Monitoring Report

Invasive Aquatic Plants

Lake Housatonic

2017

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Invasive Aquatic Plant Program

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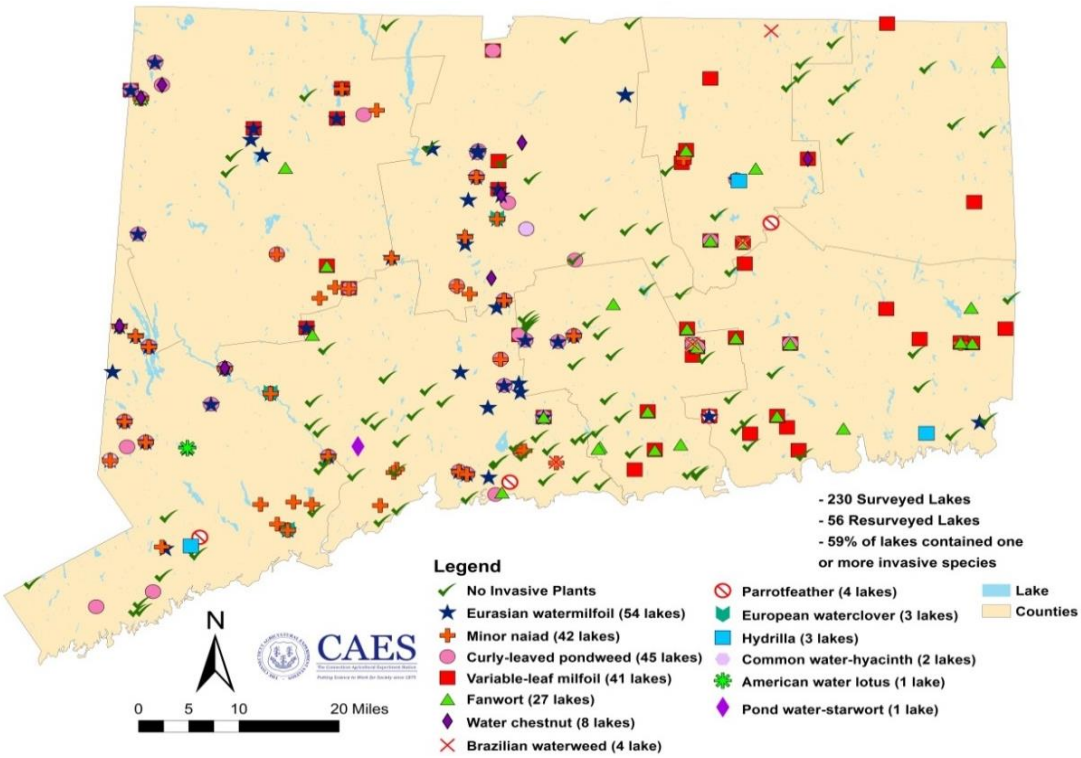

Figure 1. Locations of invasive aquatic plants found by CAES IAPP from 2004 to 2016.

Introduction

Lake Housatonic offers a diverse freshwater ecosystems and exceptional opportunities for fishing, boating and other outdoor activities. The lake is an impoundment of the Housatonic River made possible by a dam in Derby, CT. The dam is equipped with a hydroelectric generating facility owned and operated by McCallum Enterprises of Stratford. Invasive aquatic plants have become established in the lake (CAES IAPP 2017) and have few natural enemies to control their growth (Wilcove et al. 1998, Pimintel et al. 2000). They degrade native aquatic ecosystems (Barrett 1989, Les and Mehrhoff 1999), impede recreation, and reduce home values (Connecticut Aquatic Nuisance Species Working Group 2006, Fishman et al. 1998). Once invasive plants are established, long term and costly management programs are often necessary.

The Connecticut Agricultural Experiment Station (CAES) Invasive Aquatic Plant program (IAPP), surveys Lakes Candlewood, Lillinonah, Zoar and Squantz Pond for aquatic vegetation

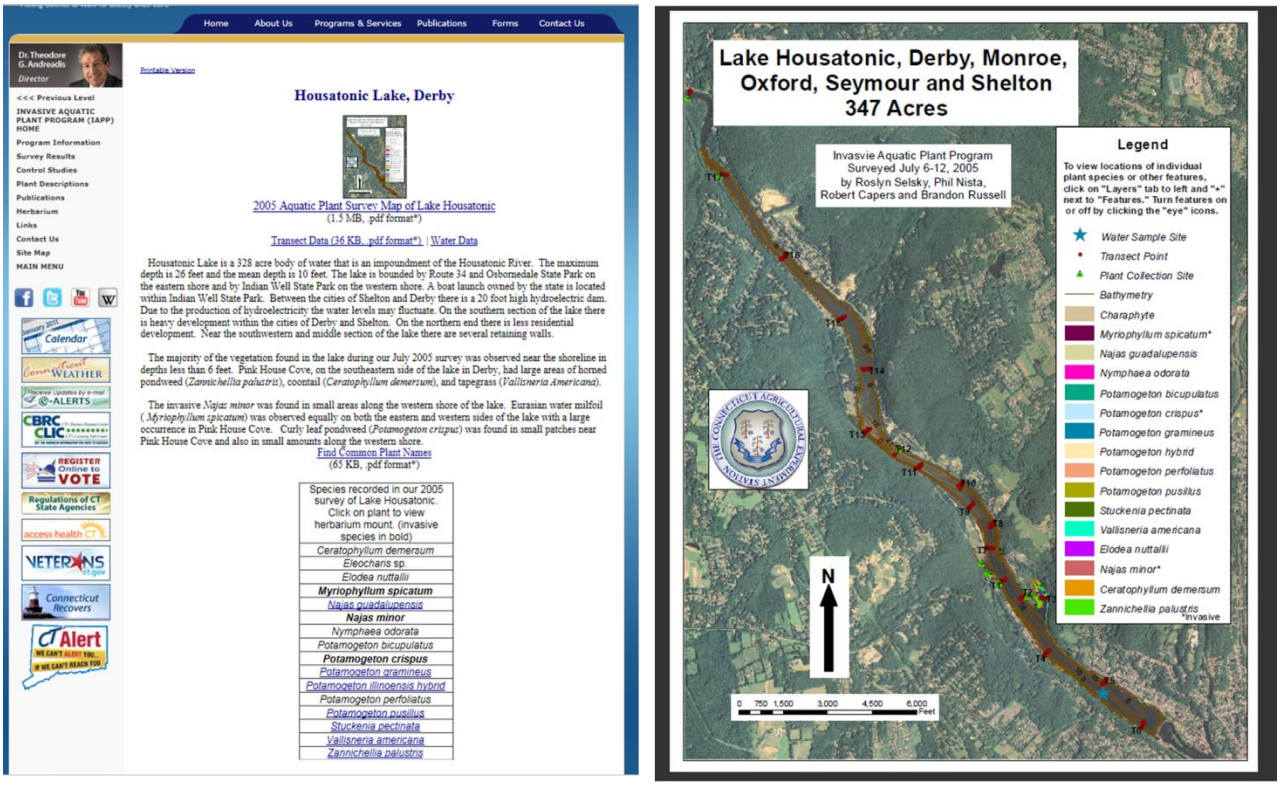

Figure 2. CAES IAPP webpages where the 2005 survey information can be found.

annually and issues a report. Lake Housatonic may be impacted by these waterbodies as they are upstream in the Housatonic River system. This report provides the surveillance to compare the conditions, identify upstream threats and provide scientific data to improve aquatic plant management decisions.

Statewide surveys by CAES IAPP have found 14 invasive aquatic plant species inhabit nearly 60 percent of Connecticut's lakes and ponds (Figure 1) (CAES IAPP 2017). CAES surveys of Lakes Candlewood, Lillinonah, Zoar and Squantz Pond over the last 11 years have found 18 plant species occur in the lakes with Eurasian watermilfoil (*Myriophyllum spicatum*), brittle waternymph (*Najas minor*), curlyleaf pondweed (*Potamogeton crispus*), European waterclover (*Marsilea quadrifolia*), and water chestnut (*Trapa natans*) being invasive. Water chestnut is found only in Lake Lillinonah and European waterclover is found only in Lake Zoar. Zebra mussels (*Dreissena polymorpha*) are now common in the Lakes Zoar and Lillinonah and can effect increase plant populations by improving water clarity or decrease populations by removal of nutrients or adhering to stems and foliage.

CAES IAPP surveyed Lake Housatonic in 2005 (Figure 2)(CAES IAPP 2017) and found three invasive and 14 native plant species (Table 1). Eurasian watermilfoil was the most common invasive plant along with smaller populations of brittle waternymph 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. The most common native plants in Lake Housatonic in 2005 were horned pondweed and eel grass. Overall, however, the coverage of both invasive and native plants in 2005 was minimal. Zebra mussels were not observed in Lake Housatonic in 2005.

The following report represents the first year of CAES IAPP surveillance and mapping of invasive aquatic plants in Lake Housatonic using the same techniques that have been employed for Lakes Candlewood, Lillinonah, Zoar as well as Squantz Pond for the last 11 years.

Objectives

- Survey and map invasive aquatic plants in Lake Housatonic.
- Document changes from the 2005 CAES IAPP.
- Provide aquatic plant management options.

Materials and Methods

Our 2017 aquatic vegetation surveys utilized methods established by CAES IAPP. These methods have provided a consistent record throughout the years. We recorded locations of all invasive plants with Trimble GeoXT® or ProXT® global positioning systems (GPS) with sub-meter accuracy. 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. While in 2005 surveying was done primarily by sight and hand, we updated our practices to obtain more accurate acreages and coordinates of plant locations. 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

Figure 3. Curlyleaf pondweed (top left), mix species mainly Eurasian watermilfoil with filamentous algae (top right), large leaf pondweed (bottom left), hybrid pondweed (bottom right).

type was estimated. Comparing depths from our 2005 survey with our 2017 survey to determine changes, is inherently inaccurate because of the wide fluctuations in lake level caused by the release of water for power generation. 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 (2000*a*, 2000*b*). We post-processed the GPS data in Pathfinder® 5.85 (Trimble Navigation Limited, Sunnyvale, CA) and then imported it into ArcGIS® 10.5.1 (ESRI, Redlands, CA), where it was geo-corrected. Data were then overlaid onto 2010 United States Department of Agriculture - National Agricultural Inventory Program aerial imagery with 1 m resolution.

We collected occurrence and abundance plant information from ten transects. Transect points were positioned 0.5, 5, 10, 20, 30, 40, 50, 60, 70 and 80 meters perpendicular from

Table 1. Yearly comparisons of the frequency of occurrence on transects and total area of aquatic vegetation in Lake Housatonic.

Scientific Name	Common Name	Frequency of Occurrence (percent*)		Area (acres)		
		2005	2017	2005	Spring 2017	Summer 2017
Ceratophyllum demersum	coontail	9	35	ND**	ND	ND
Eleocharis species	spikerush	0	0	ND	ND	ND
Elodea nuttallii	western waterweed	4	23	ND	ND	ND
Myriophyllum spicatum	**Eurasian watermilfoil**	**6**	**52**	**4.6**	**ND**	**139.0**
Najas guadalupensis	southern waternymph	0	4	ND	ND	ND
Najas minor	**brittle waternymph**	**1**	**9**	**0.3**	**ND**	**3.0**
Nymphaea odorata	white water lily	0	0	ND	ND	ND
Potamogeton amplifolius	large-leaf pondweed	0	3	ND	ND	ND
Potamogeton bicupulatus	snailseed pondweed	0	0	ND	ND	ND
Potamogeton crispus	**curly leaf pondweed**	**0**	**17**	**0.1**	**49.7**	**12.9**
Potamogeton epihydrus	ribbon-leaf pondweed	0	0	ND	ND	ND
Potamogeton gramineus	variable pondweed	1	0	ND	ND	ND
Potamogeton illinoensis hybrid	Illinois pondweed hybrid	0	4	ND	ND	ND
Potamogeton nodosus	long-leaf pondweed	0	3	ND	ND	ND
Potamogeton perfoliatus	clasping-leaf pondweed	0	3	ND	ND	ND
Potamogeton pusillus	small pondweed	0	37	ND	ND	ND
Potamogeton spirillus	spiral pondweed	0	0	ND	ND	ND
Potamogeton zosterformis	flat-stemmed pondweed	0	17	ND	ND	ND
Sagittaria species	arrowhead	0	1	ND	ND	ND
Sparganium species	bur-reed	0	2	ND	ND	ND
Spirodela polyrhiza	great duckweed	0	7	ND	ND	ND
Stuckenia pectinata	Sago pondweed	0	0	ND	ND	ND
Vallisneria americana	tapegrass	8	25	ND	ND	ND
Zannichellia palustris	horned pondweed	0	0	ND	ND	ND
Zosterella dubia	water stargrass	0	25	ND	ND	ND
Total Invasive Species Richness		**3**	**3**			
Total Native Species Richness		14	18			
Total Species Richness		17	21			

Invasive plant (in bold)
*Percent occurrence on 100 points in 10 transects
** No data

the shore. These transects were a subset of the 18 laid out in 2005 (CAES IAPP 2017) and contained at least one occurrence of each native and invasive 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 along transects were determined using chi-squared statistic calculations. Significant differences in species richness per transect point were determined by ± one standard error of the mean (SEM).

We surveyed Lake Housatonic for curlyleaf pondweed only on June 13 and all invasive plants from July 18 – 21. The spring curlyleaf pondweed survey was performed to provide more thorough documentation of curlyleaf pondweed prior to its normal summer senescence. Our transect data were obtained on July 20 and 21 and the water samples were

obtained on June 13 and July 21. Detailed information regarding our "on-lake" time is located in the Appendix (Page 27).

We used a Secchi disk to measure transparency. Because water clarity can affect our ability to see vegetation, we also performed Secchi measurements most days we performed surveillance. We used 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

Our 2017 survey of Lake Housatonic confirmed the presence of three invasive species Eurasian watermilfoil, minor waternymph, and curlyleaf pondweed along with 18 native plant species (Table 1). This compares to two invasive and six native species in Lake Candlewood, eight native and three invasive in Lake Lillinonah and three invasive and 11 native in Lake Zoar (Bugbee and Fanzutti, 2017). A trend toward increasing numbers of species in downstream lakes is evident. Of greatest concern to Lake Housatonic is Lake Lilllinonah's water chestnut population moving downstream. Eurasian watermilfoil covered 139 acres of Lake Housatonic in 2017 (Figure 3) which is a dramatic increase from the 4.6 acres we found in 2005 (Figures 4, 5). Minor waternymph acreage increased tenfold from 0.3 acres in 2005 to 3.0 acres in 2017 and summer curlyleaf pondweed acreage increased from 0.1 to 13. Curlyleaf pondweed is more prevalent in the spring. Our 2017 spring survey found 50 acres. Unfortunately, there is no data from previous years to which this can be compared. Native species found both survey years included coontail, western waterweed, southern waternymph, white water lily, clasping-leaf pondweed, small pondweed, Sago pondweed, tapegrass, and horned pondweed. Also found in both years was an unidentified species that is suspected to be a *Potamogeton* hybrid. New species found in Lake Housatonic as of 2017 include large-leaf pondweed (Figure 3), ribbon-leaf pondweed, long-leaf pondweed, flat-stemmed pondweed, arrowhead), bur-read, great duckweed, and water stargrass. Native

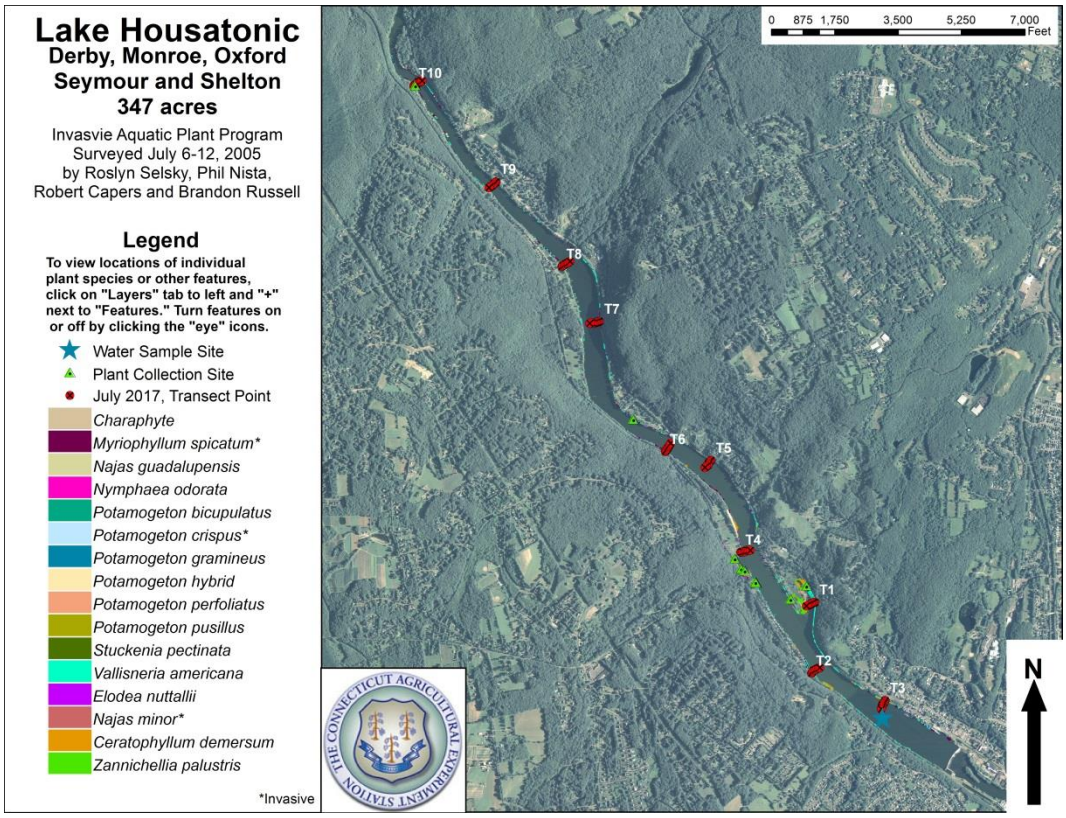

Figure 4. CAES IAPP summer 2005 survey of Lake Housatonic (see appendix for close-ups).

