Lake Housatonic Monitoring Report Invasive Aquatic Plants

2023

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Bulletin 1098

June 10, 2024

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Connecticut Agricultural Experiment Station

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Figure 1. Peaceful September afternoon on Lake Housatonic.

Introduction

Lake Housatonic is an 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. The lake offers a diverse freshwater ecosystem as well as exceptional opportunities for fishing, boating, swimming, and a peaceful respite nearby urbanization (Figure 1). Aquatic plants are necessary to maintain a healthy ecosystem. They provide habitat for fish and other aquatic organisms, remove nutrients and pollutants from water, and stabilize the shoreline. Invasive aquatic plants, however, have become established in the lake (Bugbee and Stebbins 2023). Because they have few natural enemies to control their growth (Wilcove et al. 1998) they can degrade native aquatic ecosystems (Les and Mehrhoff 1999), impede 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.

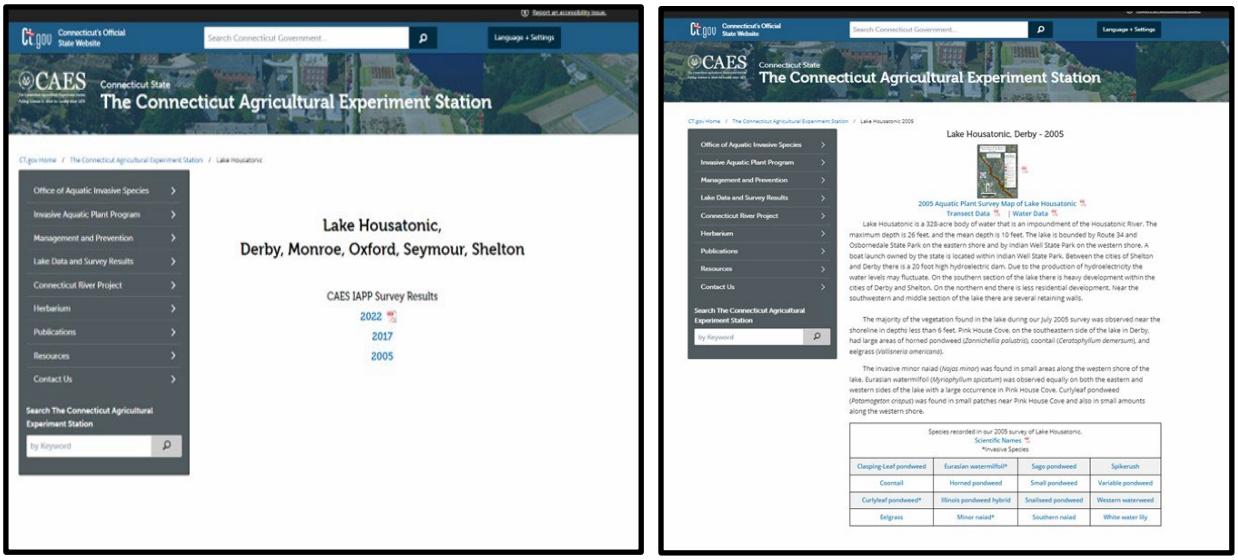


Figure 2. CAES IAPP webpages with 2005, 2017, 2022, and 2023 survey information.

CAES (Connecticut Agricultural Experiment Station) Office of Aquatic Invasive Species (OAIS)[1] surveys of Lake Housatonic in 2005, 2017, and 2022 found the invasive plant species Eurasian watermilfoil (*Myriophyllum spicatum*), minor naiad (*Najas minor*), and curlyleaf pondweed (*Potamogeton crispus*). Fourteen native species were observed in 2005, fourteen in 2017, and nine in 2022. In all survey years, Eurasian watermilfoil was the most common invasive plant along with smaller populations of minor naiad and curlyleaf pondweed.

Curlyleaf pondweed may have been underestimated in the 2005 survey because it naturally dies back in late spring (Catling and Dobson 1985) before the survey occurred. Alternatively, in the following years it may have been overestimated because of its similarities to other pondweeds. The most common native plants in Lake Housatonic in 2005 were coontail (*Ceratophyllum demersum*) and eelgrass (*Vallisneria americana*). Overall, however, the coverage of both invasive and native plants in 2005 was minimal. A substantial increase in aquatic vegetation was documented in 2017 when Eurasian watermilfoil increased to 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 which resulted in Eurasian watermilfoil coverage to 2

[1] Formerly Invasive Aquatic Plant Program (IAPP)

Figure 3. Heavily vegetated cove near transect 1 (left). High flow rates caused by heavy spring and summer rains likely effected vegetation, survey efforts, and water chemistry (right).

acres and curlyleaf pondweed to 19 acres in 2022 (Bugbee and Stebbins 2023). In 2021 and 2022, small areas of eelgrass were treated with diquat as well. In 2022, OAIS began pre and posttreatment survey to document the short-term efficacy. Our past information on Lake Housatonic is found at the CAES OAIS website https://portal.ct.gov/caes-oais (Figure 2).

The following report represents the fourth CAES OAIS surveillance and mapping of invasive aquatic plants and native eelgrass in Lake Housatonic with emphasis on pre and posttreatment conditions.

Objectives

- Survey and map invasive aquatic plants and eelgrass in Lake Housatonic and compare with past surveys
- Resurvey CAES OAIS transects established in 2005 for all plants and compare with past surveys
- Document changes from the 2005 - 2023 CAES OAIS surveys
- Document changes before and after the 2022 herbicide treatment
- Assess current aquatic plant management strategy

Figure 4. Newly discovered hybrid pondweed (*Potamogeton X assidiens*) common along east shore across from Indian Wells State Park (left). Herbarium mount of the plant collected from Sudan (right).

Materials and Methods

Our 2023 aquatic vegetation surveys utilized methods established by CAES OAIS to maintain consistent records of nearly 300 Connecticut lakes and ponds (CAES IAPP 2023). 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 native eelgrass based on concern that it was becoming a nuisance and would need management. We used a Lowrance HDS® sonar system, with structure scan technology, 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 (1 m^2). We measured depth with a rake handle, drop line, or digital depth finder, and sediment type was estimated. Comparing depths from our surveys to determine changes over time is inherently inaccurate because of the wide fluctuations in 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

Table 1. Yearly comparisons of the frequency of occurrence on transects in Lake Housatonic (2022 and 2023 data are pretreatment).

Species (invasives in bold)		**FOQ** (%/point)			
Common Name	**Scientitic Name**	**2005**	**2017**	**2022**	**2023**
Arrowhead	*Sagittaria species*	0%	1%	1%	0%
Bur-reed	*Sparganium species*	0%	2%	0%	0%
Clasping-leaf pondweed	*Potamogeton perfoliatus*	0%	3%	1%	13%
Coontail	*Ceratophyllum demersum*	9%	33%	5%	14%
Curlyleaf pondweed	***Potamogeton crispus***	**0%**	**17%**	**19%**	**21%**
Eelgrass	*Vallisneria americana*	8%	25%	22%	26%
Eurasian watermilfoil	***Myriophyllum spicatum***	**6%**	**52%**	**12%**	**17%**
Flat-leaf pondweed	*Potamogeton zosteriformis*	0%	19%	0%	1%
Great duckweed	*Spirodela polyrhiza*	0%	7%	0%	3%
Hybrid pondweed	*Potamogeton gramineus x nodosus*	0%	4%	0%	4%
Illinois pondweed	*Potamogeton illinoensis*	0%	0%	1%	1%
Large-leaf pondweed	*Potamogeton amplifolius*	0%	3%	0%	0%
Leafy pondweed	*Potamogeton foliosus*	0%	0%	0%	5%
Long-leaf pondweed	*Potamogeton nodosus*	0%	3%	7%	4%
Long-leaf pondweed hybrid	*Potamogeton x assidens*	0%	0%	0%	4%
Minor naiad	***Najas minor***	**1%**	**9%**	**0%**	**0%**
Small pondweed	*Potamogeton pusillus*	0%	37%	19%	0%
Southern naiad	*Najas guadalupensis*	0%	4%	0%	0%
Variable pondweed	*Potamogeton gramineus*	1%	0%	0%	0%
Water stargrass	*Zosterella dubia*	0%	25%	18%	10%
Western waterweed	*Elodea nuttallii*	3%	23%	15%	14%
Total Species Richness	21	6	17	11	14
Total Native Species Richnesss	18	4	14	9	12
Total Invasive Species Richness	3	2	3	2	2

for review using the taxonomy of Crow and Hellquist (2000*a*, 2000*b*). If the species was still questionable a plant sample was analyzed using DNA technology. 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 were 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 spring and summer of 2023 hampered surveillance as plants were often stretched out along the bottom because of strong currents (Figure 3).

We collected occurrence and abundance plant information from ten transects pre and posttreatment. 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 2023) and contained at least one occurrence of each native and invasive

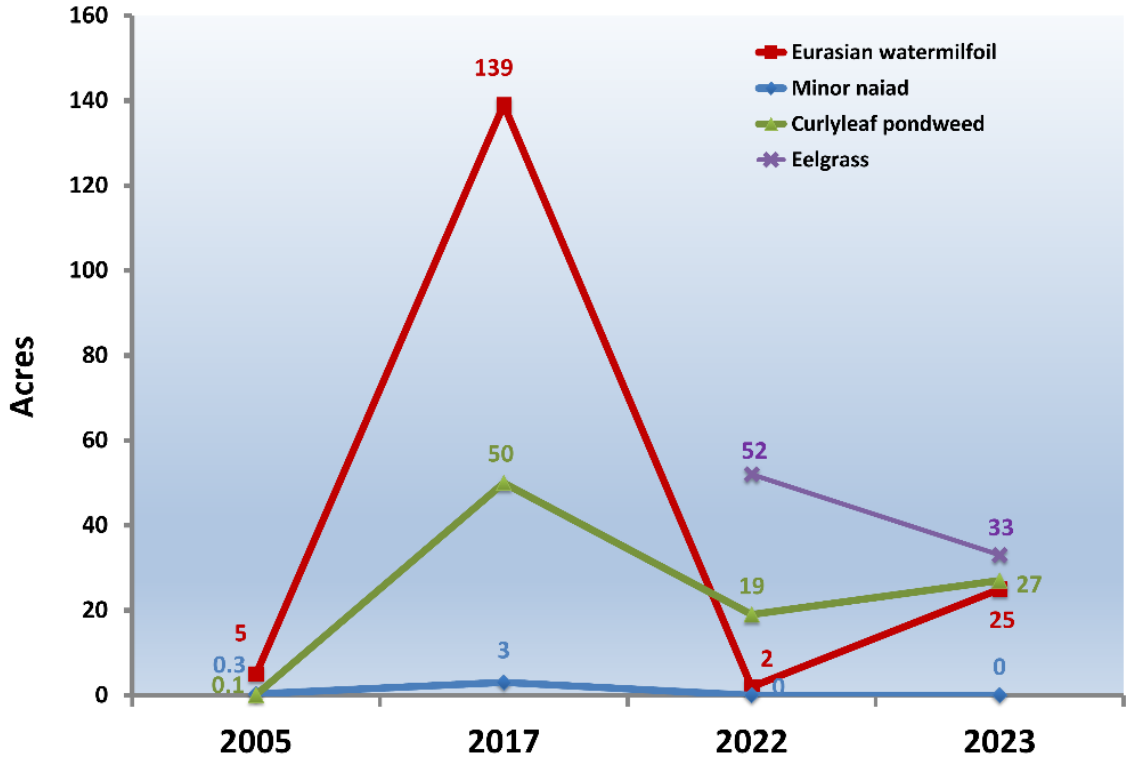


Figure 5. Changes in acreages of plants in Lake Housatonic from 2005 – 2023. All values are pre-treatment except eelgrass.

plant species. We selected transects formerly numbered 3, 4, 5, 7, 10, 11, 14, 15, 16, and 17 and renamed them 1-10 respectively. Significant differences in the frequency of occurrence of plant species between the two years on transects were determined using analysis of variance (ANOVA) followed by a Tukey's post-hoc test ($p < 0.05$). Significant differences in species richness per transect point were determined by ± one standard error of the mean (SEM).

We performed the pretreatment survey on Lake Housatonic from June 21, 23, and 28, and the posttreatment survey from September 21, 27, and 28. Pretreatment transect data were obtained on June 28 and posttreatment transect data were gathered on September 10. We obtained water chemistry information on June 28th. A Secchi disk was used to measure transparency and an YSI® 58 meter (YSI Inc. Yellow Springs, Ohio) to measure water temperature and dissolved oxygen. Measurements occurred in the same deep areas of each lake as previous surveys at 0.5 m and at 1 m depth intervals until we reached the bottom. We collected water samples from 0.5 m below the surface and 0.5 m from the bottom.

Results and Discussion

Aquatic Plant Survey

To maintain consistency with previous surveys, our year-to-year plant species comparisons utilize early summer pretreatment data. Our pretreatment 2023 survey of Lake Housatonic confirmed the presence of the invasive species Eurasian watermilfoil and curlyleaf pondweed which were also found in 2005, 2017, and 2022 (Table 1). Eurasian watermilfoil covered 25 acres in 2023 compared 2 acres in 2022, 139 acres in 2017, and 5 acres in 2005 (Figure 5). Curlyleaf pondweed coverage increased to 27 acres in 2023 from 19 acres in 2022. This compares to 59 acres in 2017 and only 0.3 acres in 2005. Minor naiad was found in 2005 (0.3 acres) and 2017 (3 acres) but not in 2022 and 2023. Increases in the coverage of Eurasian watermilfoil and curlyleaf pondweed are likely related to short-term control from the previous year's treatments or other factors such as water temperature and flow rates.

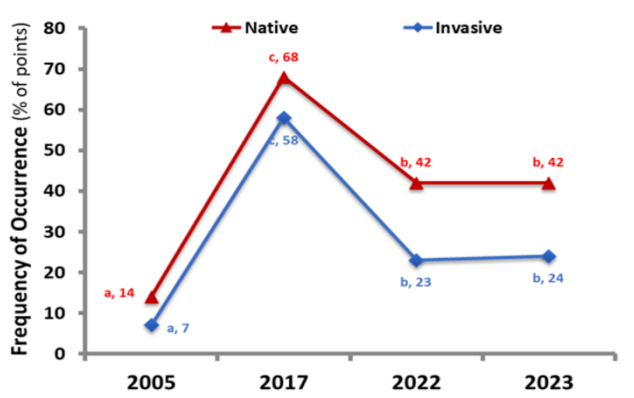


Figure 6. Yearly comparison of the frequency of occurrence of native and invasive species on transects. in Lake Housatonic. Points with the same letter are not significantly different.

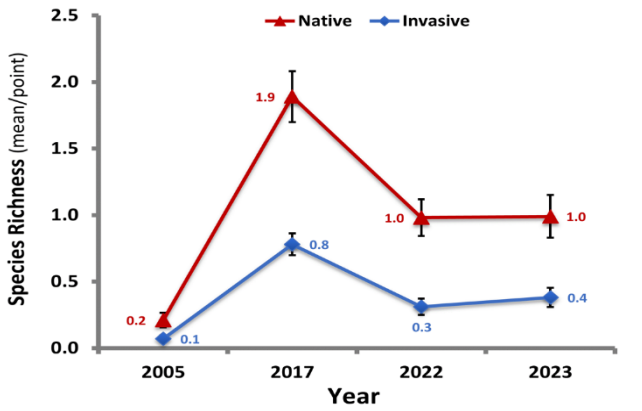


Figure 7. Yearly comparison of the average number of species per transect point in Lake Housatonic.

A total of twelve native plant species were documented in 2023 compared to 9 in 2022, 14 in 2017, and 4 in 2005. Native species present in all survey years were coontail, eelgrass, and western waterweed. New in 2023, was a long-leaf pondweed hybrid. This plant was likely present in previous years but misidentified as curlyleaf or another pondweed. Only through DNA analysis and correspondence with Dr. Barre Hellquist was this confirmed. Interestingly, this hybrid has never been documented in the northeast and is only known to occur in a few locations in North America. Because curlyleaf pondweed exhibits natural senescence and the new hybrid does not, the new hybrid will likely require a different

management approach. Other species present in 2023 but not in 2022 include flat-leaf pondweed, great duckweed, and leafy pondweed. Not present in 2023 but present in 2022 was arrowhead. Plants present in 2017 but not in 2022 or 2023 were bur-reed, large-leaf pondweed, southern naiad, and variable pondweed.

The frequency of occurrence (FOQ) of plant species on our transects gives an indication as to how the plant community has changed over time. Overall, very little plant growth occurred on transects in 2005 with total invasive species having a FOQ of only 14% and total native species having an FOQ of only 7% (Figure 6). Eurasian watermilfoil accounted for 6% of all invasive species and minor naiad 1%. Curlyleaf pondweed was not found. The predominate native plants in 2005 were coontail (9%), eelgrass (8%), and western waterweed (3%). A large increase in total invasive (68%) and native (58%) FOQ's was documented in 2017. Eurasian watermilfoil now had an FOQ of 52%, curlyleaf pondweed 17%, and minor naiad 9%. A smaller but significant decline (Tukey test, $p < 0.05$) in invasive and native species FOQ occurred in 2022 with a decrease to 42% and 32% respectively. Little change occurred from 2022 to 2023. Notable reductions in the frequency of occurrence of species on transects from 2017 to 2023 include Eurasian watermilfoil (52% to 17%), coontail (33% to 14%), small pondweed (37% to 0%), water stargrass (25% to 10%), flat-leaf pondweed (19% to 1%) and western waterweed (23% to 14%). Eelgrass FOQ was stable from 2022 to 2023 (25% to 26%) while curlyleaf pondweed rose slightly (17% to 21%) from 2022 to 2023. Given the discovery of the very similar looking pondweed hybrid after the pretreatment survey, these curlyleaf pondweed data may be erroneous.

Species richness indicates the number plant species that occur but necessarily their frequency. Plant communities with optimal diversity have species that have both frequencies and richness. In 2023, a mean of 1.0 native species and 0.4 invasive species were found per transect point. These values are nearly identical to 2022 when 1.0 native and 0.3 invasive species were documented but significantly less (SEM ±1.0) than the 1.9 native and 0.8 invasive species observed in 2017 (0.8). In 2005 the native species richness was the lowest (0.2). The species richness and FOQ data suggests a reduction in both native and invasive species after 2017 when herbicide applications began but still a robust plant community.

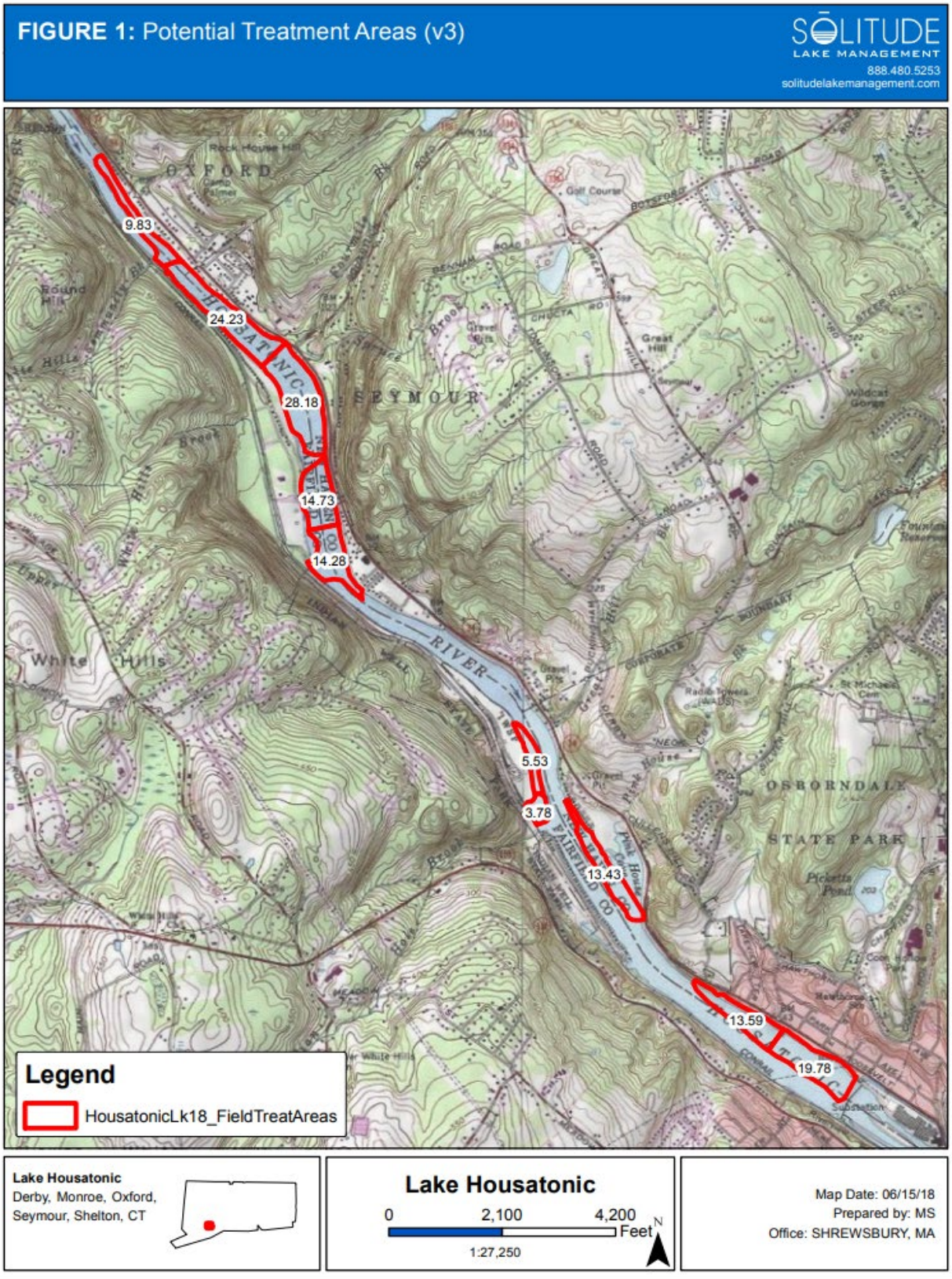


Figure 8. Areas treated with diquat for control of Eurasian watermilfoil and curlyleaf pondweed in 2023.

