus* L. Canadian Journal of Plant Science 65:655-668.
- Frink CR, Norvell WA. 1984. Chemical and physical properties of Connecticut lakes. Conn. Agric. Exp. Sta. Bull. 817.
- June-Wells MF, Gallagher J, Gibbons JA, Bugbee GJ. 2013. Water chemistry preferences of five nonnative aquatic macrophyte species in Connecticut: A preliminary risk assessment tool. Lake and Reservoir Management. 29:303-316.
- Les DH, Mehroff LJ. 1999. Introduction of nonindigenous aquatic vascular plants in southern New England: a historical perspective. Biological Invasions 1:281-300.
- Wilcove DS, Rothstien D, Dubow J, Phillips A, Losos E. 1998. Quantifying threats to imperiled species in the United States. BioScience 48:607-615.

APPENDIX

2024 Full Vegetation Survey Maps

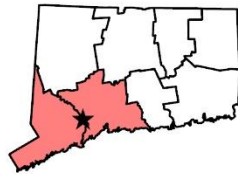
Lake Housatonic Derby, Monroe, Oxford, Seymour, and Shelton 347 acres

Office of Aquatic Invasive Species
Surveyed on August 14-15 & October 1, 2024
By Summer Weidman, Greg Bugbee,
and Madison Manke

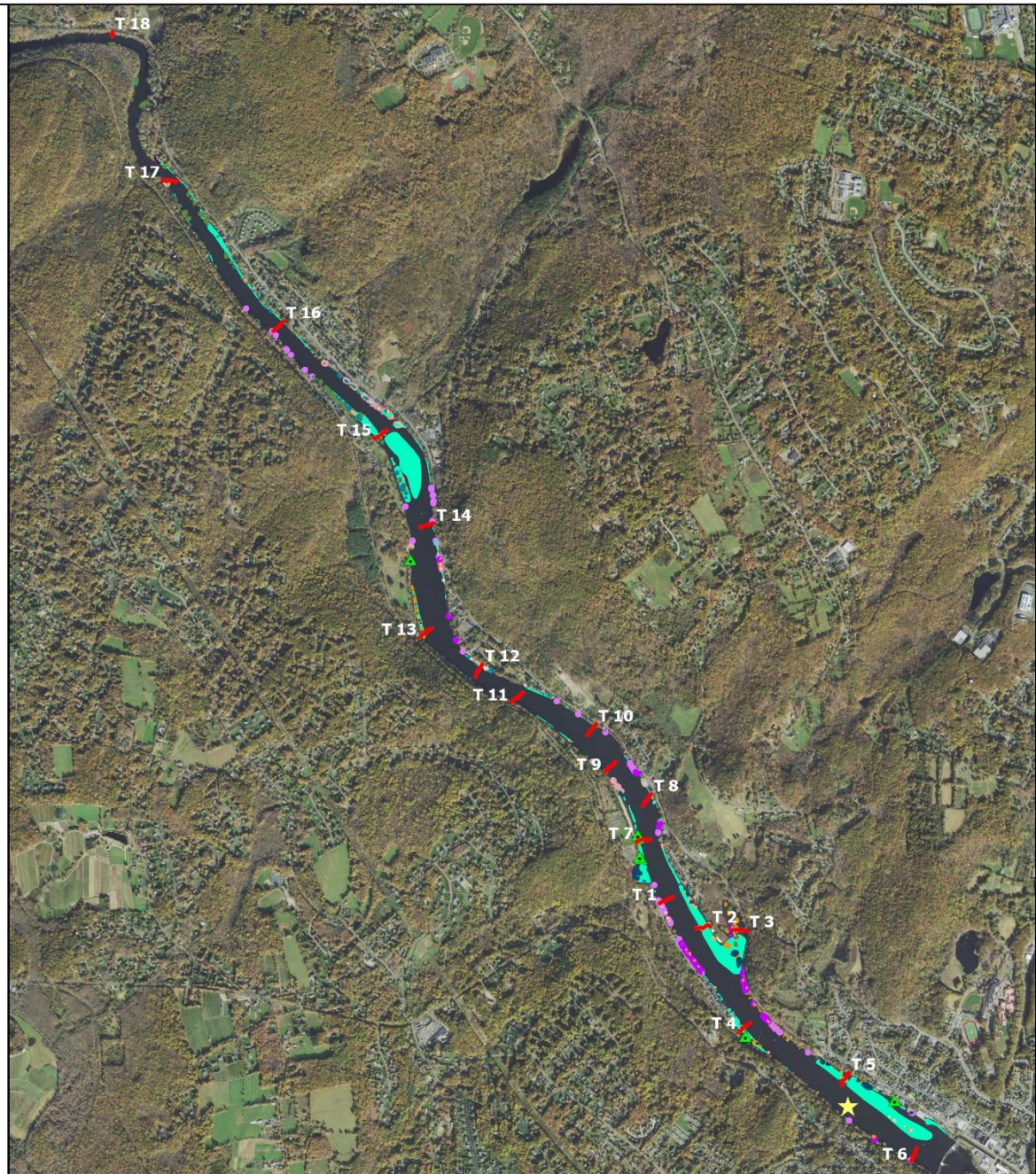
To view locations of individual plant species or other features,
open in Adobe Reader DC and click on the "Layers" tab on the left.
Turn features on or off by clicking the "Eye" icons.

Legend

- | | |
|--------------------------|-----------------------------|
| ★ Water Data | ■ Leafy pondweed |
| ● Transect Point | ■ Long-leaf pondweed hybrid |
| ▲ Collection Point | ■ Minor naiad* |
| ■ Cattail | ■ Phragmites* |
| ■ Clasp-leaf pondweed | ■ Primrose-willow |
| ■ Coontail | ■ Purple loosestrife* |
| ■ Curlyleaf pondweed* | ■ Slender naiad |
| ■ Berchtold's pondweed | ■ Unidentified Sedge |
| ■ Eelgrass | ■ Variable pondweed |
| ■ Eurasian watermilfoil* | ■ Water stargrass |
| ■ Flat-stemmed pondweed | ■ Western waterweed |
| ■ Horned pondweed | ■ White water lily |
| ■ Large-leaf pondweed | |
- *Invasive



0 300,000 500,000 1,000,000 Feet



Map 1 of 4 Lake Housatonic Derby, Monroe, Oxford, Seymour, and Shelton 347 acres

Office of Aquatic Invasive Species
Surveyed on August 14-15 & October 1, 2024
By Summer Weidman, Greg Bugbee,
and Madison Manke

To view locations of individual plant species or other features,
open in Adobe Reader DC and click on the "Layers" tab on the left.
Turn features on or off by clicking the "Eye" icons.

Legend

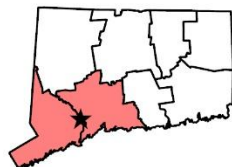
*Invasive

- | | |
|--------------------------|---------------------------|
| ★ Water Data | Leafy pondweed |
| ● Transect Point | Long-leaf pondweed hybrid |
| ▲ Collection Point | Minor naiad* |
| ■ Cattail | Phragmites* |
| ■ Claspingleaf pondweed | Primrose-willow |
| ■ Coontail | Purple loosestrife* |
| ■ Curlyleaf pondweed* | Slender naiad |
| ■ Berchtold's pondweed | Unidentified Sedge |
| ■ Eelgrass | Variable pondweed |
| ■ Eurasian watermilfoil* | Water stargrass |
| ■ Flat-stemmed pondweed | Western waterweed |
| ■ Horned pondweed | White water lily |
| ■ Large-leaf pondweed | |



OAIS

Office of Aquatic Invasive Species
Connecticut Agricultural Experiment Station



0 500 1,000 2,000 Feet



Map 2 of 4 Lake Housatonic Derby, Monroe, Oxford, Seymour, and Shelton 347 acres

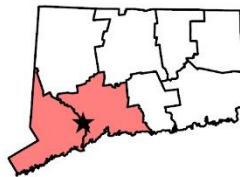
Office of Aquatic Invasive Species
Surveyed on August 14-15 & October 1, 2024
By Summer Weidman, Greg Bugbee,
and Madison Manke

To view locations of individual plant species or other features,
open in Adobe Reader DC and click on the "Layers" tab on the left.
Turn features on or off by clicking the "Eye" icons.

*Invasive

Legend

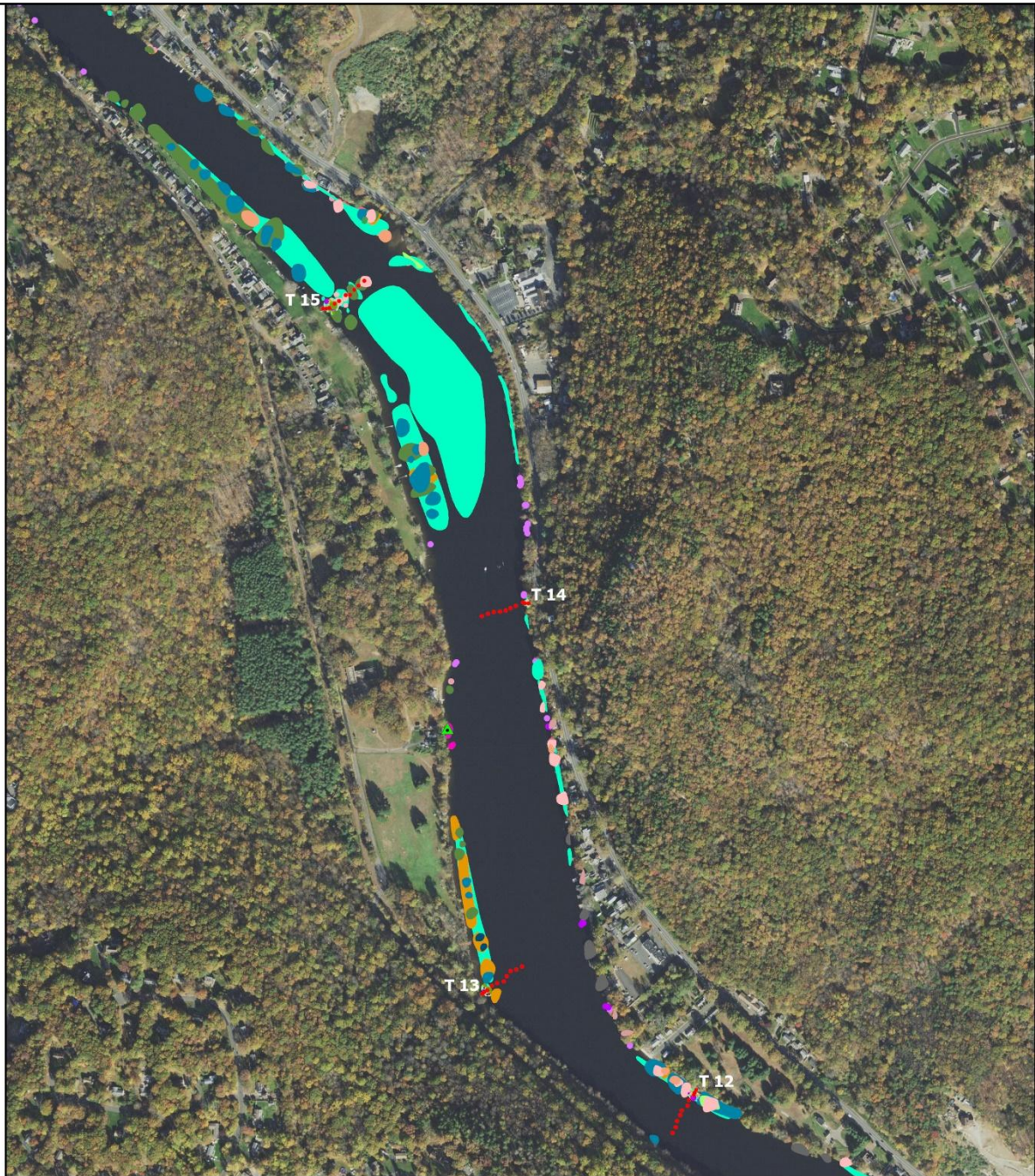
- | | |
|--------------------------|---------------------------|
| ★ Water Data | Leafy pondweed |
| ● Transect Point | Long-leaf pondweed hybrid |
| ▲ Collection Point | Minor naiad* |
| ■ Cattail | Phragmites* |
| ■ Claspingleaf pondweed | Primrose-willow |
| ■ Coontail | Purple loosestrife* |
| ■ Curlyleaf pondweed* | Slender naiad |
| ■ Berchtold's pondweed | Unidentified Sedge |
| ■ Eelgrass | Variable pondweed |
| ■ Eurasian watermilfoil* | Water stargrass |
| ■ Flat-stemmed pondweed | Western waterweed |
| ■ Horned pondweed | White water lily |
| ■ Large-leaf pondweed | |



OAIS

Office of Aquatic Invasive Species
Connecticut Agricultural Experiment Station

0 500 1,000 2,000
Feet



Map 3 of 4 Lake Housatonic Derby, Monroe, Oxford, Seymour, and Shelton 347 acres

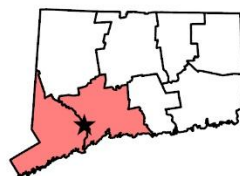
Office of Aquatic Invasive Species
Surveyed on August 14-15 & October 1, 2024
By Summer Weidman, Greg Bugbee,
and Madison Manke

To view locations of individual plant species or other features,
open in Adobe Reader DC and click on the "Layers" tab on the left.
Turn features on or off by clicking the "Eye" icons.