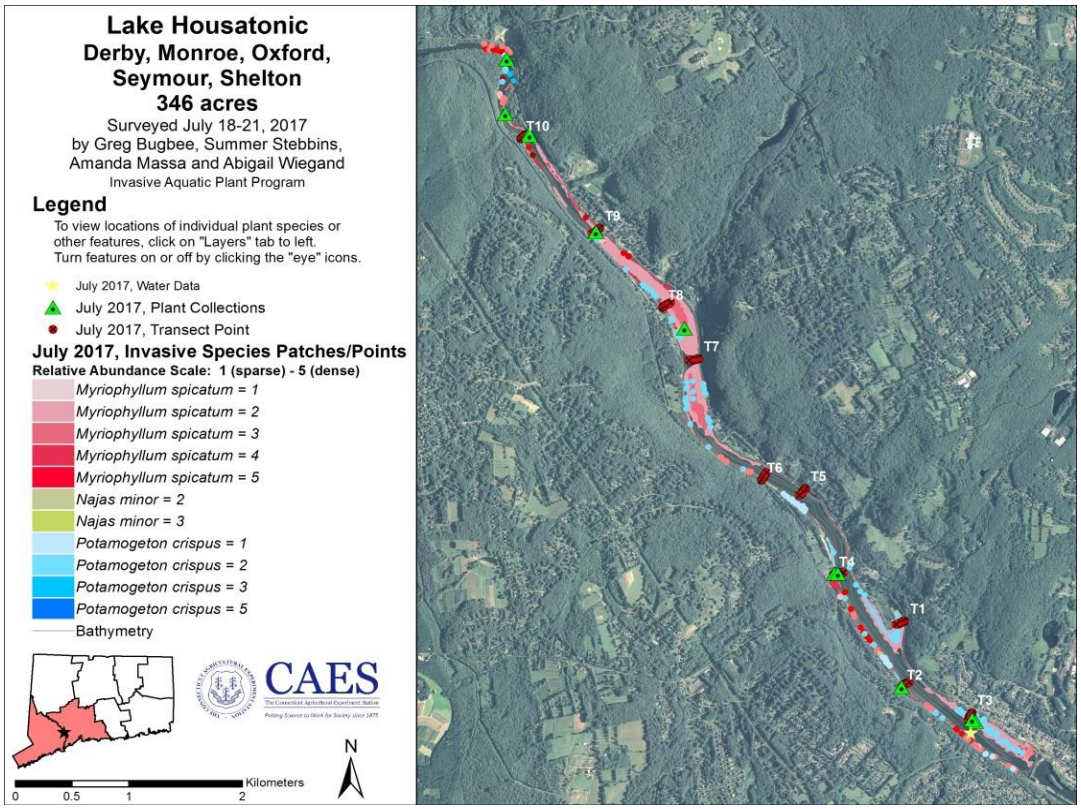

Figure 5. CAES IAPP summer 2017 survey of Lake Housatonic (see appendix for close-ups).

Table 2. Yearly comparisons of the number and size of invasive patches in Lake Housatonic.

	Eurasian watermilfoil				Minor waternymph				Curlyleaf pondweed			
Survey	Number of Features	Minimum Size (acres)	Maximum Size (acres	Mean Size (acres)	Number of Features	Minimum Size (acres)	Maximum Size (acres	Mean Size (acres)	Number of Features	Minimum Size (acres)	Maximum Size (acres	Mean Size (acres)
2005	152	0.0013	0.4346	0.0300	6	0.0028	0.1365	0.0555	12	0.0009	0.0168	0.0070
Spring 2017	0	ND	ND	ND	0	ND	ND	ND	103	0.0002	12.1395	0.4827
Summer 2017	179	0.0002	54.4610	0.7765	14	0.0002	0.6931	0.2168	139	0.0002	6.5482	0.0925

Table 3. Yearly comparisons of the abundance of invasive plants in patches in Lake Housatonic.

	Eurasian watermilfoil			Minor waternymph			Curlyleaf pondweed		
Survey	minimum	maximum	mean	minimum	maximum	mean	minimum	maximum	mean
2005	ND	ND	ND	ND	ND	ND	ND	ND	ND
Spring 2017	ND	ND	ND	ND	ND	ND	1	4	2.0
Summer 2017	1	4	2.7	2	3	2.1	1	5	1.9
Patch abundance: 1=sparse - 5=dense									

species were prolific and either alone or mixed with invasive species created potential nuisances. We did not observe any state listed species.

We found 179 patches of Eurasian watermilfoil in our 2017 survey (Table 2) with the largest patch covering 54 acres stretching from the middle of the lake north and along the eastern shore by transects 7, 8 and 9 (Figures 4 and 5) The average 2017 patch size of Eurasian watermilfoil was 0.8 acres, a sharp increase from the 0.03 acres found in 2005. The mean patch abundance of Eurasian watermilfoil in 2017 was 2.7 (Table 3). We found 14 patches of minor waternymph at an average size of 0.2 acres in 2017, an increase from 6 patches in 2005. The largest patch found in 2017 was 0.7 acres located on the western shore (pages 47 - 48). The mean patch abundance of minor waternymph was 2.1 in 2017. We found 103 patches of curlyleaf pondweed in our spring 2017 survey with an average area of 0.5 acres. By the summer that number had increased to 139, although on average they were smaller (0.09 acres). The largest patch of curlyleaf pondweed was found in the spring at 12 acres, which had shrunk by nearly half to 6.5 acres by summer. The average abundance of curlyleaf pondweed was consistent at 2.0 in the spring and 1.9 in the summer. The plant concentrates along the eastern shore of the southern end of the lake (especially in the cove), and along the majority of the western shore as well (Figures 3 and 4).

The frequency of occurrence (FO) of all plants on transects (Figure 5) showed a marked

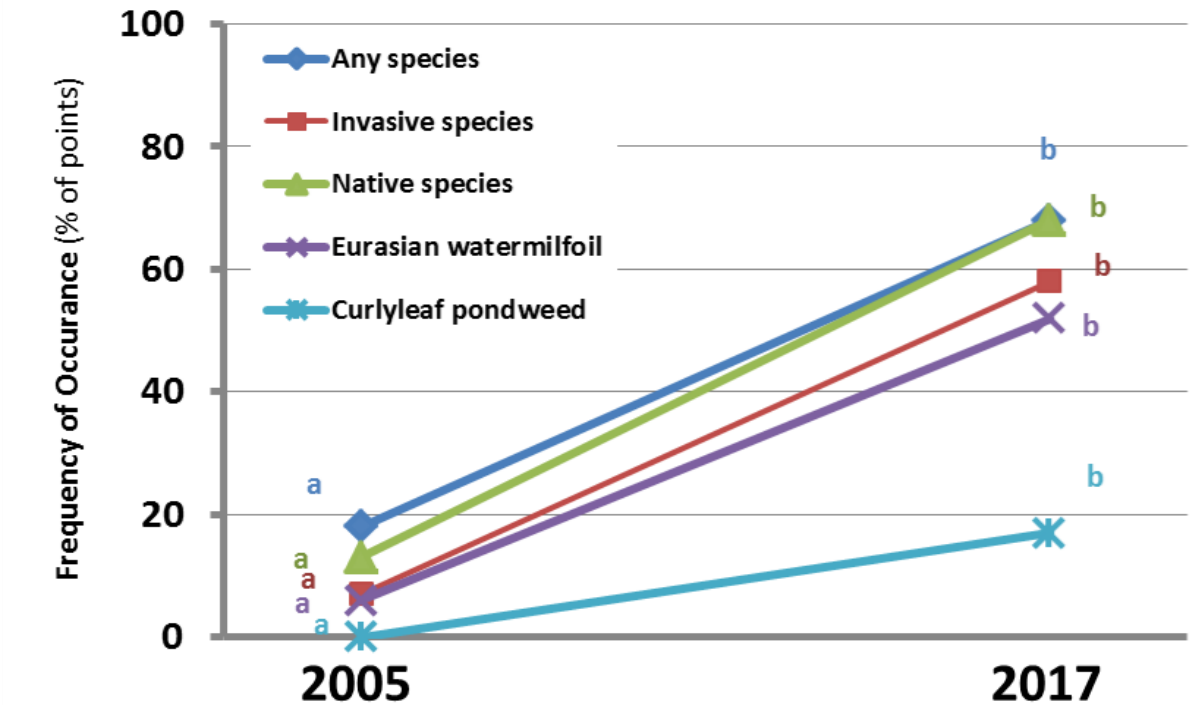

Figure 6. Yearly comparison of the frequency of occurrence of native and invasive species on transects in Lake Housatonic. Points with the same letter are not significantly different.

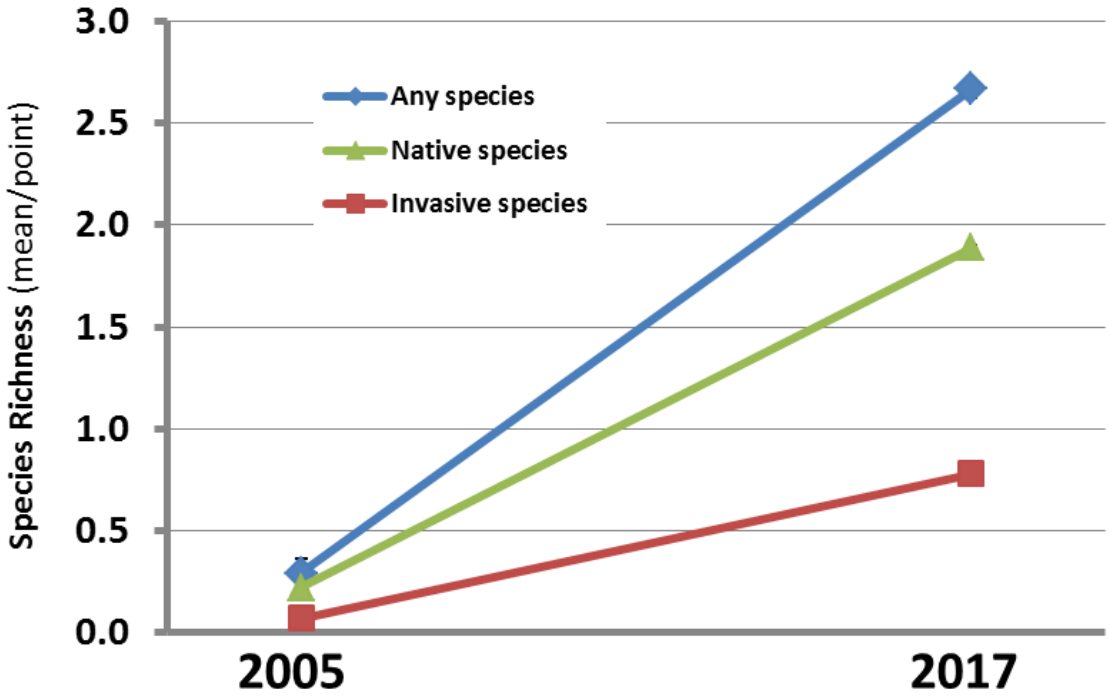

Figure 7. Yearly comparison of the average number of species per transect point in Lake Housatonic.

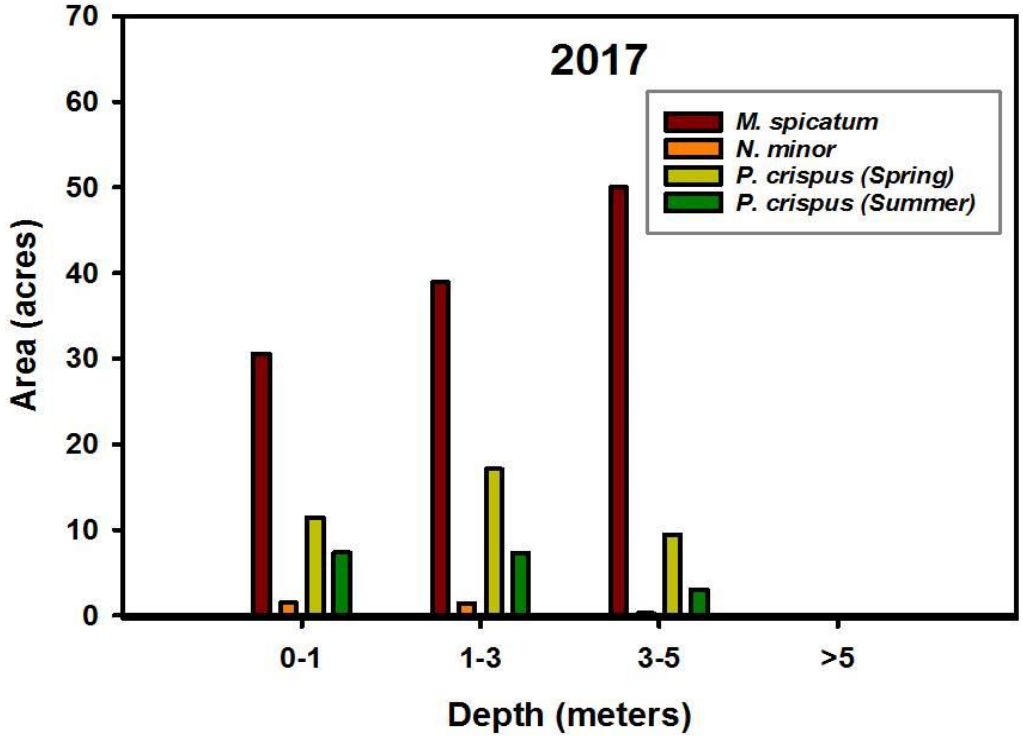

Figure 7. Comparisons of depth preferences of invasive plants in Lake Housatonic in 2017.

and significant increase ($p \leq 0.05$) from 2005 to 2017; any species (native or invasive) 18% to 68%, invasive species 7% to 58%, native species 13% to 68%, Eurasian watermilfoil 6% to 52%, curlyleaf pondweed 0% to 17% and brittle waternymph 1% to 9%. Small pondweed had the highest FO of any native species in 2017 (37%) while coontail had the highest in 2005 (9%) (Table 1). Species richness of all classes of aquatic plants also increased significantly from 2005 to 2017 (Figure 6); any species 0.3 to 2.7, invasive species 0.1 to 0.8 and native species 0.2 to 1.9. These findings are consistent with the statistical growth of FO in all categories.

Eurasian watermilfoil in 2017 grew at depth s of 0-5 m (Figure 7). As the depths increased to 5 m the acreages did as well (0 -1 m = 31, 1-3 m =39 and 3-5 m = 48). The acreage of minor waternymph was nearly equal at 0-1 m (1.5) and 1-3 m 1.4). Curlyleaf pondweed occurred at depths similar to Eurasian watermilfoil in both the spring (0-1 m = 11.5, 1-3 m =

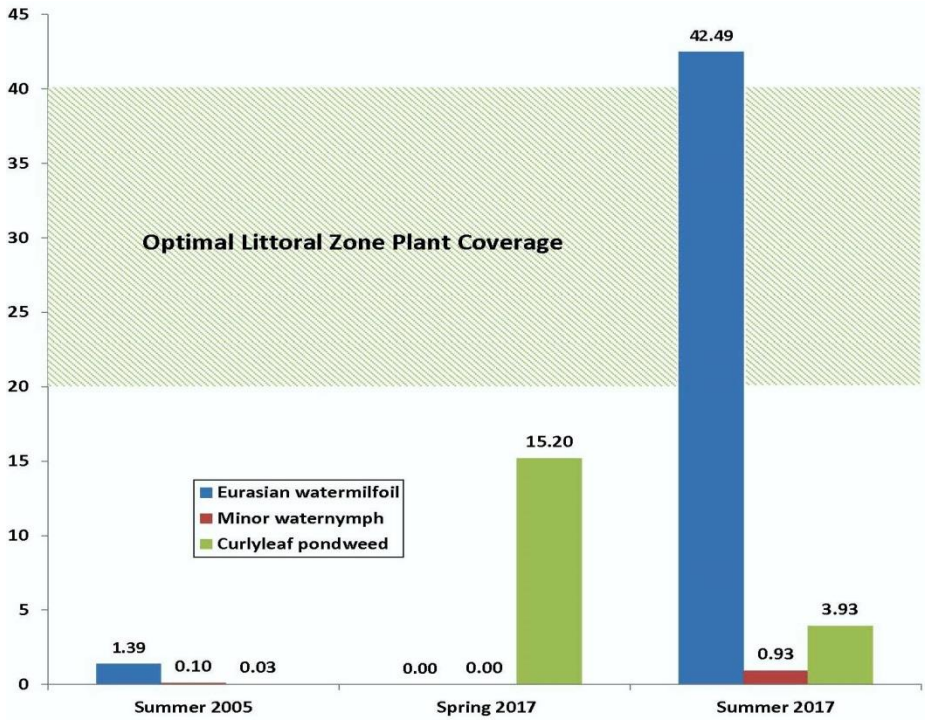

Figure 8. Littoral zone coverage of invasive aquatic plants in Lake Housatonic.

17.1, 3-5 = 3.0)and summer (0-1 m = 7.3, 1-3 m = 7.3, 3-5= 3.0).

Aquatic plants are necessary to maintain a healthy ecosystem. The provide habitat for fish and other aquatic organisms, remove nutrients and pollutants from water and stabilize the shoreline. Lake Housatonic has a littoral zone (area not too deep to support plants) of 327 acres or 94.5% of its total area. CT DEEP fisheries biologists suggest the optimal coverage of the littoral zone with plants is 20 - 40% (Jacobs and O'Donnell 2002). Eurasian watermilfoil covered 42.5% of Lake Housatonic's littoral zone in 2017 (Figure 8) and compared to only 1.4% in 2005. Minor waternymph littoral zone coverage increased slightly to 0.9% in 2017 from 0.1% in 2005 and curlyleaf pondweed (summer) increased from 0.1% in 2005 to 3.4%. We found the spring 2017 littoral zone coverage of curlyleaf pondweed was 15.2%. The optimal range littoral plant zone coverage of 20 - 40% is exceeded currently by Eurasian watermilfoil alone.

Survey	Depth (m)	Dissolved oxygen µg/L	Temperature (°C)	Secchi measurement
2005	-0.5	8.6	24.1	2
	-1	7.9	24	
	-2	7.3	23.6	
	-3	7.2	23	
	-4	6.5	22.6	
	-5	5.4	22.6	
Spring 2017	-0.5	8.7	21.1	2.5
	-1	8.9	19.2	
	-2	8.5	18.1	
	-3	8.3	17.9	
	-4	7.7	17.6	
	-5	7.8	17.4	
	-6	7.8	17.4	
	-7	7.6	17.4	
Summer 2017	-0.5	7.5	25.5	2.1
	-1	7.5	25.2	
	-2	6.8	24.8	
	-3	6.2	24.4	
	-4	5.4	24.2	

Table 4. Dissolved oxygen levels, temperatures and transparencies of the water in Lake Housatonic during the 2005 and 2017 CAES IAPP surveys.

Water Chemistry

CAES IAPP has found 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 waternymph 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. In addition, nutrients not used by plants can support the occurrence of nuisance algal blooms. At the conclusion of 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.

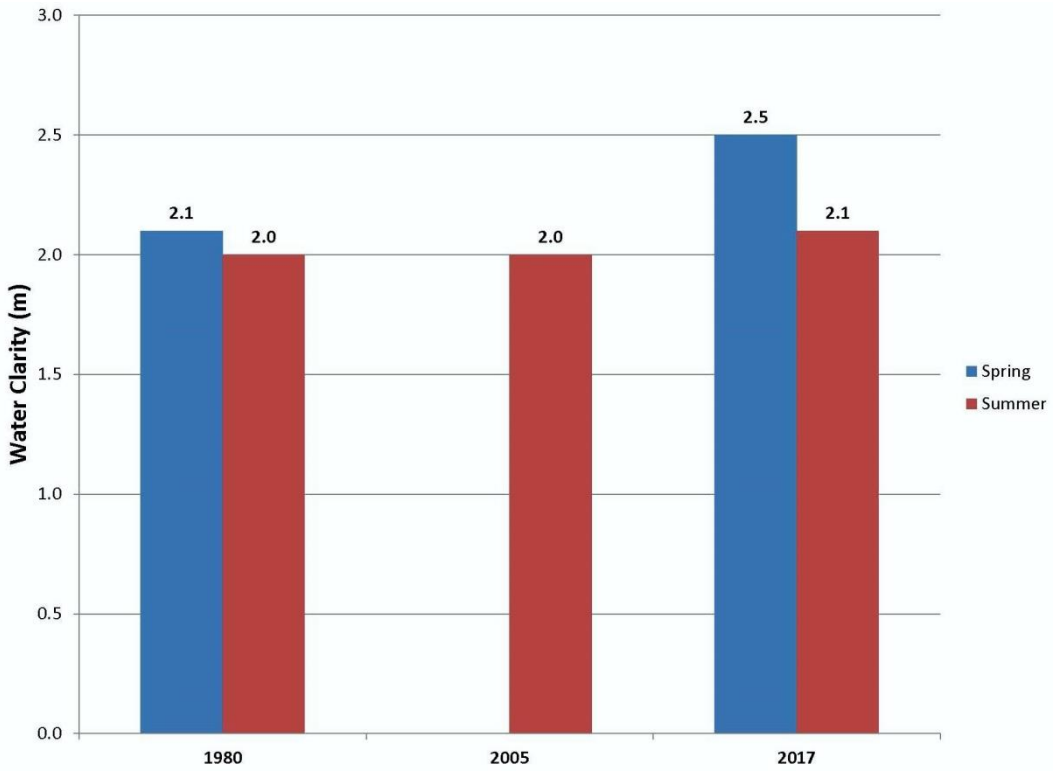

Figure 10. Water transparency in Lake Housatonic during the 2005 and 2017 CAES IAPP surveys.