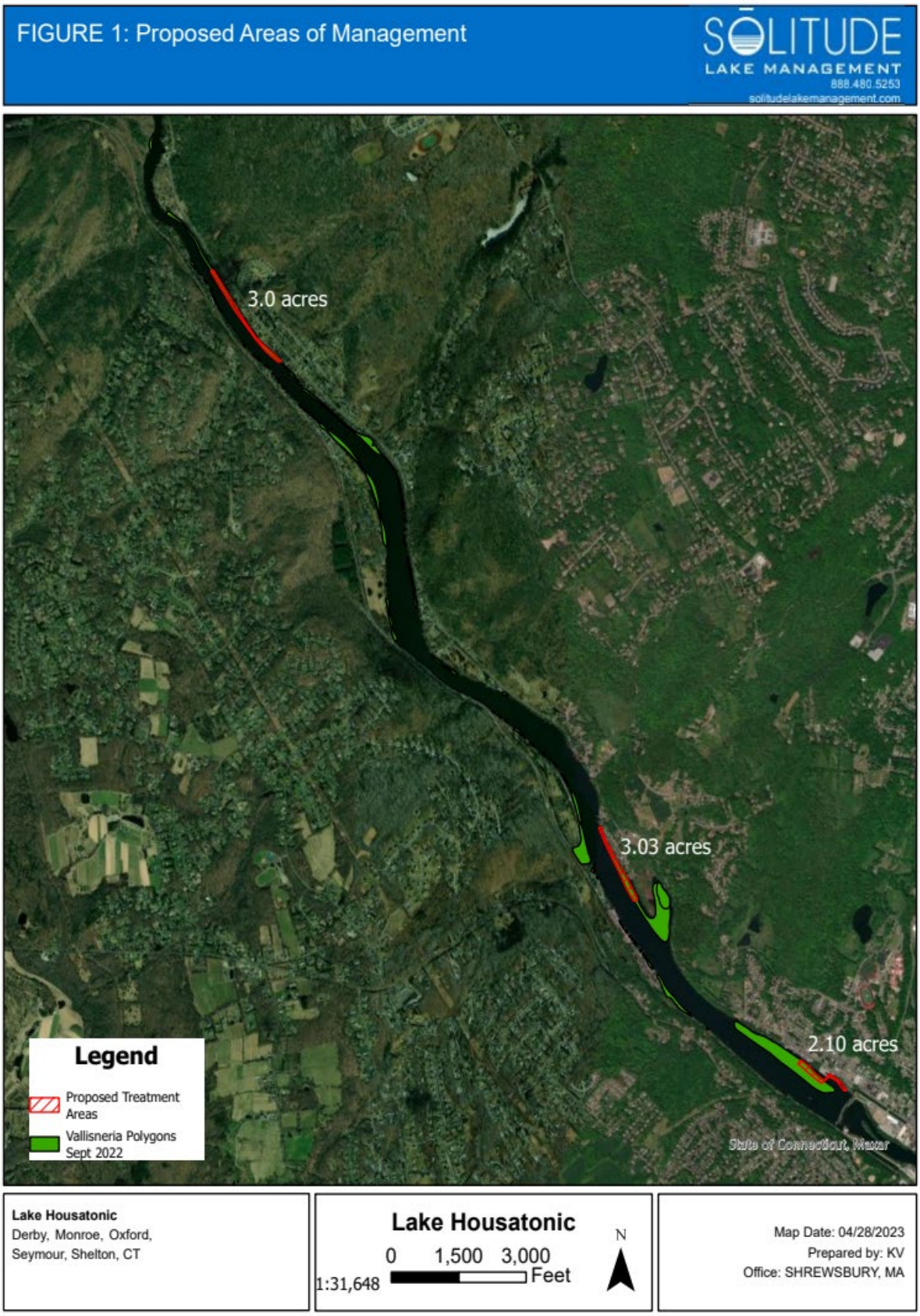


Figure 9. Areas of eelgrass treated with Harpoon® in 2023.

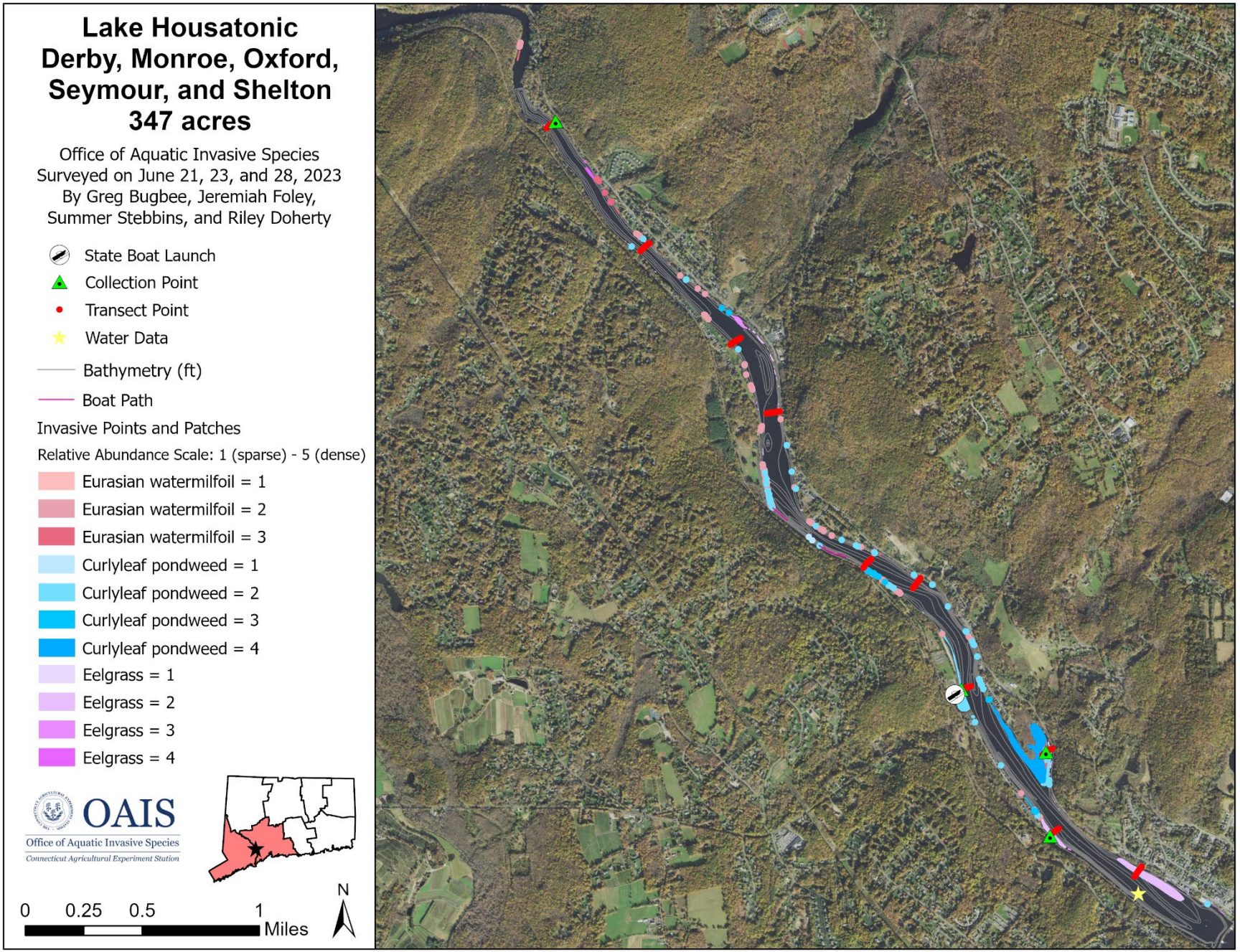


Figure 10. CAES IAPP pretreatment survey of Lake Housatonic in 2023 (see appendix for close-ups).

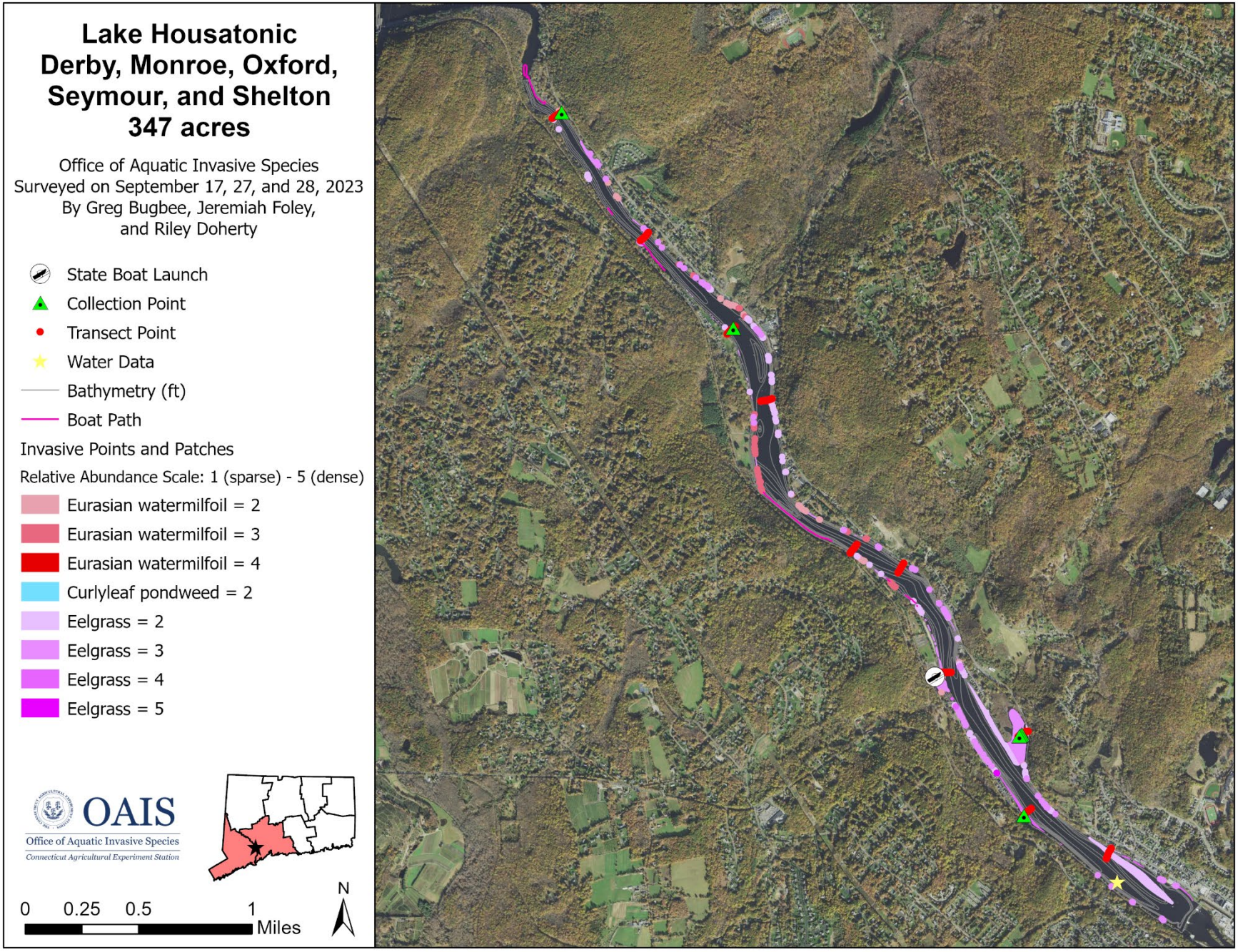


Figure 11. CAES IAPP posttreatment survey of Lake Housatonic in 2023 (see appendix for close-ups).

Table 2. Herbicide treatments performed in lake Housatonic 2018 - 2023.

Year	Product	Active Ingredient	Target Species	Acres
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	Eurasian watermilfoil/Curlyleaf pondweed	18
2019	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf pondweed	171
2018	Diquat	Diquat Dibromide	Eurasian watermilfoil/Curlyleaf pondweed	157
	®SePRO			

Pre and Posttreatment Comparisons

A total of 120 acres of Eurasian watermilfoil and curlyleaf pondweed were treated with diquat (Figure 8, Table 2) and 8.5 acres of eelgrass were treated with Harpoon®[1] in 2023 (Figure 9, Table 2) Our pretreatment survey and posttreatment survey show the decline in Eurasian watermilfoil from 25 to 13 acres and curlyleaf pondweed from 27 to 0.2 acres (Figure 11). The decline in Eurasian watermilfoil is likley attributable to the herbicide treatment while the curlyleaf pondweed reduction was likely caused by natural senescense. Eelgrass coverage, alternatively, increased from 13 acres pretreatment to 33 acres posttreatment. This likely reflects the seasonality of eelgrass growth, difficulty detecting plants that are stretched along the bottom because of high flow rates, and/or reduced herbicide efficacy caused by the very rainy summer. The increase in the pretreatment Eurasian watermilfoil coverage to 2023 (25 acres) from 2022 (2 acres) suggests no carryover is evident (Figure 5).

Based on our frequency of occurrence data from transects (Figure 12), coontail, eelgrass, great duckweed, Illinois pondweed, and large-leaf pondweed exhibited substantial increases posttreatment. Small pondweed, water stargrass, and western waterweed showed notable declines and arrowhead, clasping-leaf pondweed, flat-stemmed pondweed, and ribbon-leaf pondweed remained nearly unchanged. As with the invasive species, differences are likely caused by natural growth patterns, occurrence in untreated areas, and/or low efficacy of the

[1] Harpoon is a registered trademark of SePRO Corp.

herbicide. The changing plant community may require alterations in the type, timing, and/or applicationn technique for herbicides.

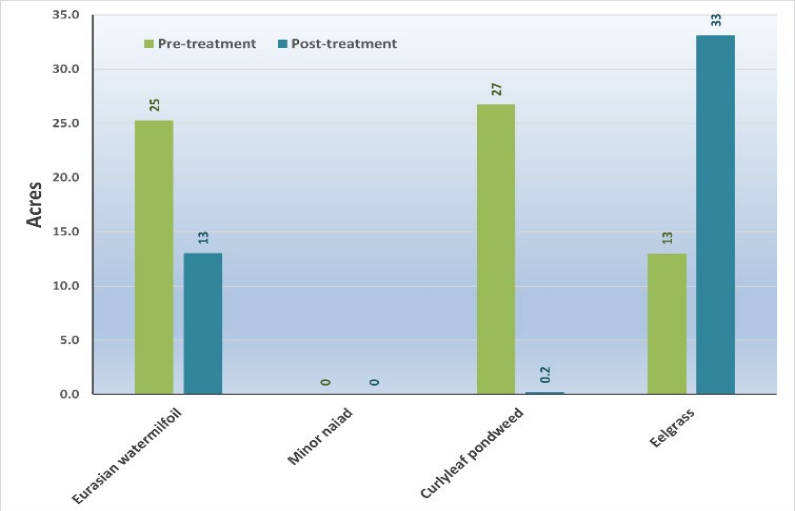


Figure 11. Acreage of aquatic vegetation in Lake Housatonic before and after the 2023 herbicide treatment.

Nutrients released when plants treated with herbicides decompose can create conditions favoring algal blooms. Mats of filamentous algae that were common in 2022 were largely absent in 2023. This could be the result of increased flushing resulting from the very rainy spring and summer.

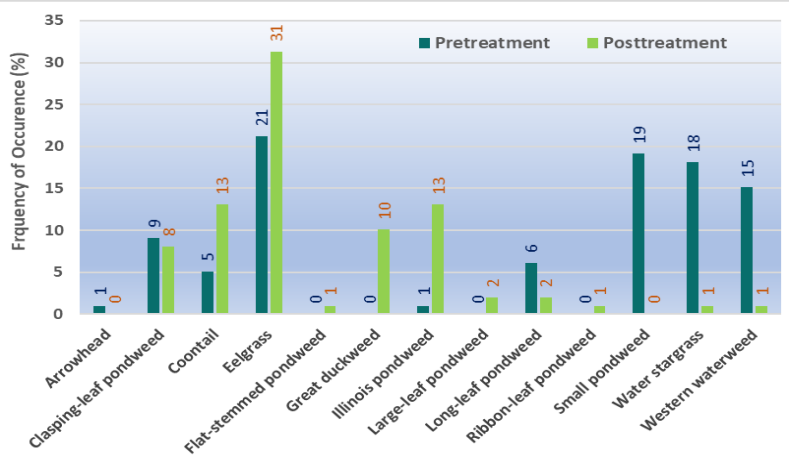


Figure 12. Frequency of occurrence of native plants in Lake Housatonic before and after the 2023 herbicide treatment.

Water Chemistry

CAES OAIS has found that the occurrence of invasive plants in lakes can be attributed to specific water chemistries (June-Wells et al. 2013). For instance, lakes with higher alkalinities and conductivities are more likely to support Eurasian watermilfoil, minor naiad and curlyleaf pondweed while lakes with lower values support fanwort and variable watermilfoil. Lake Housatonic falls into the former category. Zebra mussels also prefer water in the former category. Water chemistry may be altered when nutrients are utilized by plants or when plants decay from herbicide damage. In addition, nutrients not used by plants can support the

occurrence of nuisance algal blooms. During each lake survey we perform chemical water testing to compare conditions between lakes. Because these water tests are performed only once a year, they may not be indicative of conditions at other times. Identification of sources and quantities of nutrient reaching Lake Housatonic from the watershed are beyond the scope of this report.

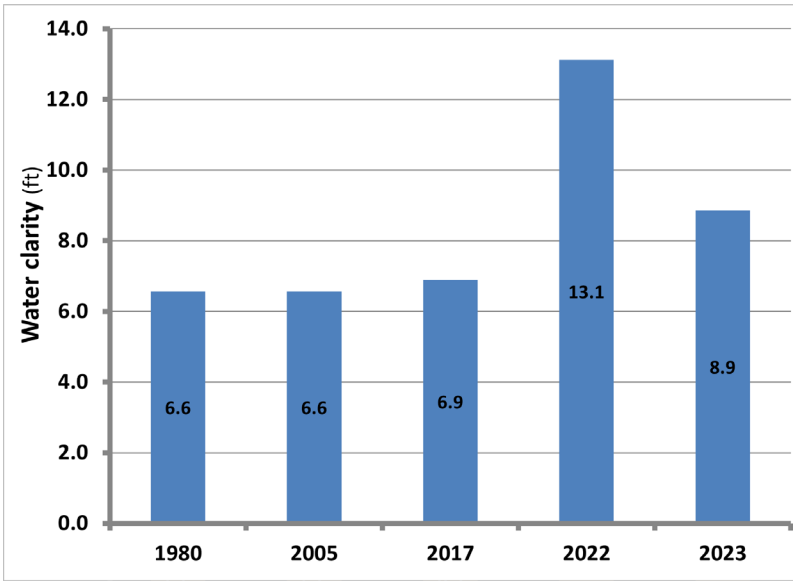
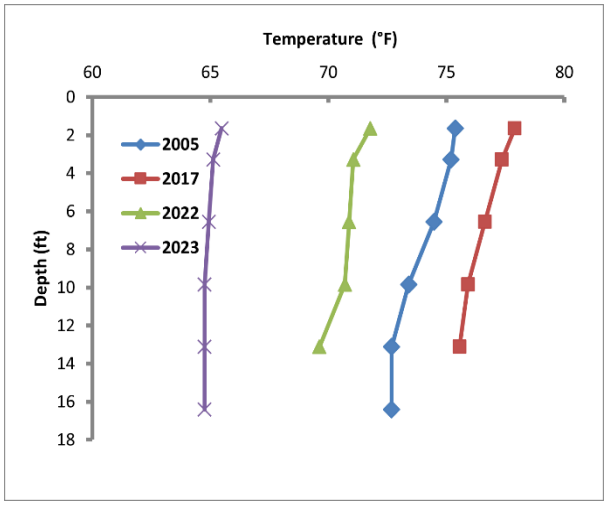
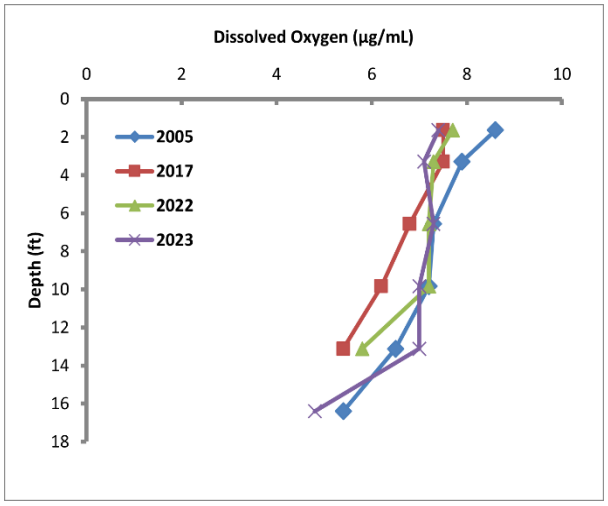


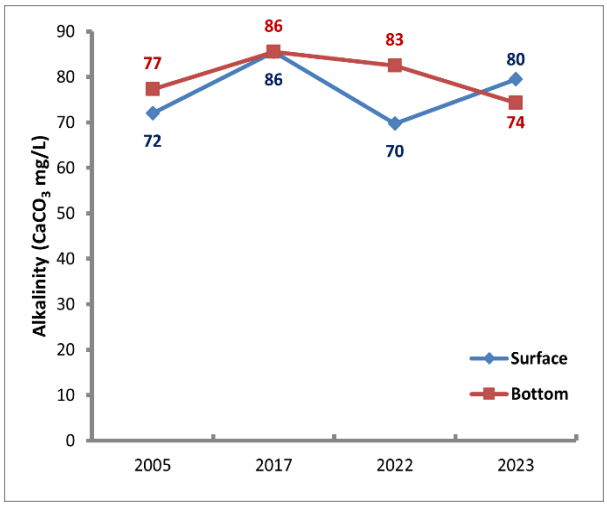
Figure 13. Water clarity in Lake Housatonic in 1980, 2005, 2017, 2022, and 2023.