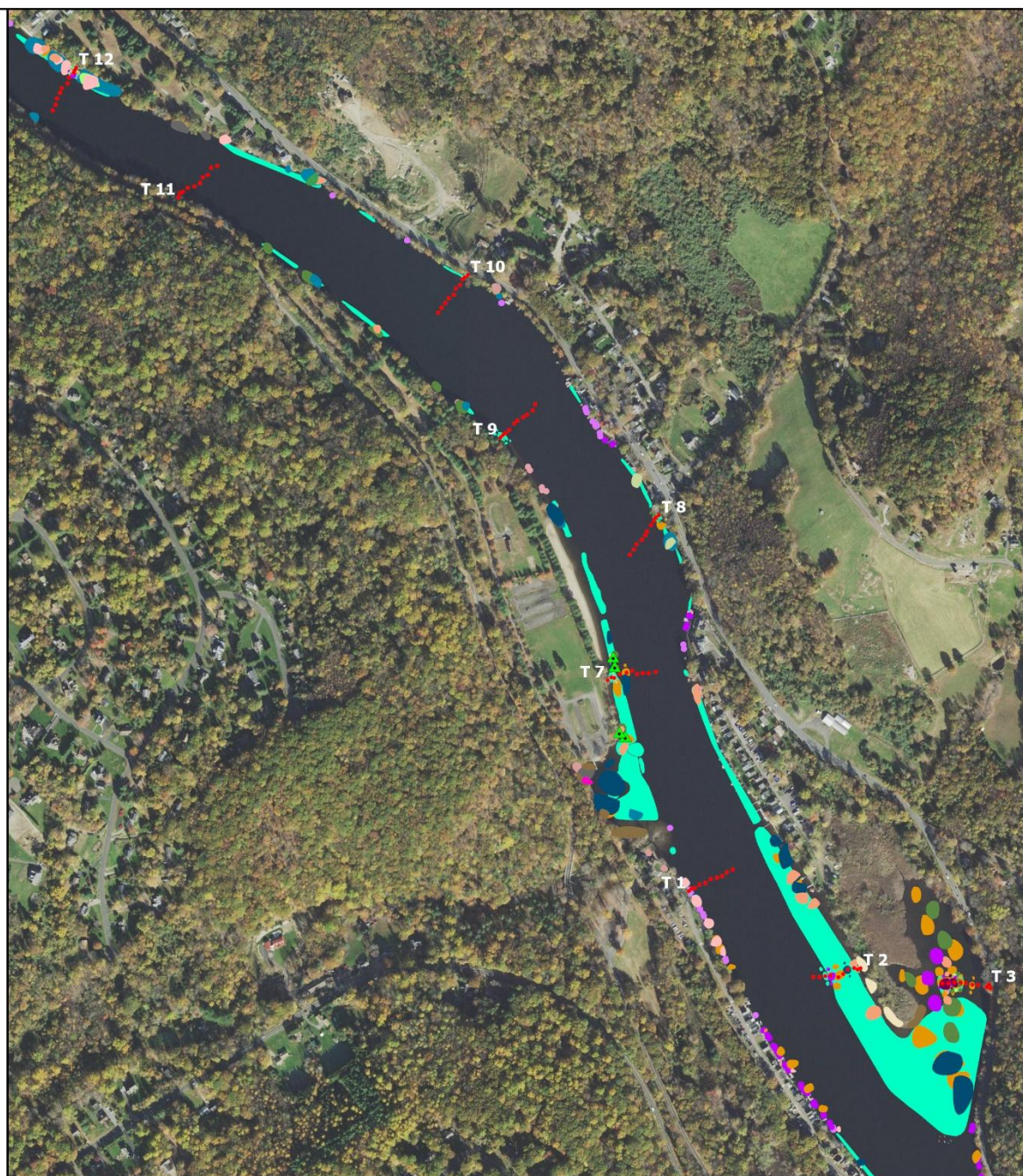
Legend

- | | |
|--------------------------|---------------------------|
| ★ Water Data | Leafy pondweed |
| ● Transect Point | Long-leaf pondweed hybrid |
| ▲ Collection Point | Minor naiad* |
| ■ Cattail | Phragmites* |
| ■ Clasp-leaf pondweed | Primrose-willow |
| ■ Coontail | Purple loosestrife* |
| ■ Curlyleaf pondweed* | Slender naiad |
| ■ Berchtold's pondweed | Unidentified Sedge |
| ■ Eelgrass | Variable pondweed |
| ■ Eurasian watermilfoil* | Water stargrass |
| ■ Flat-stemmed pondweed | Western waterweed |
| ■ Horned pondweed | White water lily |
| ■ Large-leaf pondweed | |

*Invasive



0 500 1,000 2,000
Feet



Map 4 of 4 **Lake Housatonic** **Derby, Monroe, Oxford,** **Seymour, and Shelton** **347 acres**

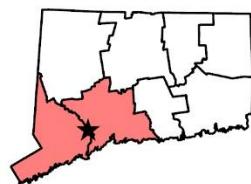
Office of Aquatic Invasive Species
 Surveyed on August 14-15 & October 1, 2024
 By Summer Weidman, Greg Bugbee,
 and Madison Manke

To view locations of individual plant species or other features,
 open in Adobe Reader DC and click on the "Layers" tab on the left.
 Turn features on or off by clicking the "Eye" icons.

Legend

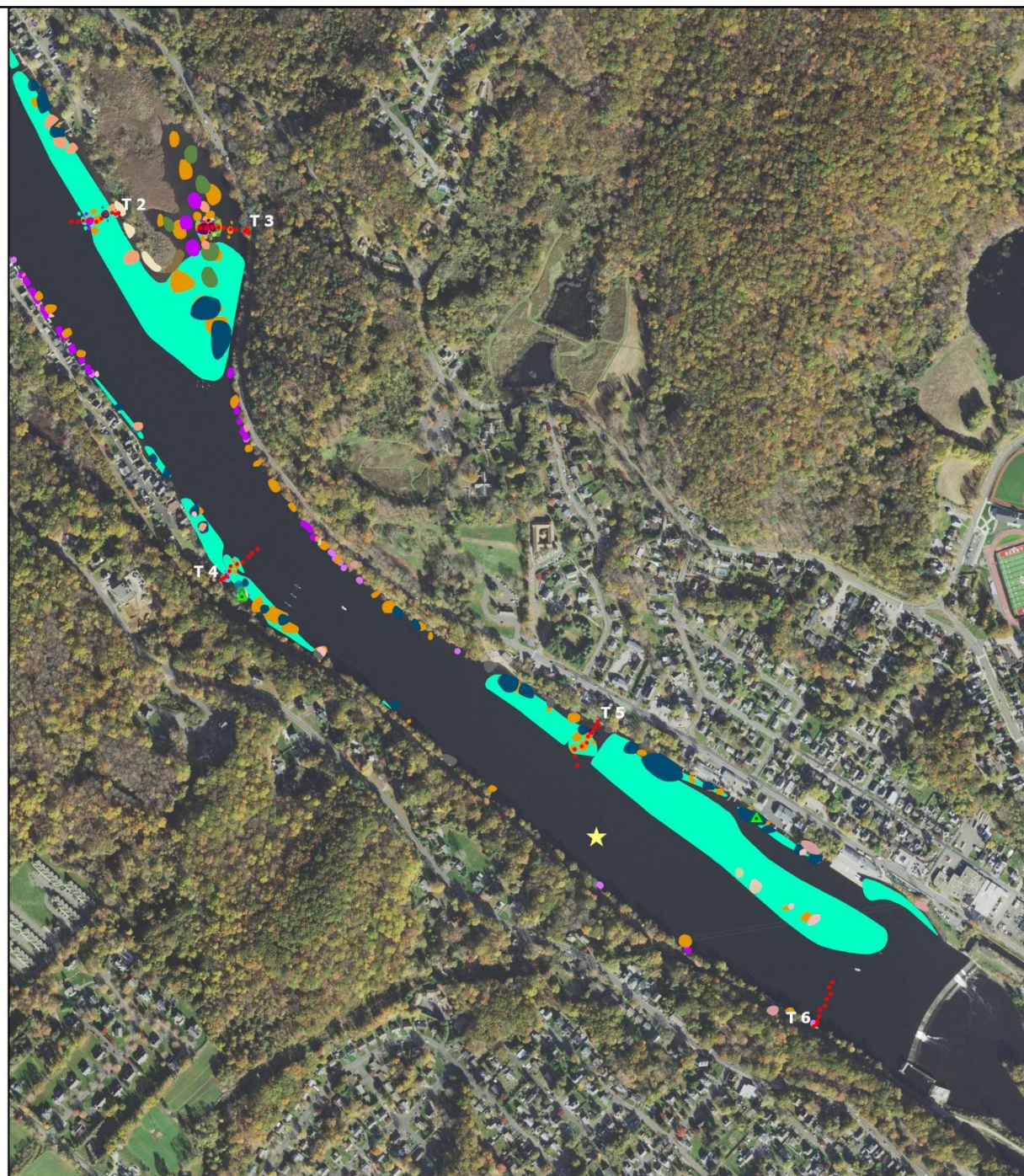
- | | |
|--------------------------|---------------------------|
| ★ Water Data | Leafy pondweed |
| ● Transect Point | Long-leaf pondweed hybrid |
| ▲ Collection Point | Minor naiad* |
| ■ Cattail | Phragmites* |
| ■ Claspingleaf pondweed | Primrose-willow |
| ■ Coontail | Purple loosestrife* |
| ■ Curlyleaf pondweed* | Slender naiad |
| ■ Berchtold's pondweed | Unidentified Sedge |
| ■ Eelgrass | Variable pondweed |
| ■ Eurasian watermilfoil* | Water stargrass |
| ■ Flat-stemmed pondweed | Western waterweed |
| ■ Horned pondweed | White water lily |
| ■ Large-leaf pondweed | |

*Invasive



 **OAIS**
 Office of Aquatic Invasive Species
 Connecticut Agricultural Experiment Station

0 500 1,000 2,000
 Feet



2024 Survey Pretreatment Maps

Lake Housatonic Derby, Monroe, Oxford, Seymour, and Shelton 347 acres

Office of Aquatic Invasive Species
Surveyed on May 31 and June 4-5, 2024
By Greg Bugbee and Ella Natri

Legend

▲ Collection Point

● Transect Point

★ Water Data

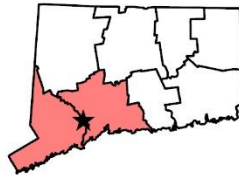
— Boat Path

Relative Abundance Scale: 1 (sparse) - 5 (dense)

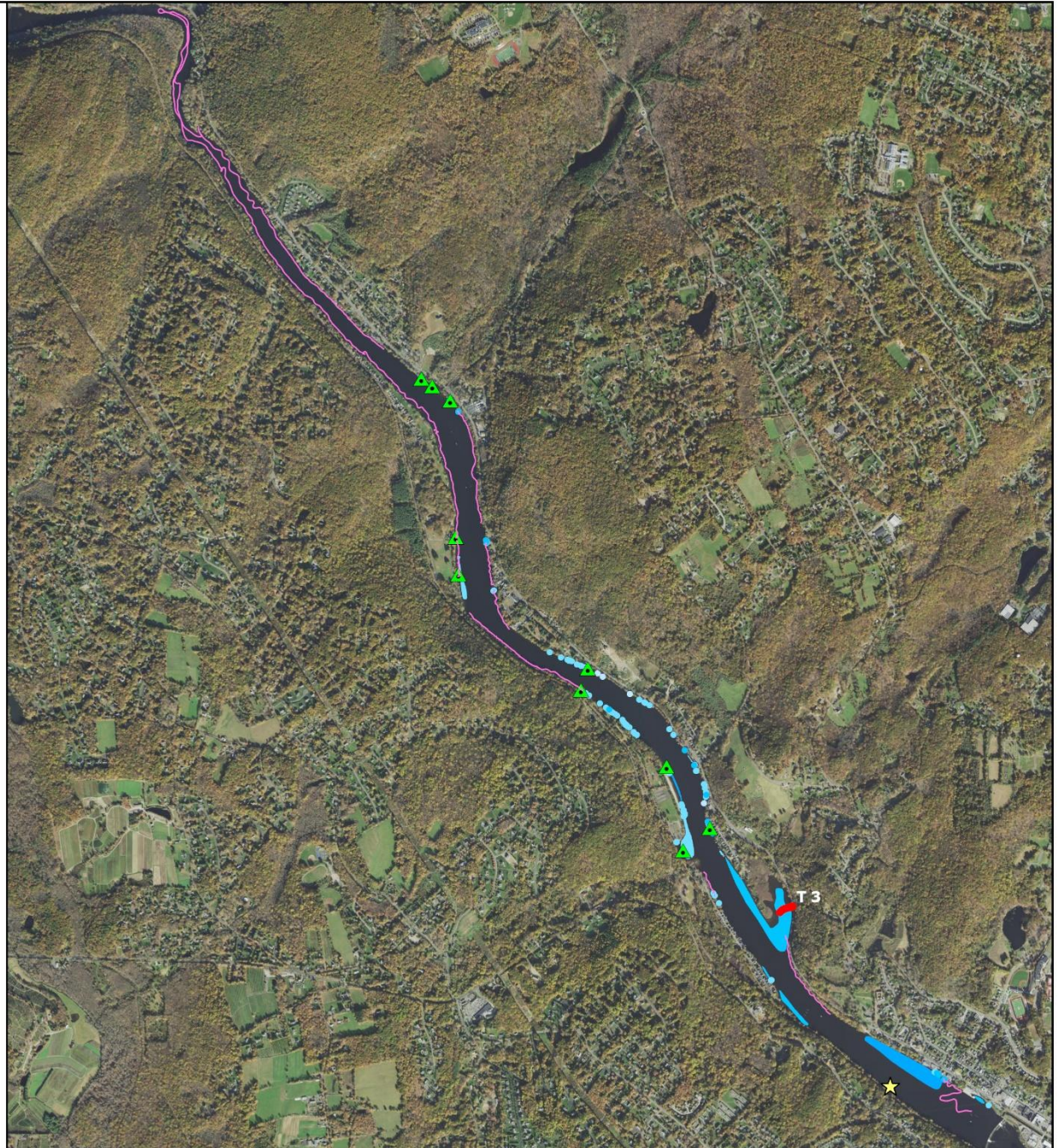
Curlyleaf pondweed, 2

Curlyleaf pondweed, 3

Curlyleaf pondweed, 4



0 0.25 0.5 1
Miles



Map 1 of 4
Lake Housatonic
Derby, Monroe, Oxford,
Seymour, and Shelton
347 acres

Office of Aquatic Invasive Species
Surveyed on May 31 and June 4-5, 2024
By Greg Bugbee and Ella Nastri