Survey	Depth (m)	Conductivity µS/cm	pH	Alkalinity (mEq/L)	[P] µg/L
2005	-0.5	229	7.6	72.0	12
	-6.5	230	7.5	77.3	12
Spring 2017	-0.5	238	7.2	80.3	15
	-4.5	238	7.2	76.5	23
Summer 2017	-0.5	232	7.2	85.5	15
	-5.0	244	7.3	85.5	25

Table 5. Conductivity, pH, alkalinity and phosphorus concentrations of the water in Lake Housatonic during the 2005 and 2017 CAES IAPP surveys.

On July 27, 2017 the water clarity of Lake Housatonic was 2.1 m (Figure 10). This is consistent with the previous measurements of the lake in 1980 (Frink and Norvell, 1984) and 2005. Water clarities in Connecticut's lakes ranged from 0.3 - 10 m with an average of 2.3 m (CAES IAPP 2017). Thus, the average water clarity of Lake Housatonic ranks near the norm.

Conductivity is an indicator of dissolved ions that come from natural and man-made sources (mineral weathering, organic matter decomposition, fertilizers, septic systems, road salts, etc.). The 2017 conductivity of Lake Housatonic ranged from 229-238 µS/cm with higher levels measured in the spring survey (Table 5). This has remained consistent to the earlier survey in 2005 when the lake's conductivity ranged from 232 µS/cm at the surface to 244 µS/cm at the bottom.

The pH of Lake Housatonic ranged from 7.2 in the summer 2017 survey to 7.6 in the spring survey with the similar levels at the surface and the bottom waters (Table 5). This is likely due to greater mixing in its riverine environment. Higher surface water pH would be consistent with daytime removal of carbon dioxide by algae and aquatic plants.

Alkalinities in Connecticut's lakes range from near 0 to over 170 mg/L $CaCO_3$ (CAES IAPP 2017, Canavan and Siver 1995, Frink and Norvell 1984). Lake Housatonic's surface alkalinity ranged from 72.0 – 82.3 mg/L spring to summer respectively, which was slightly lower than the surface alkalinity recorded in 2005 when it was 85.5 mg/L. Bottom water samples were 85.5mg/L in 2005, 77.3 mg/L in spring 2017 and 76.5 mg/L in summer of that year. Again, the alkalinities were slightly lower in 2017.

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 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 of hypereutrophic. The P concentration in Lake Housatonic in summer 2005 was 12 µg/L at both the surface and the bottom (Table 5). The spring and summer 2017 surveys yielded quite similar water test results in P concentration. At the surface both times the concentration was 15 µg/L and the bottom water concentrations increased similarly to 25 µg/L in 2005 and 23 µg/L in summer 2017. This partitioning of P be-

Figure 17. 2015 release of grass carp into Candlewood Lake (left). Herbicide treatment to Lake Zoar (right) (photo courtesy of Solitude Lake Management Inc.).

tween the surface and bottom water is common in the summer as anoxic conditions release P from the sediment (Norvell, 1974) and temperature stratification prevents vertical mixing. Summer temperature and dissolved oxygen profiles were relatively consistent from surface to bottom (Table 4) indicating little stratification. Dissolved oxygen remained high throughout the water column.

Filamentous algal mats reached nuisance levels in a few protected coves in the lake. Often they overlaid patches of Eurasian watermilfoil. Unicellular algal blooms were also prevalent in all lakes. Although usually observed as a green tinge to the water, in certain areas the cells coalesced into unsightly clumps. The mass balance of nutrients between rooted aquatic plants and algae is complex and likely varies throughout the season. When rooted aquatic plants are controlled by drawdown, grass carp, herbicides, etc. nutrients are released and algal blooms may be favored.

In order to get a more complete picture of the water chemistry of Lake Housatonic, more water data points may be established in future surveys – in a similar fashion as surveys of Lakes Candlewood, Lillinonah and Zoar. 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.

Aquatic plant management

Managing nuisance aquatic vegetation in Lake Housatonic will be challenging because of the riverine conditions and extensive areas of desirable native vegetation. In addition, large numbers of residents utilize the lake for recreational activities, particularly fishing, boating and swimming. Options include: harvesting, herbicides, biological controls, bottom barriers and water level drawdown (Cooke et al., 2005). Dry, wet or suction dredging may also be employed but is usually impractical for large lakes like Housatonic. In addition, dredged areas would disturb PCB's and create dredge spoils with disposal issues.

Hand, mechanical or suction harvesting has the benefit of providing immediate control but problems include rapid regrowth, finding suitable disposal sites and spreading of weeds by fragmentation. Weeds like milfoil (Madsen, et al, 1988) and fanwort spread by the rooting of broken pieces. Harvesting practices can therefore distribute the weed throughout a lake. Many weeds also have strong root systems that will cause regrowth. Usually, harvesting has to be done every year. Some lakes have purchased mechanical harvesters. Suction harvesting is better for small areas but costs for divers and equipment can be expensive. Machine harvesting was observed during our survey appeared to be progressing smoothly. Water chestnut is relatively easy to harvest by hand. Yearly surveillance and removal of any pioneer infestations in Lake Housatonic is suggested.

Herbicides can be effective in controlling unwanted aquatic vegetation. Aquatic herbicide must meet safety criteria set forth by the United States Environmental Protection Agency (USEPA). In addition they require permits from the Connecticut Department of Energy and Environmental Protection (CTDEEP). The fee for a permit is currently $200. Some of the most widely used aquatic herbicides in Connecticut are fluridone (Sonar™, Avast™), diquat (Reward™), 2,4-D (Navigate™, AquaKlean™) and glyphosate (Rodeo™). In recent years, several new products have emerged such as Flumioxazin (Clipper™), imazamox (Clearcast™) and triclopyr (Renovate™). Fluridone, 2,4-D, glyphosate, imazamox and triclopyr are translocated throughout the entire plant, causing dieback of the roots and shoots. Diquat, and flumioxazin destroys only foliage, and regrowth from the roots is likely. Fluridone and flumi-

Figure 18. Benthic barrier being installed in Lake Quonnipaug, Guilford, Connecticut.

oxazin are the only herbicides that are currently considered effective against fanwort. Because whole lake herbicide treatments would cause damage to non-target organisms and be cost prohibitive, spot treatments would be needed. Fluridone requires many weeks of contact time and therefore a granular formulation would likely be needed. Glyphosate is sprayed directly on plants and is effective only on weeds like water lily and water shield that have large areas of foliage above the surface. Aquatic herbicides can be expensive and often have associated water use restrictions. Annual treatments are common. Stoppage of water inflow and outflow, through coordination with the power companies, may be necessary to prevent rapid dilution of herbicide. In, addition short term beach closures may be needed. Lake Zoar is currently applying Reward to milfoil patches in selected cove (Figure 17, left). Specifics on the use of aquatic herbicides in Connecticut are found in the CTDEEP publication entitled "Nuisance Aquatic Vegetation Management: A Guidebook" (CTDEP, 2005).

Although efforts are underway to find biological controls for nuisance aquatic vegetation, breakthroughs have been limited. Plant eating fish, called grass carp (*Ctenopharyngodon idella*), can effectively reduce the populations of certain aquatic weeds. Often it is an "all or nothing" procedure where too few are introduced to have much of an effect or too many are introduced and both nuisance and desirable vegetation is eliminated.

Figure 19. Winter drawdown in Candlewood Lake, Connecticut.

The introduction of grass carp into Connecticut lakes requires approval by the CTDEEP. Often these fish are considered inappropriate because their feeding is not selective and desirable plants can be eliminated. In Connecticut, only sterile grass carp (triploid) are permitted. They are usually 10-12 inches in length when introduced (Figure 17, left) and can grow to over 30 inches. Typically 10-20 fish per vegetated acre are used at a cost of $10-$15 per fish. All lake inlets and outlets must be screened to prevent movement of the fish (Figure 12, middle). These screens must be CTDEEP approved and cannot interfere with the flow of water or the integrity of the dam. The screen must be kept free of debris to prevent flooding. Introducing grass carp in Lake Housatonic could cause damage to non-target plants necessary to maintain the current fishery (Pipalova. 2006). CAES has worked with officials from the United Sates Department of Agriculture to find new plant pathogens and insects that control nuisance aquatic plants with little success. Lake Candlewood has been stocked with nearly 10,000 grass carp (Figure 17,right)and CAES IAPP is monitoring their effectiveness.

Benthic barriers or “bottom blankets” are effective at eliminating nuisance vegetation in small areas such as swim zones and around docks. CAES IAPP tested installing the barriers in late April and removing them after 30 days at the Lake Quonnipaug town beach (Figure 18).

Season long control for Eurasian watermilfoil and fanwort was achieved. Thus, benthic barriers may be able to be moved from place to place during a season.

Water level drawdown can be an effective and economical means of controlling nuisance vegetation in large shallow lakes like Housatonic. Fortunately the lake has a dam with an outlet suitable for the technique. If weeds are allowed to freeze or dry, but this has an adverse effect on non-target aquatic organisms. Winter drawdown is preferable because of its lessened impact on ecosystems and recreation. Some weeds, like water milfoil, have root systems and other plant parts that can survive substantial drying (Standifer and Madsen, 1997) and temperatures near freezing. CAES has been monitoring the yearly drawdowns in Candlewood Lake and has observed rapid regrowth of vegetation in drawn down areas (Figure 19). Thus the practice usually needs to be done regularly. This has a benefit of allowing lake management to optimize the aquatic plant community if regular surveys are employed to document changes.

Funding for nuisance aquatic plant management usually comes from private sources. Occasionally State grants are provided but we know of none at present. Other sources could be towns or the power company running the hydrogenerating facility.

Conclusions

Lake Housatonic was surveyed using the protocol as in use for Lake Candlewood, Lillinonah, Zoar and Squantz Pond for the first time in 2017. Twenty one plant species were documented of which Eurasian watermilfoil, curlyleaf pondweed and brittle waternymph are invasive (non-native). Eurasian watermilfoil and curlyleaf pondweed dominates the plant communities along with a number of native species. Populations of all invasive species and most native species have increased dramatically since the 2005 CAES IAPP survey. For instance, Eurasian watermilfoil covered 5 acres in 2005 compared to 139 acres in 2017. And summer curlyleaf pondweed acreage increased from 0.1 to 12.9. Curlyleaf pondweed is more prevalent in the spring but this was not measured until our 2017 survey when 50 acres were present. Although not yet recorded in Lake Housatonic, there is a risk that water

chestnut could infest the waterbody due to its location upstream in Lake Lillinonah. Yearly surveillance and removal of any pioneer infestations in Lake Housatonic is suggested.

Aquatic plant management options include a continuation of current harvesting practice, utilization of targeted herbicide applications such as being performed in Lake Zoar, using a winter drawdown, exploring grass carp introduction as underway in Lake Candlewood and localized use of benthic barriers.

Acknowledgments

The assistance of the following individuals throughout the years is gratefully acknowledged.

Robert Capers, Invasive Aquatic Plant Program, CAES

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Amanda Massa, Invasive Aquatic Plant Program, CAES

Roslyn Reeps, Invasive Aquatic Plant Program, CAES

Summer Stebbins, Invasive Aquatic Plant Program, CAES

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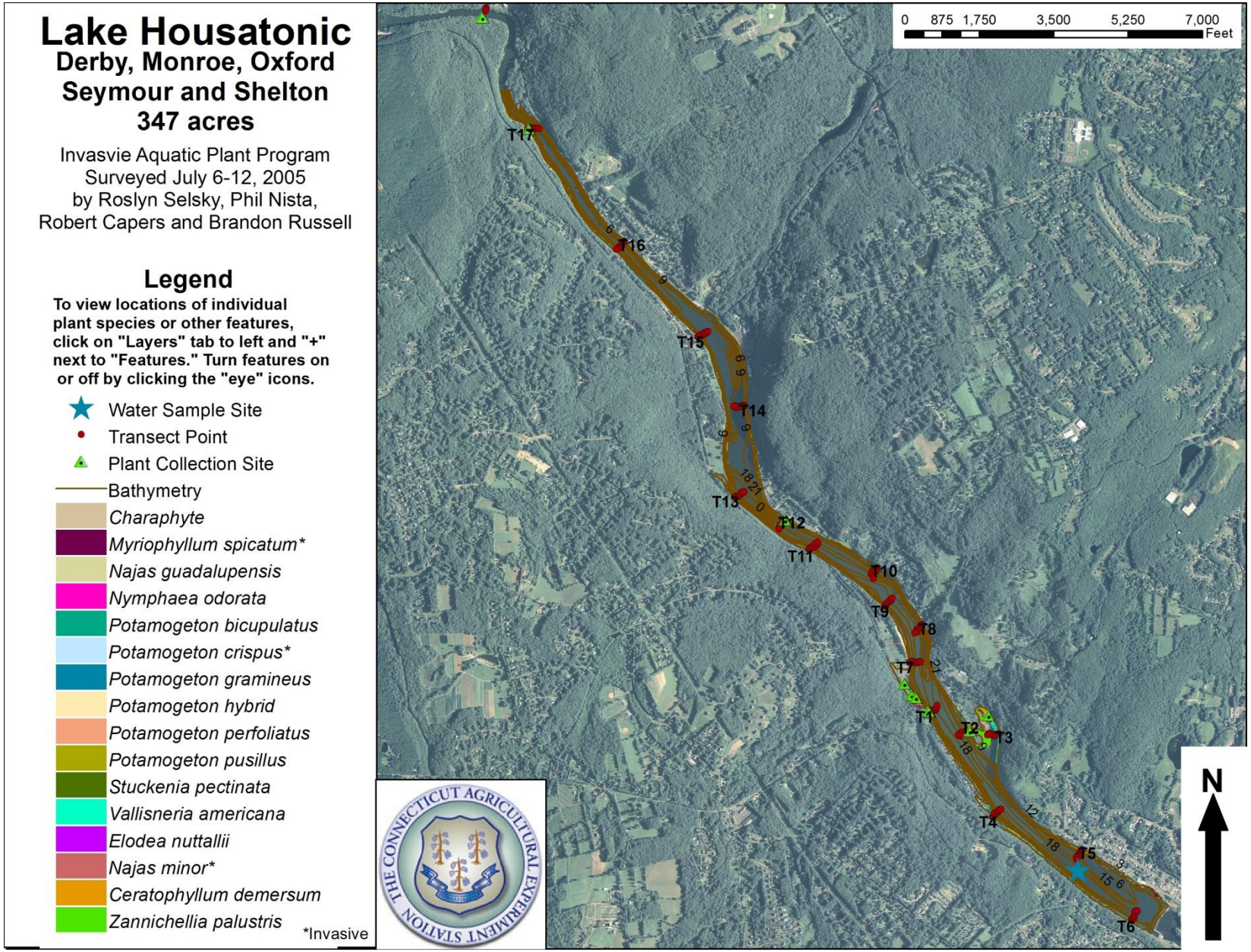
Appendix

2017 CAES IAPP On-Lake Time

Lake Housatonic (Lead surveyors)	
Boat 1	**Boat 2**
6/13/2017 (Bugbee)	6/13/2017 (Stebbins/Wiegand)
7/18/2017 (Bugbee)	7/18/2017 (Stebbins/Wiegand)
7/19/2017 (Bugbee)	7/19/2017(Stebbins/Wiegand)
7/20/2017 (Bugbee)	7/20/2017 (Stebbins/Wiegand)
7/21/2017 (Bugbee)	7/21/2017 (Stebbins/Wiegand)
5 days	**5 days**