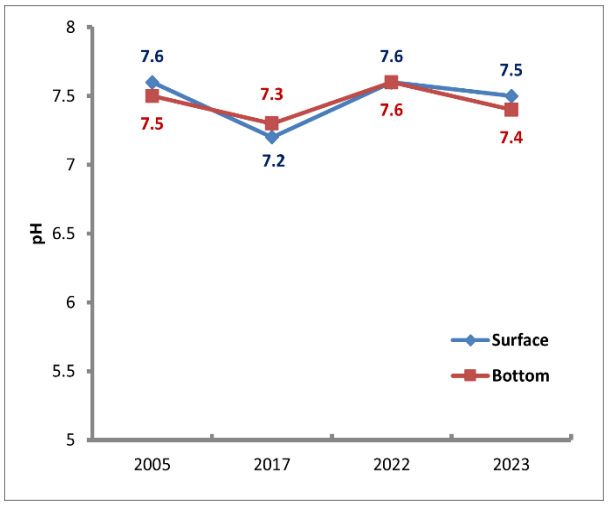
On June 28, 2023, the water clarity of Lake Housatonic was 8.9 ft. (Figure 13). This is considerably greater than the 6.6 feet documented in 1980 (Frink and Norvell 1984) and 2017 (Bugbee and Wiegand 2018) but less than the 13.1 feet found in 2022 (Bugbee and Stebbins 2023). Water clarities in Connecticut's lakes ranged from <1 to over 30 feet with an average of 7 ft. (CAES IAPP 2023). Thus, the water clarity of Lake Housatonic in 2023 ranks near the norm. Typically water clarity in Connecticut lakes declines as the summer progresses. Temperature varied from year to year ranging from the mid-sixties in 2023 to mid-seventies in 2017 with little stratification with depth. Dissolved oxygen profiles were relatively consistent from year to year from the surface to bottom (Figure 14) indicating little stratification. Dissolved oxygen remained high throughout the water column.

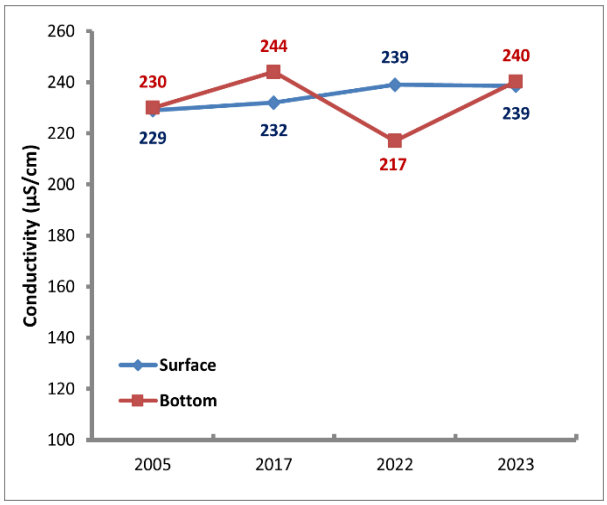
The pH of Lake Housatonic in 2023 was 7.5 at the surface and 7.4 near the bottom indicating a near neutral condition (Figure 14). Little change in pH from surface to bottom is likely the result of extensive mixing.











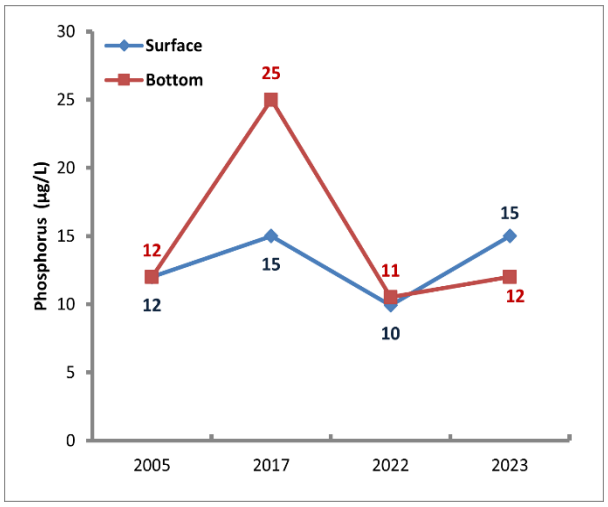


Figure 14. Water chemistry in Lake Housatonic in 2005, 2017, 2022 and 2023. Nitrogen tests results are in the text.

Alkalinities in Connecticut's lakes range from near 0 to over 170 mg/L $CaCO_3$ (CAES IAPP 2023, Canavan and Siver 1995, Frink and Norvell 1984). Increasing alkalinities reduces the risk of changes caused by acid rain and other natural and manmade influences. Lake Housatonic's surface alkalinity in 2023 ranged from 80 mg/L at the surface to 74 mg/L near the bottom. This has changed little from 2005.

Conductivity is an indicator of dissolved ions that come from natural and man-made sources (rainfall, mineral weathering, organic matter decomposition, fertilizers, septic systems, road salts, etc.). The 2023 conductivity of Lake Housatonic ranged from 239 µS/cm at the surface water to 240 µS/cm near the bottom (Figure 14). Lake Housatonic's conductivities have remained relatively consistent since 2005 with values between 229 µS/cm – 239 µS/cm at the surface and 217 µS/cm – 244 µS/cm near the bottom.

A key parameter used to categorize a lake's trophic state is the concentration of phosphorus (P) in the water column. High levels of P and N can lead to nuisance or toxic algal blooms (Frink and Norvell 1984, Wetzel 2001). Rooted macrophytes are considered to be less dependent on P from the water column as they obtain a majority of their nutrients from the hydrosoil (Bristow and Whitcombe 1971). Lakes with P levels from 0 - 10 µg/L are considered nutrient-poor or oligotrophic. When P concentrations reach 15 - 25 µg/L, lakes are classified as moderately fertile or mesotrophic and when P reaches 30 - 50 µg/L they are considered fertile or eutrophic (Frink and Norvell, 1984). Lakes with P concentrations over 50 µg/L are categorized as extremely fertile or hypereutrophic. The P concentration in Lake Housatonic in 2023 was 15 µg/L at the surface and 12 µg/L near the bottom classifying the lake a meso-oligotrophic. Previous years P concentrations were similar except for a bump in bottom water P to 25 µg/L in 2017. We tested total nitrogen (TN) for the first time in 2022 and found 1312 µg/L at the surface and 1305 µg/L near the bottom. Our 2023 TN data is pending due to an equipment malfunction. Although nitrogen is likely less limiting to the growth of aquatic plants and algae compared to terrestrial plants, it may play a role in lake productivity. Frink and Norvell (1984) found TN in Connecticut lakes ranged from 193 - 1830 µg/L and averaged 554 µg/L. High TN at Lake Housatonic's surface in 2023 may be expected because of the extremely rainy spring and summer (Shou et al. 2022).

To get a more complete picture of the water chemistry of Lake Housatonic, more water data points and sampling dates are necessary. In particular, a sampling site near the Stevenson Dam would give information on the water (possibly high P, anaerobic bottom water) being removed from Lake Zoar.

Conclusions

Lake Housatonic was surveyed for aquatic vegetation by CAES OAIS for the fourth time in 2023. Previous surveys were performed in 2005, 2017, and 2022. Eurasian watermilfoil increased to 25 acres in 2023 from 2 acres in 2022. This compares to 139 acres in 2017, and only 5 acres in 2005. Curlyleaf pondweed coverage increased to 27 acres in 2023 from 19 acres in 2022 which compares to 59 acres in 2017 and only 0.3 acres in 2005. Minor naiad was not found in 2023 or 2022. Increases in the coverage of Eurasian watermilfoil and curlyleaf pondweed are likely related to short-term control from the previous year's treatments or other factors such as water temperature and flow rates. Newly documented in 2023 was pondweed hybrid called long-leaf pondweed which was likely present in previous years but misidentified as curlyleaf or another pondweed. This brings into question the reported acreages of curlyleaf pondweed. Because curlyleaf pondweed exhibits natural senescence and the new hybrid does not, the new hybrid will likely require a different management approach. A total of 12 native plant species were documented in 2023 compared to 9 in 2022, 14 in 2017, and 4 in 2005 suggesting a relatively stable native plant community.

The 2022 and 2023 surveys included both pre and posttreatment mapping. After the 2023 herbicide application Eurasian watermilfoil coverage was reduced from 25 to 13 acres.. Eelgrass acreage increased posttreatment indicating the herbicide application was less effective on this plant. The response of the other native species to the herbicides varied with some increasing, some decreasing and others remaining largely unchanged. Overall, however, native plant numbers and frequecy of occurrence remained robust.

Lake Housatonis is classified as a meso-oligitrophic, moderatelyalkaline waterbody with little change since 2005.

Acknowledgments

The assistance of Jim Olsen from Lake Housatonic Authority and the following individuals from CAES is gratefully acknowledged: Meara Burns, Robert Capers, Jeremiah Foley, Madison Manke, Amanda Massa, Olivia O'Connor, Eva Ramey, Roslyn Reeps, and Abigail Wiegand.

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.

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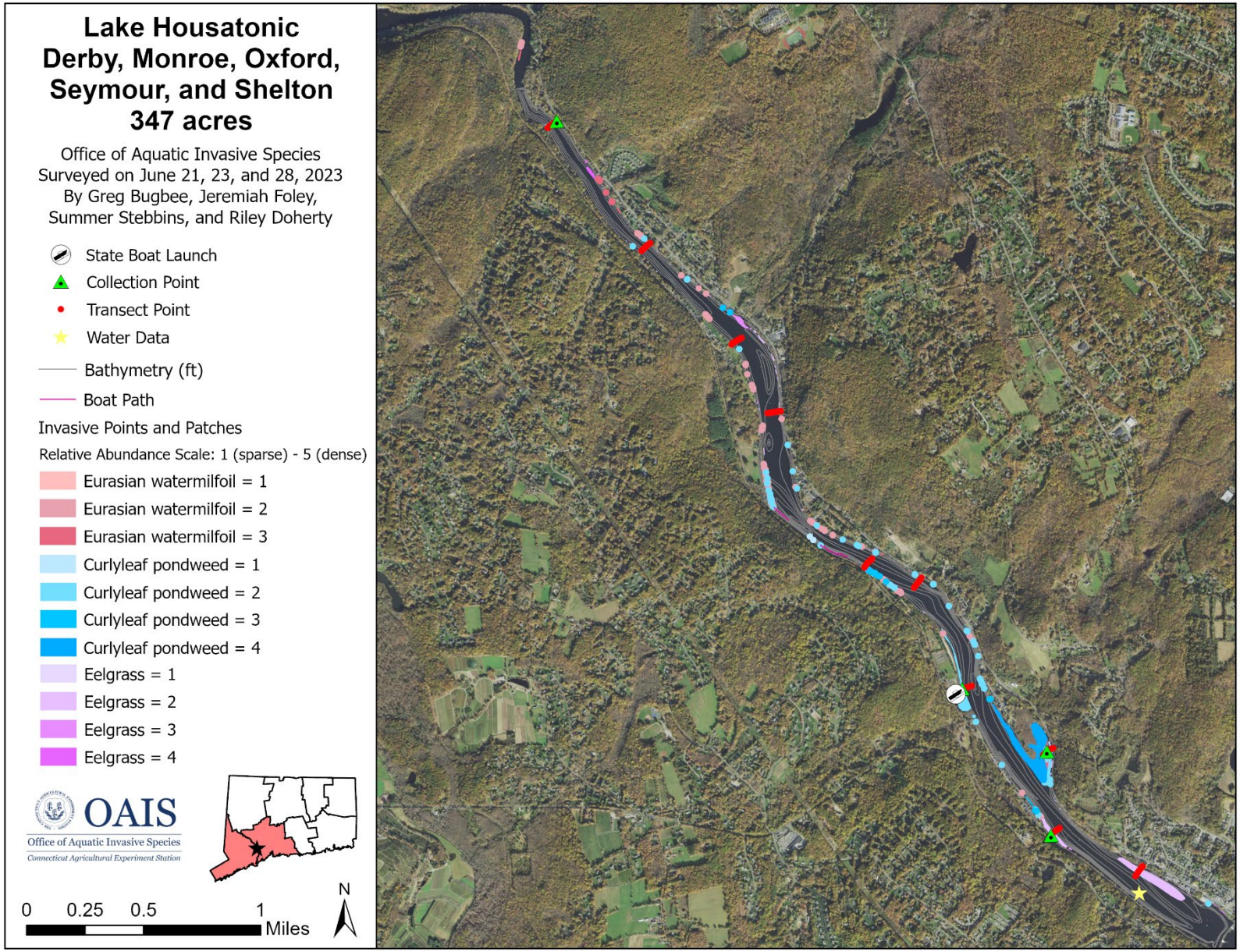
Appendix