Legend

▲ Collection Point

● Transect Point

★ Water Data

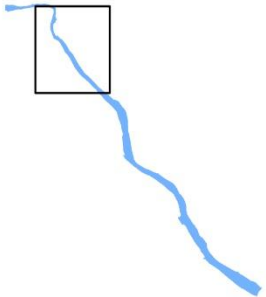
— Boat Path

Relative Abundance Scale: 1 (sparse) - 5 (dense)

Curlyleaf pondweed, 2

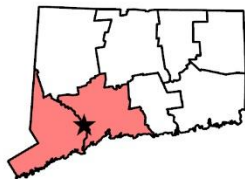
Curlyleaf pondweed, 3

Curlyleaf pondweed, 4



OAIS

Office of Aquatic Invasive Species
Connecticut Agricultural Experiment Station



0 0.1 0.2 0.4
Miles



Map 2 of 4
Lake Housatonic
Derby, Monroe, Oxford,
Seymour, and Shelton
347 acres

Office of Aquatic Invasive Species
Surveyed on May 31 and June 4-5, 2024
By Greg Bugbee and Ella Nastri

Legend

▲ Collection Point

● Transect Point

☆ Water Data

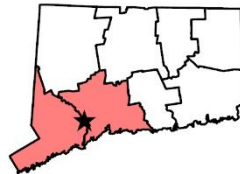
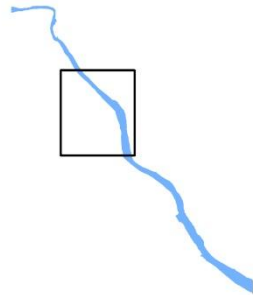
— Boat Path

Relative Abundance Scale: 1 (sparse) - 5 (dense)

Curlyleaf pondweed, 2

Curlyleaf pondweed, 3

Curlyleaf pondweed, 4



OAIS

Office of Aquatic Invasive Species
Connecticut Agricultural Experiment Station



0 0.1 0.2 0.4
Miles






Map 3 of 4
Lake Housatonic
Derby, Monroe, Oxford,
Seymour, and Shelton
347 acres

Office of Aquatic Invasive Species
Surveyed on May 31 and June 4-5, 2024
By Greg Bugbee and Ella Nastri

Legend

-  Collection Point
-  Transect Point
-  Water Data
-  Boat Path

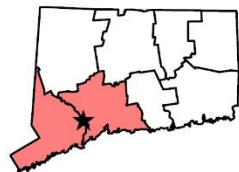
Relative Abundance Scale: 1 (sparse) - 5 (dense)

-  Curlyleaf pondweed, 2
-  Curlyleaf pondweed, 3
-  Curlyleaf pondweed, 4



OAIS

Office of Aquatic Invasive Species
Connecticut Agricultural Experiment Station



0 0.1 0.2 0.4 Miles






Map 4 of 4
Lake Housatonic
Derby, Monroe, Oxford,
Seymour, and Shelton
347 acres

Office of Aquatic Invasive Species
Surveyed on May 31 and June 4-5, 2024
By Greg Bugbee and Ella Nastri

Legend

-  Collection Point
-  Transect Point
-  Water Data
-  Boat Path

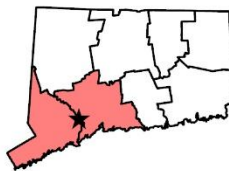
Relative Abundance Scale: 1 (sparse) - 5 (dense)

-  Curlyleaf pondweed, 2
-  Curlyleaf pondweed, 3
-  Curlyleaf pondweed, 4

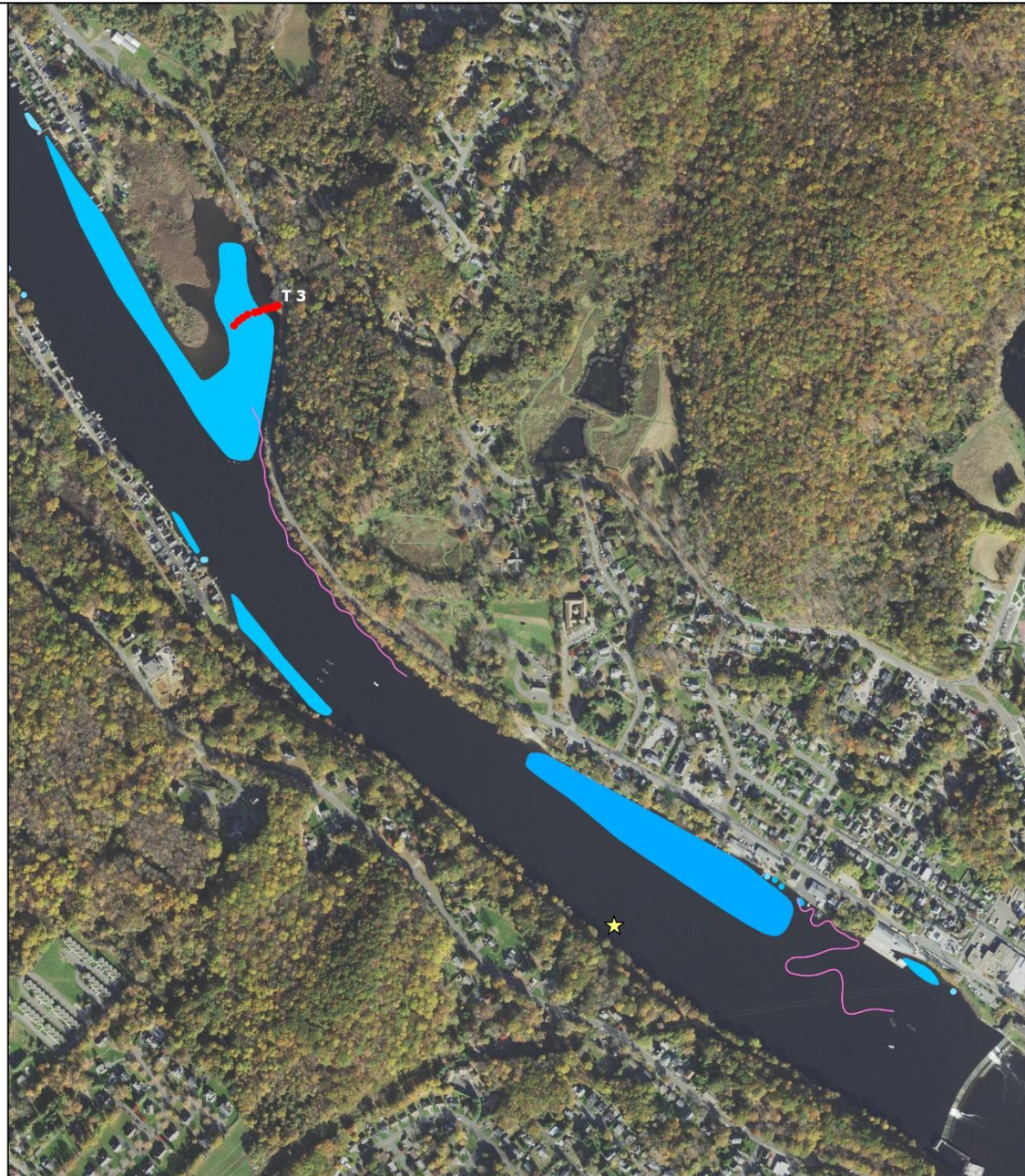


OAIS

Office of Aquatic Invasive Species
Connecticut Agricultural Experiment Station



0 0.1 0.2 0.4
Miles



2024 Survey Posttreatment Maps

Lake Housatonic Derby, Monroe, Oxford, Seymour, and Shelton 347 acres

Office of Aquatic Invasive Species
Surveyed on August 14-15
and October 1, 2024
By Greg Bugbee



Legend

▲ Collection Point

● Transect Point

★ Water Data

Invasive Points and Patches

Relative Abundance Scale: 1 (sparse) - 5 (dense)

■ Eurasian watermilfoil = 1

■ Eurasian watermilfoil = 2

■ Eurasian watermilfoil = 3

■ Minor naiad = 2

■ Minor naiad = 3

■ Curlyleaf pondweed = 1

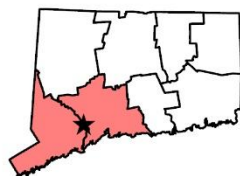
■ Curlyleaf pondweed = 2

■ Eelgrass = 1

■ Eelgrass = 2

■ Eelgrass = 3

■ Eelgrass = 4






0 0.25 0.5 1 Miles



Map 1 of 4
Lake Housatonic
Derby, Monroe, Oxford,
Seymour, and Shelton
347 acres

Office of Aquatic Invasive Species
 Surveyed on August 14-15 and
 October 1, 2024
 By Greg Bugbee

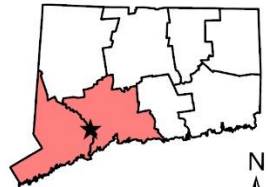
Legend

-  Collection Point
-  Transect Point
-  Water Data

Invasive Points and Patches

Relative Abundance Scale: 1 (sparse) - 5 (dense)

-  Eurasian watermilfoil = 1
-  Eurasian watermilfoil = 2
-  Eurasian watermilfoil = 3
-  Minor naiad = 2
-  Minor naiad = 3
-  Curlyleaf pondweed = 1
-  Curlyleaf pondweed = 2
-  Eelgrass = 1
-  Eelgrass = 2
-  Eelgrass = 3
-  Eelgrass = 4






0 0.1 0.2 0.4 Miles



Map 2 of 4 Lake Housatonic Derby, Monroe, Oxford, Seymour, and Shelton 347 acres

Office of Aquatic Invasive Species
Surveyed on August 14-15
and October 1, 2024
By Greg Bugbee

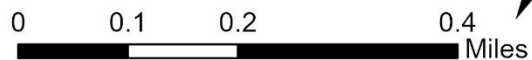
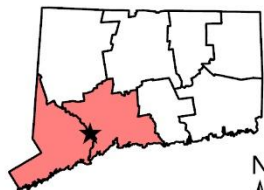
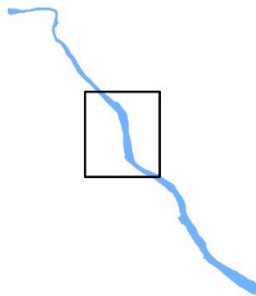
Legend