2005 CAES IAPP Survey Maps


Lake Housatonic
Derby, Monroe, Oxford
Seymour and Shelton
347 acres
Invasvie Aquatic Plant Program
Surveyed July 6-12, 2005
by Roslyn Selsky, Phil Nista,
Robert Capers and Brandon Russell
Legend
To view locations of individual plant species or other features, click on "Layers" tab to left and "+" next to "Features." Turn features on or off by clicking the "eye" icons.
Water Sample Site
Transect Point
Plant Collection Site
Bathymetry
Charaphyte
Myriophyllum spicatum*
Najas guadalupensis
Nymphaea odorata
Potamogeton bicupulatus
Potamogeton crispus*
Potamogeton gramineus
Potamogeton hybrid
Potamogeton perfoliatus
Potamogeton pusillus
Stuckenia pectinata
Vallisneria americana
Elodea nuttallii
Najas minor*
Ceratophyllum demersum
Zannichellia palustris
*Invasive
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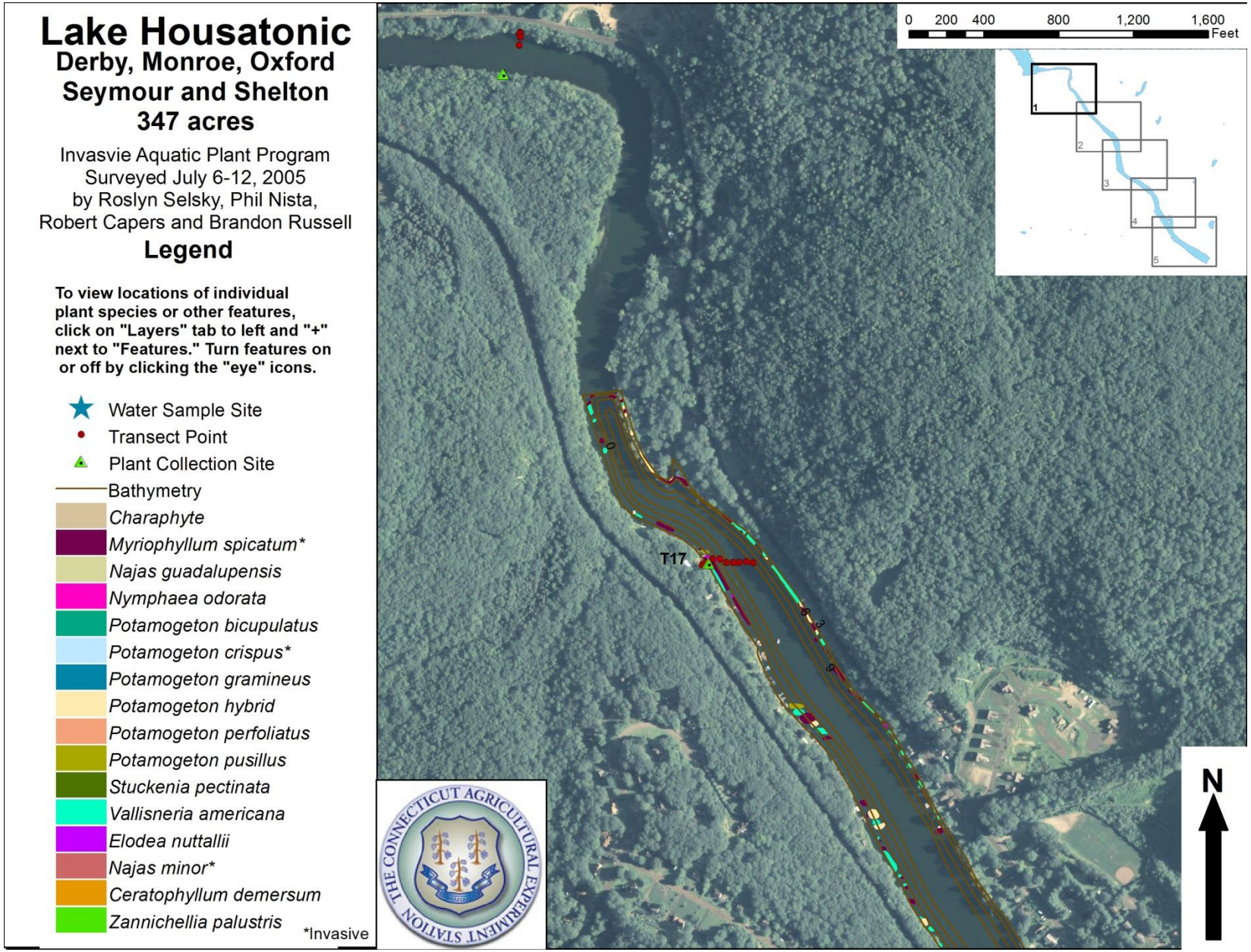
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Elodea nuttallii
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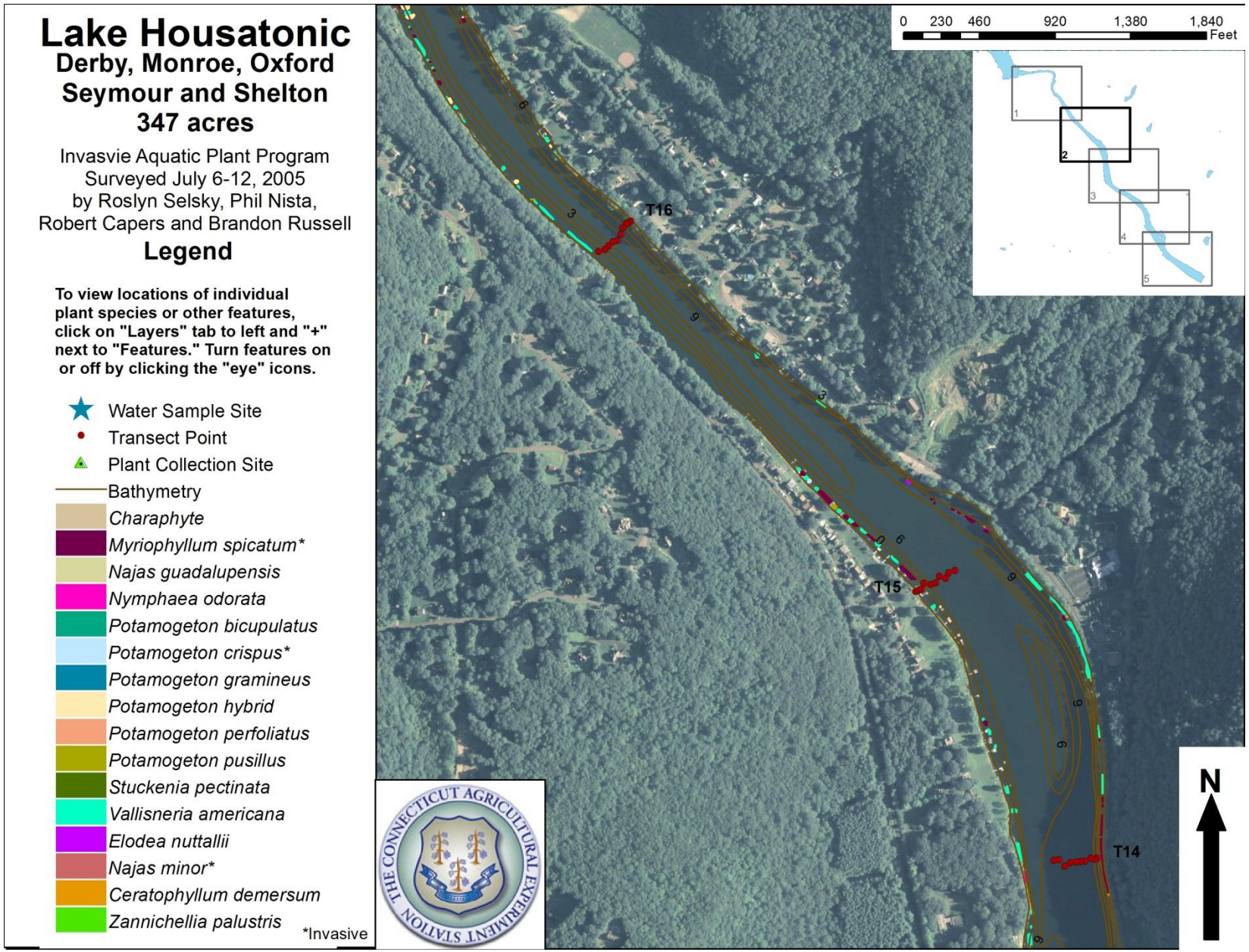
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Vallisneria americana
Elodea nuttallii
Najas minor*
Ceratophyllum demersum
Zannichellia palustris
*Invasive
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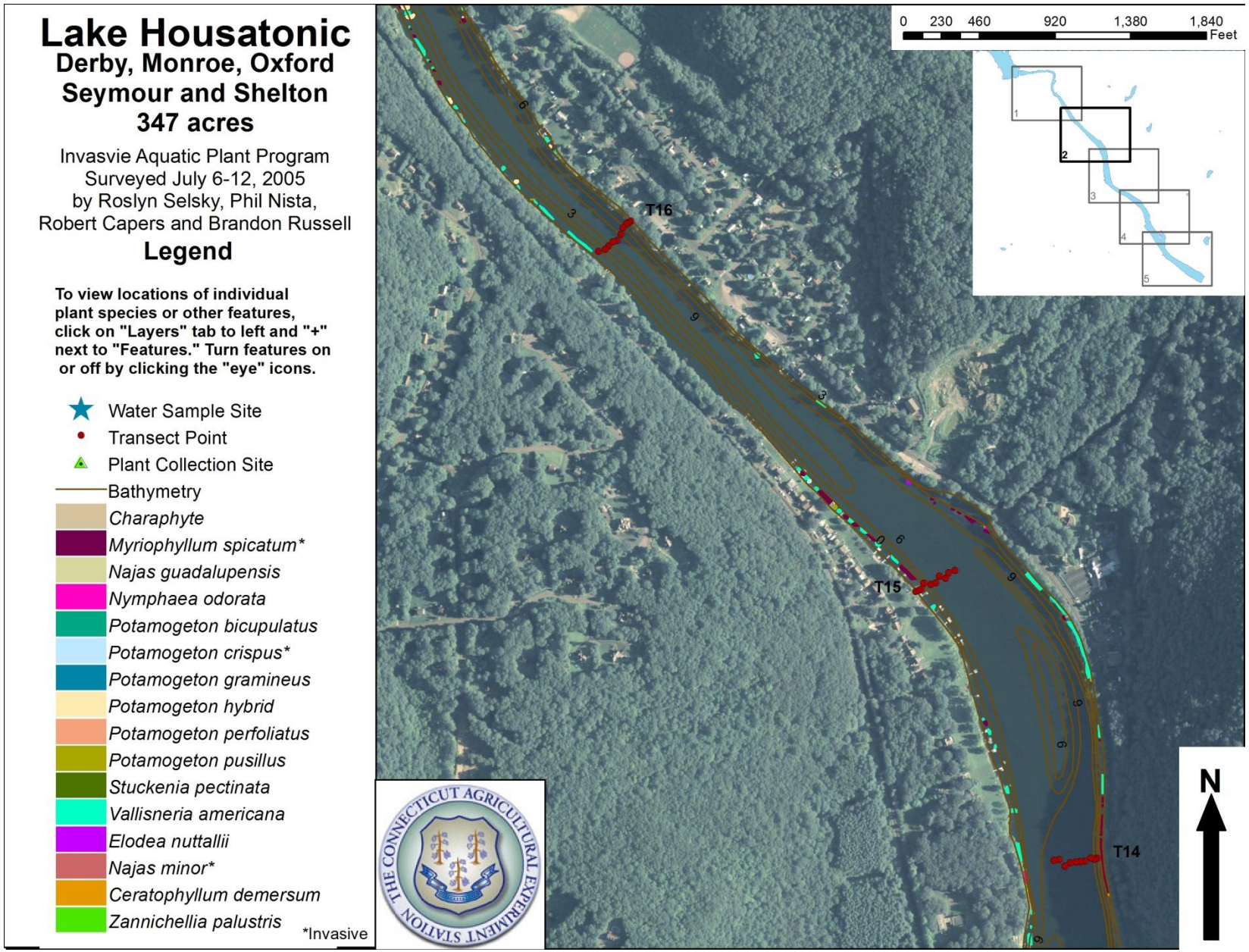
THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION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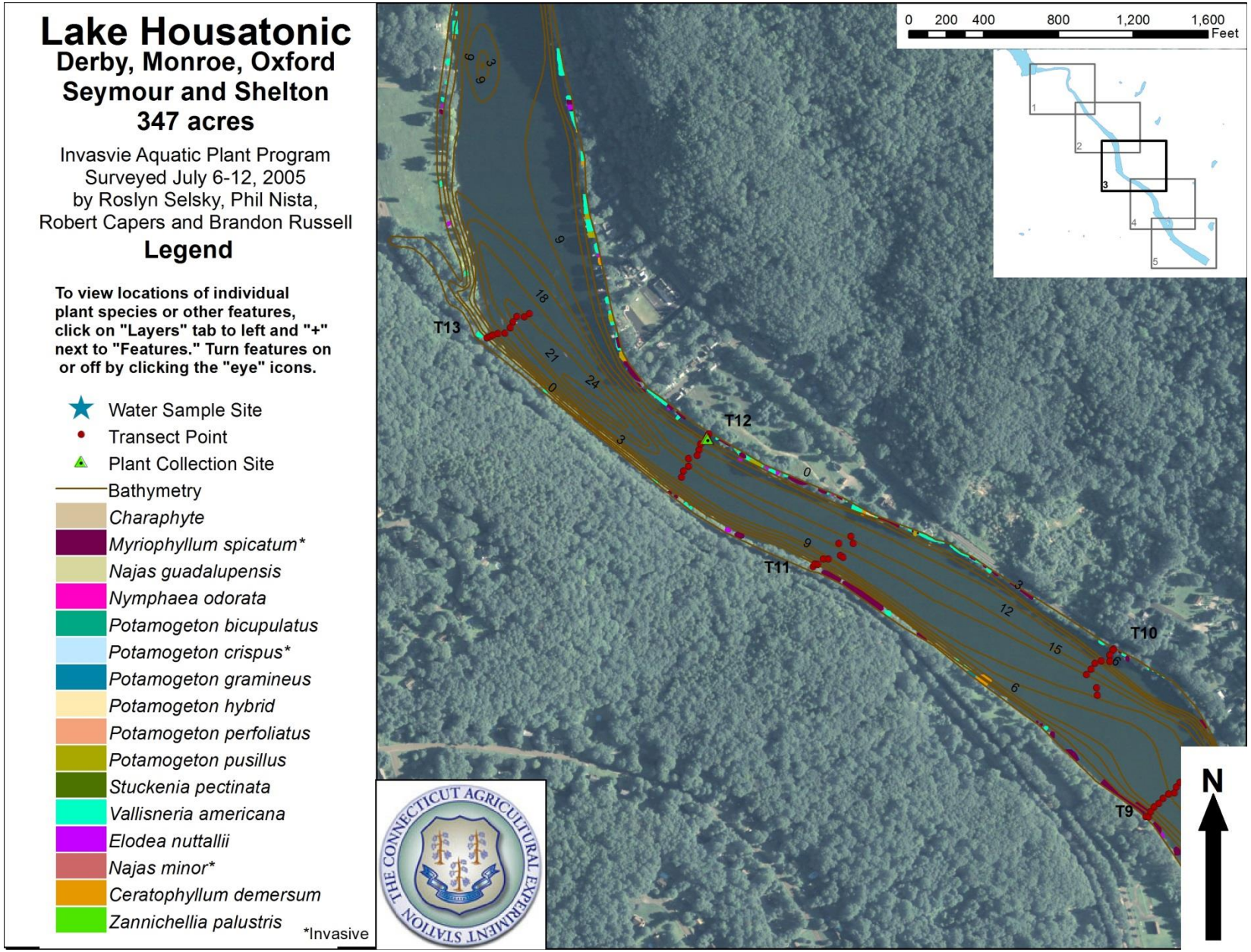
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Elodea nuttallii
Najas minor*
Ceratophyllum demersum
Zannichellia palustris
*Invasive
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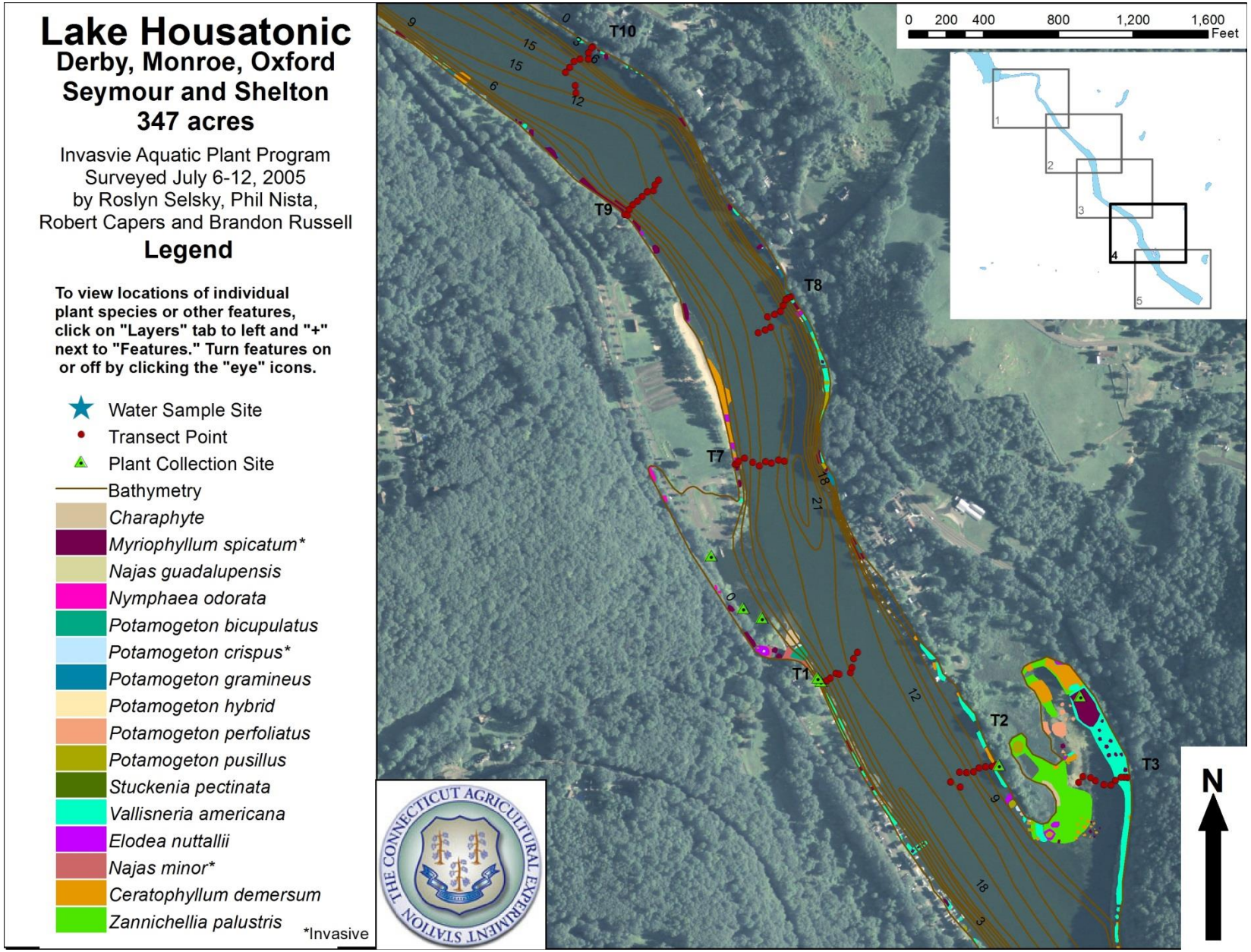
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Zannichellia palustris
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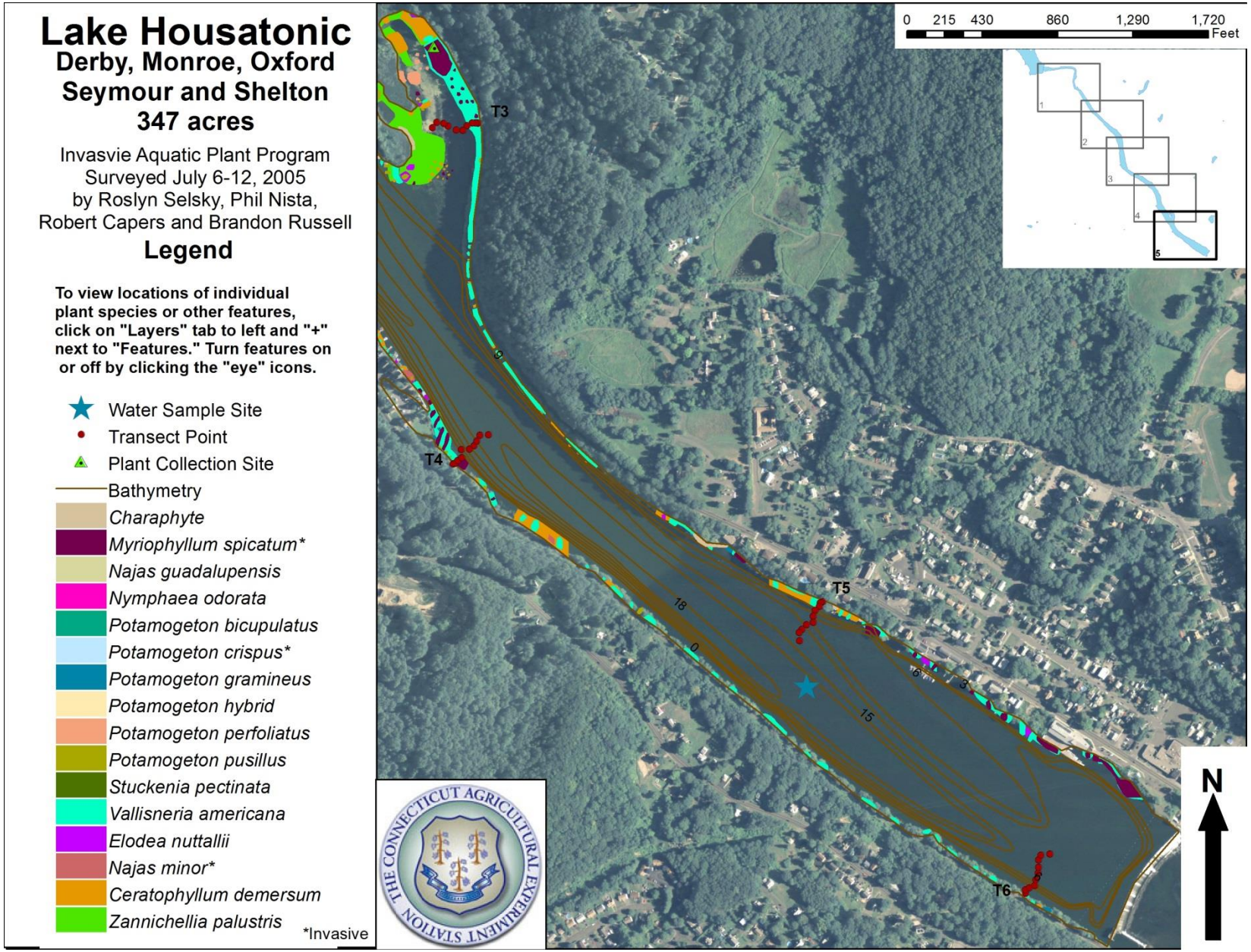
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Potamogeton pusillus
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Vallisneria americana
Elodea nuttallii
Najas minor*
Ceratophyllum demersum
Zannichellia palustris
*Invasive
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Feet
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THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION

Spring 2017 CAES IAPP Survey Maps

Lake Housatonic
Derby, Monroe, Oxford, Seymour, Shelton
346 acres

Surveyed June 13, 2017
by Greg Bugbee, Amanda Massa
and Abigail Wiegand
Invasive Aquatic Plant Program

Legend

To view locations of individual plant species or other features, click on "Layers" tab to left.
Turn features on or off by clicking the "eye" icons.