2023 Survey Pretreatment Maps


Lake Housatonic
Derby, Monroe, Oxford, Seymour, and Shelton
347 acres
Office of Aquatic Invasive Species
Surveyed on June 21, 23, and 28, 2023
By Greg Bugbee, Jeremiah Foley, Summer Stebbins, and Riley Doherty
State Boat Launch
Collection Point
Transect Point
Water Data
Bathymetry (ft)
Boat Path
Invasive Points and Patches
Relative Abundance Scale: 1 (sparse) - 5 (dense)
Eurasian watermilfoil = 1
Eurasian watermilfoil = 2
Eurasian watermilfoil = 3
Curlyleaf pondweed = 1
Curlyleaf pondweed = 2
Curlyleaf pondweed = 3
Curlyleaf pondweed = 4
Eelgrass = 1
Eelgrass = 2
Eelgrass = 3
Eelgrass = 4
OAIS
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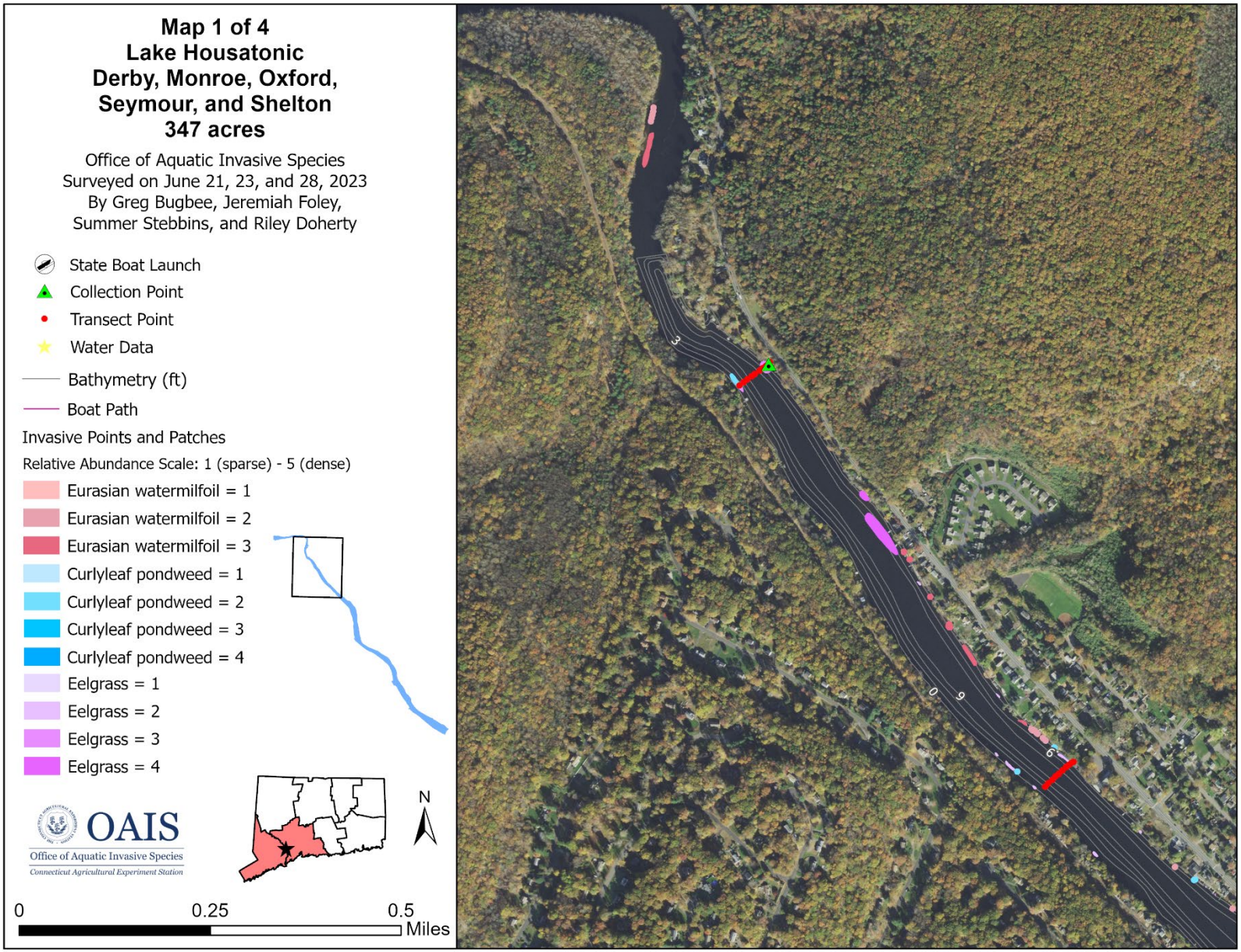
Map 1 of 4
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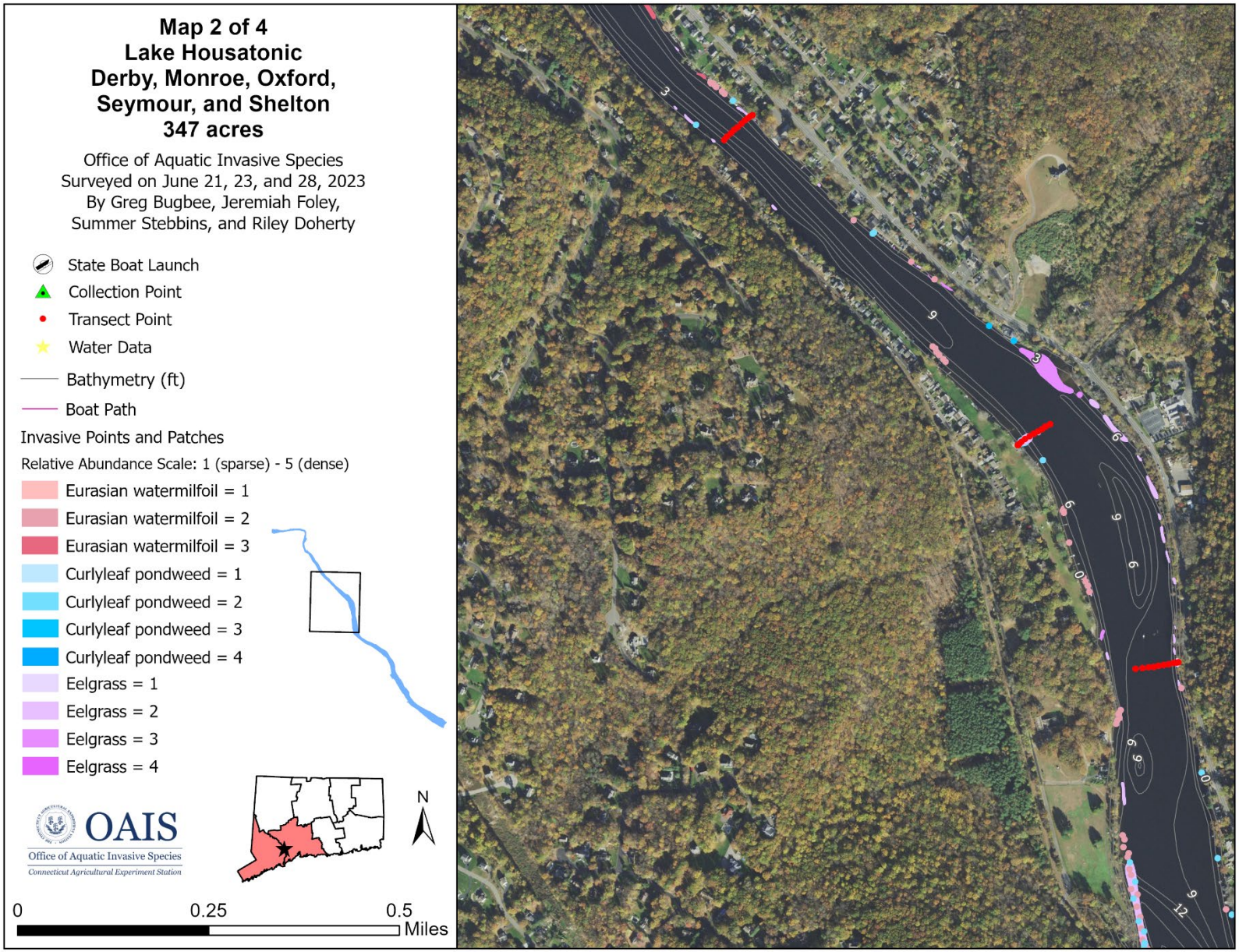
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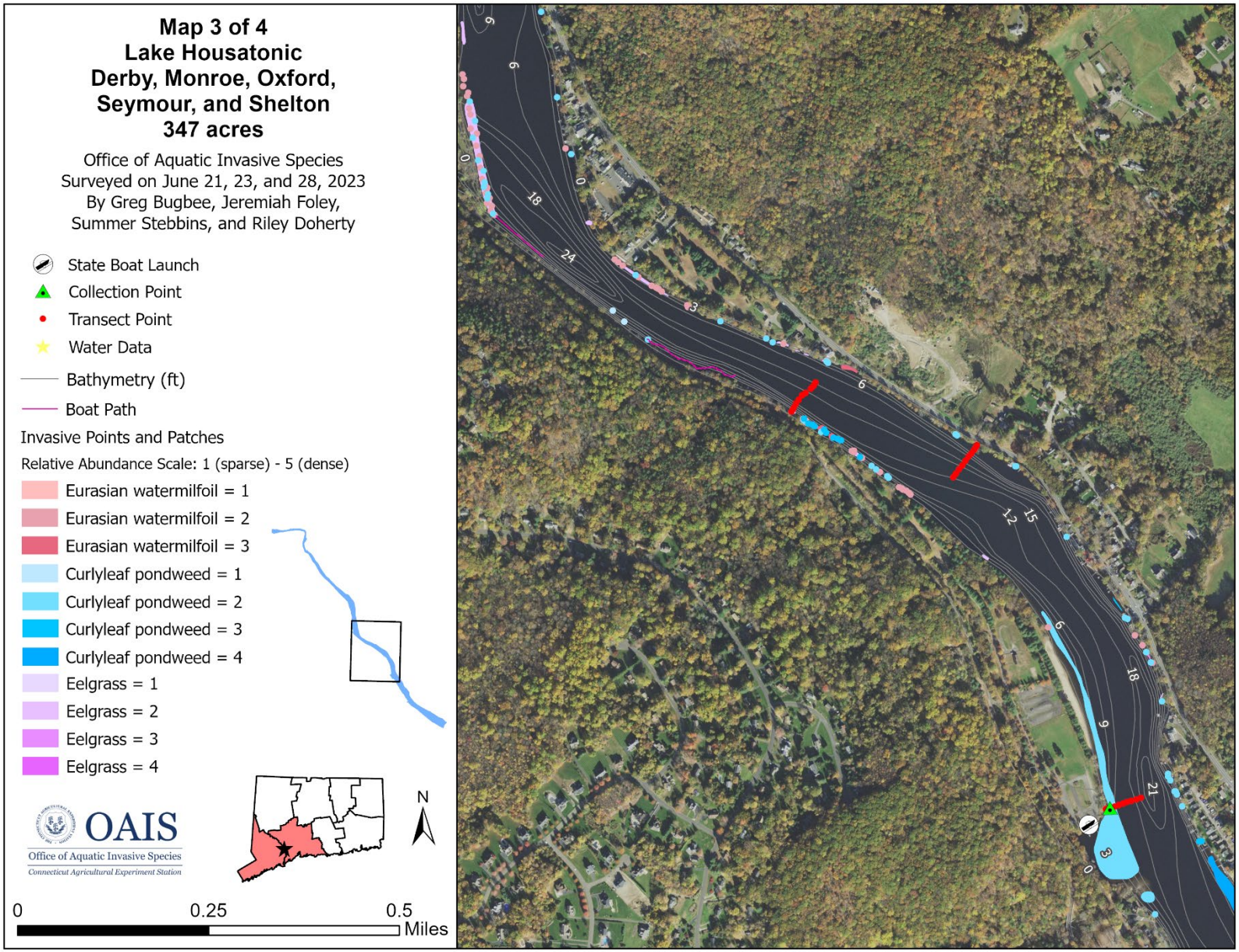
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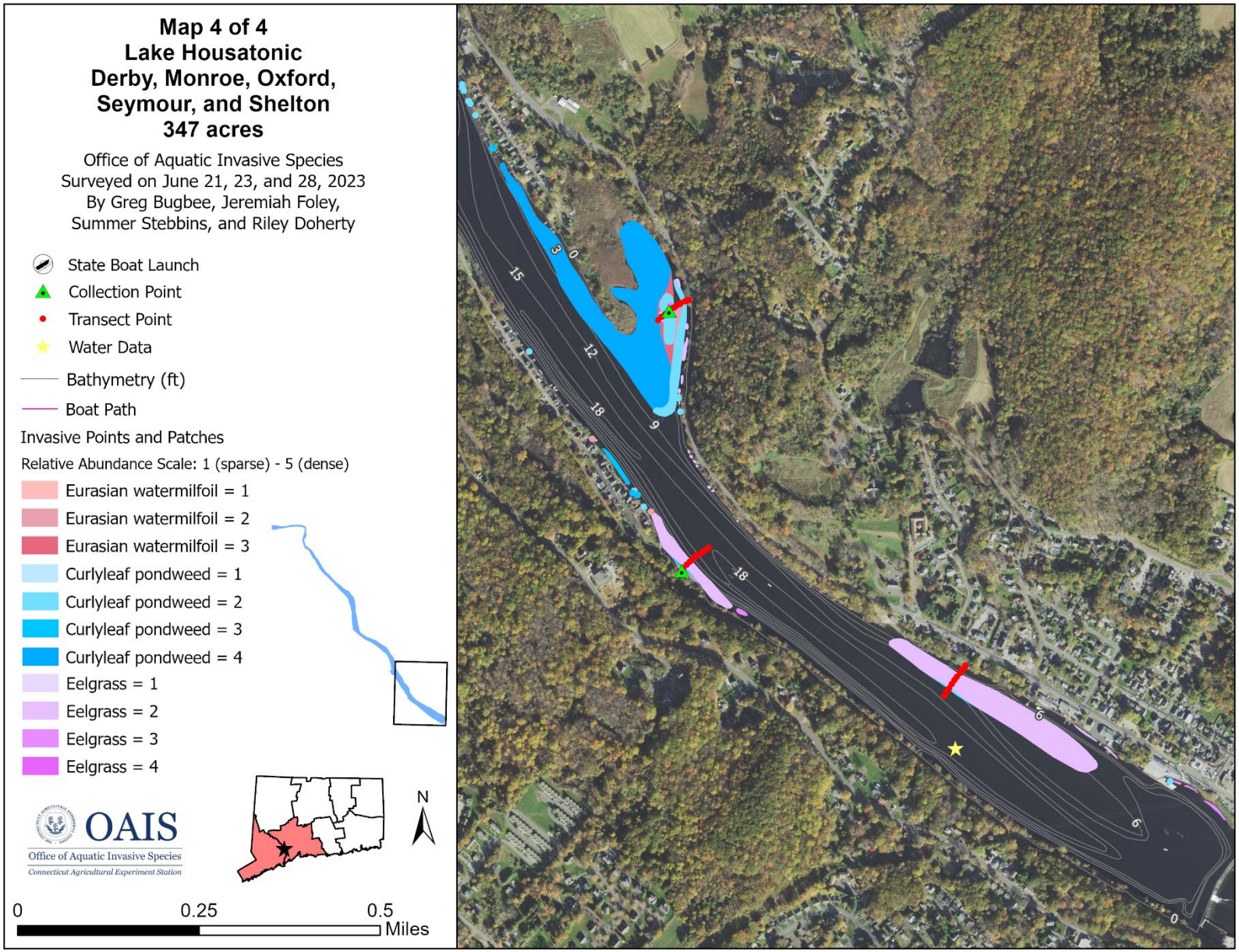
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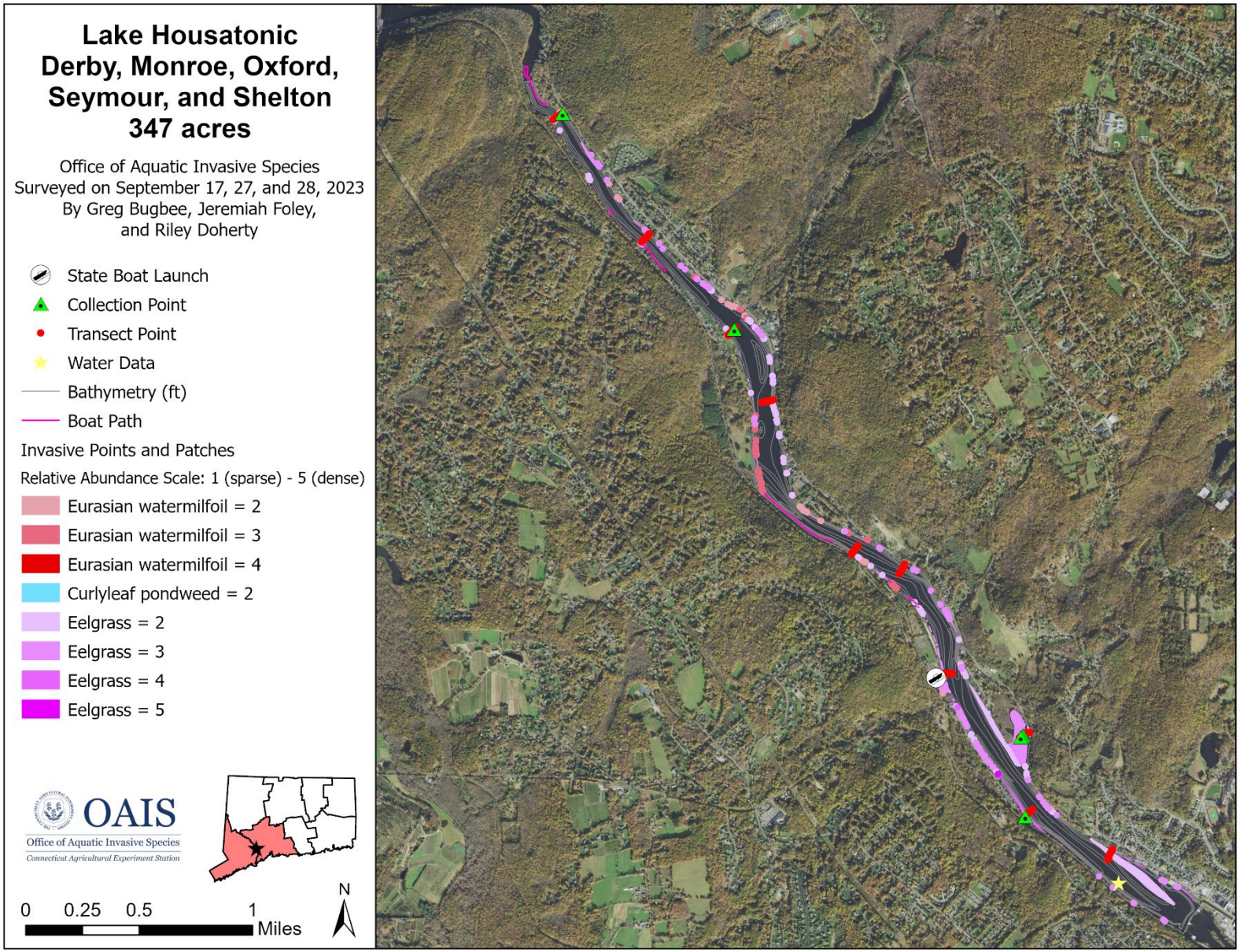
2023 Survey Posttreatment Maps


Lake Housatonic
Derby, Monroe, Oxford, Seymour, and Shelton
347 acres
Office of Aquatic Invasive Species
Surveyed on September 17, 27, and 28, 2023
By Greg Bugbee, Jeremiah Foley, and Riley Doherty
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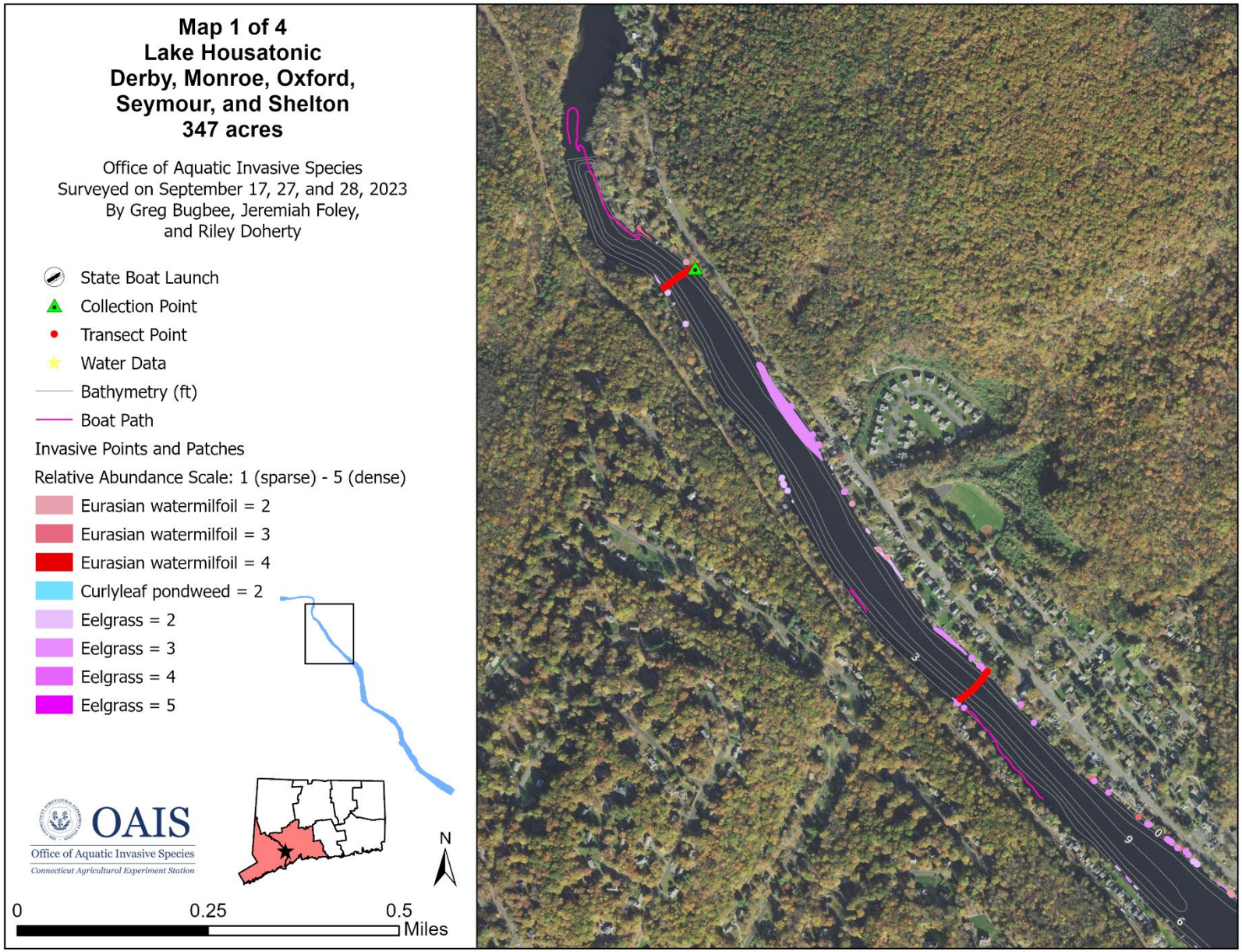
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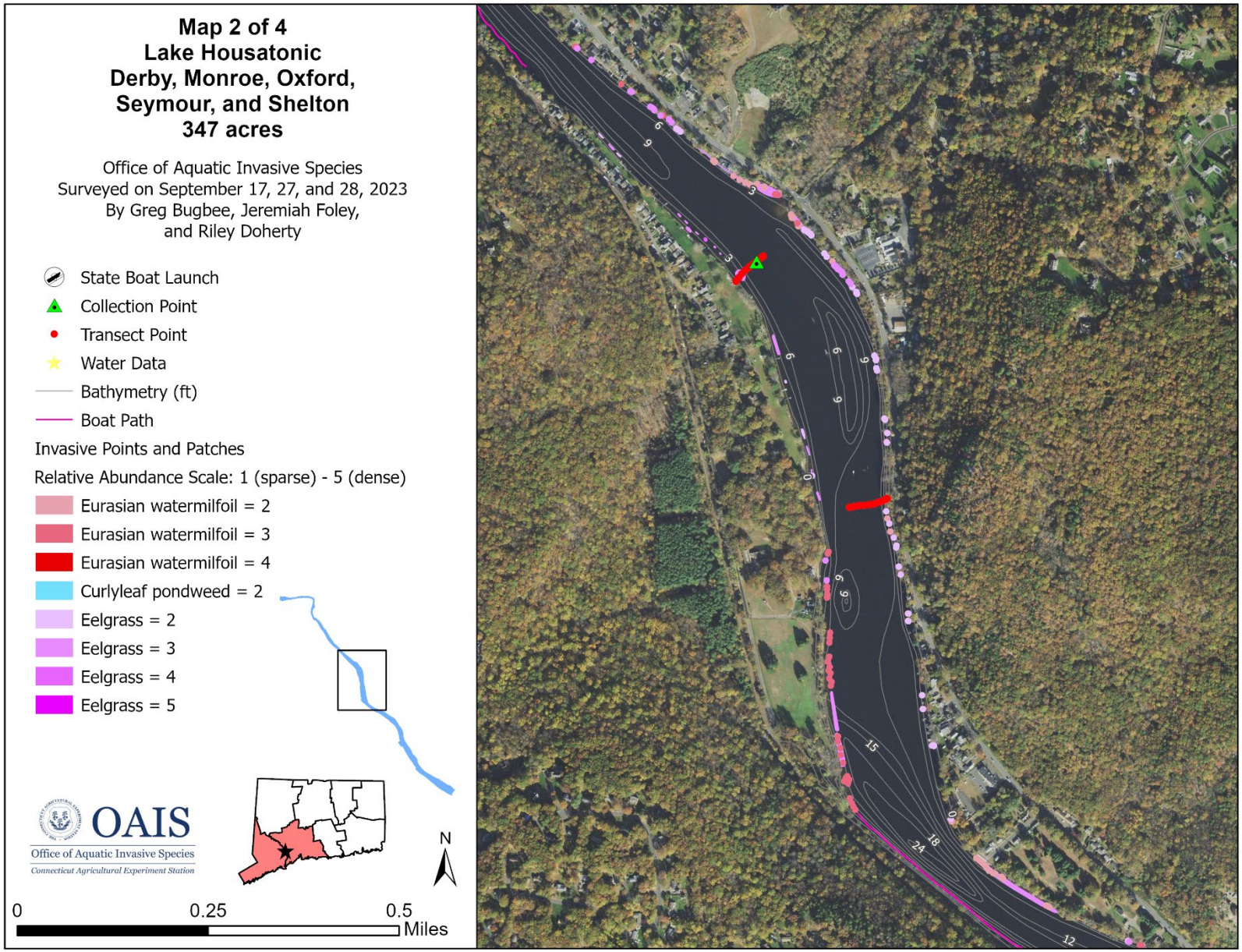
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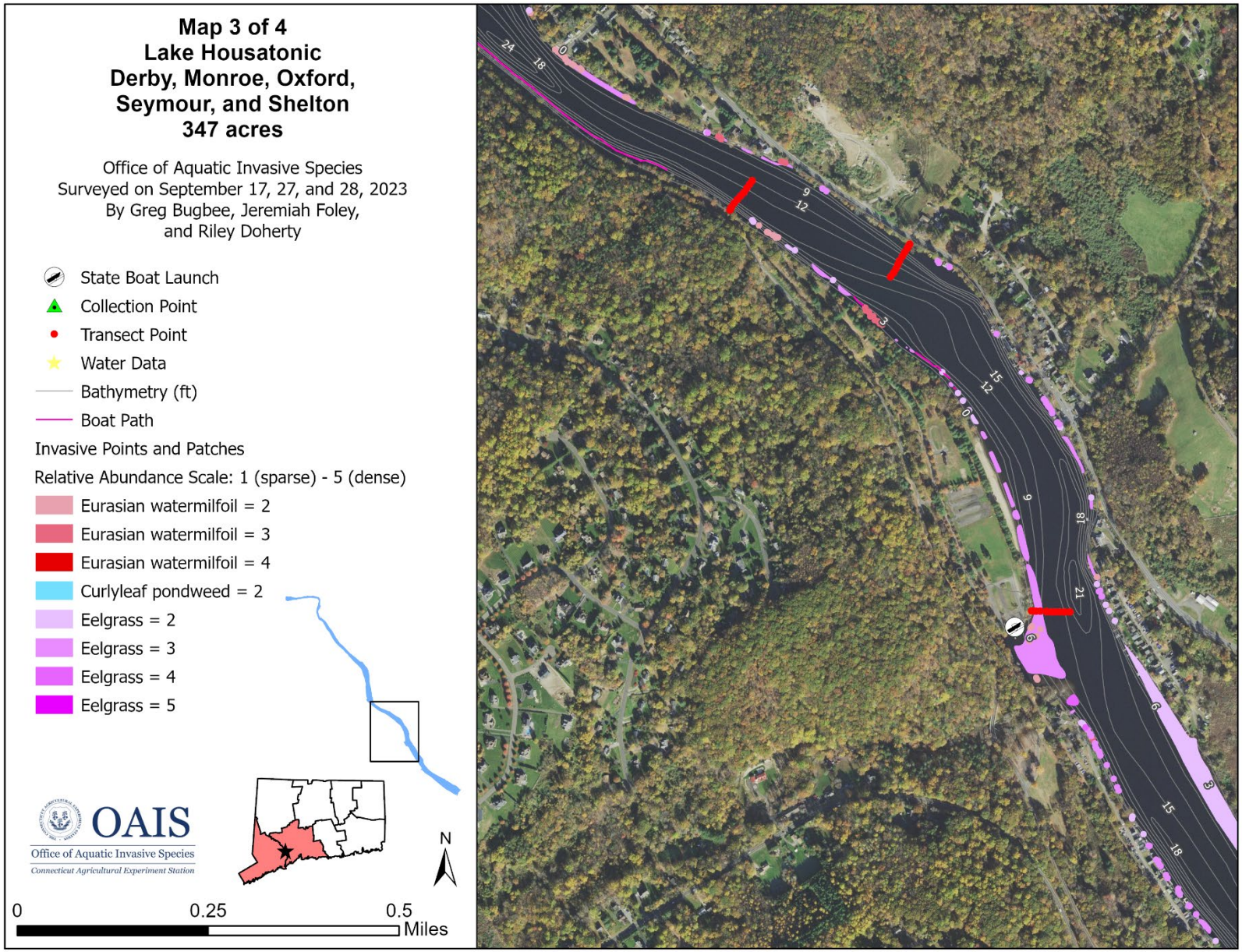
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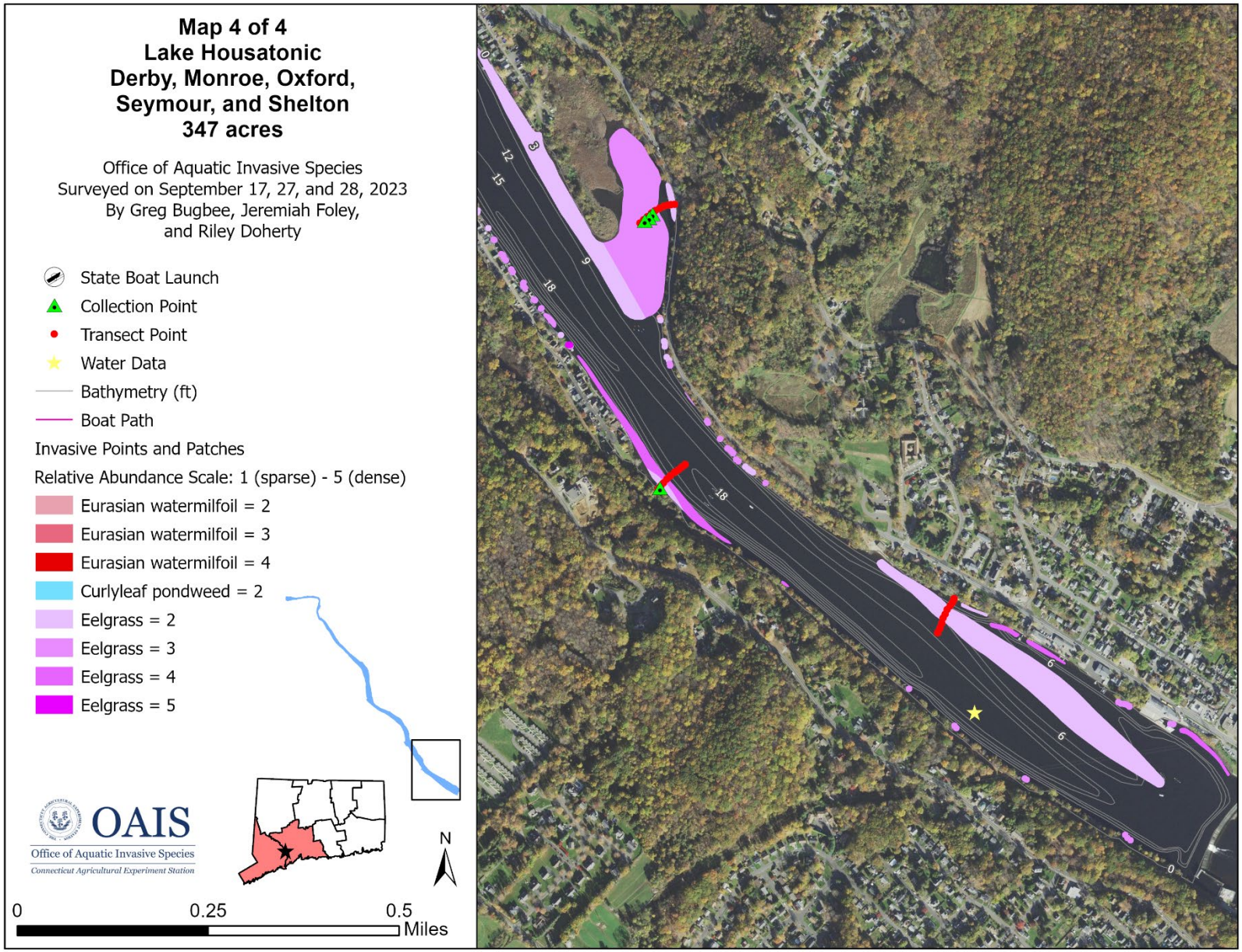
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OAIS
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Connecticut Agricultural Experiment Station
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Plant Descriptions