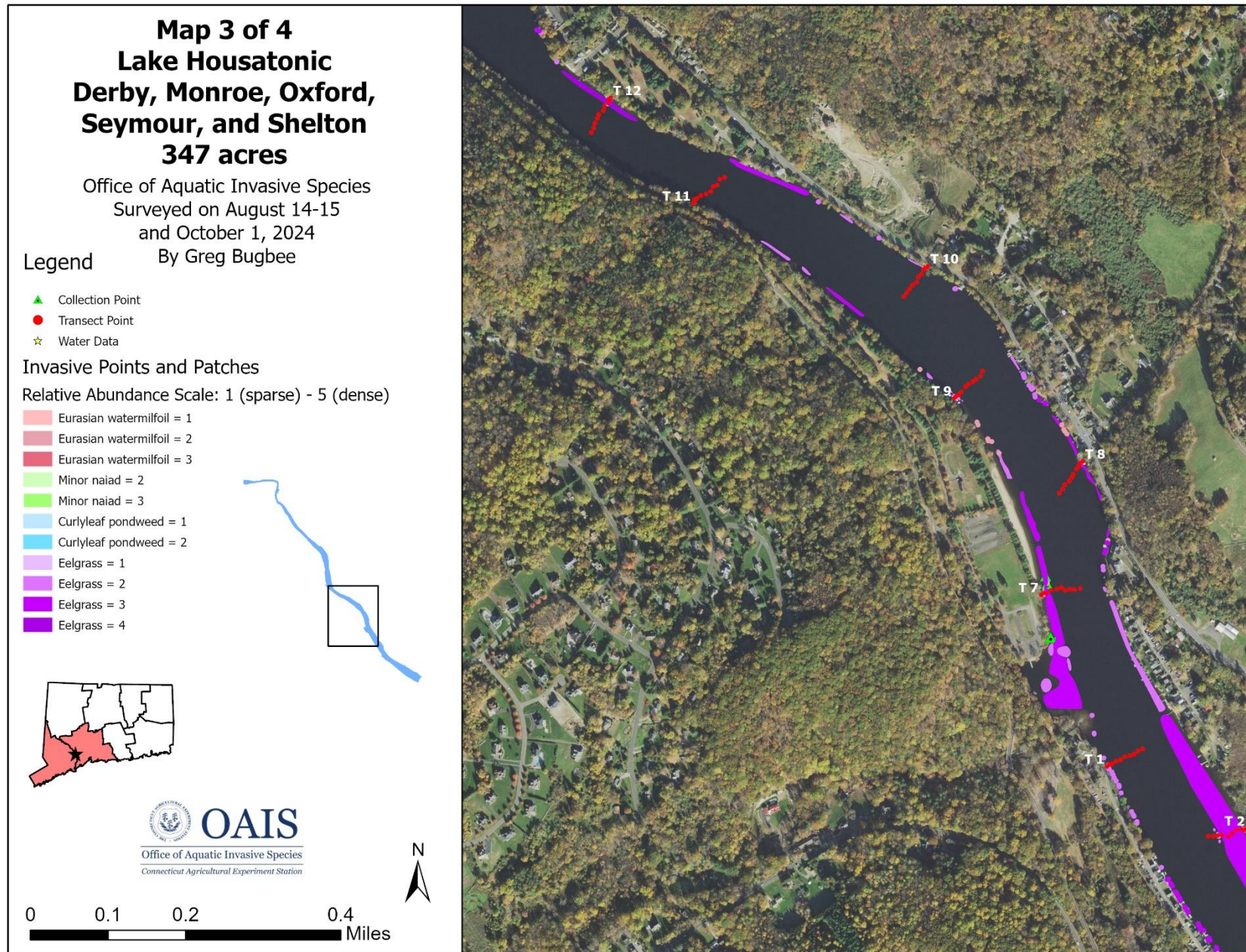
-  Collection Point
-  Transect Point
-  Water Data

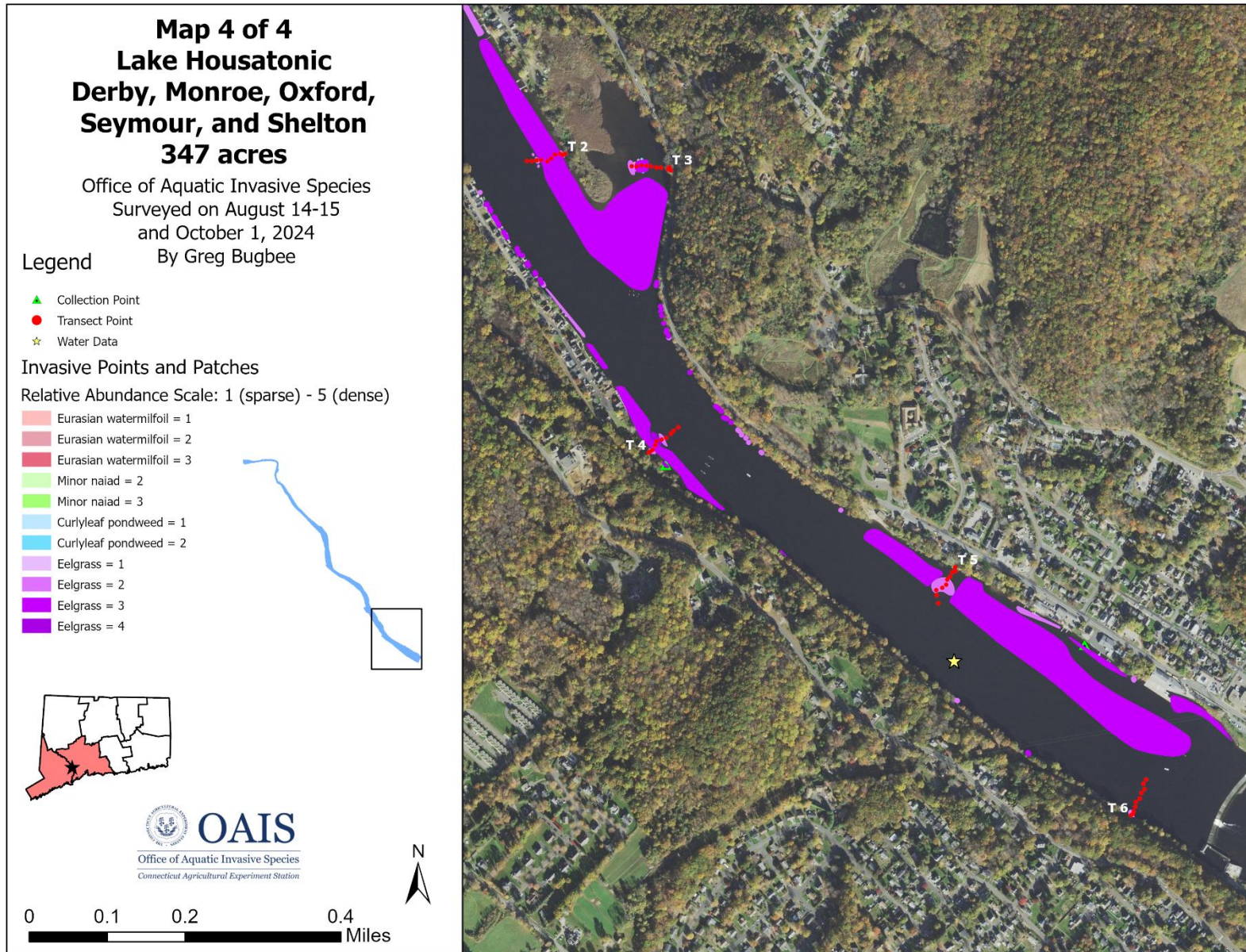
Invasive Points and Patches

Relative Abundance Scale: 1 (sparse) - 5 (dense)

-  Eurasian watermilfoil = 1
-  Eurasian watermilfoil = 2
-  Eurasian watermilfoil = 3
-  Minor naiad = 2
-  Minor naiad = 3
-  Curlyleaf pondweed = 1
-  Curlyleaf pondweed = 2
-  Eelgrass = 1
-  Eelgrass = 2
-  Eelgrass = 3
-  Eelgrass = 4







Plant Descriptions

Myriophyllum spicatum

Common name:

Eurasian watermilfoil

Origin:

Europe and Asia

Key features:

Plants are submersed

Stems: Stem diameter below the inflorescence is greater with reddish stem tips

Leaves: Leaves are rectangular with ≥ 12 pairs of leaflets per leaf and are dissected giving a feathery appearance, arranged in a whorl, whorls are 1 inch (2.5 cm) apart

Flowers: Small pinkish male flowers that occur on reddish spikes, female flowers lack petals and sepals and have 4 lobed pistil

Fruits/Seeds: Fruit are round 0.08-0.12 inches (2-3 mm) and contain 4 seeds

Reproduction: Fragmentation and seeds

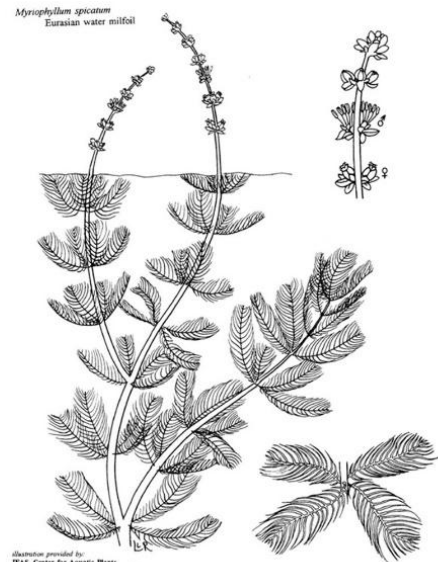
Easily confused species:

Variable-leaf watermilfoil: *Myriophyllum heterophyllum*

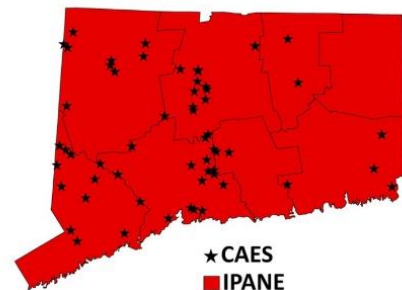
Low watermilfoil: *Myriophyllum humile*

Northern watermilfoil: *Myriophyllum sibiricum*

Whorled watermilfoil: *Myriophyllum verticillatum*



Copyright 1991 Univ. of Florida
Center for Aquatic and Invasive Plants



Najas minor

Common names:

Minor naiad
Brittle waternymph
Spiny leaf naiad
Eutrophic waternymph

Origin:

Europe

Key features:

Plants are submersed

Stems: Branched stems can grow up to 4-8 inches (10-20 cm) long

Leaves: Opposite and lance shaped on branched stems with easily visible toothed leaf edges and leaves appear curled under, basal lobes of leaf are also serrated, 0.01-0.02 inches (0.3-0.5 mm)

Flowers: Monoecious (male and female flowers on same plant)

Fruits/Seeds: Fruits are purple-tinged and seeds measure 0.03-0.06 inches (1.5-3 mm)

Reproduction: Seeds and fragmentation

Easily confused species:

Other naiads (native): *Najas* spp.



Potamogeton crispus

Common names:

Curly leaf pondweed
Crispy-leaved pondweed
Crisped pondweed

Origin:

Asia, Africa, and Europe

Key features:

Plants are submersed

Stems: Stems are flattened, can form dense stands in water up to 15 feet (5 m) deep

Leaves: Alternate leaves 0.3-1 inches (3-8 cm) wide with wavy edges (similar to lasagna) with a prominent mid-vein

Flowers: Brown and inconspicuous

Fruits/Seeds: Fruit is oval 0.1 inches (3 mm) long

Reproduction: Turions (right) and seeds

Easily confused species:

None



Photo by CAES IAPP



Photo by CAES IAPP



Vallisneria americana

Common names:

Eelgrass
Tapegrass
Wild celery

Origin:

Native to Connecticut

Key features:

Plants are submersed

Stems:

Leaves: Leaves basal, long and ribbon-like, broad lacunae band

Flowers: Pistillate flowers solitary, sessile, enclosed in a tubular spathe, reaching surface by peduncle elongation

Reproduction: Asexually via runners or stolons and winter buds and sexually via seeds

Easily confused species:

Arrowheads (Native): *Sagittaria* species

Pickernelweed (Native): *Pontederia cordata*

Bur-reeds (Native): *Sparganium* species



Photo by Ron Vanderhoff (CC BY-NC)

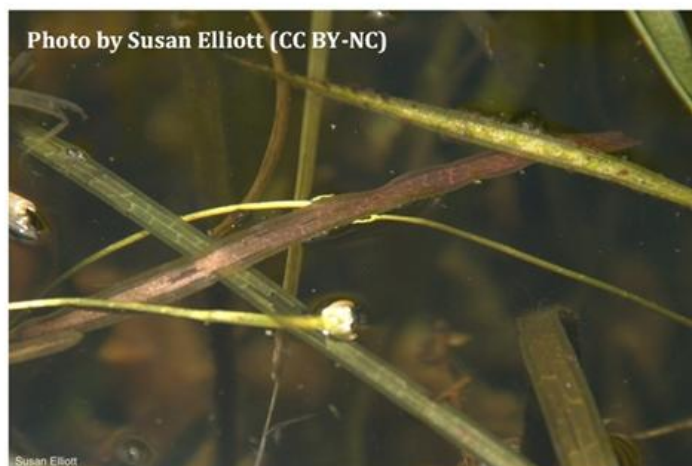


Photo by Susan Elliott (CC BY-NC)

Vallisneria americana
Tapegrass

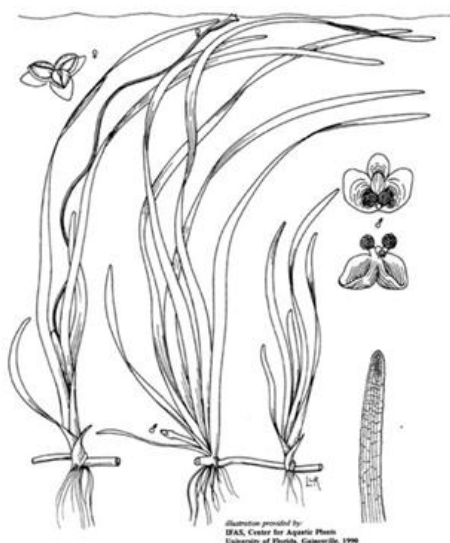


Illustration provided by
IFAS, Center for Aquatic Plants
University of Florida, Gainesville, 1990

Sources:

Crow, G.E. and C.B. Hellquist. 2000. Aquatic and wetland plants of northeastern North America. Vol 2. Angiosperms: Monocotyledons. The University of Wisconsin Press, Madison, Wisconsin.