June 2017,Water Data

Bathymetry

Invasive Species Patches/Points

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

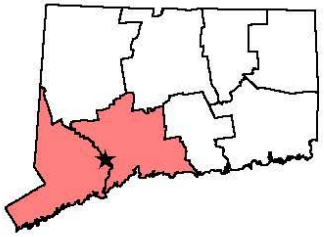
Potamogeton crispus = 1

Potamogeton crispus = 2

Potamogeton crispus = 3

Potamogeton crispus = 4

CAES
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875



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Lake Housatonic
Derby, Monroe, Oxford, Seymour, Shelton
346 acres

Surveyed June 13, 2017
by Greg Bugbee, Amanda Massa and Abigail Wiegand
Invasive Aquatic Plant Program

Legend

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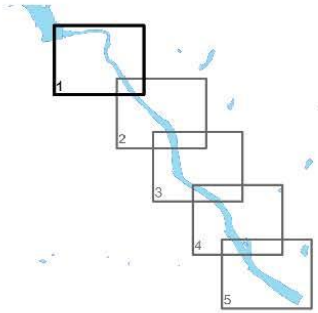

N

0 0.125 0.25 0.5 Kilometers

Lake Housatonic
Derby, Monroe, Oxford, Seymour, Shelton
346 acres

Surveyed June 13, 2017
by Greg Bugbee, Amanda Massa and Abigail Wiegand
Invasive Aquatic Plant Program

Legend

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June 2017,Water Data

Bathymetry

Invasive Species Patches/Points

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

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Potamogeton crispus = 2

Potamogeton crispus = 3

Potamogeton crispus = 4

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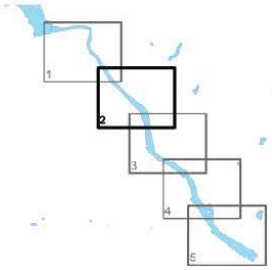

N

0 0.15 0.3 0.6 Kilometers

Lake Housatonic
Derby, Monroe, Oxford, Seymour, Shelton
346 acres

Surveyed June 13, 2017
by Greg Bugbee, Amanda Massa and Abigail Wiegand
Invasive Aquatic Plant Program

Legend

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June 2017,Water Data

Bathymetry

Invasive Species Patches/Points

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

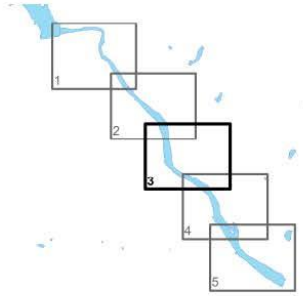
Potamogeton crispus = 1

Potamogeton crispus = 2

Potamogeton crispus = 3

Potamogeton crispus = 4

CAES
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875



N

Kilometers
0 0.15 0.3 0.6

Lake Housatonic
Derby, Monroe, Oxford, Seymour, Shelton
346 acres

Surveyed June 13, 2017
by Greg Bugbee, Amanda Massa
and Abigail Wiegand
Invasive Aquatic Plant Program

Legend

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Turn features on or off by clicking the "eye" icons.

June 2017,Water Data

Bathymetry

Invasive Species Patches/Points

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

Potamogeton crispus = 1

Potamogeton crispus = 2

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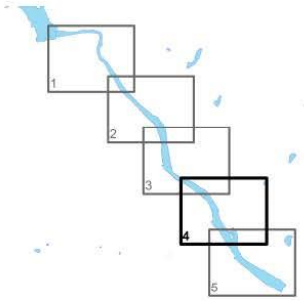
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875



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Kilometers
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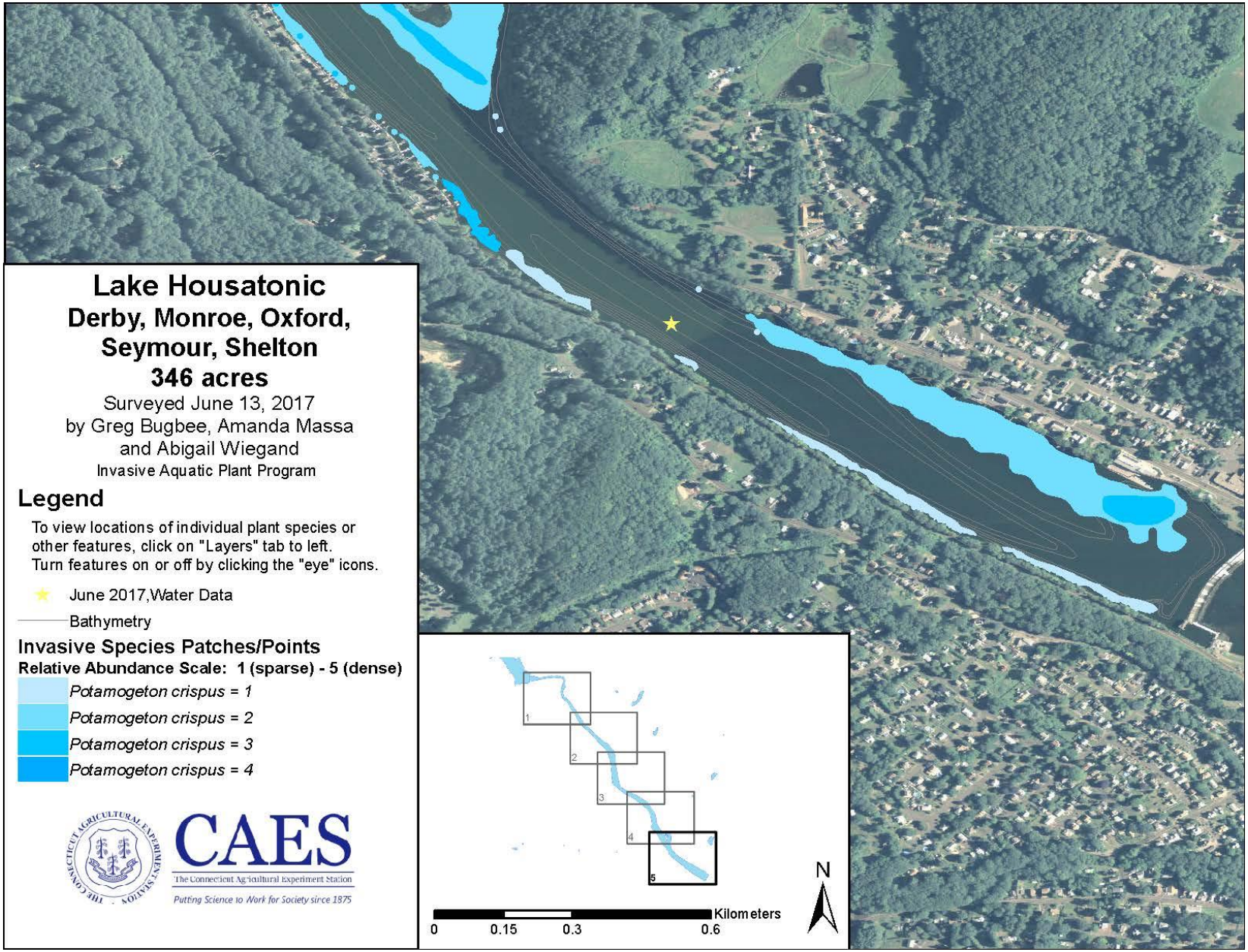
Lake Housatonic
Derby, Monroe, Oxford,
Seymour, Shelton
346 acres
Surveyed June 13, 2017
by Greg Bugbee, Amanda Massa
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Invasive Aquatic Plant Program
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June 2017,Water Data
Bathymetry
Invasive Species Patches/Points
Relative Abundance Scale: 1 (sparse) - 5 (dense)
Potamogeton crispus = 1
Potamogeton crispus = 2
Potamogeton crispus = 3
Potamogeton crispus = 4
CAES
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875
1
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5
N
Kilometers
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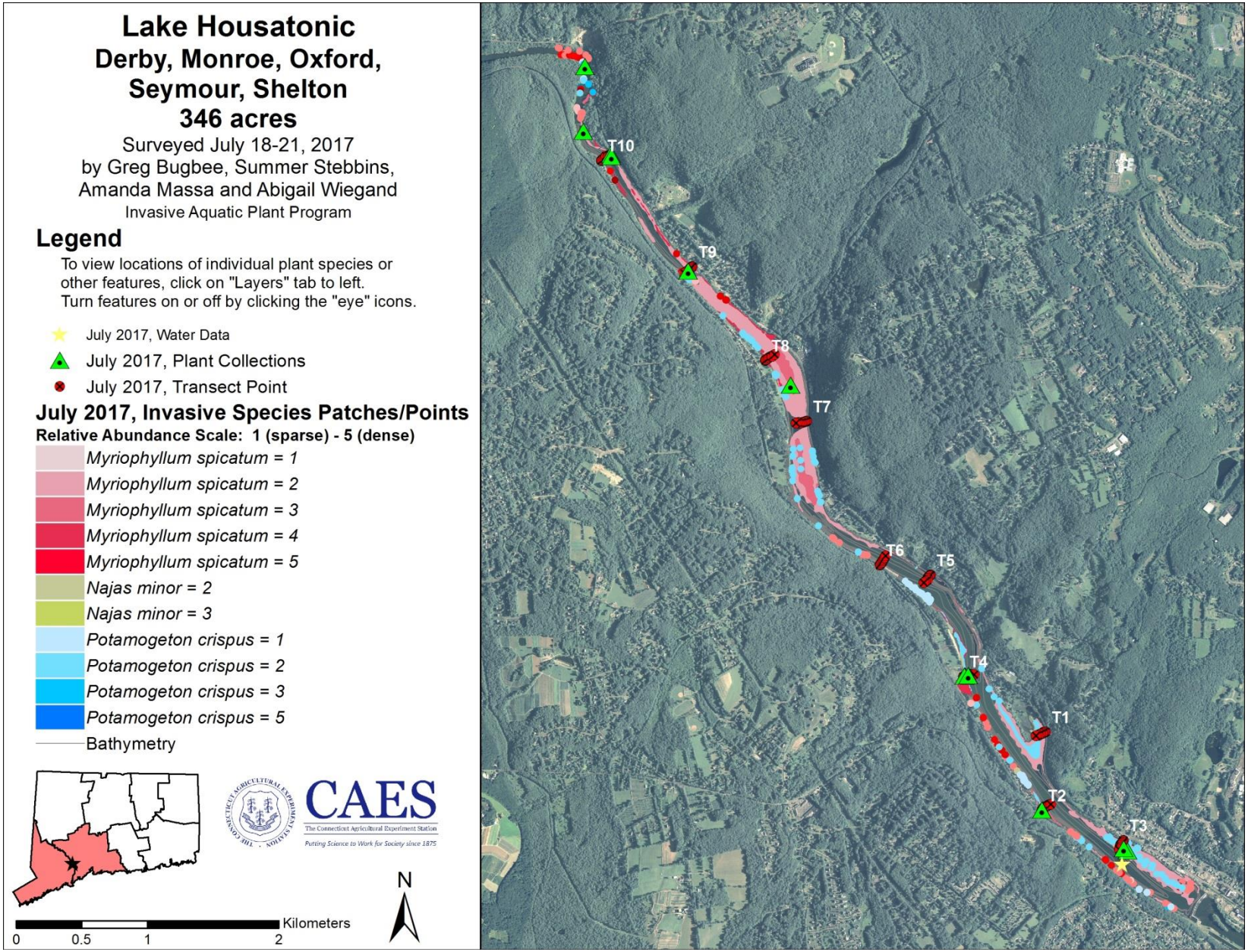
0.15
0.3
0.6

Summer 2017 CAES IAPP Survey Maps


Lake Housatonic
Derby, Monroe, Oxford,
Seymour, Shelton
346 acres
Surveyed July 18-21, 2017
by Greg Bugbee, Summer Stebbins,
Amanda Massa and Abigail Wiegand
Invasive Aquatic Plant Program
Legend
To view locations of individual plant species or other features, click on "Layers" tab to left.
Turn features on or off by clicking the "eye" icons.
July 2017, Water Data
July 2017, Plant Collections
July 2017, Transect Point
July 2017, Invasive Species Patches/Points
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Myriophyllum spicatum = 4
Myriophyllum spicatum = 5
Najas minor = 2
Najas minor = 3
Potamogeton crispus = 1
Potamogeton crispus = 2
Potamogeton crispus = 3
Potamogeton crispus = 5
Bathymetry
CAES
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875
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T9
T8
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T3

Lake Housatonic
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346 acres

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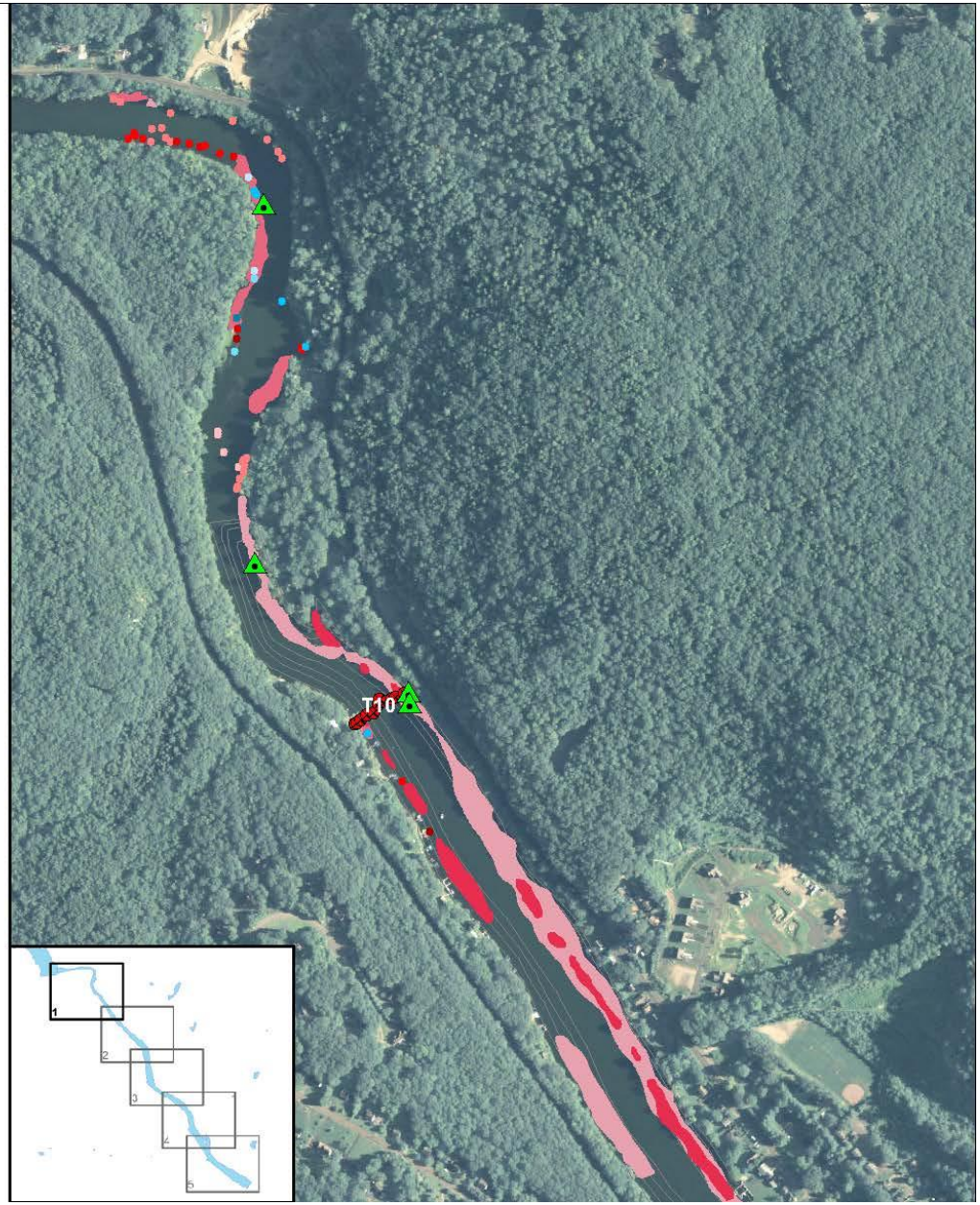
- *Najas minor = 2*
- *Najas minor = 3*
- *Potamogeton crispus = 1*
- *Potamogeton crispus = 2*
- *Potamogeton crispus = 3*
- *Potamogeton crispus = 5*
- Bathymetry