Myriophyllum spicatum


Photo by CAES IAPP

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*


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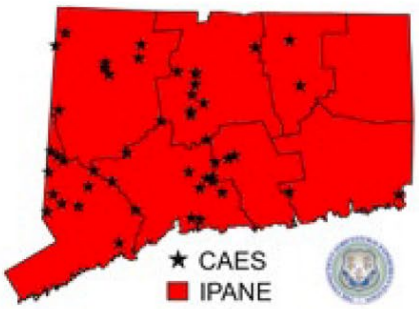
Photo by
CAES IAPP


Photo by CAES IAPP


Photo by
CAES IAPP



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

Vallisneria americana


Photo by Ron Vanderhoff (CC BY-NC)

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
Pickerelweed (Native): *Pontederia cordata*
Bur-reeds (Native): *Sparganium* species

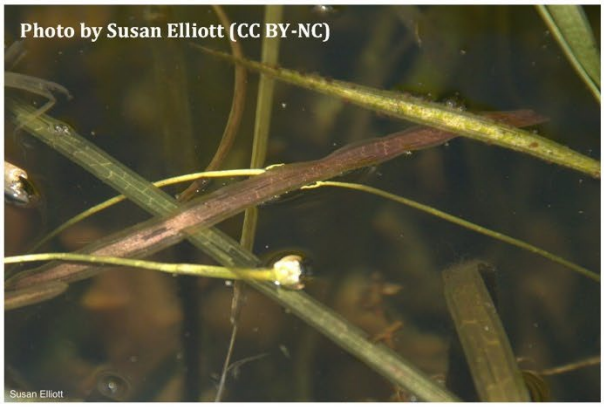
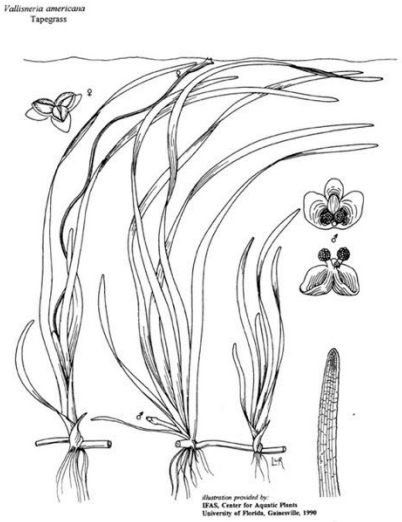


Photo by Susan Elliott (CC BY-NC)
Susan Elliott



Sources:

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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 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
0	Point	PotCri		2	1.5	6/21/2023	41.33907	-73.12242	0.0002
1	Point	PotCri		2	1.5	6/21/2023	41.33637	-73.12038	0.0002
2	Point	MyrSpi		2	1.5	6/21/2023	41.33460	-73.11876	0.0002
3	Point	MyrSpi		2	1.5	6/21/2023	41.33351	-73.11770	0.0002
4	Point	PotCri		3	1	6/21/2023	41.33350	-73.11771	0.0002
5	Point	PotCri		2	1	6/21/2023	41.33355	-73.11767	0.0002
6	Point	PotCri		3	1.5	6/21/2023	41.33346	-73.11759	0.0002
7	Point	PotCri		2	1	6/21/2023	41.33323	-73.11743	0.0002
8	Point	MyrSpi		2	1	6/21/2023	41.33312	-73.11724	0.0002
9	Point	PotCri		2	2	6/21/2023	41.32753	-73.10364	0.0002
10	Point	PotCri		2	1	6/21/2023	41.33511	-73.11641	0.0002
11	Point	PotCri		2	1	6/21/2023	41.33537	-73.11645	0.0002
12	Point	PotCri		2	1	6/21/2023	41.33539	-73.11645	0.0002
13	Point	PotCri		3	1	6/21/2023	41.34045	-73.12121	0.0002
14	Point	PotCri		3	1	6/21/2023	41.34044	-73.12126	0.0002
15	Point	PotCri		2	1	6/21/2023	41.34111	-73.12168	0.0002
16	Point	PotCri		2	1	6/21/2023	41.34134	-73.12181	0.0002
17	Point	PotCri		2	1	6/21/2023	41.34140	-73.12184	0.0002
18	Point	PotCri		2	2	6/21/2023	41.34140	-73.12187	0.0002
19	Point	PotCri		2	2	6/21/2023	41.34161	-73.12197	0.0002
20	Point	PotCri		2	2	6/21/2023	41.34168	-73.12202	0.0002
21	Point	PotCri		2	2	6/21/2023	41.34173	-73.12202	0.0002
22	Point	PotCri		2	2	6/21/2023	41.34311	-73.12214	0.0002
23	Point	PotCri		2	2	6/21/2023	41.34385	-73.12240	0.0002
24	Point	MyrSpi		2	1.5	6/21/2023	41.34384	-73.12235	0.0002
25	Point	PotCri		2	1.5	6/21/2023	41.34405	-73.12251	0.0002
26	Point	MyrSpi		2	1.5	6/21/2023	41.34418	-73.12260	0.0002
27	Point	MyrSpi		2	1.5	6/21/2023	41.34437	-73.12278	0.0002
28	Point	PotCri		2	1.5	6/21/2023	41.34468	-73.12296	0.0002
29	Point	PotCri		2	1.5	6/21/2023	41.34471	-73.12303	0.0002
30	Point	PotCri		2	1.5	6/21/2023	41.34626	-73.12446	0.0002
31	Point	PotCri		2	1.5	6/21/2023	41.34763	-73.12569	0.0002
32	Point	PotCri		2	1.5	6/21/2023	41.34762	-73.12571	0.0002
33	Point	PotCri		2	1.5	6/21/2023	41.34826	-73.12720	0.0002
34	Point	PotCri		2	1.5	6/21/2023	41.34823	-73.12717	0.0002
35	Point	PotCri		2	1.5	6/21/2023	41.34835	-73.13058	0.0002
36	Point	MyrSpi		2	1.5	6/21/2023	41.34795	-73.12976	0.0002
37	Point	MyrSpi		2	1.5	6/21/2023	41.34798	-73.12977	0.0002
38	Point	MyrSpi		2	1.5	6/21/2023	41.34798	-73.12982	0.0002
39	Point	PotCri		2	1.5	6/21/2023	41.34768	-73.12933	0.0002
40	Point	PotCri		2	1.5	6/21/2023	41.34762	-73.12921	0.0002
41	Point	MyrSpi		2	1.5	6/21/2023	41.34757	-73.12912	0.0002
42	Point	PotCri		2	1.5	6/21/2023	41.34749	-73.12894	0.0002
43	Point	PotCri		2	1.5	6/21/2023	41.34745	-73.12890	0.0002
44	Point	MyrSpi		2	1.5	6/21/2023	41.34727	-73.12865	0.0002
45	Point	MyrSpi		2	1.5	6/21/2023	41.34725	-73.12858	0.0002
46	Point	MyrSpi		2	1.5	6/21/2023	41.34723	-73.12856	0.0002
47	Point	MyrSpi		2	1.5	6/21/2023	41.34720	-73.12847	0.0002
48	Point	MyrSpi		2	1.5	6/21/2023	41.34716	-73.12840	0.0002
49	Point	MyrSpi		2	1.5	6/21/2023	41.34713	-73.12836	0.0002

Appendix Lake Housatonic Invasive Plant Location data (2 of 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
50	Point	MyrSpi		2	1.5	6/21/2023	41.34456	-73.12497	0.0002
51	Point	PotCri		2	2	6/23/2023	41.34966	-73.13037	0.0002
52	Point	PotCri		2	2	6/23/2023	41.34966	-73.13039	0.0002
53	Point	PotCri		2	2	6/23/2023	41.34969	-73.13041	0.0002
54	Point	MyrSpi		2	2	6/23/2023	41.34970	-73.13042	0.0002
55	Point	MyrSpi		2	2	6/23/2023	41.35004	-73.13149	0.0002
56	Point	PotCri		2	2	6/23/2023	41.35007	-73.13176	0.0002
57	Point	PotCri		2	2	6/23/2023	41.35014	-73.13192	0.0002
58	Point	PotCri		2	2	6/23/2023	41.35049	-73.13306	0.0002
59	Point	MyrSpi		2	2	6/23/2023	41.35081	-73.13389	0.0002
60	Point	MyrSpi		2	2	6/23/2023	41.35077	-73.13388	0.0002
61	Point	MyrSpi		2	2	6/23/2023	41.35108	-73.13453	0.0002
62	Point	MyrSpi		2	2	6/23/2023	41.35113	-73.13460	0.0002
63	Point	MyrSpi		2	2	6/23/2023	41.35115	-73.13466	0.0002
64	Point	MyrSpi		2	2	6/23/2023	41.35119	-73.13478	0.0002
65	Point	MyrSpi		2	2	6/23/2023	41.35136	-73.13511	0.0002
66	Point	PotCri		2	2	6/23/2023	41.35140	-73.13517	0.0002
67	Point	MyrSpi		2	2	6/23/2023	41.35158	-73.13549	0.0002
68	Point	MyrSpi		2	2	6/23/2023	41.35165	-73.13561	0.0002
69	Point	MyrSpi		2	2	6/23/2023	41.35170	-73.13569	0.0002
70	Point	PotCri		2	2	6/23/2023	41.35372	-73.13674	0.0002
71	Point	MyrSpi		2	2	6/23/2023	41.35383	-73.13688	0.0002
72	Point	PotCri		2	2	6/23/2023	41.35480	-73.13706	0.0002
73	Point	PotCri		2	2	6/23/2023	41.35643	-73.13743	0.0002
74	Point	MyrSpi		2	2	6/23/2023	41.35804	-73.13789	0.0002
75	Point	PotCri		3	1.5	6/23/2023	41.36469	-73.14194	0.0002
76	Point	PotCri		3	1.5	6/23/2023	41.36499	-73.14255	0.0002
77	Point	MyrSpi		2	1.5	6/23/2023	41.36589	-73.14390	0.0002
78	Point	MyrSpi		2	1.5	6/23/2023	41.36623	-73.14448	0.0002
79	Point	PotCri		2	1.5	6/23/2023	41.36679	-73.14540	0.0002
80	Point	PotCri		2	1.5	6/23/2023	41.36678	-73.14543	0.0002
81	Point	MyrSpi		2	1.5	6/23/2023	41.36704	-73.14591	0.0002
82	Point	PotCri		2	1.5	6/23/2023	41.36935	-73.14889	0.0002
83	Point	MyrSpi		2	1.5	6/23/2023	41.36954	-73.14917	0.0002
84	Point	MyrSpi		2	1.5	6/23/2023	41.36953	-73.14915	0.0002
85	Point	MyrSpi		2	1.5	6/23/2023	41.36949	-73.14910	0.0002
86	Point	MyrSpi		2	1.5	6/23/2023	41.36962	-73.14930	0.0002
87	Point	MyrSpi		2	1.5	6/23/2023	41.36964	-73.14933	0.0002
88	Point	MyrSpi		2	1.5	6/23/2023	41.36971	-73.14945	0.0002
89	Point	MyrSpi		2	1.5	6/23/2023	41.36969	-73.14942	0.0002
90	Point	MyrSpi		2	1.5	6/23/2023	41.36969	-73.14937	0.0002
91	Point	MyrSpi		3	1	6/23/2023	41.37168	-73.15145	0.0002
92	Point	MyrSpi		3	1	6/23/2023	41.37168	-73.15146	0.0002
93	Point	MyrSpi		3	1	6/23/2023	41.37170	-73.15149	0.0002
94	Point	MyrSpi		3	1	6/23/2023	41.37173	-73.15148	0.0002
95	Point	MyrSpi		3	1	6/23/2023	41.37226	-73.15193	0.0002
96	Point	MyrSpi		3	1	6/23/2023	41.37298	-73.15244	0.0002
97	Point	MyrSpi		3	1	6/23/2023	41.37311	-73.15257	0.0002
98	Point	MyrSpi		3	1	6/23/2023	41.37312	-73.15257	0.0002
99	Point	PotCri		3	0.5	6/23/2023	41.34786	-73.12961	0.0002