Tootoonchi M, Gettys L.A., and Bhadha J.H. 2019. Tapegrass, eelgrass, or wild celery (*Vallisneria americana* Michaux): a native aquatic and wetland plant. University of Florida's Institute of Food and Agricultural Sciences. Retrieved December 15, 2022. <https://edis.ifas.ufl.edu/publication/AG437>.

Invasive Aquatic Plant Location Data

Appendix Lake Housatonic Invasive Plant Location data (1 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
0	Point	PotCri		2	0-1	5/31/2024	41.34063	-73.12420	0.0002
1	Point	PotCri		2	1-3	5/31/2024	41.34063	-73.12415	0.0002
2	Point	PotCri		2	1-3	5/31/2024	41.33799	-73.12162	0.0002
3	Point	PotCri		2	1-3	5/31/2024	41.33786	-73.12154	0.0002
4	Point	PotCri		2	1-3	5/31/2024	41.33747	-73.12122	0.0002
5	Point	PotCri		2	1-3	5/31/2024	41.33348	-73.11757	0.0002
6	Point	PotCri		2	1-3	5/31/2024	41.33348	-73.11761	0.0002
7	Point	PotCri		2	1-3	5/31/2024	41.32701	-73.10255	0.0002
8	Point	PotCri		3	1-3	5/31/2024	41.32837	-73.10564	0.0002
9	Point	PotCri		3	1-3	5/31/2024	41.32835	-73.10563	0.0002
10	Point	PotCri		3	1-3	5/31/2024	41.32833	-73.10560	0.0002
11	Point	PotCri		3	1-3	5/31/2024	41.32858	-73.10600	0.0002
12	Point	PotCri		3	0-1	5/31/2024	41.32868	-73.10614	0.0002
13	Point	PotCri		2	0-1	5/31/2024	41.32874	-73.10629	0.0002
14	Point	PotCri		3	0-2	6/4/2024	41.34112	-73.12170	0.0002
15	Point	PotCri		3	0-2	6/4/2024	41.34121	-73.12178	0.0002
16	Point	PotCri		3	1-3	6/4/2024	41.34133	-73.12186	0.0002
17	Point	PotCri		2	1-3	6/4/2024	41.34135	-73.12188	0.0002
18	Point	PotCri		2	1-3	6/4/2024	41.34146	-73.12192	0.0002
19	Point	PotCri		2	2-4	6/4/2024	41.34147	-73.12194	0.0002
20	Point	PotCri		2	1-3	6/4/2024	41.34164	-73.12199	0.0002
21	Point	PotCri		3	1-3	6/4/2024	41.34169	-73.12201	0.0002
22	Point	PotCri		3	1-3	6/4/2024	41.34171	-73.12204	0.0002
23	Point	PotCri		1	1-3	6/4/2024	41.34266	-73.12229	0.0002
24	Point	PotCri		2	1-3	6/4/2024	41.34301	-73.12217	0.0002
25	Point	PotCri		2	1-3	6/4/2024	41.34303	-73.12216	0.0002
26	Point	PotCri		3	1-3	6/4/2024	41.34312	-73.12215	0.0002
27	Point	PotCri		2	0-1	6/4/2024	41.34327	-73.12217	0.0002
28	Point	PotCri		2	0-1	6/4/2024	41.34346	-73.12224	0.0002
29	Point	PotCri		1	0-1	6/4/2024	41.34361	-73.12226	0.0002
30	Point	PotCri		2	0-1	6/4/2024	41.34367	-73.12229	0.0002
31	Point	PotCri		2	1-3	6/4/2024	41.34434	-73.12287	0.0002
32	Point	PotCri		2	1-3	6/4/2024	41.34435	-73.12283	0.0002
33	Point	PotCri		2	1-3	6/4/2024	41.34467	-73.12296	0.0002
34	Point	PotCri		3	1-3	6/4/2024	41.34465	-73.12298	0.0002
35	Point	PotCri		3	1-3	6/4/2024	41.34542	-73.12363	0.0002
36	Point	PotCri		2	0-1	6/4/2024	41.34623	-73.12442	0.0002
37	Point	PotCri		2	0-1	6/4/2024	41.34650	-73.12472	0.0002
38	Point	PotCri		2	1-3	6/4/2024	41.34775	-73.12608	0.0002
39	Point	PotCri		2	1-3	6/4/2024	41.34789	-73.12637	0.0002
40	Point	PotCri		2	1-3	6/4/2024	41.34791	-73.12643	0.0002
41	Point	PotCri		2	1-3	6/4/2024	41.34804	-73.12679	0.0002
42	Point	PotCri		1	1-3	6/4/2024	41.34834	-73.12746	0.0002
43	Point	PotCri		1	1-3	6/4/2024	41.34923	-73.12933	0.0002
44	Point	PotCri		1	1-3	6/4/2024	41.34941	-73.12968	0.0002
45	Point	PotCri		2	1-3	6/4/2024	41.34967	-73.13040	0.0002
46	Point	PotCri		2	0-1	6/4/2024	41.34972	-73.13052	0.0002
47	Point	PotCri		2	2-3	6/4/2024	41.34979	-73.13081	0.0002
48	Point	PotCri		2	0-2	6/4/2024	41.34985	-73.13109	0.0002
49	Point	PotCri		2	0-2	6/4/2024	41.35004	-73.13147	0.0002

Appendix Lake Housatonic Invasive Plant Location data (2 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
50	Point	PotCri		2	0-2	6/4/2024	41.35005	-73.13155	0.0002
51	Point	PotCri		2	1-3	6/4/2024	41.35006	-73.13166	0.0002
52	Point	PotCri		2	1-3	6/4/2024	41.35010	-73.13175	0.0002
53	Point	PotCri		2	1-3	6/4/2024	41.35023	-73.13221	0.0002
54	Point	PotCri		2	1-3	6/4/2024	41.35048	-73.13300	0.0002
55	Point	PotCri		2	2-3	6/4/2024	41.35369	-73.13687	0.0002
56	Point	PotCri		2	2-3	6/4/2024	41.35366	-73.13688	0.0002
57	Point	PotCri		2	2-3	6/4/2024	41.35616	-73.13740	0.0002
58	Point	PotCri		2	0-1	6/4/2024	41.35619	-73.13738	0.0002
59	Point	PotCri		3	1-3	6/4/2024	41.35621	-73.13739	0.0002
60	Point	PotCri		3	1-3	6/4/2024	41.35631	-73.13742	0.0002
61	Point	PotCri		3	1-3	6/4/2024	41.36298	-73.13938	0.0002
62	Point	PotCri		3	0-1	6/4/2024	41.36356	-73.13999	0.0002
63	Point	PotCri		2	1-3	6/4/2024	41.36428	-73.14118	0.0002
64	Point	PotCri		2	1-3	6/4/2024	41.36467	-73.14193	0.0002
65	Point	PotCri		3	1-3	6/4/2024	41.36469	-73.14194	0.0002
66	Point	PotCri		2	1-3	6/4/2024	41.35645	-73.13948	0.0002
67	Point	PotCri		2	1-3	6/5/2024	41.34855	-73.13086	0.0002
68	Point	PotCri		2	1-3	6/5/2024	41.34854	-73.13081	0.0002
69	Point	PotCri		2	1-3	6/5/2024	41.34852	-73.13073	0.0002
70	Point	PotCri		2	0-2	6/5/2024	41.34836	-73.13049	0.0002
71	Point	PotCri		2	0-1	6/5/2024	41.34825	-73.13027	0.0002
72	Point	PotCri		2	1-3	6/5/2024	41.34785	-73.12952	0.0002
73	Point	PotCri		2	1-3	6/5/2024	41.34763	-73.12909	0.0002
74	Point	PotCri		2	1-3	6/5/2024	41.34755	-73.12895	0.0002
75	Point	PotCri		3	1-3	6/5/2024	41.34753	-73.12885	0.0002
76	Point	PotCri		2	1-3	6/5/2024	41.34750	-73.12882	0.0002
77	Point	PotCri		2	1-3	6/5/2024	41.34749	-73.12882	0.0002
78	Point	PotCri		2	1-3	6/5/2024	41.34746	-73.12880	0.0002
79	Point	PotCri		2	1-3	6/5/2024	41.34744	-73.12878	0.0002
80	Point	PotCri		2	1-3	6/5/2024	41.34741	-73.12872	0.0002
81	Point	PotCri		2	1-3	6/5/2024	41.34740	-73.12868	0.0002
82	Point	PotCri		2	1-3	6/5/2024	41.34738	-73.12865	0.0002
83	Point	PotCri		2	1-3	6/5/2024	41.34735	-73.12861	0.0002
84	Point	PotCri		2	1-3	6/5/2024	41.34728	-73.12845	0.0002
85	Point	PotCri		2	1-3	6/5/2024	41.34722	-73.12832	0.0002
86	Point	PotCri		2	1-3	6/5/2024	41.34698	-73.12795	0.0002
87	Point	PotCri		2	1-3	6/5/2024	41.34688	-73.12784	0.0002
88	Point	PotCri		2	1-3	6/5/2024	41.34673	-73.12772	0.0002
89	Point	PotCri		2	1-3	6/5/2024	41.34675	-73.12769	0.0002
90	Point	PotCri		2	1-3	6/5/2024	41.34673	-73.12765	0.0002
91	Point	PotCri		2	1-3	6/5/2024	41.34665	-73.12760	0.0002
92	Point	PotCri		2	1-3	6/5/2024	41.34660	-73.12746	0.0002
93	Point	PotCri		2	1-3	6/5/2024	41.34636	-73.12716	0.0002
94	Point	PotCri		2	1-3	6/5/2024	41.34630	-73.12709	0.0002
95	Point	PotCri		2	1-3	6/5/2024	41.34622	-73.12693	0.0002
96	Point	PotCri		2	1-3	6/5/2024	41.34456	-73.12486	0.0002
97	Point	PotCri		2	1-3	6/5/2024	41.34443	-73.12480	0.0002
98	Point	PotCri		2	1-3	6/5/2024	41.34436	-73.12475	0.0002
99	Point	PotCri		2	1-3	6/5/2024	41.34427	-73.12469	0.0002

Appendix Lake Housatonic Invasive Plant Location data (3 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
100	Point	PotCri		2	1-3	6/5/2024	41.34422	-73.12469	0.0002
101	Point	PotCri		2	1-3	6/5/2024	41.34261	-73.12386	0.0002
102	Point	PotCri		2	1-3	6/5/2024	41.34253	-73.12383	0.0002
103	Point	PotCri		2	1-3	6/5/2024	41.34251	-73.12383	0.0002
104	Point	PotCri		2	1-3	6/5/2024	41.34230	-73.12368	0.0002
105	Point	PotCri		2	1-3	6/5/2024	41.34226	-73.12370	0.0002
106	Point	PotCri		2	1-3	6/5/2024	41.34224	-73.12371	0.0002
107	Point	PotCri		2	1-3	6/5/2024	41.34212	-73.12363	0.0002
108	Point	PotCri		2	1-3	6/5/2024	41.34206	-73.12361	0.0002
109	Point	PotCri		2	1-3	6/5/2024	41.34197	-73.12368	0.0002
1	Patch	PotCri		2	1-3	5/31/2024	41.34063	-73.12344	2.6875
2	Patch	PotCri		3	1-3	5/31/2024	41.33389	-73.11796	0.2050
3	Patch	PotCri		3	1-3	5/31/2024	41.33200	-73.11610	1.3680
4	Patch	PotCri		3	1-3	5/31/2024	41.32731	-73.10318	0.2628
5	Patch	PotCri		4	2-4	5/31/2024	41.32913	-73.10816	8.3426
6	Patch	PotCri	A variable	3	1-4	5/31/2024	41.33692	-73.11779	11.1020
7	Patch	PotCri		2	1-3	6/4/2024	41.34007	-73.12107	0.0933
8	Patch	PotCri		2	1-3	6/4/2024	41.34498	-73.12326	0.0626
9	Patch	PotCri		2	1-3	6/5/2024	41.35412	-73.13904	1.1231
1	Point	ValAme		2	1-3	8/14/2024	41.33970	-73.12254	0.0002
2	Point	ValAme		2	1-3	8/14/2024	41.33890	-73.12225	0.0002
3	Point	ValAme		2	1-3	8/14/2024	41.33877	-73.12213	0.0002
4	Point	ValAme		2	0-1	8/14/2024	41.33870	-73.12210	0.0002
5	Point	ValAme		2	1-3	8/14/2024	41.33864	-73.12204	0.0002
6	Point	ValAme		2	1-3	8/14/2024	41.33859	-73.12202	0.0002
7	Point	ValAme		2	1-3	8/14/2024	41.33853	-73.12198	0.0002
8	Point	ValAme		2	0-2	8/14/2024	41.33847	-73.12193	0.0002
9	Point	ValAme		2	0-2	8/14/2024	41.33840	-73.12187	0.0002
10	Point	ValAme		2	0-2	8/14/2024	41.33836	-73.12185	0.0002
11	Point	ValAme		2	0-2	8/14/2024	41.33825	-73.12180	0.0002
12	Point	ValAme		2	1-3	8/14/2024	41.33790	-73.12155	0.0002
13	Point	ValAme		2	1-3	8/14/2024	41.33784	-73.12151	0.0002
14	Point	ValAme		2	1-3	8/14/2024	41.33781	-73.12148	0.0002
15	Point	ValAme		2	0-1	8/14/2024	41.33772	-73.12141	0.0002
16	Point	ValAme		2	0-1	8/14/2024	41.33769	-73.12140	0.0002
17	Point	ValAme		2	0-2	8/14/2024	41.33686	-73.12080	0.0002
18	Point	ValAme		3	0-2	8/14/2024	41.33665	-73.12063	0.0002
19	Point	ValAme		3	0-2	8/14/2024	41.33663	-73.12062	0.0002
20	Point	ValAme		3	0-2	8/14/2024	41.33663	-73.12065	0.0002
21	Point	ValAme		3	0-2	8/14/2024	41.33656	-73.12056	0.0002
22	Point	ValAme		3	1-3	8/14/2024	41.33653	-73.12055	0.0002
23	Point	ValAme		3	1-3	8/14/2024	41.33652	-73.12053	0.0002
24	Point	ValAme		3	1-3	8/14/2024	41.33640	-73.12045	0.0002
25	Point	ValAme		3	1-3	8/14/2024	41.33639	-73.12042	0.0002
26	Point	ValAme		3	1-3	8/14/2024	41.33636	-73.12041	0.0002
27	Point	ValAme		3	1-3	8/14/2024	41.33633	-73.12039	0.0002
28	Point	ValAme		3	1-3	8/14/2024	41.33631	-73.12037	0.0002
29	Point	ValAme		3	1-3	8/14/2024	41.33629	-73.12035	0.0002
30	Point	ValAme		3	1-3	8/14/2024	41.33627	-73.12033	0.0002
31	Point	ValAme		3	1-3	8/14/2024	41.33624	-73.12032	0.0002