CAES
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875

N

0 0.125 0.25 0.5 Kilometers



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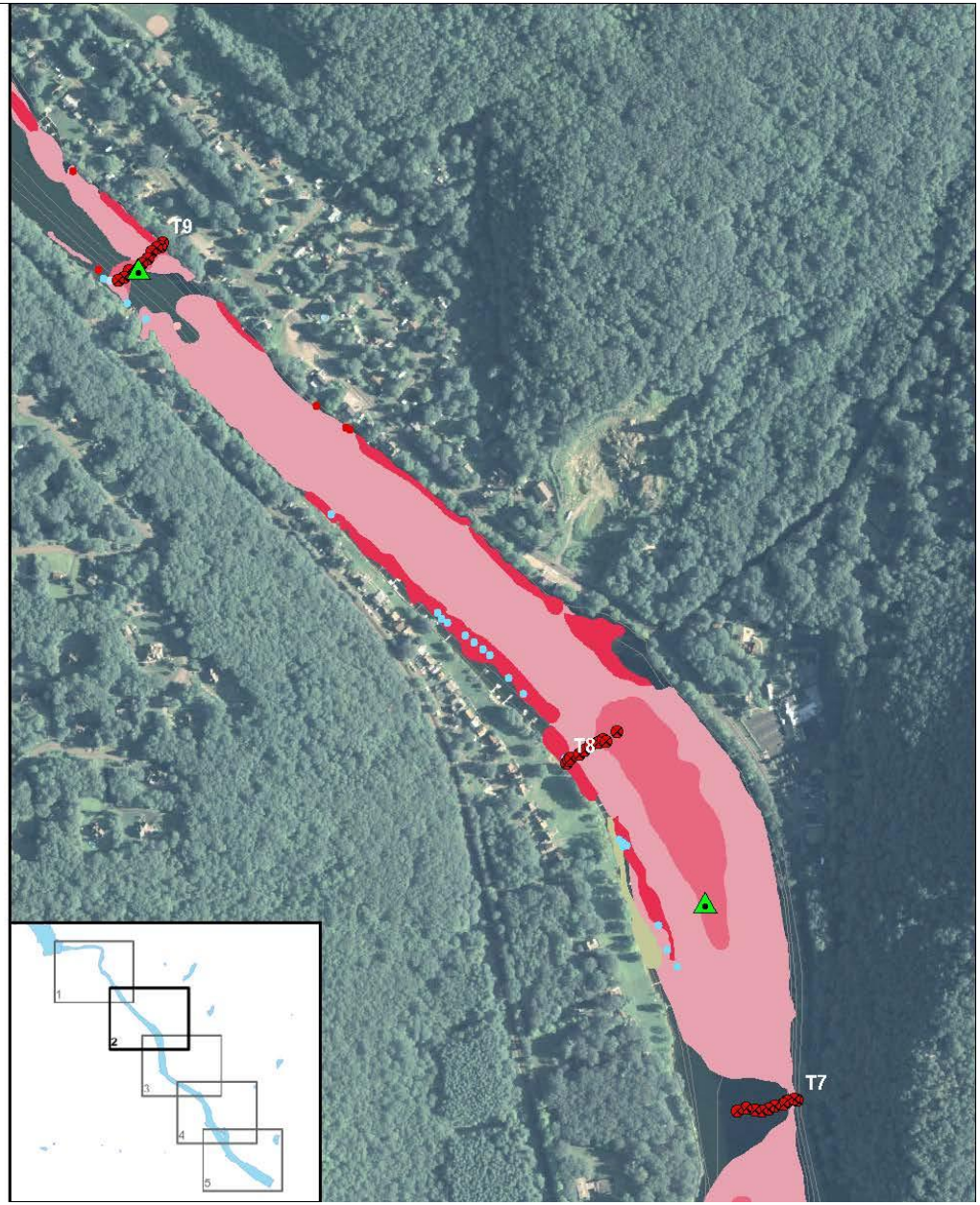

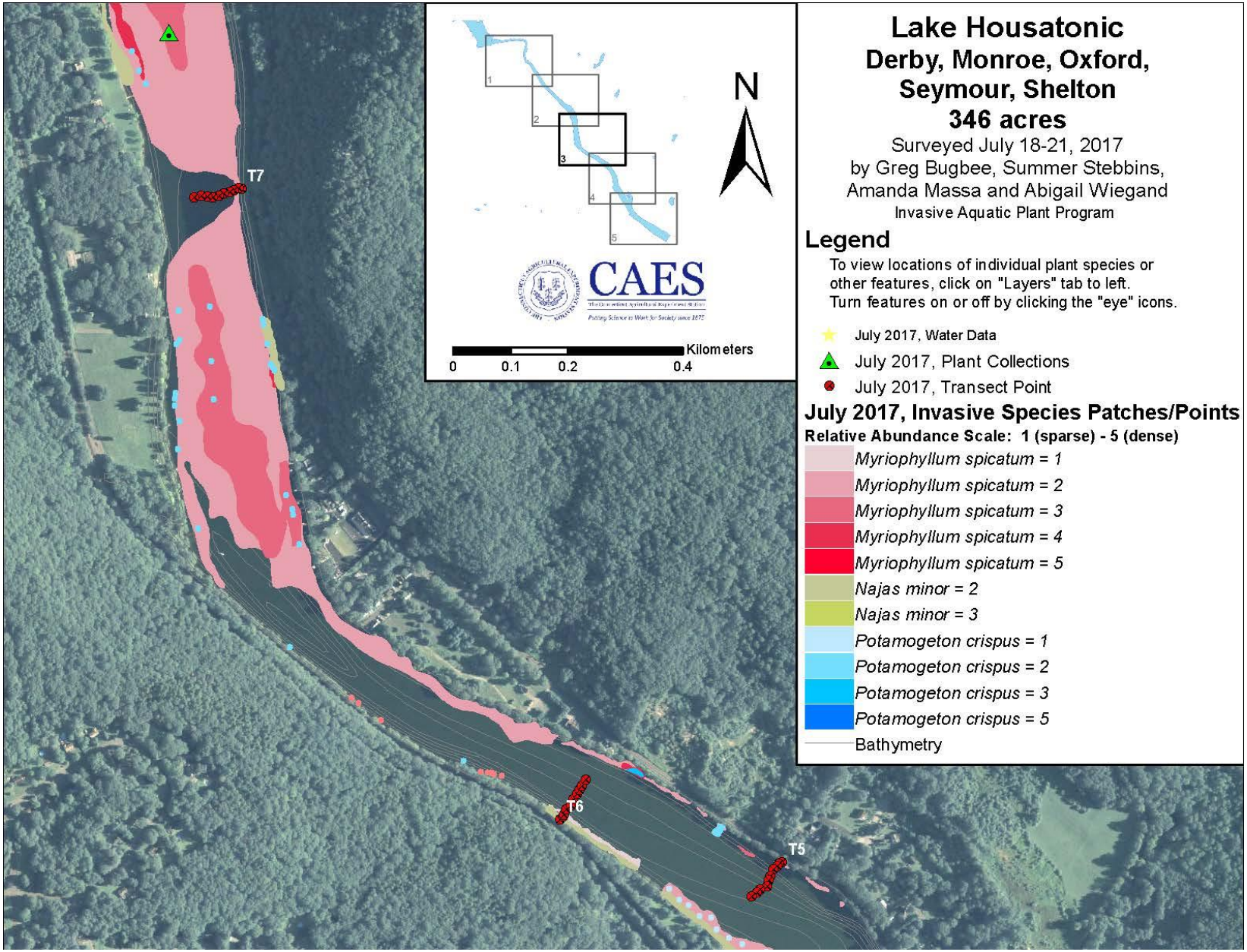
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Kilometers
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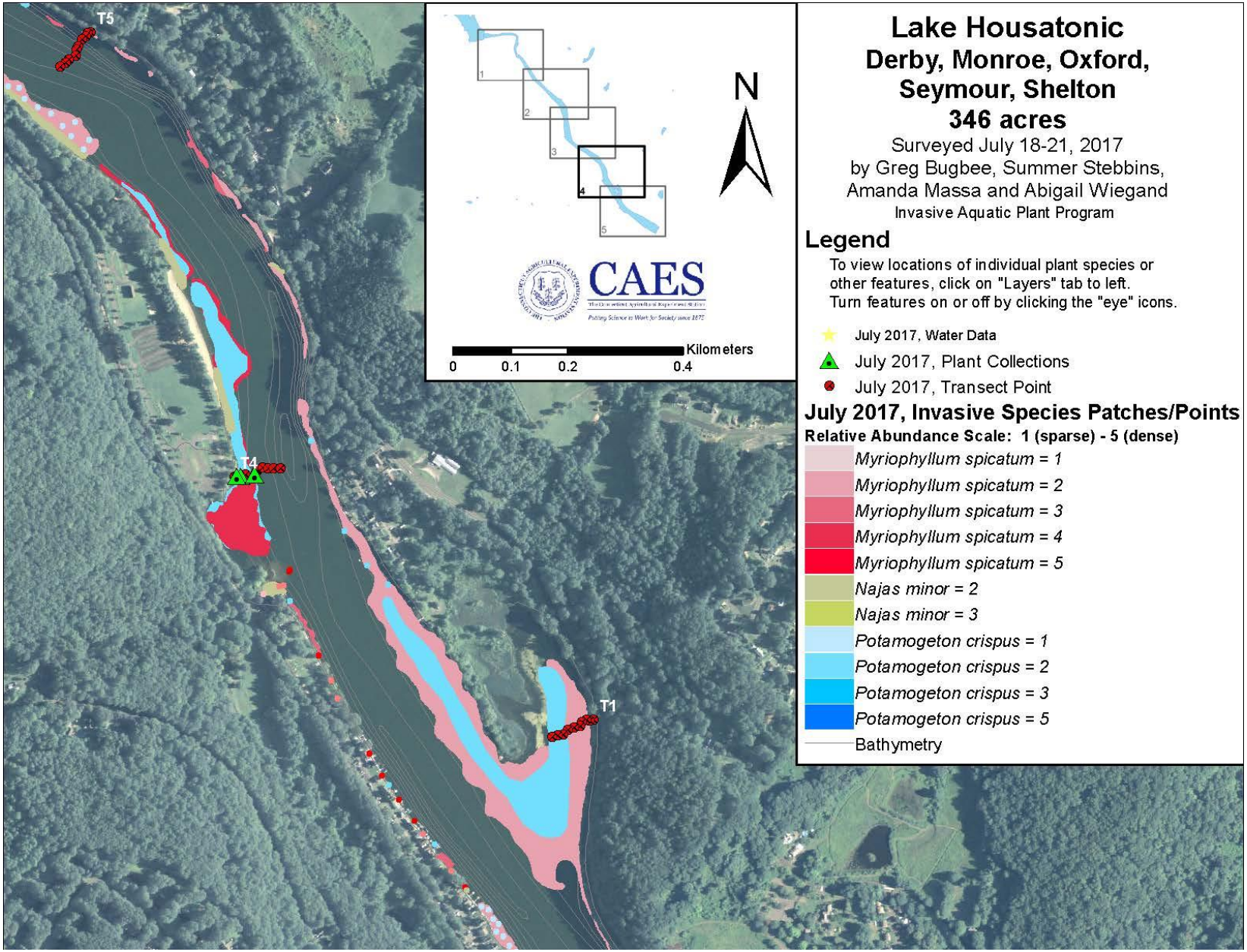
T5
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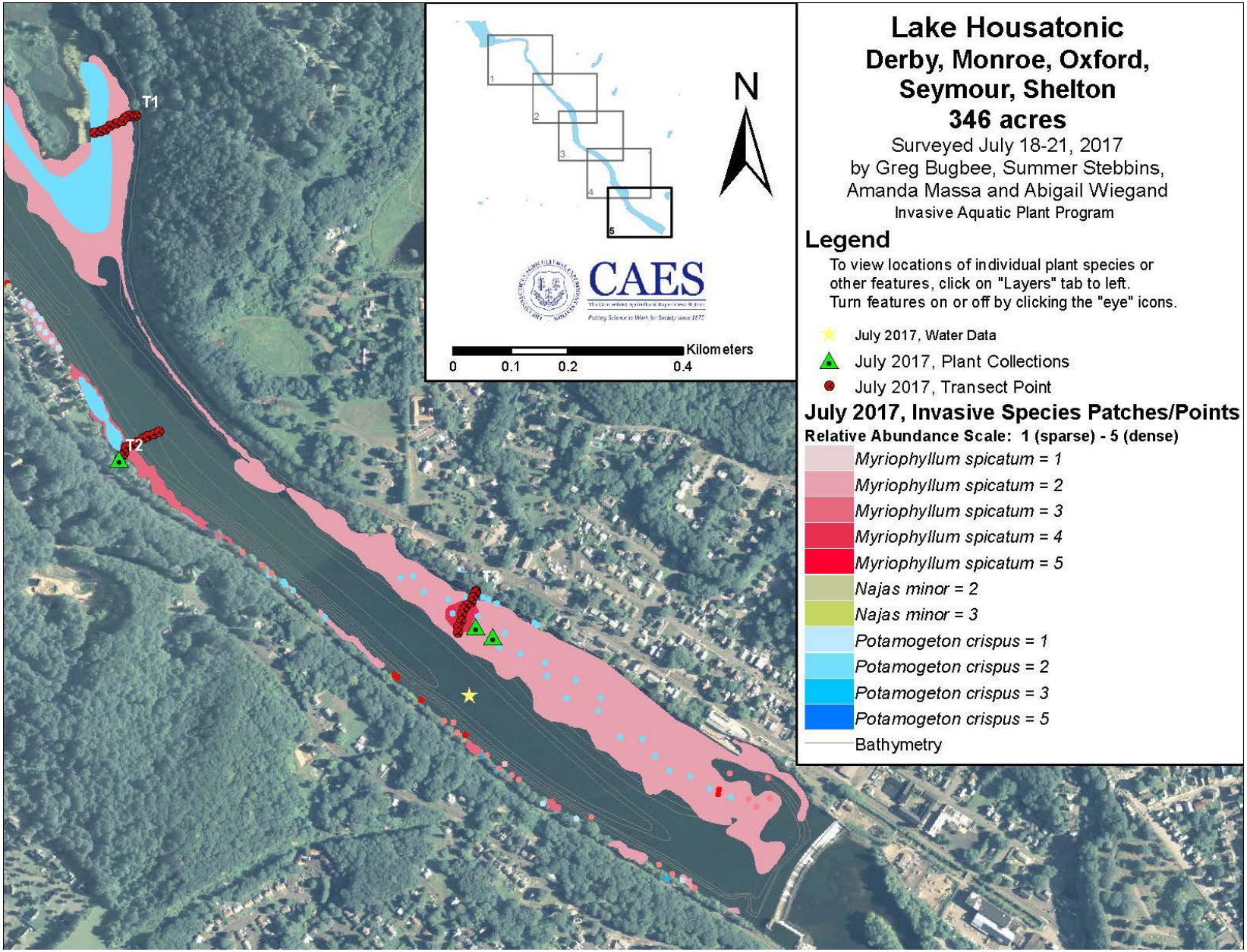
T1
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Bathymetry

Invasive Plant Descriptions

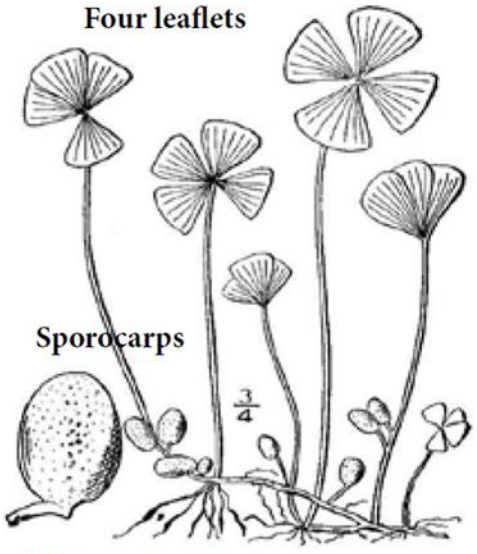
Marsilea quadrifolia

Common names:
European waterclover
Water shamrock

Origin:
Europe

Key features:
Floating leaf plant
Stems: Smooth petioles 2-12 inches (5-30 cm)
Leaves: Comprised of 4 fan-shaped leaflets (similar to a four-leaf clover)
Fruits/Seeds: 2 or 3 dark brown sporocarps 0.2 inches × 0.2 inches (4-5.5 mm × 3-4 mm)
Reproduction: Cloning and sporocarps

Easily confused species:
None



Britton, N.L., and A. Brown. 1913

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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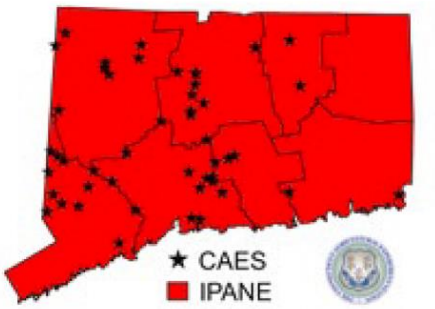
Center forAquatic and Invasive Plants


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.

Trapa natans

Common names:
Water chestnut
European water chestnut

Origin:
Asia and Europe

Key features:
Plants are rooted to substrate and float

Stems: Stem is submersed, flaccid and can be up to 15 feet (5 m) long

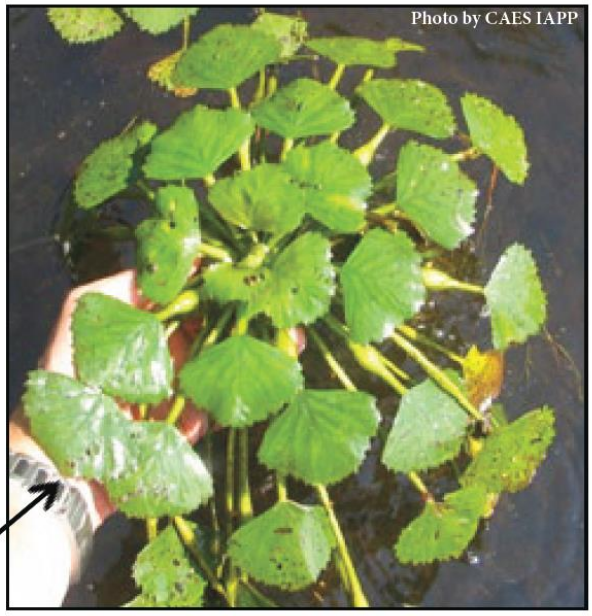
Leaves: Leaves 0.8-0.16 inches (2-4 cm) long are triangular and toothed along the front edge with inflated petioles, leaves float in a rosette pattern

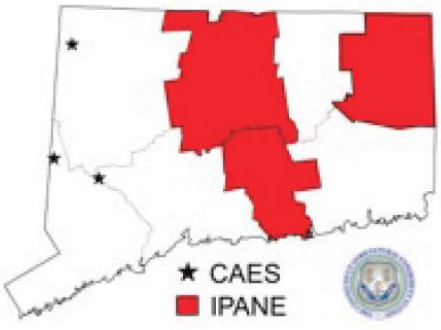
Flowers: Flowers are located in the center of the rosette and have four white petals

Fruits/Seeds: Fruit is hard and has four sharp spines

Reproduction: Seeds and fragmentation

Easily confused species:
None





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

Metadata

Metadata is data about data. This metadata gives background information on the content, quality, condition, legal liability and other appropriate characteristics of the data.

Metadata

Polygons and Points of Invasive Plants

Abstract This polygon and point data is of the invasive aquatic plant locations in Lake Housatonic found during the 2017 aquatic plant survey. The invasive aquatic plants found during the survey were *Potamogeton crispus* (curlyleaf pondweed), *Najas minor* (minor waternymph), and *Myriophyllum spicatum* (Eurasian watermilfoil). Survey boats with Trimble GPS units traveled along the outside of each invasive patch to obtain the polygons. In the event that invasive aquatic plants species co-occurred, two separate polygons would be made or the occurrence would be noted in the notes field. If plants covered an area of less than 1 meter in diameter a point feature was recorded. Depth was at three different locations in patches and the average depth range was assigned. For points one depth measurement was recorded. Abundance of each species in the patch or point was ranked on a scale of 1-5 (1 = rare, a single stem; 2 = uncommon, few stems; 3 = common; 4 = abundant; 5 = extremely abundant or dominant).

Purpose To document and assess the invasive aquatic plant infestation on Lake Housatonic during 2017. This data will also be available to compare with future invasive aquatic plant survey data.