Appendix Lake Housatonic Invasive Plant Location data (3 of 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
100	Point	PotCri		3	2	6/23/2023	41.34819	-73.13009	0.0002
101	Point	PotCri		3	1	6/23/2023	41.34821	-73.13018	0.0002
102	Point	PotCri		3	1	6/23/2023	41.34824	-73.13027	0.0002
103	Point	PotCri		3	1	6/23/2023	41.34834	-73.13046	0.0002
104	Point	PotCri		3	1	6/23/2023	41.34839	-73.13051	0.0002
105	Point	PotCri		2	2	6/23/2023	41.35017	-73.13490	0.0002
106	Point	PotCri		1	2	6/23/2023	41.35052	-73.13549	0.0002
107	Point	PotCri		1	2	6/23/2023	41.35073	-73.13577	0.0002
108	Point	MyrSpi		2	0.5	6/23/2023	41.36085	-73.14064	0.0002
109	Point	PotCri		2	1	6/23/2023	41.36241	-73.14127	0.0002
110	Point	PotCri		2	1	6/23/2023	41.36891	-73.14983	0.0002
111	Point	MyrSpi		2	0.5	6/23/2023	41.34785	-73.12957	0.0002
112	Point	MyrSpi		3	1	6/23/2023	41.34826	-73.13032	0.0002
113	Point	MyrSpi		3	1	6/23/2023	41.34842	-73.13056	0.0002
114	Point	MyrSpi		2	No Data	6/23/2023	41.38139	-73.15873	0.0002
115	Point	MyrSpi		2	No Data	6/23/2023	41.38146	-73.15871	0.0002
116	Point	MyrSpi		2	No Data	6/23/2023	41.38151	-73.15869	0.0002
117	Point	MyrSpi		2	No Data	6/23/2023	41.38158	-73.15867	0.0002
118	Point	MyrSpi		2	No Data	6/23/2023	41.38165	-73.15865	0.0002
119	Point	MyrSpi		2	No Data	6/23/2023	41.36462	-73.14398	0.0002
120	Point	MyrSpi		2	No Data	6/23/2023	41.36458	-73.14392	0.0002
121	Point	MyrSpi		2	No Data	6/23/2023	41.36451	-73.14389	0.0002
122	Point	MyrSpi		2	No Data	6/23/2023	41.36445	-73.14382	0.0002
123	Point	MyrSpi		2	No Data	6/23/2023	41.36437	-73.14372	0.0002
124	Point	MyrSpi		2	No Data	6/23/2023	41.36432	-73.14366	0.0002
125	Point	MyrSpi		2	No Data	6/23/2023	41.36141	-73.14076	0.0002
126	Point	MyrSpi		2	No Data	6/23/2023	41.36149	-73.14075	0.0002
127	Point	MyrSpi		2	No Data	6/23/2023	41.36145	-73.14079	0.0002
128	Point	MyrSpi		2	No Data	6/23/2023	41.35260	-73.13870	0.0002
129	Point	MyrSpi		2	No Data	6/23/2023	41.35267	-73.13880	0.0002
130	Point	MyrSpi		2	No Data	6/23/2023	41.35277	-73.13877	0.0002
131	Point	MyrSpi		2	No Data	6/23/2023	41.35283	-73.13888	0.0002
132	Point	MyrSpi		2	No Data	6/23/2023	41.35311	-73.13887	0.0002
133	Point	MyrSpi		2	No Data	6/23/2023	41.35301	-73.13890	0.0002
134	Point	MyrSpi		2	No Data	6/23/2023	41.35291	-73.13882	0.0002
135	Point	MyrSpi		2	No Data	6/23/2023	41.35349	-73.13903	0.0002
136	Point	MyrSpi		2	No Data	6/23/2023	41.35328	-73.13899	0.0002
137	Point	MyrSpi		2	No Data	6/23/2023	41.35391	-73.13913	0.0002
138	Point	MyrSpi		2	No Data	6/23/2023	41.35371	-73.13904	0.0002
139	Point	MyrSpi		2	No Data	6/23/2023	41.35451	-73.13925	0.0002
140	Point	MyrSpi		2	No Data	6/23/2023	41.35462	-73.13929	0.0002
141	Point	MyrSpi		2	No Data	6/23/2023	41.35424	-73.13926	0.0002
142	Point	MyrSpi		2	No Data	6/23/2023	41.35414	-73.13910	0.0002
143	Point	PotCri		2	No Data	6/23/2023	41.35262	-73.13873	0.0002
144	Point	PotCri		2	No Data	6/23/2023	41.35291	-73.13887	0.0002
145	Point	PotCri		2	No Data	6/23/2023	41.35299	-73.13885	0.0002
146	Point	PotCri		2	No Data	6/23/2023	41.35322	-73.13894	0.0002
147	Point	PotCri		2	No Data	6/23/2023	41.35313	-73.13896	0.0002
148	Point	PotCri		2	No Data	6/23/2023	41.35343	-73.13895	0.0002
149	Point	PotCri		2	No Data	6/23/2023	41.35364	-73.13908	0.0002

Appendix Lake Housatonic Invasive Plant Location data (4 of 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
150	Point	PotCri		2	No Data	6/23/2023	41.35438	-73.13915	0.0002
151	Point	PotCri		2	No Data	6/23/2023	41.35407	-73.13920	0.0002
152	Point	PotCri		2	No Data	6/23/2023	41.35475	-73.13927	0.0002
153	Point	MyrSpi		2	No Data	6/23/2023	41.35485	-73.13933	0.0002
154	Point	MyrSpi		2	No Data	6/23/2023	41.35493	-73.13930	0.0002
155	Point	MyrSpi		2	No Data	6/23/2023	41.35527	-73.13944	0.0002
156	Point	MyrSpi		2	No Data	6/23/2023	41.35519	-73.13940	0.0002
157	Point	MyrSpi		2	No Data	6/23/2023	41.35505	-73.13942	0.0002
158	Point	MyrSpi		2	No Data	6/23/2023	41.35739	-73.13955	0.0002
159	Point	MyrSpi		2	No Data	6/23/2023	41.35745	-73.13952	0.0002
160	Point	MyrSpi		2	No Data	6/23/2023	41.35749	-73.13946	0.0002
161	Point	MyrSpi		2	No Data	6/23/2023	41.35765	-73.13943	0.0002
162	Point	MyrSpi		2	No Data	6/23/2023	41.35757	-73.13949	0.0002
163	Point	MyrSpi		2	No Data	6/23/2023	41.36010	-73.14025	0.0002
164	Point	MyrSpi		2	No Data	6/23/2023	41.36002	-73.14019	0.0002
165	Point	MyrSpi		2	No Data	6/23/2023	41.35990	-73.14015	0.0002
166	Point	MyrSpi		2	No Data	6/23/2023	41.36018	-73.14029	0.0002
167	Point	MyrSpi		2	No Data	6/23/2023	41.34861	-73.13104	0.0002
168	Point	MyrSpi		2	No Data	6/23/2023	41.34858	-73.13096	0.0002
169	Point	MyrSpi		2	No Data	6/23/2023	41.34854	-73.13096	0.0002
170	Point	PotCri		2	No Data	6/23/2023	41.34857	-73.13101	0.0002
171	Point	PotCri		3	No Data	6/23/2023	41.34861	-73.13101	0.0002
172	Point	PotCri		3	No Data	6/23/2023	41.34851	-73.13090	0.0002
173	Point	PotCri		3	No Data	6/23/2023	41.34850	-73.13080	0.0002
174	Point	PotCri		3	No Data	6/23/2023	41.34846	-73.13074	0.0002
0	Patch	PotCri	Various PotSp., StuPec	2	0.5-2.5	6/21/2023	41.34120	-73.12363	3.5311
1	Patch	PotCri	Various PotSp	2	0.5-2.5	6/21/2023	41.33940	-73.12259	0.1378
2	Patch	PotCri	Various PotSp	3	0.5-2.5	6/21/2023	41.33404	-73.11812	0.2270
3	Patch	PotCri	Various PotSp	3	0.5-2.5	6/21/2023	41.33208	-73.11630	1.5994
4	Patch	PotCri	PotAmp, Various PotSp	2	0.5-3	6/21/2023	41.32903	-73.10804	6.3281
5	Patch	PotCri	PotAmp, Various PotSp	2	0.5-3	6/21/2023	41.33615	-73.11650	1.4704
6	Patch	PotCri		3	1-2.5	6/21/2023	41.34497	-73.12321	0.0215
7	Patch	MyrSpi	with PotNodxPotPer	3	2	6/21/2023	41.34955	-73.12986	0.0671
8	Patch	MyrSpi	with PotNodxPotPer	3	2	6/21/2023	41.34847	-73.13075	0.0378
9	Patch	PotCri	with PotNodxPotPer	3	2	6/21/2023	41.34795	-73.12977	0.0515
10	Patch	MyrSpi		3	1.5	6/23/2023	41.36984	-73.14966	0.0307
11	Patch	PotCri	with pondweeds	2	2	6/23/2023	41.37642	-73.15672	0.0930
12	Patch	MyrSpi	with pondweeds	3	1.5	6/21/2023	41.38085	-73.15882	0.2014
13	Patch	MyrSpi		3	1.5	6/21/2023	41.33731	-73.11788	13.1766
14	Patch	PotCri		4	1.5	6/21/2023	41.33734	-73.11799	12.0748
15	Patch	MyrSpi		3	2.5	6/21/2023	41.37113	-73.15096	0.1284
16	Patch	MyrSpi	Various PotSp., StuPec	2	0.5-2.5	6/21/2023	41.34120	-73.12363	3.5311
17	Patch	MyrSpi	Various PotSp	2	0.5-2.5	6/21/2023	41.33940	-73.12259	0.1378
18	Patch	MyrSpi	Various PotSp	2	0.5-2.5	6/21/2023	41.33404	-73.11812	0.2270
19	Patch	MyrSpi	Various PotSp	2	0.5-2.5	6/21/2023	41.33208	-73.11630	1.6774
20	Patch	MyrSpi	Various PotSp	2	0.5-3	6/21/2023	41.32867	-73.10731	4.4994
21	Patch	MyrSpi	Various PotSp	2	0.5-3	6/21/2023	41.33609	-73.11651	1.4394
22	Patch	PotCri		2	1.5	6/21/2023	41.33698	-73.11667	1.0089
23	Patch	MyrSpi		1	3	6/28/2023	41.32948	-73.10941	0.0384
24	Patch	PotCri		3	1.5	6/28/2023	41.37671	-73.15593	0.0585

Appendix Lake Housatonic Invasive Plant Location data (5 of 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
25	Patch	MyrSpi		2	3	6/28/2023	41.37633	-73.15662	0.0262
26	Patch	PotCri		2	0.6	6/28/2023	41.34879	-73.13129	0.0144
27	Patch	PotCri		2	1.2	6/28/2023	41.36278	-73.14174	0.0981
28	Patch	MyrSpi		2	1.2	6/28/2023	41.36280	-73.14173	0.0438
0	Point	ValAme		2	0-2	9/27/2023	-73.12521	41.34491	0.0002
1	Point	ValAme		2	0-2	9/27/2023	-73.12537	41.34509	0.0002
2	Point	ValAme		2	0-2	9/27/2023	-73.12550	41.34524	0.0002
3	Point	ValAme		2	0-2	9/27/2023	-73.12589	41.34563	0.0002
4	Point	ValAme		2	0-2	9/27/2023	-73.12865	41.34737	0.0002
5	Point	ValAme		2	0-2	9/27/2023	-73.12962	41.34793	0.0002
7	Point	ValAme		2	0-2	9/27/2023	-73.13067	41.34847	0.0002
8	Point	ValAme		2	0-2	9/27/2023	-73.13070	41.34850	0.0002
9	Point	ValAme		3	0-2	9/27/2023	-73.13948	41.35698	0.0002
10	Point	ValAme		3	0-2	9/27/2023	-73.13951	41.35735	0.0002
11	Point	ValAme		2	0-2	9/27/2023	-73.13986	41.35896	0.0002
12	Point	ValAme		2	0-2	9/27/2023	-73.14198	41.36308	0.0002
13	Point	ValAme		3	0-2	9/27/2023	-73.14910	41.36843	0.0002
14	Point	ValAme		3	0-2	9/27/2023	-73.14926	41.36851	0.0002
15	Point	ValAme		3	0-2	9/27/2023	-73.14928	41.36854	0.0002
16	Point	ValAme		2	0-1	9/27/2023	-73.15357	41.37253	0.0002
17	Point	ValAme		2	0-1	9/27/2023	-73.15367	41.37264	0.0002
18	Point	ValAme		2	0-1	9/27/2023	-73.15369	41.37267	0.0002
19	Point	ValAme		2	0-1	9/27/2023	-73.15371	41.37278	0.0002
20	Point	ValAme		2	0-1	9/27/2023	-73.15616	41.37569	0.0002
21	Point	ValAme		2	0-1	9/27/2023	-73.15661	41.37628	0.0002
23	Point	ValAme		3	0-1	9/27/2023	-73.15349	41.37414	0.0002
31	Point	ValAme		2	0-2	9/17/2023	-73.12235	41.33899	0.0002
32	Point	ValAme		2	0-2	9/17/2023	-73.12232	41.33897	0.0002
33	Point	ValAme		2	0-2	9/17/2023	-73.12229	41.33893	0.0002
34	Point	ValAme		4	0-2	9/17/2023	-73.12225	41.33890	0.0002
35	Point	ValAme		3	0-2	9/17/2023	-73.12219	41.33884	0.0002
36	Point	ValAme		3	0-2	9/17/2023	-73.12214	41.33877	0.0002
37	Point	ValAme		3	0-2	9/17/2023	-73.12211	41.33873	0.0002
39	Point	ValAme		3	0-2	9/17/2023	-73.12200	41.33860	0.0002
40	Point	ValAme		3	0-2	9/17/2023	-73.12199	41.33853	0.0002
41	Point	ValAme		3	0-2	9/17/2023	-73.12197	41.33850	0.0002
42	Point	ValAme		3	0-2	9/17/2023	-73.12192	41.33844	0.0002
43	Point	ValAme		3	0-2	9/17/2023	-73.12189	41.33841	0.0002
44	Point	ValAme		3	0-2	9/17/2023	-73.12187	41.33836	0.0002
45	Point	ValAme		3	0-2	9/17/2023	-73.12171	41.33819	0.0002
46	Point	ValAme		3	0-2	9/17/2023	-73.12153	41.33793	0.0002
47	Point	ValAme		3	0-2	9/17/2023	-73.12144	41.33776	0.0002
48	Point	ValAme		3	0-2	9/17/2023	-73.12140	41.33770	0.0002
49	Point	ValAme		2	0-2	9/17/2023	-73.12106	41.33721	0.0002
50	Point	ValAme		2	0-2	9/17/2023	-73.12107	41.33717	0.0002
51	Point	ValAme		2	0-2	9/17/2023	-73.12078	41.33688	0.0002
52	Point	ValAme		3	0-2	9/17/2023	-73.12063	41.33665	0.0002
53	Point	ValAme		3	0-2	9/17/2023	-73.12065	41.33666	0.0002
54	Point	ValAme		3	0-2	9/17/2023	-73.12045	41.33639	0.0002
55	Point	ValAme		3	0-2	9/17/2023	-73.12041	41.33637	0.0002

Appendix Lake Housatonic Invasive Plant Location data (6 of 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
56	Point	ValAme		3	0-2	9/17/2023	-73.12040	41.33633	0.0002
57	Point	ValAme		3	0-2	9/17/2023	-73.12037	41.33630	0.0002
58	Point	ValAme		3	0-2	9/17/2023	-73.12034	41.33627	0.0002
59	Point	ValAme		3	0-2	9/17/2023	-73.12020	41.33610	0.0002
60	Point	ValAme		3	0-2	9/17/2023	-73.12021	41.33610	0.0002
61	Point	ValAme		3	0-2	9/17/2023	-73.12016	41.33605	0.0002
62	Point	ValAme		3	0-2	9/17/2023	-73.11990	41.33584	0.0002
63	Point	ValAme		3	0-2	9/17/2023	-73.11990	41.33579	0.0002
64	Point	ValAme		3	0-2	9/17/2023	-73.11986	41.33574	0.0002
65	Point	ValAme		3	0-2	9/17/2023	-73.11964	41.33553	0.0002
66	Point	ValAme		3	0-2	9/17/2023	-73.11961	41.33551	0.0002
67	Point	ValAme		3	0-2	9/17/2023	-73.11945	41.33535	0.0002
68	Point	ValAme		3	0-2	9/17/2023	-73.11944	41.33536	0.0002
69	Point	ValAme		3	0-2	9/17/2023	-73.11920	41.33513	0.0002
70	Point	ValAme		2	0-2	9/17/2023	-73.11894	41.33485	0.0002
71	Point	ValAme		5	0-2	9/17/2023	-73.11877	41.33467	0.0002
72	Point	ValAme		5	0-2	9/17/2023	-73.11872	41.33467	0.0002
73	Point	ValAme		3	0-2	9/17/2023	-73.11871	41.33464	0.0002
74	Point	ValAme		3	0-2	9/17/2023	-73.11014	41.32817	0.0002
75	Point	ValAme		3	0-2	9/17/2023	-73.10900	41.32747	0.0002
76	Point	ValAme		3	0-2	9/17/2023	-73.10895	41.32743	0.0002
77	Point	ValAme		3	0-2	9/17/2023	-73.10723	41.32648	0.0002
78	Point	ValAme		3	0-2	9/17/2023	-73.10718	41.32646	0.0002
79	Point	ValAme		3	0-2	9/17/2023	-73.10469	41.32541	0.0002
80	Point	ValAme		3	0-2	9/17/2023	-73.10463	41.32536	0.0002
81	Point	ValAme		3	0-2	9/17/2023	-73.10456	41.32531	0.0002
82	Point	ValAme		3	0-2	9/17/2023	-73.10350	41.32751	0.0002
83	Point	ValAme		3	0-2	9/17/2023	-73.10357	41.32752	0.0002
84	Point	ValAme		3	0-2	9/17/2023	-73.10460	41.32784	0.0002
85	Point	ValAme		3	0-2	9/17/2023	-73.10464	41.32787	0.0002
86	Point	ValAme		3	0-2	9/17/2023	-73.10469	41.32789	0.0002
87	Point	ValAme		3	0-2	9/17/2023	-73.10474	41.32790	0.0002
88	Point	ValAme		3	0-2	9/17/2023	-73.10482	41.32791	0.0002
89	Point	ValAme		3	0-2	9/17/2023	-73.10488	41.32793	0.0002
91	Point	ValAme		2	0-2	9/27/2023	-73.12213	41.34326	0.0002
92	Point	ValAme		2	0-2	9/27/2023	-73.12292	41.34459	0.0002
93	Point	ValAme		3	0-2	9/27/2023	-73.12293	41.34465	0.0002
94	Point	ValAme		3	0-2	9/27/2023	-73.12299	41.34468	0.0002
95	Point	ValAme		3	0-2	9/27/2023	-73.12312	41.34485	0.0002
96	Point	ValAme		3	0-2	9/27/2023	-73.12314	41.34491	0.0002
97	Point	ValAme		3	0-2	9/27/2023	-73.12319	41.34497	0.0002
98	Point	ValAme		3	0-2	9/27/2023	-73.12322	41.34499	0.0002
99	Point	ValAme		3	0-2	9/27/2023	-73.12328	41.34505	0.0002
100	Point	ValAme		3	0-2	9/27/2023	-73.12330	41.34509	0.0002
101	Point	ValAme		3	0-2	9/27/2023	-73.12333	41.34513	0.0002
102	Point	ValAme		3	0-2	9/27/2023	-73.12369	41.34547	0.0002
103	Point	ValAme		3	0-2	9/27/2023	-73.12372	41.34549	0.0002
104	Point	ValAme		3	0-2	9/27/2023	-73.12453	41.34636	0.0002
105	Point	ValAme		3	0-2	9/27/2023	-73.12572	41.34762	0.0002
107	Point	ValAme		3	0-2	9/27/2023	-73.12573	41.34763	0.0002

Appendix Lake Housatonic Invasive Plant Location data (7 of 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
108	Point	ValAme		3	0-2	9/27/2023	-73.12599	41.34770	0.0002
109	Point	ValAme		3	0-2	9/27/2023	-73.12602	41.34774	0.0002
110	Point	ValAme		3	0-2	9/27/2023	-73.12884	41.34905	0.0002
111	Point	ValAme		3	0-2	9/27/2023	-73.12893	41.34911	0.0002
118	Point	ValAme		3	0-2	9/27/2023	-73.13182	41.35015	0.0002
119	Point	ValAme		2	0-2	9/27/2023	-73.13186	41.35016	0.0002
135	Point	ValAme		2	0-2	9/27/2023	-73.13633	41.35246	0.0002
136	Point	ValAme		2	0-2	9/27/2023	-73.13676	41.35384	0.0002
137	Point	ValAme		2	0-2	9/27/2023	-73.13680	41.35385	0.0002
140	Point	ValAme		2	1-3	9/27/2023	-73.13705	41.35454	0.0002
141	Point	ValAme		2	1-3	9/27/2023	-73.13706	41.35481	0.0002
142	Point	ValAme		2	1-3	9/27/2023	-73.13742	41.35621	0.0002
145	Point	ValAme		2	1-3	9/27/2023	-73.13741	41.35636	0.0002
146	Point	ValAme		2	1-3	9/27/2023	-73.13761	41.35709	0.0002
147	Point	ValAme		2	0-2	9/27/2023	-73.13767	41.35725	0.0002
148	Point	ValAme		2	0-2	9/27/2023	-73.13772	41.35764	0.0002
149	Point	ValAme		2	0-2	9/27/2023	-73.13773	41.35764	0.0002
150	Point	ValAme		2	0-2	9/27/2023	-73.13774	41.35761	0.0002
151	Point	ValAme		2	0-2	9/27/2023	-73.13779	41.35779	0.0002
153	Point	ValAme		2	0-2	9/27/2023	-73.13791	41.35806	0.0002
155	Point	ValAme		2	1-3	9/27/2023	-73.13799	41.35830	0.0002
156	Point	ValAme		2	0-2	9/27/2023	-73.13797	41.35960	0.0002
158	Point	ValAme		2	0-2	9/27/2023	-73.13797	41.35978	0.0002
159	Point	ValAme		2	0-2	9/27/2023	-73.13803	41.36003	0.0002
160	Point	ValAme		2	0-2	9/27/2023	-73.13805	41.36005	0.0002
161	Point	ValAme		2	0-2	9/27/2023	-73.13824	41.36097	0.0002
162	Point	ValAme		2	0-2	9/27/2023	-73.13825	41.36101	0.0002
163	Point	ValAme		2	0-2	9/27/2023	-73.13826	41.36116	0.0002
164	Point	ValAme		2	0-2	9/27/2023	-73.13827	41.36119	0.0002
165	Point	ValAme		2	0-2	9/27/2023	-73.13831	41.36124	0.0002
166	Point	ValAme		2	0-2	9/27/2023	-73.13874	41.36242	0.0002
167	Point	ValAme		2	0-2	9/27/2023	-73.13876	41.36244	0.0002
168	Point	ValAme		2	0-2	9/27/2023	-73.13876	41.36245	0.0002
169	Point	ValAme		2	0-2	9/27/2023	-73.13887	41.36255	0.0002
170	Point	ValAme		3	0-2	9/27/2023	-73.13890	41.36261	0.0002
171	Point	ValAme		3	0-2	9/27/2023	-73.13895	41.36266	0.0002
172	Point	ValAme		3	0-2	9/27/2023	-73.13911	41.36278	0.0002
173	Point	ValAme		3	0-2	9/27/2023	-73.13912	41.36281	0.0002
174	Point	ValAme		3	0-2	9/27/2023	-73.13914	41.36284	0.0002
175	Point	ValAme		3	0-2	9/27/2023	-73.13919	41.36288	0.0002
176	Point	ValAme		3	0-2	9/27/2023	-73.13923	41.36289	0.0002
177	Point	ValAme		3	0-2	9/27/2023	-73.13926	41.36291	0.0002
178	Point	ValAme		3	0-2	9/27/2023	-73.13930	41.36294	0.0002
179	Point	ValAme		3	0-2	9/27/2023	-73.13932	41.36296	0.0002
181	Point	ValAme		2	0-2	9/27/2023	-73.13951	41.36312	0.0002
182	Point	ValAme		2	0-2	9/27/2023	-73.13957	41.36318	0.0002
183	Point	ValAme		2	0-2	9/27/2023	-73.13990	41.36352	0.0002
184	Point	ValAme		2	0-2	9/27/2023	-73.13993	41.36355	0.0002
185	Point	ValAme		2	0-2	9/27/2023	-73.13997	41.36358	0.0002
186	Point	ValAme		2	0-2	9/27/2023	-73.14000	41.36359	0.0002