Appendix Lake Housatonic Invasive Plant Location data (4 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
32	Point	ValAme		3	1-3	8/14/2024	41.33612	-73.12020	0.0002
33	Point	ValAme		3	1-3	8/14/2024	41.33610	-73.12020	0.0002
34	Point	ValAme		2	1-3	8/14/2024	41.33608	-73.12017	0.0002
35	Point	ValAme		3	1-3	8/14/2024	41.33605	-73.12015	0.0002
36	Point	ValAme		3	1-3	8/14/2024	41.33603	-73.12013	0.0002
37	Point	ValAme		3	1-3	8/14/2024	41.33582	-73.11988	0.0002
38	Point	ValAme		3	1-3	8/14/2024	41.33578	-73.11987	0.0002
39	Point	ValAme		3	1-3	8/14/2024	41.33576	-73.11985	0.0002
40	Point	ValAme		3	1-3	8/14/2024	41.33571	-73.11983	0.0002
41	Point	ValAme		3	1-3	8/14/2024	41.33569	-73.11975	0.0002
42	Point	ValAme		3	1-3	8/14/2024	41.33555	-73.11962	0.0002
43	Point	ValAme		3	1-3	8/14/2024	41.33552	-73.11964	0.0002
44	Point	ValAme		3	1-3	8/14/2024	41.33552	-73.11962	0.0002
45	Point	ValAme		3	1-3	8/14/2024	41.33550	-73.11959	0.0002
46	Point	ValAme		3	1-3	8/14/2024	41.33537	-73.11943	0.0002
47	Point	ValAme		3	1-3	8/14/2024	41.33535	-73.11943	0.0002
48	Point	ValAme		3	1-3	8/14/2024	41.33534	-73.11942	0.0002
49	Point	ValAme		3	1-3	8/14/2024	41.33524	-73.11931	0.0002
50	Point	ValAme		3	1-3	8/14/2024	41.33517	-73.11927	0.0002
51	Point	ValAme		2	1-3	8/14/2024	41.33517	-73.11924	0.0002
52	Point	ValAme		2	1-3	8/14/2024	41.33513	-73.11922	0.0002
53	Point	ValAme		2	1-3	8/14/2024	41.32744	-73.10898	0.0002
54	Point	ValAme		2	1-3	8/14/2024	41.32743	-73.10896	0.0002
55	Point	ValAme		3	1-3	8/14/2024	41.32648	-73.10722	0.0002
56	Point	ValAme		3	1-3	8/14/2024	41.32645	-73.10719	0.0002
57	Point	ValAme		2	0-1	8/14/2024	41.32537	-73.10467	0.0002
58	Point	ValAme		2	0-2	8/14/2024	41.32534	-73.10466	0.0002
59	Point	ValAme		2	0-2	8/14/2024	41.32783	-73.10460	0.0002
60	Point	ValAme		2	0-2	8/14/2024	41.32783	-73.10460	0.0002
61	Point	ValAme		2	0-2	8/14/2024	41.32785	-73.10462	0.0002
62	Point	ValAme		2	0-2	8/14/2024	41.32786	-73.10461	0.0002
63	Point	ValAme		2	0-2	8/14/2024	41.33097	-73.11186	0.0002
64	Point	ValAme		2	0-2	8/14/2024	41.33204	-73.11383	0.0002
65	Point	ValAme		2	0-2	8/14/2024	41.33203	-73.11382	0.0002
66	Point	ValAme		2	0-2	8/14/2024	41.33222	-73.11414	0.0002
67	Point	ValAme		2	0-2	8/14/2024	41.33230	-73.11421	0.0002
68	Point	ValAme		2	0-2	8/14/2024	41.33236	-73.11432	0.0002
69	Point	ValAme		2	0-2	8/14/2024	41.33244	-73.11437	0.0002
70	Point	ValAme		2	0-2	8/14/2024	41.33246	-73.11441	0.0002
71	Point	ValAme		3	0-2	8/14/2024	41.33259	-73.11458	0.0002
72	Point	ValAme		3	0-2	8/14/2024	41.33266	-73.11467	0.0002
73	Point	ValAme		3	0-2	8/14/2024	41.33267	-73.11470	0.0002
74	Point	ValAme		3	0-2	8/14/2024	41.33269	-73.11477	0.0002
75	Point	ValAme		3	0-2	8/14/2024	41.33280	-73.11482	0.0002
76	Point	ValAme		3	0-2	8/14/2024	41.33283	-73.11485	0.0002
77	Point	ValAme		3	0-2	8/14/2024	41.33285	-73.11487	0.0002
78	Point	ValAme		3	0-2	8/14/2024	41.33287	-73.11491	0.0002
79	Point	ValAme		3	0-2	8/14/2024	41.33289	-73.11496	0.0002
80	Point	ValAme		3	0-2	8/14/2024	41.33352	-73.11560	0.0002
81	Point	ValAme		2	0-2	8/14/2024	41.33416	-73.11612	0.0002

Appendix Lake Housatonic Invasive Plant Location data (5 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
82	Point	ValAme		3	0-2	8/14/2024	41.33419	-73.11613	0.0002
83	Point	ValAme		3	0-2	8/14/2024	41.33424	-73.11616	0.0002
84	Point	ValAme		3	0-2	8/14/2024	41.33428	-73.11619	0.0002
85	Point	ValAme		3	0-2	8/14/2024	41.33431	-73.11618	0.0002
86	Point	ValAme		3	0-2	8/14/2024	41.33443	-73.11625	0.0002
87	Point	ValAme		3	0-2	8/14/2024	41.33458	-73.11630	0.0002
88	Point	ValAme		3	0-2	8/14/2024	41.33467	-73.11633	0.0002
89	Point	ValAme		3	0-2	8/14/2024	41.33471	-73.11631	0.0002
90	Point	ValAme		3	0-2	8/14/2024	41.33476	-73.11634	0.0002
91	Point	ValAme		3	0-2	8/14/2024	41.33513	-73.11645	0.0002
92	Point	ValAme		3	0-2	8/14/2024	41.33517	-73.11644	0.0002
93	Point	ValAme		3	0-2	8/14/2024	41.33520	-73.11643	0.0002
94	Point	ValAme		2	0-2	8/15/2024	41.34241	-73.12227	0.0002
95	Point	ValAme		2	0-2	8/15/2024	41.34248	-73.12228	0.0002
96	Point	ValAme		3	0-2	8/15/2024	41.34273	-73.12224	0.0002
97	Point	ValAme		3	0-2	8/15/2024	41.34278	-73.12222	0.0002
98	Point	ValAme		3	0-2	8/15/2024	41.34291	-73.12217	0.0002
99	Point	ValAme		3	0-2	8/15/2024	41.34291	-73.12216	0.0002
100	Point	ValAme		3	0-2	8/15/2024	41.34292	-73.12217	0.0002
101	Point	MyrSpi		2	0-2	8/15/2024	41.34296	-73.12216	0.0002
102	Point	MyrSpi		2	0-2	8/15/2024	41.34495	-73.12319	0.0002
103	Point	MyrSpi		2	0-2	8/15/2024	41.34499	-73.12324	0.0002
104	Point	MyrSpi		2	0-2	8/15/2024	41.34503	-73.12326	0.0002
105	Point	MyrSpi		2	0-2	8/15/2024	41.34512	-73.12332	0.0002
106	Point	ValAme		3	0-2	8/15/2024	41.34551	-73.12371	0.0002
107	Point	ValAme		3	0-2	8/15/2024	41.34551	-73.12373	0.0002
108	Point	ValAme		3	1-3	8/15/2024	41.34558	-73.12388	0.0002
109	Point	ValAme		2	1-3	8/15/2024	41.34563	-73.12398	0.0002
110	Point	ValAme		2	1-3	8/15/2024	41.34568	-73.12399	0.0002
111	Point	ValAme		2	1-3	8/15/2024	41.34581	-73.12407	0.0002
112	Point	ValAme		2	1-3	8/15/2024	41.34580	-73.12408	0.0002
113	Point	ValAme		2	1-3	8/15/2024	41.34580	-73.12405	0.0002
114	Point	ValAme		2	1-3	8/15/2024	41.34586	-73.12414	0.0002
115	Point	ValAme		2	1-3	8/15/2024	41.34606	-73.12428	0.0002
116	Point	ValAme		2	1-3	8/15/2024	41.34605	-73.12427	0.0002
117	Point	ValAme		2	1-3	8/15/2024	41.34603	-73.12427	0.0002
118	Point	ValAme		2	1-3	8/15/2024	41.34600	-73.12425	0.0002
119	Point	ValAme		2	1-3	8/15/2024	41.34765	-73.12597	0.0002
120	Point	ValAme		2	1-3	8/15/2024	41.34765	-73.12598	0.0002
121	Point	ValAme		2	0-1	8/15/2024	41.34859	-73.12787	0.0002
122	Point	ValAme		2	1-3	8/15/2024	41.34926	-73.12938	0.0002
123	Point	ValAme		2	1-3	8/15/2024	41.35185	-73.13588	0.0002
124	Point	ValAme		3	1-3	8/15/2024	41.35244	-73.13637	0.0002
125	Point	ValAme		3	1-3	8/15/2024	41.35243	-73.13631	0.0002
126	Point	ValAme		2	0-1	8/15/2024	41.35240	-73.13628	0.0002
127	Point	ValAme		3	1-3	8/15/2024	41.35370	-73.13682	0.0002
128	Point	ValAme		3	1-3	8/15/2024	41.35371	-73.13684	0.0002
129	Point	ValAme		3	1-3	8/15/2024	41.35368	-73.13686	0.0002
130	Point	MyrSpi		3	1-3	8/15/2024	41.35612	-73.13736	0.0002
131	Point	MyrSpi		3	1-3	8/15/2024	41.35617	-73.13739	0.0002