Access Constraints This data is public access data and can be freely distributed. The Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP) should be clearly cited as the author in any published works. The State of Connecticut shall not be held liable for improper or incorrect use of the data described and/or contained within this web site. These data and related graphics are not legal documents and are not intended to be used as such. The information contained in these data is dynamic and will change over time. The State of Connecticut gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. It is the responsibility of the data user to use the data appropriately and consistent within these limitations. Although these data have been processed successfully on a computer system at the State of Connecticut, no warranty expressed or implied is made regarding the utility of the data on another system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data.

Use Constraints No restrictions or legal prerequisites for using the data. The data is suitable for use at appropriate scale, and is not intended for maps printed at scales greater or more detailed than 1:24,000 scale (1 inch = 2,000 feet). Although this data set has been used by the State of Connecticut, The Connecticut Agricultural Experiment Station, no warranty, expressed or implied, is made by the State of Connecticut, Connecticut Agricultural Experiment Station as to the accuracy of the data and or related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the State of Connecticut, Connecticut Agricultural Experiment Station in

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Credit Gregory J. Bugbee and Abigail C. Wiegand, The Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP)

Accuracy Report All aquatic plants noted in this feature were confirmed in the lab using a dichotomous key and, when possible, molecular techniques. Collection specimens of each plant can be found at The Connecticut Agricultural Experiment Station herbarium. Abundance determinations were made by the surveyor based on the abundance guidelines listed in the abstract of this metadata.

GPS Accuracy Positions were acquired by using a Trimble GeoXT® or a Trimble ProXT® with TerraSync 2.40 or 5.02 (WAAS enabled). Data was post-processed in the lab with Pathfinder Office 5.85 with data from local base stations. Therefore, the average accuracy of the data is less than 1m.

Process Position data was obtained in the field using a Trimble GeoXT® or a Trimble ProXT® with TerraSync 2.40 or 5.02 (WAAS enabled). Data was post-processed in the lab with Pathfinder Office 5.85 with data from local base stations and then imported into ESRI ArcMap 10.4.1 for display and analysis.

Metadata

Transects

Abstract Quantitative abundance information on native and invasive aquatic plants were obtained by using the CAES IAPP transect method. We positioned transects perpendicular to the shoreline and recorded GPS location and the abundance of each plant species found within a 2 m² area at 0.5, 5, 10, 20, 30, 40, 50, 60, 70 and 80 m from the shore (a total of 10 samples on each transect unless impaired by rocks, land etc.). Ten transects were established for Lake Housatonic. We ranked abundance of each species, at each transect point, on a scale of 1–5 (1 = rare, a single stem; 2 = uncommon, few stems; 3 = common; 4 = abundant; 5 = extremely abundant or dominant). Depth was measured at each transect point.

Purpose To document and assess the native and invasive aquatic plant community in Lake Housatonic during 2017. This data will also be available to compare with future aquatic plant survey data.

Access Constraints This data is public access data and can be freely distributed. The Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP) should be clearly cited as the author in any published works. The State of Connecticut shall not be held liable for improper or incorrect use of the data described and/or contained within this web site. These data and related graphics are not legal documents and are not intended to be used as such. The information contained in these data is dynamic and will change over time. The State of Connecticut gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. It is the responsibility of the data user to use the data appropriately and consistent within these limitations. Although these data have been processed successfully on a computer system at the State of Connecticut, no warranty expressed or implied is made regarding the utility of the data on another system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data.

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Metadata

Water Testing

Abstract Water data is taken by The Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP) in order to document and analyze the water conditions of surveyed aquatic plants in Lake Housatonic. At least one sample location is chosen in the deepest part of the lake. The depth (meters) and Secchi measurement (transparency; meters) are taken at each location, along with dissolved oxygen (mg/L) and temperature (◦C) at 0.5 meters from the surface and one-meter intervals to the bottom. Water samples are also taken at the sample location at 0.5-meter from the surface and near the water-body bottom. Water samples are assessed in the lab for conductivity (µs/cm), pH, alkalinity (expressed as mg/L $CaCO_3$) and phosphorous (µg/L).

Purpose Water data was taken by The Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP) in order to document and analyze the water conditions in Lakes Candlewood, Lillinonah, Zoar and Squantz Pond and correlate with surveyed aquatic plants.

Access Constraints This data is public access data and can be freely distributed. The Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP) should be clearly cited as the author in any published works. The State of Connecticut shall not be held liable for improper or incorrect use of the data described and/or contained within this web site. These data and related graphics are not legal documents and are not for use as such. The information contained in these data is dynamic and will change over time. The State of Connecticut gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of these data. It is the responsibility of the data user to use the data appropriately and consistent within these limitations. Although these data have been processed successfully on a computer system used by the State of Connecticut, no warranty expressed or implied is made regarding the utility of the data on another system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data.

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Credit Gregory J. Bugbee and Abigail C. Wiegand, The Connecticut Agricultural Experiment Station Invasive Aquatic Plant Program (CAES IAPP)

Accuracy Report Secchi measurements were taken in the field with a Secchi disk with measurement markers (meters), using the same method each time. Dissolved oxygen and temperature were taken in the field with a YSI 58 meter (YSI Incorporated, Yellow Springs, Ohio, USA) that was calibrated every time it was used. Water samples were stored at 3˚ C until analyzed for pH, alkalinity, conductivity and total phosphorus. Conductivity and pH were measured with a Fisher-Accumet AR20 meter (Fisher Scientific International Incorporated, Hampton, New Hampshire, USA), which was calibrated each time it was used. Alkalinity was quantified by titration and expressed as milligrams of $CaCO_3$ per liter (titrant was 0.08 mol/L H_2SO_4 with an end point of pH 4.5). The total phosphorus analysis was conducted on samples that were acidified with three drops of concentrated H_2SO_4, and consisted of the ascorbic acid method and potassium persulfate digestion outlined by the American Public Health Association (Standard Methods of the Examination of Water and Waste Water, 1995).

GPS Accuracy Positions were acquired by using a Trimble GeoXT® or a Trimble ProXT® with TerraSync 2.40 or 5.02 (WAAS enabled). Data was post-processed in the lab with Pathfinder Office 5.85 with data from local base stations. Therefore, the average accuracy of the data is less than 1m.

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Invasive Aquatic Plant Location Data

Lake Housatonic Invasive Plant Location Data (Page 1 of 3)

FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
1	PotCri		Patch	0-4	2	6/13/2017	09:58:02am	41.33710	-73.11780	12.1395
2	PotCri	Densest to the south	Patch	0-4	2	6/13/2017	10:48:12am	41.32831	-73.10655	11.9710
3	PotCri		Patch	2-4	2	6/13/2017	12:33:30pm	41.34436	-73.12286	0.0162
4	PotCri	Fixed from notes	Patch	0-4	1	6/13/2017	12:34:50pm	41.34496	-73.12322	0.1659
5	PotCri	Fixed from notes	Patch	0-1	3	6/13/2017	12:46:59pm	41.34775	-73.12605	0.0070
6	PotCri	Fixed from notes	Patch	0-2	3	6/13/2017	12:54:30pm	41.34951	-73.12989	0.0345
7	PotCri	Fixed from notes	Patch	0-2	4	6/13/2017	01:18:38pm	41.35370	-73.13685	0.0198
8	PotCri		Patch	1-3	3	6/13/2017	01:23:26pm	41.35540	-73.13726	0.0921
9	PotCri		Patch	0-2	2	6/13/2017	01:46:47pm	41.36438	-73.14138	0.2033
10	PotCri		Patch	0-3	2	6/13/2017	10:06:03am	41.33387	-73.11781	0.1965
11	PotCri		Patch	1-3	3	6/13/2017	10:08:46am	41.33263	-73.11677	0.7501
12	PotCri		Patch	0-4	1	6/13/2017	10:31:26am	41.33142	-73.11534	0.7926
13	PotCri		Patch	1-3	1	6/13/2017	10:38:37am	41.32982	-73.11257	0.1002
14	PotCri		Patch	1-4	1	6/13/2017	10:46:14am	41.32744	-73.10875	1.4154
15	PotCri		Patch	1-4	1	6/13/2017	10:58:07am	41.32547	-73.10473	0.9271
16	PotCri	Variable abundance	Patch	0-4	2	6/13/2017	12:29:50pm	41.34349	-73.12564	8.0340
17	PotCri		Patch	0-3	2	6/13/2017	01:10:06pm	41.36014	-73.14106	7.6805
18	PotCri		Patch	0-2	2	6/13/2017	02:26:52pm	41.37628	-73.15658	0.1274
19	PotCri	Plotted from notes	Patch	1-2	3	6/13/2017		41.33680	-73.11826	2.0119
20	PotCri	Plotted from notes	Patch	1-3	3	6/13/2017		41.32695	-73.10375	1.5030
21	PotCri	Plotted from notes	Patch	0-4	2	6/13/2017		41.33667	-73.12046	1.5110
22	PotCri		Point	0-1	1	6/13/2017	02:05:16pm	41.36814	-73.14879	0.0002
23	PotCri		Point	0-1	1	6/13/2017	02:15:39pm	41.37240	-73.15346	0.0002
24	PotCri		Point	0-1	2	6/13/2017	02:17:01pm	41.37296	-73.15379	0.0002
25	PotCri		Point	1-2	2	6/13/2017	02:23:38pm	41.37600	-73.15629	0.0002
26	PotCri		Point	0-1	2	6/13/2017	02:28:50pm	41.37648	-73.15683	0.0002
27	PotCri		Point	1-2	2	6/13/2017	02:30:32pm	41.37653	-73.15679	0.0002
28	PotCri		Point	0-2	1	6/13/2017	10:31:05am	41.33462	-73.11632	0.0002
29	PotCri		Point	0-2	1	6/13/2017	10:32:04am	41.33436	-73.11623	0.0002
30	PotCri		Point	0-1	1	6/13/2017	10:38:26am	41.33124	-73.11235	0.0002
31	PotCri		Point	3-4	1	6/13/2017	10:46:18am	41.33039	-73.11121	0.0002
32	PotCri		Point	3-4	2	6/13/2017	12:29:32pm	41.34270	-73.12231	0.0002
33	PotCri		Point	2-3	2	6/13/2017	12:41:03pm	41.34624	-73.12448	0.0002
34	PotCri		Point	3-4	2	6/13/2017	12:42:05pm	41.34634	-73.12455	0.0002
35	PotCri		Point	0-1	2	6/13/2017	12:46:27pm	41.34767	-73.12602	0.0002
36	PotCri		Point	0-1	2	6/13/2017	12:51:07pm	41.34881	-73.12833	0.0002

Lake Housatonic Invasive Plant Location Data (Page 2 of 3)

FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
37	PotCri		Point	1-2	2	6/13/2017	12:53:10pm	41.34925	-73.12935	0.0002
38	PotCri		Point	2-3	2	6/13/2017	12:58:01pm	41.34995	-73.13144	0.0002
39	PotCri		Point	1-3	2	6/13/2017	12:58:57pm	41.35003	-73.13161	0.0002
40	PotCri		Point	1-2	2	6/13/2017	12:59:23pm	41.35012	-73.13186	0.0002
41	PotCri		Point	1-2	2	6/13/2017	12:59:32pm	41.35014	-73.13193	0.0002
42	PotCri		Point	1-2	2	6/13/2017	12:59:36pm	41.35015	-73.13196	0.0002
43	PotCri		Point	2-3	2	6/13/2017	01:00:09pm	41.35028	-73.13253	0.0002
44	PotCri		Point	2-3	2	6/13/2017	01:02:27pm	41.35082	-73.13411	0.0002
45	PotCri		Point	2-3	3	6/13/2017	01:02:57pm	41.35094	-73.13433	0.0002
46	PotCri		Point	2-3	2	6/13/2017	01:03:10pm	41.35100	-73.13446	0.0002
47	PotCri		Point	2-3	2	6/13/2017	01:03:31pm	41.35105	-73.13464	0.0002
48	PotCri		Point	2-3	2	6/13/2017	01:04:25pm	41.35128	-73.13512	0.0002
49	PotCri		Point	1-3	3	6/13/2017	01:05:15pm	41.35157	-73.13556	0.0002
50	PotCri		Point	2-3	1	6/13/2017	01:05:38pm	41.35168	-73.13577	0.0002
51	PotCri		Point	1-3	2	6/13/2017	01:05:44pm	41.35172	-73.13581	0.0002
52	PotCri		Point	1-3	2	6/13/2017	01:05:52pm	41.35177	-73.13587	0.0002
53	PotCri		Point	1-3	3	6/13/2017	01:08:29pm	41.35321	-73.13681	0.0002
54	PotCri		Point	1-2	2	6/13/2017	01:20:50pm	41.35417	-73.13699	0.0002
55	PotCri		Point	1-2	2	6/13/2017	01:21:13pm	41.35424	-73.13702	0.0002
56	PotCri		Point	1-2	2	6/13/2017	01:21:56pm	41.35468	-73.13711	0.0002
57	PotCri		Point	2-3	1	6/13/2017	01:22:16pm	41.35488	-73.13719	0.0002
58	PotCri		Point	2-3	2	6/13/2017	01:22:23pm	41.35494	-73.13723	0.0002
59	PotCri		Point	2-3	2	6/13/2017	01:22:34pm	41.35504	-73.13724	0.0002
60	PotCri		Point	1-3	2	6/13/2017	01:22:38pm	41.35507	-73.13722	0.0002
61	PotCri		Point	1-3	2	6/13/2017	01:22:43pm	41.35510	-73.13719	0.0002
62	PotCri		Point	1-3	2	6/13/2017	01:25:40pm	41.35575	-73.13734	0.0002
63	PotCri		Point	1-2	2	6/13/2017	01:25:50pm	41.35585	-73.13735	0.0002
64	PotCri		Point	1-3	2	6/13/2017	01:26:06pm	41.35605	-73.13748	0.0002
65	PotCri		Point	0-2	2	6/13/2017	01:26:14pm	41.35612	-73.13744	0.0002
66	PotCri		Point	0-2	2	6/13/2017	01:27:15pm	41.35628	-73.13748	0.0002
67	PotCri		Point	0-2	3	6/13/2017	01:27:29pm	41.35642	-73.13753	0.0002
68	PotCri		Point	1-2	2	6/13/2017	01:27:51pm	41.35663	-73.13759	0.0002
69	PotCri		Point	1-2	2	6/13/2017	01:28:32pm	41.35684	-73.13760	0.0002
70	PotCri		Point	1-3	2	6/13/2017	01:29:17pm	41.35705	-73.13768	0.0002
71	PotCri		Point	1-3	2	6/13/2017	01:29:22pm	41.35710	-73.13770	0.0002
72	PotCri		Point	2-3	2	6/13/2017	01:29:49pm	41.35743	-73.13778	0.0002

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FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
73	PotCri		Point	2-3	2	6/13/2017	01:29:54pm	41.35750	-73.13779	0.0002
74	PotCri		Point	2-3	2	6/13/2017	01:30:12pm	41.35770	-73.13786	0.0002
75	PotCri		Point	2-4	2	6/13/2017	01:30:27pm	41.35788	-73.13793	0.0002
76	PotCri		Point	2-3	2	6/13/2017	01:31:01pm	41.35828	-73.13804	0.0002
77	PotCri		Point	2-3	2	6/13/2017	01:31:10pm	41.35836	-73.13806	0.0002
78	PotCri		Point	2-4	2	6/13/2017	01:31:17pm	41.35842	-73.13807	0.0002
79	PotCri		Point	2-4	2	6/13/2017	01:31:28pm	41.35852	-73.13809	0.0002
80	PotCri		Point	2-4	2	6/13/2017	01:31:34pm	41.35857	-73.13810	0.0002
81	PotCri		Point	1-3	2	6/13/2017	02:06:16pm	41.36938	-73.14906	0.0002
82	PotCri		Point	1-2	2	6/13/2017	02:08:32pm	41.37073	-73.15068	0.0002
83	PotCri		Point	2-4	2	6/13/2017	02:11:11pm	41.37202	-73.15200	0.0002
84	PotCri		Point	0-1	2	6/13/2017	02:19:10pm	41.37664	-73.15581	0.0002
85	PotCri		Point	1-2	2	6/13/2017	02:22:09pm	41.37748	-73.15735	0.0002
86	PotCri		Point	1-3	2	6/13/2017	02:22:19pm	41.37739	-73.15733	0.0002
87	PotCri		Point	0-1	2	6/13/2017	02:28:01pm	41.38097	-73.15753	0.0002
88	PotCri		Point	1-3	2	6/13/2017	02:28:21pm	41.38096	-73.15759	0.0002
89	PotCri	Plotted from notes	Point	3-4	3	6/13/2017		41.33780	-73.12129	0.0002
90	PotCri	Plotted from notes	Point	1-2	3	6/13/2017		41.33618	-73.12014	0.0002
91	PotCri	Plotted from notes	Point	1-2	3	6/13/2017		41.33546	-73.11946	0.0002
92	PotCri	Plotted from notes	Point	2-4	3	6/13/2017		41.33683	-73.12061	0.0002
93	PotCri	Plotted from notes	Point	3-4	2	6/13/2017		41.33832	-73.12171	0.0002
94	PotCri	Plotted from notes	Point	3-4	2	6/13/2017		41.33843	-73.12161	0.0002
95	PotCri	Plotted from notes	Point	3-4	2	6/13/2017		41.33867	-73.12191	0.0002
96	PotCri	Plotted from notes	Point	3-4	2	6/13/2017		41.33892	-73.12210	0.0002
97	PotCri	Plotted from notes	Point	1-3	2	6/13/2017		41.33519	-73.11913	0.0002
98	PotCri	Plotted from notes	Point	0-2	2	6/13/2017		41.33462	-73.11860	0.0002
99	PotCri	Plotted from notes	Point	0-2	2	6/13/2017		41.33432	-73.11830	0.0002
100	PotCri	Plotted from notes	Point	1-3	2	6/13/2017		41.33387	-73.11778	0.0002
101	PotCri	Plotted from notes	Point	1-2	2	6/13/2017		41.33343	-73.11749	0.0002
102	PotCri	Plotted from notes	Point	3-4	2	6/13/2017		41.33947	-73.12215	0.0002
103	PotCri	Plotted from notes	Point	3-4	2	6/13/2017		41.33970	-73.12224	0.0002