Appendix Lake Housatonic Invasive Plant Location data (8 of 9)

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
187	Point	ValAme		2	0-2	9/27/2023	-73.14009	41.36363	0.0002
212	Point	ValAme		2	0-2	9/27/2023	-73.14321	41.36548	0.0002
213	Point	ValAme		2	0-2	9/27/2023	-73.14327	41.36552	0.0002
214	Point	ValAme		2	0-2	9/27/2023	-73.14332	41.36554	0.0002
215	Point	ValAme		3	0-2	9/27/2023	-73.14344	41.36566	0.0002
216	Point	ValAme		3	0-2	9/27/2023	-73.14350	41.36572	0.0002
217	Point	ValAme		3	0-2	9/27/2023	-73.14349	41.36571	0.0002
219	Point	ValAme		3	0-2	9/27/2023	-73.14371	41.36579	0.0002
220	Point	ValAme		3	0-2	9/27/2023	-73.14386	41.36589	0.0002
221	Point	ValAme		3	0-2	9/27/2023	-73.14389	41.36591	0.0002
222	Point	ValAme		3	0-2	9/27/2023	-73.14394	41.36593	0.0002
223	Point	ValAme		3	0-2	9/27/2023	-73.14398	41.36595	0.0002
224	Point	ValAme		3	0-2	9/27/2023	-73.14443	41.36623	0.0002
225	Point	ValAme		3	0-2	9/27/2023	-73.14447	41.36624	0.0002
227	Point	ValAme		3	0-2	9/27/2023	-73.14546	41.36684	0.0002
228	Point	ValAme		3	0-2	9/27/2023	-73.14581	41.36705	0.0002
231	Point	ValAme		3	1-3	9/27/2023	-73.14735	41.36815	0.0002
232	Point	ValAme		3	0-2	9/27/2023	-73.14769	41.36850	0.0002
234	Point	ValAme		3	1-3	9/27/2023	-73.14861	41.36916	0.0002
235	Point	ValAme		3	1-3	9/27/2023	-73.14872	41.36924	0.0002
236	Point	ValAme		3	1-3	9/27/2023	-73.14869	41.36922	0.0002
237	Point	ValAme		3	1-3	9/27/2023	-73.14867	41.36921	0.0002
238	Point	ValAme		3	1-3	9/27/2023	-73.14892	41.36937	0.0002
239	Point	ValAme		3	1-3	9/27/2023	-73.14891	41.36938	0.0002
243	Point	ValAme		3	1-3	9/27/2023	-73.15215	41.37252	0.0002
244	Point	ValAme		3	1-3	9/27/2023	-73.15280	41.37342	0.0002
245	Point	ValAme		3	1-3	9/27/2023	-73.15279	41.37340	0.0002
246	Point	ValAme		3	1-3	9/27/2023	-73.15296	41.37359	0.0002
247	Point	ValAme		3	1-3	9/27/2023	-73.15294	41.37360	0.0002
248	Point	ValAme		3	1-3	9/27/2023	-73.11378	41.33206	0.0002
249	Point	ValAme		2	1-3	9/27/2023	-73.11410	41.33226	0.0002
250	Point	ValAme		2	1-3	9/27/2023	-73.11415	41.33228	0.0002
251	Point	ValAme		2	1-3	9/27/2023	-73.11420	41.33231	0.0002
252	Point	ValAme		2	1-3	9/27/2023	-73.11422	41.33233	0.0002
253	Point	ValAme		2	1-3	9/27/2023	-73.11430	41.33237	0.0002
254	Point	ValAme		3	1-3	9/27/2023	-73.11446	41.33247	0.0002
255	Point	ValAme		3	1-3	9/27/2023	-73.11452	41.33251	0.0002
256	Point	ValAme		3	1-3	9/27/2023	-73.11460	41.33262	0.0002
257	Point	ValAme		3	1-3	9/27/2023	-73.11464	41.33265	0.0002
258	Point	ValAme		3	1-3	9/27/2023	-73.11468	41.33269	0.0002
259	Point	ValAme		3	1-3	9/27/2023	-73.11475	41.33272	0.0002
260	Point	ValAme		3	1-3	9/27/2023	-73.11493	41.33290	0.0002
261	Point	ValAme		3	1-3	9/27/2023	-73.11524	41.33320	0.0002
262	Point	ValAme		3	1-3	9/27/2023	-73.11526	41.33324	0.0002
263	Point	ValAme		3	1-3	9/27/2023	-73.11620	41.33429	0.0002
264	Point	ValAme		3	1-3	9/27/2023	-73.11620	41.33432	0.0002
265	Point	ValAme		2	1-3	9/27/2023	-73.11623	41.33439	0.0002
266	Point	ValAme		2	1-3	9/27/2023	-73.11628	41.33444	0.0002
267	Point	ValAme		2	1-3	9/27/2023	-73.11633	41.33464	0.0002
268	Point	ValAme		2	1-3	9/27/2023	-73.11634	41.33470	0.0002

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

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
269	Point	ValAme		2	1-3	9/27/2023	-73.11634	41.33473	0.0002
270	Point	ValAme		2	1-3	9/27/2023	-73.11635	41.33475	0.0002
271	Point	ValAme		2	1-3	9/27/2023	-73.11644	41.33515	0.0002
273	Point	ValAme		2	0-2	9/27/2023	-73.12152	41.34092	0.0002
274	Point	ValAme		2	0-2	9/27/2023	-73.12166	41.34111	0.0002
275	Point	ValAme		2	0-2	9/27/2023	-73.12175	41.34122	0.0002
276	Point	ValAme		3	1-3	9/27/2023	-73.12185	41.34138	0.0002
277	Point	ValAme		3	1-3	9/27/2023	-73.12186	41.34139	0.0002
278	Point	ValAme		3	1-3	9/27/2023	-73.12189	41.34149	0.0002
279	Point	ValAme		3	1-3	9/27/2023	-73.12193	41.34148	0.0002
280	Point	ValAme		2	1-3	9/27/2023	-73.12197	41.34161	0.0002
0	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34239	-73.12384	0.2531
1	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34292	-73.12402	0.0644
2	Patch	ValAme	with pondweeds	3	0-2	9/27/2023	41.34330	-73.12420	0.1142
3	Patch	ValAme	with pondweeds	3	0-2	9/27/2023	41.34392	-73.12455	0.1143
4	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34443	-73.12484	0.0396
5	Patch	ValAme	With pondweeds	2	0-2	9/27/2023	41.34473	-73.12508	0.0507
6	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34539	-73.12567	0.0201
7	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34603	-73.12666	0.0144
8	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34609	-73.12679	0.0037
9	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34623	-73.12705	0.0074
10	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34669	-73.12766	0.1019
11	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34716	-73.12838	0.0678
12	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.34752	-73.12898	0.0960
13	Patch	ValAme	With pondweeds	2	0-2	9/27/2023	41.34798	-73.12976	0.0355
14	Patch	ValAme	With pondweeds	2	0-2	9/27/2023	41.34819	-73.13012	0.0299
15	Patch	ValAme	With pondweeds	2	0-2	9/27/2023	41.34826	-73.13029	0.0117
16	Patch	ValAme	With pondweeds	4	0-2	9/27/2023	41.35273	-73.13881	0.0957
17	Patch	ValAme	With pondweeds	4	0-2	9/27/2023	41.35319	-73.13894	0.0863
18	Patch	ValAme	With pondweeds	3	0-2	9/27/2023	41.35376	-73.13912	0.2058
19	Patch	ValAme	With pondweeds	3	1-3	9/27/2023	41.35447	-73.13927	0.1669
20	Patch	ValAme	With pondweeds	3	1-3	9/27/2023	41.35526	-73.13939	0.1444
21	Patch	ValAme	With pondweeds	3	1-3	9/27/2023	41.35590	-73.13939	0.0785
22	Patch	ValAme	With pondweeds	3	1-3	9/27/2023	41.35677	-73.13947	0.0703
23	Patch	ValAme	With pondweeds	3	1-3	9/27/2023	41.35751	-73.13944	0.0064
24	Patch	ValAme		3	1-3	9/27/2023	41.35858	-73.13969	0.0271
25	Patch	ValAme		3	1-3	9/27/2023	41.35904	-73.13987	0.0083
26	Patch	ValAme		3	1-3	9/27/2023	41.35944	-73.13996	0.0231
27	Patch	ValAme		2	1-3	9/27/2023	41.35977	-73.14008	0.0312
28	Patch	ValAme		2	1-3	9/27/2023	41.36050	-73.14042	0.0000
29	Patch	ValAme		2	1-3	9/27/2023	41.36075	-73.14053	0.0096
30	Patch	ValAme		3	1-3	9/27/2023	41.36144	-73.14078	0.0736
31	Patch	ValAme	With pondweeds	3	1-3	9/27/2023	41.36277	-73.14168	0.0935
32	Patch	ValAme		3	1-3	9/27/2023	41.36309	-73.14207	0.0060
33	Patch	ValAme		3.0000	1-3	9/27/2023	41.36317	-73.14219	0.0052
34	Patch	ValAme		3.0000	1-3	9/27/2023	41.36329	-73.14233	0.0062
35	Patch	ValAme		4.0000	1-3	9/27/2023	41.36344	-73.14256	0.0155
36	Patch	ValAme		3.0000	1-3	9/27/2023	41.36356	-73.14278	0.0079
37	Patch	ValAme		3.0000	0-2	9/27/2023	41.36362	-73.14299	0.0250
38	Patch	ValAme		3.0000	1-3	9/27/2023	41.36377	-73.14306	0.0091

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

FID	Type	Invasive Plant Name	Notes	Abundance	Depth (m)	Date	Latitude	Longitude	Area (acres)
39	Patch	ValAme		3.0000	1-3	9/27/2023	41.36390	-73.14323	0.0106
40	Patch	ValAme		2.0000	1-3	9/27/2023	41.36503	-73.14476	0.0139
41	Patch	ValAme		3.0000	1-3	9/27/2023	41.36518	-73.14494	0.0203
42	Patch	ValAme		2.0000	1-3	9/27/2023	41.36540	-73.14521	0.0162
43	Patch	ValAme		3.0000	1-3	9/27/2023	41.36859	-73.14936	0.0089
44	Patch	ValAme		2.0000	0-1	9/27/2023	41.37233	-73.15344	0.0070
45	Patch	ValAme		2.0000	0-1	9/27/2023	41.37636	-73.15673	0.0084
46	Patch	ValAme	with pondweeds	2.0000	0-1	9/27/2023	41.37653	-73.15687	0.0189
48	Patch	ValAme	With PotAmp, PotSp, EloNut	3.0000	1-3	9/17/2023	41.34054	-73.12344	2.3284
49	Patch	ValAme	With PotSp, EloNut	4.0000	0-2	9/17/2023	41.33940	-73.12257	0.1185
50	Patch	ValAme	With ZosDob	3.0000	0-1	9/17/2023	41.33919	-73.12257	0.0149
51	Patch	ValAme		3.0000	0-1	9/17/2023	41.33514	-73.11921	0.0981
52	Patch	ValAme		4.0000	0-2	9/17/2023	41.33250	-73.11664	1.6866
53	Patch	ValAme		4.0000	0-2	9/17/2023	41.33015	-73.11328	0.0256
54	Patch	ValAme		4.0000	0-2	9/17/2023	41.32709	-73.10272	0.3156
55	Patch	ValAme		4.0000	0-2	9/17/2023	41.32889	-73.10675	0.2047
56	Patch	ValAme		4.0000	0-2	9/17/2023	41.32931	-73.10775	0.1590
57	Patch	ValAme	With PotAmp	2.0000	0-2	9/17/2023	41.32967	-73.10853	0.1009
58	Patch	ValAme		3.0000	1-3	9/27/2023	41.34192	-73.12210	0.0779
59	Patch	ValAme		3.0000	0-2	9/27/2023	41.34314	-73.12213	0.0364
60	Patch	ValAme		3.0000	0-2	9/27/2023	41.34411	-73.12257	0.1597
61	Patch	ValAme		2.0000	0-2	9/27/2023	41.34562	-73.12390	0.0236
62	Patch	ValAme		3.0000	1-3	9/27/2023	41.34959	-73.13009	0.0858
63	Patch	ValAme		3.0000	0-2	9/27/2023	41.34981	-73.13083	0.0329
64	Patch	ValAme		3.0000	0-2	9/27/2023	41.35005	-73.13148	0.0300
65	Patch	ValAme		3.0000	0-2	9/27/2023	41.35118	-73.13470	0.5090
66	Patch	ValAme		3.0000	0-2	9/27/2023	41.36377	-73.14024	0.1120
67	Patch	ValAme		3.0000	0-2	9/27/2023	41.36450	-73.14133	0.3896
68	Patch	ValAme		3.0000	1-3	9/27/2023	41.36973	-73.14950	0.1918
69	Patch	ValAme		2.0000	1-3	9/27/2023	41.37119	-73.15101	0.1464
70	Patch	ValAme	WithPotNod	2.0000	1-3	9/27/2023	41.37178	-73.15155	0.0231
71	Patch	ValAme		2.0000	1-3	9/27/2023	41.37297	-73.15246	0.0111
72	Patch	ValAme	Some PotNodxPotPer North	3.0000	1-3	9/27/2023	41.37402	-73.15355	1.2315
73	Patch	ValAme	WithPotAmp, CerDem	2.0000	1-3	9/27/2023	41.32831	-73.10696	8.6591
74	Patch	ValAme	WithPotAmp, CerDem	3.0000	1-3	9/27/2023	41.33365	-73.11570	0.0209
75	Patch	ValAme	With PotAmp PotSp CerDem	3.0000	1-3	9/27/2023	41.33697	-73.11698	8.0351
76	Patch	ValAme		2.0000	0.5-1.5	9/28/2023	41.36268	-73.14176	0.0149
80	Patch	ValAme		2.0000	0.2-1	9/27/2023	41.33740	-73.11618	0.2329
85	Patch	ValAme	With PotAmp PotSp CerDem	2.0000	1-3	9/27/2023	41.33750	-73.11891	5.3036
88	Patch	ValAme		2.0000	0-2	9/17/2023	41.33197	-73.11632	0.2678
89	Patch	ValAme		2.0000	1	9/28/2023	41.34109	-73.12357	0.0103
90	Patch	ValAme		2.0000	2.5	9/28/2023	41.35851	-73.13802	0.0203
91	Patch	ValAme		3.0000	2-2.5	9/28/2023	41.36907	-73.14855	0.0194
94	Patch	ValAme		3.0000	1-2	9/28/2023	41.37671	-73.15597	0.0550

Transect Data

Appendix Lake Housatonic June Transect Data (1 of 2)

Transect	Point	Distance from Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	CerDem	EloNut	MyrSpi	PotCri	PotFol	PotGra	PotIll	PotNod	PotPer	PotPra	PotPus	PotZos	SpiPol	Typha	ValAme	ZosDub
1	1	0.5	Greg Bugbee	41.33733	-73.11613	6/28/2023	0.5	Organic	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
1	2	5	Greg Bugbee	41.33732	-73.11617	6/28/2023	1.0	Muck	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
1	3	10	Greg Bugbee	41.33731	-73.11623	6/28/2023	1.3	Muck	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1	4	20	Greg Bugbee	41.33727	-73.11635	6/28/2023	2.0	Muck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	5	30	Greg Bugbee	41.33722	-73.11646	6/28/2023	2.0	Muck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	6	40	Greg Bugbee	41.33719	-73.11655	6/28/2023	1.5	Muck	4	0	2	4	0	0	0	0	0	0	0	0	0	0	2	0
1	7	50	Greg Bugbee	41.33713	-73.11666	6/28/2023	1.5	Muck	3	1	2	2	0	0	0	0	0	0	0	0	0	0	3	0
1	8	60	Greg Bugbee	41.33706	-73.11676	6/28/2023	1.0	Muck	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
1	9	70	Greg Bugbee	41.33701	-73.11685	6/28/2023	1.5	Muck	0	1	2	0	0	0	0	0	0	0	0	0	0	0	2	0
1	10	80	Greg Bugbee	41.33695	-73.11695	6/28/2023	1.5	Muck	2	0	2	2	0	0	0	0	0	0	0	0	1	0	0	0
2	1	0.5	Summer Stebbins	41.33190	-73.11649	6/28/2023	0.5	Sand	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2	2	5	Summer Stebbins	41.33193	-73.11646	6/28/2023	0.7	Sand	0	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0
2	3	10	Summer Stebbins	41.33198	-73.11641	6/28/2023	0.5	Sand	2	0	2	3	2	2	0	0	0	0	0	0	0	0	0	2
2	4	20	Summer Stebbins	41.33205	-73.11632	6/28/2023	1.3	Sand	2	3	3	3	0	0	0	0	3	0	2	0	0	0	2	0
2	5	30	Summer Stebbins	41.33211	-73.11624	6/28/2023	2.0	Sand	0	0	2	3	0	0	0	0	0	0	0	0	0	0	2	0
2	6	40	Summer Stebbins	41.33217	-73.11614	6/28/2023	4.1	Organic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	7	50	Summer Stebbins	41.33223	-73.11606	6/28/2023	5.2	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	8	60	Summer Stebbins	41.33228	-73.11593	6/28/2023	5.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	70	Summer Stebbins	41.33232	-73.11583	6/28/2023	5.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10	80	Summer Stebbins	41.33238	-73.11574	6/28/2023	5.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	0.5	Greg Bugbee	41.32992	-73.10899	6/28/2023	0.5	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	2	5	Greg Bugbee	41.32989	-73.10901	6/28/2023	2.0	Muck	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
3	3	10	Greg Bugbee	41.32984	-73.10907	6/28/2023	2.8	Muck	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	4	20	Greg Bugbee	41.32978	-73.10914	6/28/2023	2.3	Muck	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	5	30	Greg Bugbee	41.32970	-73.10922	6/28/2023	2.6	Muck	4	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
3	6	40	Greg Bugbee	41.32963	-73.10929	6/28/2023	2.6	Muck	4	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
3	7	50	Greg Bugbee	41.32956	-73.10936	6/28/2023	2.6	Muck	4	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
3	8	60	Greg Bugbee	41.32947	-73.10944	6/28/2023	3.0	Muck	0	2	1	2	0	0	0	0	0	0	1	0	0	0	2	0
3	9	70	Greg Bugbee	41.32941	-73.10950	6/28/2023	3.3	Muck	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
3	10	80	Greg Bugbee	41.32932	-73.10957	6/28/2023	3.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	1	0.5	Summer Stebbins	41.34109	-73.12361	6/28/2023	0.3	Sand	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2	5	Summer Stebbins	41.34110	-73.12356	6/28/2023	0.5	Sand	2	3	1	1	2	0	0	0	0	0	0	0	0	0	2	2
4	3	10	Summer Stebbins	41.34111	-73.12350	6/28/2023	0.6	Sand	2	3	1	1	2	0	0	3	3	0	2	0	0	0	2	2
4	4	20	Summer Stebbins	41.34113	-73.12338	6/28/2023	1.6	Sand	2	3	2	2	2	0	2	0	2	0	3	0	0	0	2	2
4	5	30	Summer Stebbins	41.34116	-73.12327	6/28/2023	2.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	6	40	Summer Stebbins	41.34118	-73.12317	6/28/2023	3.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	7	50	Summer Stebbins	41.34121	-73.12307	6/28/2023	4.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	8	60	Greg Bugbee	41.34123	-73.12296	6/28/2023	5.8	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	9	70	Greg Bugbee	41.34126	-73.12283	6/28/2023	6.0	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	10	80	Greg Bugbee	41.34129	-73.12271	6/28/2023	6.2	Muck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0.5	Greg Bugbee	41.34804	-73.12667	6/28/2023	0.5	Sand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2	5	Greg Bugbee	41.34800	-73.12670	6/28/2023	3.5	Muck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	3	10	Greg Bugbee	41.34795	-73.12674	6/28/2023	5.0	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4	20	Greg Bugbee	41.34788	-73.12682	6/28/2023	5.0	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	30	Greg Bugbee	41.34783	-73.12689	6/28/2023	4.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	6	40	Greg Bugbee	41.34775	-73.12696	6/28/2023	4.4	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	7	50	Greg Bugbee	41.34767	-73.12704	6/28/2023	4.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	8	60	Greg Bugbee	41.34759	-73.12713	6/28/2023	4.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	9	70	Greg Bugbee	41.34751	-73.12721	6/28/2023	4.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	10	80	Greg Bugbee	41.34744	-73.12728	6/28/2023	4.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Lake Housatonic June Transect Data (2 of 2)