Appendix Lake Housatonic Invasive Plant Location data (6 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
132	Point	MyrSpi		3	1-3	8/15/2024	41.35621665	-73.1373975	0.0002
133	Point	MyrSpi		3	1-3	8/15/2024	41.35630458	-73.1374297	0.0002
134	Point	MyrSpi		3	1-3	8/15/2024	41.35633118	-73.1374446	0.0002
135	Point	MyrSpi		3	1-3	8/15/2024	41.3563931	-73.1374518	0.0002
136	Point	MyrSpi		3	1-3	8/15/2024	41.35645264	-73.1374746	0.0002
137	Point	ValAme		3	1-3	8/15/2024	41.35666658	-73.1375344	0.0002
138	Point	ValAme		3	1-3	8/15/2024	41.35666244	-73.1375135	0.0002
139	Point	ValAme		2	0-2	8/15/2024	41.35679266	-73.1375688	0.0002
140	Point	ValAme		2	0-2	8/15/2024	41.35750945	-73.1377373	0.0002
141	Point	ValAme		2	0-2	8/15/2024	41.35765513	-73.1378065	0.0002
142	Point	ValAme		2	0-2	8/15/2024	41.35865	-73.13804	0.0002
143	Point	ValAme		2	0-2	8/15/2024	41.35867	-73.13804	0.0002
144	Point	ValAme		2	1-3	8/15/2024	41.35958	-73.13798	0.0002
145	Point	ValAme		2	0-2	8/15/2024	41.35964	-73.13800	0.0002
146	Point	ValAme		2	0-2	8/15/2024	41.35968	-73.13800	0.0002
147	Point	ValAme		2	0-2	8/15/2024	41.35973	-73.13797	0.0002
148	Point	ValAme		2	0-2	8/15/2024	41.36001	-73.13803	0.0002
149	Point	ValAme		2	0-2	8/15/2024	41.36001	-73.13800	0.0002
150	Point	ValAme		2	0-2	8/15/2024	41.36001	-73.13801	0.0002
151	Point	ValAme		2	0-2	8/15/2024	41.36031	-73.13812	0.0002
152	Point	ValAme		2	0-2	8/15/2024	41.36034	-73.13811	0.0002
153	Point	ValAme		2	0-2	8/15/2024	41.36037	-73.13812	0.0002
154	Point	ValAme		2	0-2	8/15/2024	41.36038	-73.13812	0.0002
155	Point	ValAme		2	0-2	8/15/2024	41.36042	-73.13812	0.0002
156	Point	MyrSpi		2	0-2	8/15/2024	41.36370	-73.14058	0.0002
157	Point	MyrSpi		2	0-2	8/15/2024	41.36366	-73.14051	0.0002
158	Point	MyrSpi		2	0-2	8/15/2024	41.36368	-73.14048	0.0002
159	Point	MyrSpi		2	0-2	8/15/2024	41.36370	-73.14045	0.0002
160	Point	MyrSpi		2	0-2	8/15/2024	41.36368	-73.14042	0.0002
161	Point	MyrSpi		2	0-2	8/15/2024	41.36367	-73.14040	0.0002
162	Point	MyrSpi		2	0-2	8/15/2024	41.36368	-73.14034	0.0002
163	Point	MyrSpi		2	0-2	8/15/2024	41.36368	-73.14033	0.0002
164	Point	MyrSpi		2	0-2	8/15/2024	41.36412	-73.14099	0.0002
165	Point	MyrSpi		2	0-2	8/15/2024	41.36416	-73.14098	0.0002
166	Point	MyrSpi		3	0-2	8/15/2024	41.36420	-73.14099	0.0002
167	Point	MyrSpi		3	0-2	8/15/2024	41.36422	-73.14101	0.0002
168	Point	MyrSpi		3	0-2	8/15/2024	41.36424	-73.14103	0.0002
169	Point	MyrSpi		3	0-2	8/15/2024	41.36424	-73.14106	0.0002
170	Point	MyrSpi		3	0-2	8/15/2024	41.36424	-73.14110	0.0002
171	Point	MyrSpi		3	0-2	8/15/2024	41.36430	-73.14116	0.0002
172	Point	MyrSpi		3	0-2	8/15/2024	41.36430	-73.14112	0.0002
173	Point	MyrSpi		3	0-2	8/15/2024	41.36427	-73.14104	0.0002
174	Point	MyrSpi		3	0-2	8/15/2024	41.36427	-73.14119	0.0002
175	Point	MyrSpi		3	0-2	8/15/2024	41.36430	-73.14121	0.0002
176	Point	MyrSpi		3	0-2	8/15/2024	41.36434	-73.14122	0.0002
177	Point	MyrSpi		3	0-2	8/15/2024	41.36438	-73.14125	0.0002
178	Point	MyrSpi		3	0-2	8/15/2024	41.36439	-73.14128	0.0002
179	Point	MyrSpi		3	0-2	8/15/2024	41.36440	-73.14130	0.0002
180	Point	MyrSpi		3	0-2	8/15/2024	41.36439	-73.14133	0.0002
181	Point	MyrSpi		3	0-2	8/15/2024	41.36439	-73.14137	0.0002
182	Point	MyrSpi		3	0-2	8/15/2024	41.36441	-73.14140	0.0002

Appendix Lake Housatonic Invasive Plant Location data (7 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
183	Point	MyrSpi		3	0-2	8/15/2024	41.36443	-73.14140	0.0002
184	Point	MyrSpi		3	0-2	8/15/2024	41.36445	-73.14138	0.0002
185	Point	MyrSpi		3	0-2	8/15/2024	41.36446	-73.14134	0.0002
186	Point	MyrSpi		3	0-2	8/15/2024	41.36445	-73.14129	0.0002
187	Point	MyrSpi		3	0-2	8/15/2024	41.36436	-73.14147	0.0002
188	Point	MyrSpi		3	0-2	8/15/2024	41.36440	-73.14149	0.0002
189	Point	MyrSpi		3	0-2	8/15/2024	41.36443	-73.14151	0.0002
190	Point	MyrSpi		3	0-2	8/15/2024	41.36448	-73.14159	0.0002
191	Point	MyrSpi		3	0-2	8/15/2024	41.36451	-73.14163	0.0002
192	Point	MyrSpi		3	0-2	8/15/2024	41.36455	-73.14169	0.0002
193	Point	MyrSpi		3	0-2	8/15/2024	41.36459	-73.14179	0.0002
194	Point	MyrSpi		2	1-3	8/15/2024	41.36464	-73.14192	0.0002
195	Point	MyrSpi		2	1-3	8/15/2024	41.36479	-73.14223	0.0002
196	Point	MyrSpi		2	1-3	8/15/2024	41.36484	-73.14227	0.0002
197	Point	MyrSpi		2	1-3	8/15/2024	41.36487	-73.14232	0.0002
198	Point	MyrSpi		2	1-3	8/15/2024	41.36489	-73.14237	0.0002
199	Point	MyrSpi		2	1-3	8/15/2024	41.36492	-73.14242	0.0002
200	Point	MyrSpi		2	1-3	8/15/2024	41.36495	-73.14246	0.0002
201	Point	MyrSpi		2	1-3	8/15/2024	41.36511	-73.14269	0.0002
202	Point	MyrSpi		2	1-3	8/15/2024	41.36519	-73.14282	0.0002
203	Point	MyrSpi		2	1-3	8/15/2024	41.36564	-73.14342	0.0002
204	Point	MyrSpi		2	1-3	8/15/2024	41.36568	-73.14347	0.0002
205	Point	MyrSpi		2	1-3	8/15/2024	41.36575	-73.14362	0.0002
206	Point	MyrSpi		2	1-3	8/15/2024	41.36594	-73.14396	0.0002
207	Point	MyrSpi		2	1-3	8/15/2024	41.36601	-73.14409	0.0002
208	Point	MyrSpi		2	1-3	8/15/2024	41.36686	-73.14550	0.0002
209	Point	MyrSpi		2	1-3	8/15/2024	41.36690	-73.14559	0.0002
210	Point	MyrSpi		1	1-3	10/1/2024	41.37633	-73.15663	0.0002
211	Point	MyrSpi		1	1-3	10/1/2024	41.37624	-73.15655	0.0002
212	Point	ValAme		2	1-3	10/1/2024	41.36972	-73.15104	0.0002
213	Point	ValAme		2	1-3	10/1/2024	41.36855	-73.14922	0.0002
214	Point	ValAme		2	1-3	10/1/2024	41.36832	-73.14897	0.0002
215	Point	ValAme		2	1-3	10/1/2024	41.36760	-73.14822	0.0002
216	Point	ValAme		2	1-3	10/1/2024	41.36756	-73.14821	0.0002
217	Point	ValAme		2	1-3	10/1/2024	41.36730	-73.14790	0.0002
218	Point	ValAme		2	1-3	10/1/2024	41.36653	-73.14691	0.0002
219	Point	ValAme		2	1-3	10/1/2024	41.36618	-73.14642	0.0002
220	Point	ValAme		2	1-3	10/1/2024	41.35941	-73.13991	0.0002
221	Point	ValAme		2	1-3	10/1/2024	41.35761	-73.13942	0.0002
222	Point	ValAme		2	1-3	10/1/2024	41.35763	-73.13939	0.0002
223	Point	MyrSpi		2	1-3	10/1/2024	41.35735	-73.13950	0.0002
224	Point	MyrSpi		2	1-3	10/1/2024	41.34614	-73.12684	0.0002
225	Point	MyrSpi		2	1-3	10/1/2024	41.34516	-73.12542	0.0002
226	Point	MyrSpi		2	1-3	10/1/2024	41.34511	-73.12539	0.0002
227	Point	MyrSpi		2	1-3	10/1/2024	41.34480	-73.12506	0.0002
228	Point	MyrSpi		2	1-3	10/1/2024	41.34481	-73.12514	0.0002
229	Point	MyrSpi		2	1-3	10/1/2024	41.34485	-73.12515	0.0002
230	Point	MyrSpi		2	1-3	10/1/2024	41.34458	-73.12487	0.0002
1	Patch	ValAme	WithCERDemMid-South_PotAmpNorth	3	1-3	8/14/2024	41.34079	-73.12338	2.1170
2	Patch	ValAme	WithCERDemMid-South_PotAmpNorth	2	0-2	8/14/2024	41.33935	-73.12248	0.0240
3	Patch	ValAme		2	1-3	8/14/2024	41.33459	-73.11863	0.1884

Appendix Lake Housatonic Invasive Plant Location data (8 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
4	Patch	ValAme		3	1-3	8/14/2024	41.33382	-73.11789	0.1682
5	Patch	ValAme	WithPotAmpNorth	3	1-3	8/14/2024	41.33213	-73.11626	1.7071
6	Patch	ValAme	WithPotAmpNorth	3	1-3	8/14/2024	41.33017	-73.11328	0.0140
7	Patch	ValAme	WithPotAmpNorth	3	1-3	8/14/2024	41.32725	-73.10310	0.6044
8	Patch	ValAme	WithPotAmpNorth	3	1-3	8/14/2024	41.32794	-73.10621	10.0878
9	Patch	ValAme	Mixed withPotAmp in Patches	3	0-2	8/14/2024	41.32822	-73.10546	0.3149
10	Patch	ValAme	Mixed withPotAmp in Patches	2	0-2	8/14/2024	41.32900	-73.10704	0.2013
11	Patch	ValAme	This Cove MyrSpiSporadicAlgalMats	3	0-2	8/14/2024	41.33656	-73.11627	0.0000
12	Patch	ValAme	D=0-3,Pot Amp Pathces SW_See Greg_MyrSpiNEA=2	3	0-2	8/14/2024	41.33681	-73.11803	11.2045
13	Patch	ValAme		2	1-3	8/15/2024	41.34070	-73.12142	0.6459
14	Patch	ValAme		2	1-3	8/15/2024	41.34205	-73.12224	0.0154
15	Patch	ValAme		3	1-3	8/15/2024	41.34309	-73.12216	0.0219
16	Patch	ValAme		3	0-2	8/15/2024	41.34413	-73.12262	0.1070
17	Patch	ValAme		3	0-2	8/15/2024	41.34494	-73.12321	0.1350
18	Patch	ValAme		2	0-2	8/15/2024	41.34628	-73.12449	0.0397
19	Patch	ValAme		2	1-3	8/15/2024	41.34811	-73.12692	0.0348
20	Patch	ValAme		2	1-3	8/15/2024	41.34895	-73.12867	0.0397
21	Patch	ValAme		3	1-3	8/15/2024	41.34970	-73.13058	0.3964
22	Patch	ValAme	WithDensePatchesofPotAss	4	1-3	8/15/2024	41.35120	-73.13482	0.4305
23	Patch	ValAme		2	1-3	8/15/2024	41.35436	-73.13700	0.0001
24	Patch	ValAme		2	1-3	8/15/2024	41.35471	-73.13710	0.0402
25	Patch	ValAme		3	1-3	8/15/2024	41.35588	-73.13731	0.2025
26	Patch	ValAme		2	1-3	8/15/2024	41.35715	-73.13766	0.0774
27	Patch	ValAme		2	0-2	8/15/2024	41.35826	-73.13798	0.0253
28	Patch	ValAme		2	0-2	8/15/2024	41.36136	-73.13834	0.2089
29	Patch	ValAme		3	0-2	8/15/2024	41.36269	-73.13902	0.1350
30	Patch	ValAme	WithPotAss?Dense	3	1-3	8/15/2024	41.36178	-73.13984	9.0022
31	Patch	ValAme		3	0-2	8/15/2024	41.36366	-73.14037	0.2662
32	Patch	NajMin		3	0-2	8/15/2024	41.36369	-73.14029	0.0552
33	Patch	ValAme	WithPoyAssinDensePatches	3	0-2	8/15/2024	41.36473	-73.14198	0.8580
34	Patch	ValAme		3	1-3	8/15/2024	41.36742	-73.14639	0.0143
35	Patch	ValAme		3	1-3	8/15/2024	41.36798	-73.14706	0.1702
36	Patch	ValAme		2	0-2	8/15/2024	41.36953	-73.14920	0.2668
37	Patch	ValAme	MixeSpZosDubPotZos?PotHybrid?	2	1-3	8/15/2024	41.37264	-73.15234	2.1687
38	Patch	ValAme	MixeSpZosDubPotZos?PotHybrid?	2	1-3	8/15/2024	41.37432	-73.15391	0.0701
39	Patch	ValAme	MixeSpZosDubPotZos?PotHybrid?	2	1-3	8/15/2024	41.37463	-73.15411	0.1852
40	Patch	ValAme	MixeSpZosDubPotZos?PotHybrid?	3	1-3	8/15/2024	41.37554	-73.15476	0.1672
41	Patch	ValAme	MixeSpZosDubPotZos?PotHybrid?	3	0-2	8/15/2024	41.37711	-73.15670	0.4699
42	Patch	ValAme	MixeSpZosDubPotZos?PotHybrid?	3	0-2	8/15/2024	41.37616	-73.15533	0.0329
43	Patch	MyrSpi	NajMinA=2	3	0-2	8/15/2024	41.37743	-73.15724	0.1472
44	Patch	ValAme		3	1-3	10/1/2024	41.37631	-73.15662	0.0814
45	Patch	ValAme		2	0-2	10/1/2024	41.37563	-73.15598	0.0223
46	Patch	ValAme		2	0-2	10/1/2024	41.37507	-73.15560	0.0206
47	Patch	ValAme	With PotCriorPotAss	2	1-3	10/1/2024	41.37461	-73.15540	0.0492
48	Patch	ValAme	With PotCriorPotAss	2	1-3	10/1/2024	41.37418	-73.15501	0.0337
49	Patch	ValAme	With PotHybd	2	1-3	10/1/2024	41.37239	-73.15348	0.0825
50	Patch	ValAme		2	1-3	10/1/2024	41.37194	-73.15314	0.0246
51	Patch	ValAme		2	1-3	10/1/2024	41.36911	-73.15017	0.0216
52	Patch	ValAme		2	1-3	10/1/2024	41.36808	-73.14868	0.0085
53	Patch	ValAme		2	1-3	10/1/2024	41.36607	-73.14626	0.0154
54	Patch	ValAme	With PotHybd	2	1-3	10/1/2024	41.36590	-73.14587	0.0403