Transect	Point	Distance from Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	CerDem	EloNut	MyrSpi	PotCri	PotFol	PotGra	PotIll	PotNod	PotPer	PotPra	PotPus	PotZos	SpiPol	Typha	ValAme	ZosDub
6	1	1	Summer Stebbins	41.34875	-73.13132	6/28/2023	0.6	Bedrock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
6	2	5	Summer Stebbins	41.34878	-73.13129	6/28/2023	0.6	Bedrock	0	0	0	2	0	0	0	0	0	0	2	0	0	0	2	0
6	3	10	Summer Stebbins	41.34882	-73.13126	6/28/2023	3.1	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	4	20	Summer Stebbins	41.34890	-73.13120	6/28/2023	5.2	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	5	30	Summer Stebbins	41.34897	-73.13113	6/28/2023	5.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	6	40	Summer Stebbins	41.34905	-73.13105	6/28/2023	5.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	7	50	Summer Stebbins	41.34910	-73.13096	6/28/2023	5.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	8	60	Summer Stebbins	41.34918	-73.13082	6/28/2023	5.2	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	9	70	Summer Stebbins	41.34923	-73.13075	6/28/2023	5.0	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	10	80	Summer Stebbins	41.34929	-73.13070	6/28/2023	4.8	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0.5	Greg Bugbee	41.35853	-73.13795	6/28/2023	0.5	Sand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7	2	5	Greg Bugbee	41.35853	-73.13800	6/28/2023	2.2	Sand	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0
7	3	10	Greg Bugbee	41.35852	-73.13807	6/28/2023	3.8	Sand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	4	20	Greg Bugbee	41.35850	-73.13819	6/28/2023	5.2	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	5	30	Greg Bugbee	41.35848	-73.13832	6/28/2023	5.0	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	6	40	Greg Bugbee	41.35847	-73.13845	6/28/2023	5.1	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	7	50	Greg Bugbee	41.35845	-73.13857	6/28/2023	4.4	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	8	60	Greg Bugbee	41.35845	-73.13870	6/28/2023	4.4	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	9	70	Greg Bugbee	41.35843	-73.13886	6/28/2023	4.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	10	80	Greg Bugbee	41.35842	-73.13903	6/28/2023	4.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	1	0.5	Summer Stebbins	41.36271	-73.14189	6/28/2023	0.1	Sand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	2	5	Summer Stebbins	41.36274	-73.14184	6/28/2023	0.5	Sand	0	2	0	2	0	0	0	0	0	0	2	0	0	0	0	0
8	3	10	Summer Stebbins	41.36278	-73.14179	6/28/2023	1.2	Sand	0	2	2	2	0	0	0	0	0	0	2	0	0	0	2	2
8	4	20	Summer Stebbins	41.36283	-73.14170	6/28/2023	1.2	Sand	0	2	2	2	0	0	0	0	0	2	2	0	0	0	2	2
8	5	30	Summer Stebbins	41.36288	-73.14159	6/28/2023	2.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
8	6	40	Summer Stebbins	41.36292	-73.14148	6/28/2023	2.9	Silt	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
8	7	50	Summer Stebbins	41.36296	-73.14137	6/28/2023	2.9	Silt	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
8	8	60	Summer Stebbins	41.36301	-73.14127	6/28/2023	2.9	Silt	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
8	9	70	Summer Stebbins	41.36305	-73.14118	6/28/2023	2.9	Silt	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0
8	10	80	Summer Stebbins	41.36310	-73.14106	6/28/2023	2.9	Silt	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
9	1	0.5	Greg Bugbee	41.36908	-73.14840	6/28/2023	0.2	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9	2	5	Greg Bugbee	41.36905	-73.14846	6/28/2023	1.3	Sand	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
9	3	10	Greg Bugbee	41.36902	-73.14852	6/28/2023	3.0	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	4	20	Greg Bugbee	41.36898	-73.14860	6/28/2023	4.0	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	5	30	Greg Bugbee	41.36891	-73.14869	6/28/2023	3.8	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	6	40	Greg Bugbee	41.36885	-73.14878	6/28/2023	3.8	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	7	50	Greg Bugbee	41.36880	-73.14887	6/28/2023	4.2	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	8	60	Greg Bugbee	41.36874	-73.14895	6/28/2023	4.3	Silt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	9	70	Greg Bugbee	41.36868	-73.14906	6/28/2023	4.3	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	10	80	Greg Bugbee	41.36861	-73.14913	6/28/2023	4.0	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1	0.5	Greg Bugbee	41.37678	-73.15585	6/28/2023	0.3	Sand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2	5	Greg Bugbee	41.37674	-73.15589	6/28/2023	0.3	Sand	0	0	0	3	0	0	0	0	0	0	0	0	0	0	2	1
10	3	10	Greg Bugbee	41.37670	-73.15596	6/28/2023	1.5	Sand	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	0
10	4	20	Greg Bugbee	41.37666	-73.15604	6/28/2023	2.3	Sand	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0
10	5	30	Greg Bugbee	41.37662	-73.15612	6/28/2023	3.4	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	40	Greg Bugbee	41.37655	-73.15624	6/28/2023	4.4	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	7	50	Greg Bugbee	41.37651	-73.15632	6/28/2023	5.2	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	8	60	Greg Bugbee	41.37646	-73.15643	6/28/2023	5.8	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	9	70	Greg Bugbee	41.37640	-73.15652	6/28/2023	4.8	Gravel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	10	80	Greg Bugbee	41.37634	-73.15663	6/28/2023	3.0	Gravel	0	0	2	3	0	0	2	0	0	0	0	0	0	0	3	0

Appendix Lake Housatonic September Transect Data (1 of 2)

Transect	Point	Distance from Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	CerDem	EloNut	LemMin	MyrSpi	PolAmp	PotAmp	PotCri	PotGra	PotIll	PotPer	ValAme	ZosDub
1	1	0.5	Greg Bugbee	41.33734	-73.11610	9/28/2023	0.2	Gravel	2	0	2	0	0	0	0	0	0	0	2	0
1	2	5	Greg Bugbee	41.33734	-73.11619	9/28/2023	1.0	Muck	2	0	0	0	0	0	0	0	0	0	2	0
1	3	10	Greg Bugbee	41.33733	-73.11626	9/28/2023	1.6	Muck	0	0	0	0	0	0	0	0	0	0	0	0
1	4	20	Greg Bugbee	41.33731	-73.11637	9/28/2023	1.6	Muck	0	0	0	0	0	0	0	0	0	0	0	0
1	5	30	Greg Bugbee	41.33727	-73.11648	9/28/2023	1.8	Muck	0	0	0	0	0	0	0	0	0	0	0	0
1	6	40	Greg Bugbee	41.33723	-73.11658	9/28/2023	1.8	Muck	3	0	0	2	2	0	0	0	0	0	3	0
1	7	50	Greg Bugbee	41.33718	-73.11668	9/28/2023	1.8	Muck	2	0	0	0	2	0	2	0	0	0	3	0
1	8	60	Greg Bugbee	41.33711	-73.11678	9/28/2023	1.6	Muck	2	0	0	2	2	0	2	0	0	0	3	0
1	9	70	Greg Bugbee	41.33705	-73.11688	9/28/2023	1.6	Muck	2	0	0	4	0	0	0	0	0	2	3	0
1	10	70	Greg Bugbee	41.33699	-73.11697	9/28/2023	1.5	Muck	3	0	0	4	0	0	0	0	0	0	3	0
2	1	0.5	Greg Bugbee	41.33192	-73.11649	9/28/2023	0.2	Sand	0	0	0	0	0	0	0	0	0	0	0	0
2	2	0.5	Greg Bugbee	41.33196	-73.11646	9/28/2023	0.8	Sand	0	2	0	2	0	0	2	0	0	0	0	0
2	3	10	Greg Bugbee	41.33200	-73.11642	9/28/2023	0.9	Sand	0	2	0	0	0	0	2	0	0	0	2	0
2	4	20	Greg Bugbee	41.33205	-73.11635	9/28/2023	1.5	Sand	0	2	0	0	0	0	2	0	0	0	2	0
2	5	30	Greg Bugbee	41.33213	-73.11627	9/28/2023	2.0	Sand	3	0	0	0	0	0	0	0	0	0	4	0
2	6	40	Greg Bugbee	41.33219	-73.11618	9/28/2023	4.6	Sand	0	0	0	0	0	0	0	0	0	0	0	0
2	7	50	Greg Bugbee	41.33226	-73.11607	9/28/2023	6.3	Sand	0	0	0	0	0	0	0	0	0	0	0	0
2	8	60	Greg Bugbee	41.33230	-73.11598	9/28/2023	6.8	Sand	0	0	0	0	0	0	0	0	0	0	0	0
2	9	70	Greg Bugbee	41.33236	-73.11590	9/28/2023	6.5	Sand	0	0	0	0	0	0	0	0	0	0	0	0
2	10	80	Greg Bugbee	41.33241	-73.11581	9/28/2023	6.6	Sand	0	0	0	0	0	0	0	0	0	0	0	0
3	1	0.5	Greg Bugbee	41.32989	-73.10902	9/28/2023	0.5	Gravel	0	0	0	0	0	0	0	0	0	0	0	0
3	2	5	Greg Bugbee	41.32985	-73.10904	9/28/2023	2.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
3	3	10	Greg Bugbee	41.32981	-73.10907	9/28/2023	2.6	Organic	0	0	0	0	0	0	0	0	0	0	0	0
3	4	10	Greg Bugbee	41.32974	-73.10912	9/28/2023	3.0	Organic	3	0	0	0	0	0	0	0	0	0	0	0
3	5	30	Greg Bugbee	41.32968	-73.10920	9/28/2023	2.5	Organic	3	0	0	0	0	0	0	0	0	0	2	0
3	6	40	Greg Bugbee	41.32959	-73.10925	9/28/2023	2.7	Organic	3	0	0	0	0	0	0	0	0	0	2	0
3	7	50	Greg Bugbee	41.32951	-73.10930	9/28/2023	2.9	Organic	2	0	0	0	0	0	0	0	0	0	2	0
3	8	60	Greg Bugbee	41.32941	-73.10933	9/28/2023	3.2	Organic	0	0	0	0	0	0	0	0	0	0	0	0
3	9	70	Greg Bugbee	41.32932	-73.10937	9/28/2023	3.5	Organic	0	0	0	0	0	0	0	0	0	0	0	0
3	10	80	Greg Bugbee	41.32923	-73.10943	9/28/2023	3.8	Organic	0	0	0	0	0	0	0	0	0	0	0	0
4	1	0.5	Greg Bugbee	41.34110	-73.12362	9/28/2023	0.3	Sand	0	0	0	0	0	0	0	0	0	0	0	0
4	2	5	Greg Bugbee	41.34110	-73.12356	9/28/2023	1.0	Sand	2	0	0	0	0	0	0	0	0	2	2	0
4	3	10	Greg Bugbee	41.34110	-73.12350	9/28/2023	1.2	Sand	0	2	0	0	0	0	0	0	0	0	3	0
4	4	20	Greg Bugbee	41.34110	-73.12340	9/28/2023	2.2	Sand	3	0	0	0	0	2	0	0	2	0	3	0
4	5	30	Greg Bugbee	41.34109	-73.12325	9/28/2023	3.2	Organic	0	0	0	0	0	0	0	0	0	0	0	0
4	6	40	Greg Bugbee	41.34109	-73.12313	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
4	7	50	Greg Bugbee	41.34109	-73.12302	9/28/2023	6.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
4	8	60	Greg Bugbee	41.34109	-73.12291	9/28/2023	6.3	Organic	0	0	0	0	0	0	0	0	0	0	0	0
4	9	70	Greg Bugbee	41.34109	-73.12278	9/28/2023	6.4	Organic	0	0	0	0	0	0	0	0	0	0	0	0
4	10	80	Greg Bugbee	41.34109	-73.12265	9/28/2023	6.6	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0.5	Greg Bugbee	41.34806	-73.12673	9/28/2023	0.3	Gravel	0	0	0	0	0	0	0	0	0	0	0	0
5	2	5	Greg Bugbee	41.34801	-73.12676	9/28/2023	2.2	Gravel	0	0	0	0	0	0	0	0	0	0	0	0
5	3	10	Greg Bugbee	41.34797	-73.12679	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	4	20	Greg Bugbee	41.34790	-73.12685	9/28/2023	5.3	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	5	30	Greg Bugbee	41.34782	-73.12691	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	6	40	Greg Bugbee	41.34774	-73.12698	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	7	50	Greg Bugbee	41.34767	-73.12702	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	8	60	Greg Bugbee	41.34759	-73.12707	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	9	70	Greg Bugbee	41.34751	-73.12713	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
5	10	80	Greg Bugbee	41.34743	-73.12721	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Lake Housatonic September Transect Data (2 of 2)

Transect	Point	Distance from Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	CerDem	EloNut	LemMin	MyrSpi	PolAmp	PotAmp	PotCri	PotGra	PotIll	PotPer	ValAme	ZosDub
6	1	1	Greg Bugbee	41.34869	-73.13125	45197	0.2	Gravel	0	0	0	0	0	0	0	0	0	0	0	0
6	2	5	Greg Bugbee	41.34872	-73.13124	9/28/2023	1.2	Sand	0	0	0	0	0	0	0	0	0	0	0	0
6	3	10	Greg Bugbee	41.34874	-73.13122	9/28/2023	2.4	Organic	0	0	0	0	0	0	0	0	0	0	0	0
6	4	20	Greg Bugbee	41.34882	-73.13115	9/28/2023	6.7	Organic	0	0	0	0	0	0	0	0	0	0	0	0
6	5	30	Greg Bugbee	41.34889	-73.13107	9/28/2023	6.7	Organic	0	0	0	0	0	0	0	0	0	0	0	0
6	6	40	Greg Bugbee	41.34895	-73.13099	9/28/2023	10.3	Silt	0	0	0	0	0	0	0	0	0	0	0	0
6	7	50	Greg Bugbee	41.34902	-73.13090	9/28/2023	11.4	Silt	0	0	0	0	0	0	0	0	0	0	0	0
6	8	60	Greg Bugbee	41.34911	-73.13083	9/28/2023	11.4	Silt	0	0	0	0	0	0	0	0	0	0	0	0
6	9	70	Greg Bugbee	41.34918	-73.13076	9/28/2023	10.4	Silt	0	0	0	0	0	0	0	0	0	0	0	0
6	10	80	Greg Bugbee	41.34924	-73.13070	9/28/2023	10.0	Silt	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0.5	Greg Bugbee	41.35853	-73.13796	9/28/2023	0.3	Gravel	0	0	0	0	0	0	0	0	0	0	0	0
7	2	5	Greg Bugbee	41.35852	-73.13801	9/28/2023	2.5	Gravel	0	0	0	0	0	0	0	0	0	0	2	0
7	3	10	Greg Bugbee	41.35849	-73.13807	9/28/2023	2.5	Organic	0	0	0	0	0	0	0	0	0	0	0	0
7	4	20	Greg Bugbee	41.35847	-73.13819	9/28/2023	5.0	Organic	0	0	0	0	0	0	0	0	0	0	0	0
7	5	30	Greg Bugbee	41.35843	-73.13829	9/28/2023	5.5	Organic	0	0	0	0	0	0	0	0	0	0	0	0
7	6	40	Greg Bugbee	41.35842	-73.13841	9/28/2023	5.5	Organic	0	0	0	0	0	0	0	0	0	0	0	0
7	7	50	Greg Bugbee	41.35841	-73.13855	9/28/2023	5.0	Silt	0	0	0	0	0	0	0	0	0	0	0	0
7	8	60	Greg Bugbee	41.35840	-73.13867	9/28/2023	4.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0
7	9	70	Greg Bugbee	41.35838	-73.13880	9/28/2023	4.9	Silt	0	0	0	0	0	0	0	0	0	0	0	0
7	10	80	Greg Bugbee	41.35837	-73.13891	9/28/2023	4.9	Silt	0	0	0	0	0	0	0	0	0	0	0	0
8	1	0.5	Greg Bugbee	41.36265	-73.14179	9/28/2023	0.3	Sand	0	0	0	0	0	0	0	0	0	0	0	0
8	2	5	Greg Bugbee	41.36269	-73.14175	9/28/2023	1.3	Organic	0	0	0	0	0	0	0	0	0	0	2	0
8	3	10	Greg Bugbee	41.36272	-73.14172	9/28/2023	1.5	Organic	2	0	0	0	0	0	0	0	0	0	3	0
8	4	20	Greg Bugbee	41.36279	-73.14165	9/28/2023	1.5	Organic	0	0	0	0	0	0	0	0	2	0	3	0
8	5	30	Greg Bugbee	41.36286	-73.14155	9/28/2023	3.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0
8	6	40	Greg Bugbee	41.36292	-73.14146	9/28/2023	3.7	Silt	0	0	0	0	0	0	0	0	0	0	0	0
8	7	50	Greg Bugbee	41.36297	-73.14138	9/28/2023	3.4	Silt	0	0	0	0	0	0	0	0	0	0	0	0
8	8	60	Greg Bugbee	41.36302	-73.14129	9/28/2023	3.1	Silt	0	0	0	0	0	0	0	0	0	0	0	4
8	9	70	Greg Bugbee	41.36307	-73.14120	9/28/2023	3.2	Silt	0	0	0	0	0	0	0	0	0	0	0	3
8	10	70	Greg Bugbee	41.36313	-73.14111	9/28/2023	3.2	Silt	0	0	0	0	0	0	0	0	2	0	0	4
9	1	0.5	Greg Bugbee	41.36912	-73.14852	9/28/2023	0.3	Gravel	0	0	0	0	0	0	0	0	0	0	0	0
9	2	5	Greg Bugbee	41.36907	-73.14857	9/28/2023	2.5	Gravel	0	0	0	0	0	0	0	0	0	0	3	0
9	3	10	Greg Bugbee	41.36902	-73.14860	9/28/2023	4.0	Sand	0	0	0	0	0	0	0	0	0	0	0	0
9	4	20	Greg Bugbee	41.36896	-73.14866	9/28/2023	4.2	Sand	0	0	0	0	0	0	0	0	0	0	0	0
9	5	30	Greg Bugbee	41.36890	-73.14874	9/28/2023	4.2	Sand	0	0	0	0	0	0	0	0	0	0	0	0
9	6	40	Greg Bugbee	41.36882	-73.14882	9/28/2023	4.4	Sand	0	0	0	0	0	0	0	0	0	0	0	0
9	7	50	Greg Bugbee	41.36876	-73.14890	9/28/2023	4.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0
9	8	60	Greg Bugbee	41.36870	-73.14900	9/28/2023	4.6	Silt	0	0	0	0	0	0	0	0	0	0	0	0
9	9	70	Greg Bugbee	41.36864	-73.14910	9/28/2023	4.5	Silt	0	0	0	0	0	0	0	0	0	0	0	0
9	10	80	Greg Bugbee	41.36860	-73.14920	9/28/2023	3.6	Gravel	0	0	0	0	0	0	0	0	0	0	0	0
10	1	0.5	Greg Bugbee	41.37678	-73.15591	9/28/2023	0.3	Sand	0	0	0	0	0	0	0	0	0	0	0	0
10	2	5	Greg Bugbee	41.37676	-73.15594	9/28/2023	1.0	Gravel	0	0	0	2	0	0	0	3	0	0	3	0
10	3	10	Greg Bugbee	41.37674	-73.15600	9/28/2023	2.0	Organic	0	0	0	2	0	0	0	3	0	0	3	0
10	4	20	Greg Bugbee	41.37670	-73.15611	9/28/2023	3.2	Organic	0	0	0	0	0	0	0	3	0	0	0	0
10	5	30	Greg Bugbee	41.37665	-73.15621	9/28/2023	4.4	Organic	0	0	0	0	0	0	0	3	0	0	0	0
10	6	40	Greg Bugbee	41.37660	-73.15631	9/28/2023	5.0	Gravel	0	0	0	0	0	0	0	3	0	0	0	0
10	7	50	Greg Bugbee	41.37654	-73.15641	9/28/2023	6.0	Gravel	0	0	0	0	0	0	0	3	0	0	0	0
10	8	60	Greg Bugbee	41.37648	-73.15653	9/28/2023	5.8	Gravel	0	0	0	0	0	0	0	3	0	0	0	0
10	9	70	Greg Bugbee	41.37643	-73.15661	9/28/2023	3.8	Gravel	0	0	0	0	0	0	0	3	0	0	0	0
10	10	80	Greg Bugbee	41.37638	-73.15671	9/28/2023	2.7	Gravel	0	0	0	3	0	0	0	2	0	0	0	0

Notes