Appendix Lake Housatonic Invasive Plant Location data (9 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
55	Patch	ValAme	With PotHybdand SporadicMyrSpi	2	1-3	10/1/2024	41.36419	-73.14328	2.6605
56	Patch	ValAme	With SporadicMyrSpi	2	1-3	10/1/2024	41.36175	-73.14078	0.1393
57	Patch	ValAme	With SporadicMyrSpi	2	1-3	10/1/2024	41.36056	-73.14011	2.0159
58	Patch	ValAme	With SporadicMyrSpi_CerDem_PotHybrd	2	0-2	10/1/2024	41.35395	-73.13904	1.1988
59	Patch	ValAme		2	0-2	10/1/2024	41.34834	-73.13040	0.0967
60	Patch	ValAme	With SporadicMyrSpi_PotHybrd	2	0-2	10/1/2024	41.34797	-73.12968	0.0331
61	Patch	ValAme	With SporadicMyrSpi_PotHybrd	3	0-2	10/1/2024	41.34738	-73.12869	0.1569
62	Patch	ValAme		2	0-2	10/1/2024	41.34601	-73.12660	0.0241
63	Patch	ValAme	WithDensePotAmp_SporadicMyrSpi	2	1-3	10/1/2024	41.34436	-73.12474	0.1257
64	Patch	ValAme	WithPotAmp_SporadicMyrSpi	3	1-3	10/1/2024	41.34336	-73.12409	0.2722
65	Patch	MyrSpi		2	0-2	8/12/2024	41.37638	-73.15678	0.0140
66	Patch	NajMin		2	0-2	8/12/2024	41.37638	-73.15678	0.0092
67	Patch	ValAme	hybrid?	3	0-2	8/12/2024	41.38405	-73.16032	0.0033
68	Patch	ValAme	hybrid?	3	0-2	8/12/2024	41.38409	-73.16056	0.0028
69	Patch	ValAme	hybrid?	3	0-2	8/12/2024	41.38407	-73.16044	0.0149
70	Patch	ValAme	Boulders	2	0-2	8/12/2024	41.38398	-73.16035	0.0017
71	Patch	ValAme	Boulders	2	0-2	8/12/2024	41.38395	-73.16051	0.0025
72	Patch	ValAme	Boulders	2	0-2	8/12/2024	41.38399	-73.16045	0.0122
73	Patch	ValAme		2	0-2	8/5/2024	41.33874	-73.12216	0.0060
74	Patch	ValAme		2	0-2	8/5/2024	41.33758	-73.11877	0.0165
75	Patch	ValAme		2	1-3	8/5/2024	41.33746	-73.11940	0.0263
76	Patch	ValAme		2	1-3	8/5/2024	41.33735	-73.11936	0.0078
77	Patch	ValAme		2	1-3	8/5/2024	41.33757	-73.11949	0.0075
78	Patch	ValAme	PotAss 2	3	0-2	8/5/2024	41.33736	-73.11681	0.1705
79	Patch	PotCri		2	0-2	8/5/2024	41.33737	-73.11682	0.0200
80	Patch	MyrSpi	PotAss 2	2	0-2	8/5/2024	41.33737	-73.11682	0.0347
81	Patch	MyrSpi	PotAss 2	2	0-2	8/5/2024	41.33732	-73.11683	0.0034
82	Patch	PotCri	PotAss 2	2	0-2	8/5/2024	41.33749	-73.11681	0.0074
83	Patch	MyrSpi	PotAss 2	2	0-2	8/5/2024	41.33747	-73.11690	0.0064
84	Patch	PotCri	PotAss 2	2	0-2	8/5/2024	41.33726	-73.11678	0.0072
85	Patch	MyrSpi	PotAss 2	2	0-2	8/5/2024	41.33735	-73.11700	0.0745
86	Patch	ValAme		2	0-2	8/5/2024	41.33734	-73.11706	0.0840
87	Patch	ValAme	PotAss 2	2	0-2	8/5/2024	41.33205	-73.11653	0.0301
88	Patch	ValAme		4	1-3	8/5/2024	41.33229	-73.11644	0.0956
89	Patch	ValAme		2	2-4	8/5/2024	41.33227	-73.11626	0.0553
90	Patch	ValAme	WithPotAmpNorth	3	1-3	8/14/2024	41.33011	-73.11031	1.5708
91	Patch	ValAme		2	2-4	8/5/2024	41.32956	-73.10932	0.3311
92	Patch	ValAme		2	0-2	8/5/2024	41.32531	-73.10465	0.0133
93	Patch	ValAme		2	0-2	8/5/2024	41.34198	-73.12375	0.0206
94	Patch	ValAme		1	0-2	8/8/2024	41.34442	-73.12279	0.0161
95	Patch	ValAme		1	0-2	8/8/2024	41.34560	-73.12598	0.0156
96	Patch	ValAme		2	0-2	8/8/2024	41.34563	-73.12593	0.0254
97	Patch	ValAme		1	0-2	8/8/2024	41.34566	-73.12610	0.0058
98	Patch	ValAme		1	0-2	8/8/2024	41.34552	-73.12587	0.0044
99	Patch	ValAme		2	0-2	8/8/2024	41.34572	-73.12606	0.0034
100	Patch	ValAme		2	0-2	8/8/2024	41.34556	-73.12579	0.0026
101	Patch	ValAme		1	0-2	8/8/2024	41.34807	-73.12667	0.0080
102	Patch	ValAme		1	0-2	8/8/2024	41.35119	-73.13454	0.0106
103	Patch	ValAme		3	0-2	8/8/2024	41.35115	-73.13456	0.0154

Appendix Lake Housatonic Invasive Plant Location data (10 of 10)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
104	Patch	NajMin		2	0-2	8/8/2024	41.35115	-73.13458	0.0091
105	Patch	NajMin		2	0-2	8/8/2024	41.35113	-73.13451	0.0017
106	Patch	NajMin		2	0-2	8/8/2024	41.35120	-73.13465	0.0021
107	Patch	NajMin		2	0-2	8/8/2024	41.35108	-73.13462	0.0243
108	Patch	PotCri		2	0-2	8/8/2024	41.35265	-73.13880	0.0097
109	Patch	PotCri		2	0-2	8/8/2024	41.35273	-73.13883	0.0035
110	Patch	PotCri		2	0-2	8/8/2024	41.35260	-73.13877	0.0019
111	Patch	MyrSpi		2	0-2	8/8/2024	41.35261	-73.13874	0.0014
112	Patch	MyrSpi		2	0-2	8/8/2024	41.35272	-73.13881	0.0015
113	Patch	MyrSpi		2	0-2	8/8/2024	41.35266	-73.13880	0.0058
114	Patch	NajMin		2	0-2	8/8/2024	41.35262	-73.13878	0.0007
115	Patch	NajMin		2	0-2	8/8/2024	41.35270	-73.13885	0.0008
116	Patch	NajMin		2	0-2	8/8/2024	41.35266	-73.13880	0.0031
117	Patch	ValAme		3	0-2	8/8/2024	41.35267	-73.13880	0.0253
118	Patch	ValAme		4	0-2	8/8/2024	41.35271	-73.13873	0.0347
119	Patch	PotCri		1	0-2	8/8/2024	41.35268	-73.13873	0.0147
120	Patch	PotCri		1	0-2	8/8/2024	41.35273	-73.13876	0.0015
121	Patch	PotCri		1	0-2	8/8/2024	41.35263	-73.13870	0.0024
122	Patch	MyrSpi		2	0-2	8/8/2024	41.35269	-73.13875	0.0081
123	Patch	MyrSpi		2	0-2	8/8/2024	41.35276	-73.13878	0.0044
124	Patch	MyrSpi		2	0-2	8/8/2024	41.35263	-73.13870	0.0029
125	Patch	ValAme		1	0-2	8/8/2024	41.35854	-73.13796	0.0087
126	Patch	ValAme		2	0-2	8/8/2024	41.35853	-73.13802	0.0086
127	Patch	ValAme		1	0-2	8/8/2024	41.35847	-73.13796	0.0019
128	Patch	ValAme		1	0-2	8/8/2024	41.35861	-73.13798	0.0016
129	Patch	ValAme		2	0-2	8/8/2024	41.36299	-73.14199	0.0485
130	Patch	ValAme		2	0-2	8/8/2024	41.36286	-73.14189	0.0093
131	Patch	ValAme		2	0-2	8/8/2024	41.36312	-73.14209	0.0088
132	Patch	NajMin	potgraxnod 2	2	0-2	8/8/2024	41.36298	-73.14196	0.0181
133	Patch	NajMin	potgraxnod 2	2	0-2	8/8/2024	41.36308	-73.14200	0.0074
134	Patch	NajMin	potgraxnod 2	2	0-2	8/8/2024	41.36293	-73.14191	0.0047
135	Patch	ValAme		3	1-3	8/8/2024	41.36305	-73.14187	0.0506
136	Patch	ValAme		3	1-3	8/8/2024	41.36292	-73.14175	0.0073
137	Patch	ValAme		2	1-3	8/8/2024	41.36313	-73.14172	0.1392
138	Patch	ValAme		2	1-3	8/8/2024	41.36294	-73.14159	0.0081
139	Patch	ValAme	Potgraxnod 4	2	1-3	8/8/2024	41.36324	-73.14144	0.0811
140	Patch	ValAme		2	0-2	10/1/2024	41.34092	-73.12356	0.0542
141	Patch	ValAme		2	0-2	10/1/2024	41.34088	-73.12323	0.1240
142	Patch	ValAme		2	1-3	10/1/2024	41.34065	-73.12311	0.0391
143	Patch	ValAme		2	0-2	10/1/2024	41.34025	-73.12368	0.1237
144	Patch	ValAme	Collected PotBer PotGra ValAme ZosDub	4	0-2	8/15/2024	41.33180	-73.11619	0.0278
145	Patch	MyrSpi	Collected MyrSpi	2		10/2/2024	41.34217	-73.12367	0.0328

Transect Data

[illegible]

Appendix Lake Housatonic June Transect Data (2 of 2)

[illegible]

Notes

Equal employment opportunity means employment of people without consideration of age, ancestry, color, criminal record (in state employment and licensing), gender identity or expression, genetic information, intellectual disability, learning disability, marital status, mental disability (past or present), national origin, physical disability (including blindness), race, religious creed, retaliation for previously opposed discrimination or coercion, sex (pregnancy or sexual harassment), sexual orientation, veteran status, and workplace hazards to reproductive systems unless the provisions of sec. 46a-80(b) or 46a-81(b) of the Connecticut General Statutes are controlling or there are bona fide occupational qualifications excluding persons in one of the above protected classes. To file a complaint of discrimination, contact Dr. Jason White, Director, The Connecticut Agricultural Experiment Station, 123 Huntington Street, New Haven, CT 06511, (203) 974-8440 (voice), or Jason.White@ct.gov (e-mail). CAES is an affirmative action/equal opportunity provider and employer. Persons with disabilities who require alternate means of communication of program information should contact the Chief of Services, Michael Last at (203) 974-8442 (voice), (203) 974-8502 (FAX), or Michael.Last@ct.gov (e-mail).