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FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
1	MyrSpi	Patchy	Patch	0-5	2	7/18/2017	01:40:27pm	41.33204	-73.11173	39.5881
2	MyrSpi	Patchy	Patch	1-3	2	7/18/2017	02:21:52pm	41.34376	-73.12243	0.2080
3	MyrSpi	Patchy	Patch	0-1	2	7/18/2017	02:32:12pm	41.34492	-73.12316	0.0954
4	MyrSpi	Patchy	Patch	0-1	2	7/18/2017	02:36:00pm	41.34554	-73.12378	0.1326
5	MyrSpi	Patchy	Patch	0-1	2	7/18/2017	02:48:12pm	41.34738	-73.12541	0.0123
6	MyrSpi	Patchy	Patch	0-1	2	7/18/2017	02:49:22pm	41.34767	-73.12590	0.0512
7	MyrSpi	Patchy	Patch	0-1	2	7/18/2017	02:52:36pm	41.34799	-73.12668	0.0173
8	MyrSpi		Patch	1-3	3	7/18/2017	02:55:27pm	41.34818	-73.12739	0.0278
9	MyrSpi		Patch	0-1	2	7/19/2017	09:27:46am	41.34856	-73.12792	0.0201
10	MyrSpi	Patchy at depth less than 1m	Patch	0-3	2	7/19/2017	09:32:52am	41.34946	-73.12990	0.2925
11	MyrSpi		Patch	0-2	4	7/19/2017	09:45:15am	41.34945	-73.12976	0.1007
12	MyrSpi		Patch	0-1	3	7/19/2017	12:29:36pm	41.38406	-73.16054	0.1025
13	MyrSpi		Patch	0-2	2	7/19/2017	12:32:26pm	41.38399	-73.16016	0.0205
14	MyrSpi		Patch	0-2	3	7/19/2017	12:49:28pm	41.38048	-73.15819	0.4075
15	MyrSpi		Patch	0-3	4	7/19/2017	01:17:18pm	41.37745	-73.15727	0.1808
16	MyrSpi		Patch	0-4	2	7/20/2017	09:23:29am	41.37343	-73.15323	7.3166
17	MyrSpi	Variable abundance	Patch	0-4	2	7/20/2017	09:49:59am	41.36052	-73.14067	54.4610
18	MyrSpi		Patch	0-2	4	7/20/2017	10:43:11am	41.36806	-73.14720	0.1516
19	MyrSpi		Patch	0-2	4	7/20/2017	10:51:37am	41.36620	-73.14443	0.4035
20	MyrSpi		Patch	0-2	4	7/20/2017	10:53:33am	41.36497	-73.14253	0.4276
21	MyrSpi		Patch	0-3	4	7/20/2017	10:56:09am	41.36415	-73.14119	0.8888
22	MyrSpi		Patch	2-4	3	7/20/2017	11:00:49am	41.36219	-73.14005	6.0449
23	MyrSpi	Fixed from notes	Patch	1-4	3	7/20/2017	11:14:51am	41.35469	-73.13800	7.9652
24	MyrSpi		Patch	0-1	2	7/18/2017	10:26:35am	41.32491	-73.10364	0.0337
25	MyrSpi		Patch	0-1	2	7/18/2017	10:36:56am	41.32536	-73.10463	0.0683
26	MyrSpi		Patch	0-1	2	7/18/2017	10:43:43am	41.32581	-73.10582	0.2427
27	MyrSpi		Patch	0-1	3	7/18/2017	10:55:39am	41.32653	-73.10740	0.0726
28	MyrSpi		Patch	0-1	3	7/18/2017	11:05:51am	41.32743	-73.10907	0.0808
29	MyrSpi		Patch	0-2	2	7/18/2017	11:18:12am	41.32910	-73.11161	0.2820
30	MyrSpi		Patch	0-1	2	7/18/2017	11:33:07am	41.32991	-73.11288	0.0354
31	MyrSpi		Patch	1-3	3	7/18/2017	11:39:41am	41.33070	-73.11427	0.0382
32	MyrSpi		Patch	0-4	3	7/18/2017	11:48:34am	41.33270	-73.11687	0.8709
33	MyrSpi		Patch	0-2	2	7/18/2017	01:23:43pm	41.33400	-73.11808	0.4184
34	MyrSpi		Patch	0-1	3	7/18/2017	01:41:51pm	41.33510	-73.11920	0.0756
35	MyrSpi		Patch	0-3	3	7/18/2017	02:02:30pm	41.33878	-73.12216	0.1187
36	MyrSpi		Patch	0-4	4	7/18/2017	02:27:01pm	41.34286	-73.12381	2.5019
37	MyrSpi		Patch	0-3	4	7/18/2017	02:46:39pm	41.34494	-73.12522	0.9309
38	MyrSpi		Patch	0-4	2	7/19/2017	09:27:33am	41.34678	-73.12760	1.6785
39	MyrSpi		Patch	0-4	1	7/19/2017	09:47:01am	41.34831	-73.13034	0.3595
40	MyrSpi		Patch	1-3	3	7/19/2017	12:38:21pm	41.38227	-73.15851	0.6852
41	MyrSpi		Patch	1-3	3	7/19/2017	01:22:58pm	41.37625	-73.15658	0.0578
42	MyrSpi		Patch	0-2	4	7/19/2017	01:30:31pm	41.37589	-73.15621	0.0359
43	MyrSpi		Patch	1-3	4	7/19/2017	01:33:00pm	41.37540	-73.15576	0.1529
44	MyrSpi		Patch	0-3	4	7/19/2017	01:36:19pm	41.37438	-73.15495	0.6193

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FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
45	MyrSpi		Patch	0-3	2	7/19/2017	01:42:54pm	41.37158	-73.15265	1.3603
46	MyrSpi		Patch	0-1	2	7/19/2017	01:53:20pm	41.36902	-73.14998	0.0669
47	MyrSpi		Patch	0-1	2	7/20/2017	09:26:37am	41.36852	-73.14917	0.1133
48	MyrSpi		Patch	0-3	4	7/20/2017	09:51:15am	41.36444	-73.14373	1.9550
49	MyrSpi		Patch	0-3	4	7/20/2017	10:21:52am	41.36121	-73.14051	0.6223
50	MyrSpi		Patch	1-3	4	7/20/2017	10:59:44am	41.35558	-73.13726	0.0826
51	MyrSpi		Patch	0-3	4	7/20/2017	11:03:45am	41.35623	-73.13741	0.0597
52	PotCri	Plotted from notes	Patch	0-4	2	7/20/2017		41.33216	-73.11632	1.0490
53	MyrSpi	Plotted from notes	Patch	0-4	3	7/20/2017		41.34617	-73.12442	0.0982
54	MyrSpi	Plotted from notes	Patch	1-2	3	7/20/2017		41.34464	-73.12299	0.0043
55	MyrSpi	Plotted from notes	Patch	1-3	3	7/20/2017		41.34564	-73.12399	0.0545
56	PotCri	Plotted from notes	Patch	0-3	2	7/20/2017		41.34852	-73.12798	0.0698
57	PotCri	Plotted from notes	Patch	0-2	3	7/20/2017		41.34943	-73.12970	0.0396
58	PotCri	Plotted from notes	Patch	0-4	2	7/20/2017		41.34160	-73.12366	4.5249
59	PotCri	Plotted from notes	Patch	0-3	2	7/20/2017		41.34489	-73.12516	0.4176
60	MyrSpi	Plotted from notes	Patch	1-3	4	7/20/2017		41.37700	-73.15660	0.0304
61	MyrSpi	Plotted from notes	Patch	0-2	4	7/20/2017		41.37673	-73.15605	0.0404
62	MyrSpi	Plotted from notes	Patch	2-4	4	7/20/2017		41.37418	-73.15388	0.2010
63	MyrSpi	Plotted from notes	Patch	2-4	4	7/20/2017		41.37365	-73.15343	0.0763
64	MyrSpi	Plotted from notes	Patch	2-4	4	7/20/2017		41.37301	-73.15280	0.2624
65	MyrSpi	Plotted from notes	Patch	2-4	4	7/20/2017		41.37225	-73.15212	0.0310
66	MyrSpi	Plotted from notes	Patch	1-4	4	7/20/2017		41.37118	-73.15124	0.7240
67	MyrSpi	Plotted from notes	Patch	1-3	4	7/20/2017		41.36938	-73.14900	0.2359
68	PotCri	Plotted from notes	Patch	0-4	2	7/20/2017		41.33698	-73.11795	6.5482
69	Naj min	Plotted from notes	Patch	0-3	2	7/20/2017		41.34435	-73.12275	0.0413
70	Naj min	Plotted from notes	Patch	0-2	2	7/20/2017		41.34226	-73.12384	0.3480
71	Naj min	Plotted from notes	Patch	0-2	2	7/20/2017		41.34440	-73.12490	0.2899
72	Naj min	Plotted from notes	Patch	0-2	2	7/20/2017		41.34679	-73.12790	0.6931
73	Naj min	Plotted from notes	Patch	0-2	2	7/20/2017		41.34839	-73.13064	0.3117
74	Naj min	Plotted from notes	Patch	0-2	2	7/20/2017		41.36082	-73.14060	0.6501
75	Naj min	Plotted from notes	Patch	0-2	2	7/20/2017		41.35596	-73.13729	0.4361
76	Naj min	Plotted from notes	Patch	0-3	2	7/20/2017		41.33932	-73.12280	0.1638
77	MyrSpi	Plotted from notes	Patch	2-3	1	7/18/2017		41.34110	-73.12357	0.0160
78	MyrSpi		Patch	0-4	4	7/18/2017	02:27:01pm	41.34039	-73.12349	2.0600
79	MyrSpi	Plotted from notes	Patch	1-4	2	7/18/2017		41.34111	-73.12337	0.0691
80	Naj min	Plotted from notes	Patch	2-4	3	7/18/2017		41.34110	-73.12354	0.0188
81	Naj min	Plotted from notes	Patch	3-4	2	7/18/2017		41.34110	-73.12346	0.0174
82	MyrSpi	Plotted from notes	Patch	0-1	4	7/18/2017		41.37635	-73.15663	0.0157
83	MyrSpi	Plotted from notes	Patch	0-1	2	7/18/2017		41.37630	-73.15673	0.0169
84	Naj min	Plotted from notes	Patch	0-1	2	7/18/2017		41.37635	-73.15676	0.0157
85	PotCri	Plotted from notes	Patch	0-1	2	7/18/2017		41.37635	-73.15677	0.0120
86	PotCri	Plotted from notes	Patch	0-2	2	7/18/2017		41.37671	-73.15597	0.0141
87	MyrSpi	Plotted from notes	Patch	0-2	4	7/18/2017		41.36270	-73.14174	0.5217
88	PotCri	Plotted from notes	Patch	0-1	2	7/18/2017		41.36270	-73.14177	0.0308

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FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
89	MyrSpi	Plotted from notes	Patch	0-2	3	7/18/2017		41.34872	-73.13120	0.0035
90	MyrSpi	Plotted from notes	Patch	0-2	2	7/18/2017		41.34875	-73.13122	0.0032
91	Naj min	Plotted from notes	Patch	0-1	3	7/18/2017		41.33200	-73.11639	0.0356
92	Naj min	Plotted from notes	Patch	0-1	2	7/18/2017		41.33194	-73.11647	0.0139
93	MyrSpi		Patch	0-4	3	7/18/2017	11:48:34am	41.33151	-73.11559	0.7098
94	MyrSpi	Plotted from notes	Patch	1-3	2	7/18/2017		41.33210	-73.11631	0.0299
95	MyrSpi	Plotted from notes	Patch	2-4	1	7/18/2017		41.33214	-73.11622	0.0252
96	PotCri	Plotted from notes	Patch	0-3	3	7/18/2017		41.33212	-73.11634	0.0359
97	MyrSpi	Plotted from notes	Patch	0-4	3	7/18/2017		41.36879	-73.14887	0.4283
98	MyrSpi		Patch	0-4	2	7/20/2017	09:23:29am	41.36879	-73.14831	0.2402
99	MyrSpi	Plotted from notes	Patch	0-2	3	7/18/2017		41.35853	-73.13796	0.0067
100	MyrSpi	Plotted from notes	Patch	2-4	2	7/18/2017		41.34780	-73.12692	0.0087
101	MyrSpi	Plotted from notes	Patch	2-4	4	7/18/2017		41.32949	-73.10933	0.5124
102	MyrSpi	Plotted from notes	Patch	3-4	3	7/18/2017		41.32924	-73.10943	0.0175
103	PotCri	Plotted from notes	Patch	0-3	2	7/18/2017		41.32975	-73.10913	0.0700
104	PotCri	Plotted from notes	Patch	0-1	3	7/18/2017		41.32984	-73.10906	0.0157
105	MyrSpi		Point	0-1	2	7/18/2017	10:34:36am	41.32525	-73.10444	0.0002
106	MyrSpi		Point	0-1	2	7/18/2017	10:40:24am	41.32546	-73.10492	0.0002
107	PotCri		Point	0-1	3	7/18/2017	10:41:34am	41.32540	-73.10503	0.0002
108	MyrSpi		Point	0-1	2	7/18/2017	10:42:27am	41.32561	-73.10519	0.0002
109	MyrSpi		Point	1-2	2	7/18/2017	10:52:35am	41.32634	-73.10660	0.0002
110	PotCri		Point	0-1	1	7/18/2017	10:53:35am	41.32633	-73.10692	0.0002
111	PotCri		Point	0-1	1	7/18/2017	10:55:19am	41.32655	-73.10762	0.0002
112	MyrSpi		Point	0-1	2	7/18/2017	10:59:33am	41.32693	-73.10811	0.0002
113	MyrSpi		Point	0-1	2	7/18/2017	10:59:58am	41.32701	-73.10826	0.0002
114	MyrSpi		Point	0-1	1	7/18/2017	11:00:20am	41.32717	-73.10840	0.0002
115	PotCri		Point	0-1	3	7/18/2017	11:01:03am	41.32708	-73.10857	0.0002
116	PotCri		Point	0-1	3	7/18/2017	11:02:36am	41.32730	-73.10885	0.0002
117	MyrSpi		Point	0-1	3	7/18/2017	11:09:22am	41.32762	-73.10924	0.0002
118	MyrSpi		Point	0-1	2	7/18/2017	11:10:28am	41.32766	-73.10940	0.0002
119	MyrSpi		Point	0-1	2	7/18/2017	11:11:16am	41.32782	-73.10947	0.0002
120	MyrSpi		Point	0-1	2	7/18/2017	11:12:05am	41.32784	-73.10967	0.0002
121	MyrSpi		Point	0-1	3	7/18/2017	11:13:38am	41.32816	-73.11015	0.0002
122	MyrSpi		Point	0-1	3	7/18/2017	11:14:34am	41.32852	-73.11065	0.0002
123	MyrSpi		Point	0-1	3	7/18/2017	11:14:50am	41.32856	-73.11070	0.0002
124	PotCri		Point	0-1	2	7/18/2017	11:27:37am	41.32945	-73.11215	0.0002
125	PotCri		Point	0-1	2	7/18/2017	11:36:16am	41.33011	-73.11332	0.0002
126	MyrSpi		Point	0-1	2	7/18/2017	11:37:04am	41.33027	-73.11346	0.0002
127	MyrSpi		Point	0-1	2	7/18/2017	11:37:54am	41.33048	-73.11388	0.0002
128	MyrSpi		Point	0-1	3	7/18/2017	01:35:46pm	41.33467	-73.11878	0.0002
129	MyrSpi		Point	0-1	2	7/18/2017	01:40:26pm	41.33492	-73.11908	0.0002
130	MyrSpi		Point	0-1	3	7/18/2017	01:46:24pm	41.33534	-73.11942	0.0002
131	MyrSpi		Point	0-1	2	7/18/2017	01:47:26pm	41.33550	-73.11967	0.0002
132	MyrSpi		Point	0-1	4	7/18/2017	01:48:37pm	41.33570	-73.11984	0.0002

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FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
133	MyrSpi		Point	0-1	4	7/18/2017	01:50:08pm	41.33603	-73.12016	0.0002
134	MyrSpi		Point	0-1	3	7/18/2017	01:51:22pm	41.33626	-73.12038	0.0002
135	MyrSpi		Point	0-1	3	7/18/2017	01:52:09pm	41.33640	-73.12052	0.0002
136	MyrSpi		Point	0-1	3	7/18/2017	01:54:03pm	41.33674	-73.12079	0.0002
137	MyrSpi		Point	0-1	2	7/18/2017	01:56:42pm	41.33761	-73.12146	0.0002
138	MyrSpi		Point	1-2	2	7/18/2017	01:57:28pm	41.33789	-73.12158	0.0002
139	MyrSpi		Point	1-2	3	7/18/2017	01:59:30pm	41.33827	-73.12184	0.0002
140	MyrSpi		Point	2-3	2	7/18/2017	02:09:22pm	41.33936	-73.12267	0.0002
141	MyrSpi		Point	2-3	2	7/18/2017	02:10:26pm	41.33937	-73.12258	0.0002
142	MyrSpi		Point	3-4	3	7/18/2017	02:11:11pm	41.33962	-73.12246	0.0002
143	MyrSpi		Point	3-4	4	7/18/2017	02:12:44pm	41.33959	-73.12247	0.0002
144	MyrSpi		Point	2-3	2	7/19/2017	09:59:41am	41.34936	-73.13247	0.0002
145	MyrSpi		Point	1-2	2	7/19/2017	10:02:32am	41.34938	-73.13264	0.0002
146	MyrSpi		Point	1-2	2	7/19/2017	10:02:46am	41.34940	-73.13271	0.0002
147	MyrSpi		Point	1-2	2	7/19/2017	10:02:57am	41.34941	-73.13277	0.0002
148	MyrSpi		Point	0-1	2	7/19/2017	10:03:14am	41.34942	-73.13291	0.0002
149	PotCri		Point	1-2	2	7/19/2017	10:04:50am	41.34958	-73.13327	0.0002
150	MyrSpi		Point	1-2	2	7/19/2017	10:08:50am	41.35021	-73.13499	0.0002
151	MyrSpi		Point	1-2	2	7/19/2017	10:10:08am	41.35048	-73.13546	0.0002
152	MyrSpi		Point	1-2	2	7/19/2017	10:10:37am	41.35056	-73.13561	0.0002
153	PotCri		Point	2-3	2	7/19/2017	10:14:46am	41.35135	-73.13690	0.0002
154	MyrSpi		Point	0-1	3	7/19/2017	12:28:08pm	41.38354	-73.16052	0.0002
155	MyrSpi		Point	0-1	3	7/19/2017	12:29:03pm	41.38362	-73.16041	0.0002
156	MyrSpi		Point	0-1	3	7/19/2017	12:29:19pm	41.38358	-73.16040	0.0002
157	MyrSpi		Point	1-3	2	7/19/2017	12:32:09pm	41.38367	-73.15997	0.0002
158	MyrSpi		Point	1-3	2	7/19/2017	12:32:40pm	41.38367	-73.16013	0.0002
159	MyrSpi		Point	0-1	3	7/19/2017	12:33:10pm	41.38353	-73.16027	0.0002
160	MyrSpi		Point	0-1	2	7/19/2017	12:33:43pm	41.38350	-73.16015	0.0002
161	MyrSpi		Point	0-1	2	7/19/2017	12:34:25pm	41.38355	-73.15991	0.0002
162	MyrSpi		Point	0-1	2	7/19/2017	12:34:39pm	41.38351	-73.15982	0.0002
163	MyrSpi		Point	0-1	4	7/19/2017	12:34:52pm	41.38351	-73.15973	0.0002
164	MyrSpi		Point	0-1	3	7/19/2017	12:35:20pm	41.38349	-73.15951	0.0002
165	MyrSpi		Point	0-1	4	7/19/2017	12:35:51pm	41.38345	-73.15933	0.0002
166	MyrSpi		Point	0-1	3	7/19/2017	12:36:02pm	41.38345	-73.15926	0.0002
167	MyrSpi		Point	0-1	3	7/19/2017	12:36:37pm	41.38337	-73.15901	0.0002
168	MyrSpi		Point	0-1	4	7/19/2017	12:37:03pm	41.38332	-73.15878	0.0002
169	PotCri		Point	0-1	1	7/19/2017	12:47:55pm	41.38307	-73.15853	0.0002
170	PotCri		Point	0-1	3	7/19/2017	12:48:24pm	41.38290	-73.15843	0.0002
171	PotCri		Point	0-1	3	7/19/2017	12:48:35pm	41.38285	-73.15841	0.0002
172	PotCri		Point	0-1	1	7/19/2017	12:49:07pm	41.38268	-73.15833	0.0002
173	PotCri		Point	0-1	1	7/19/2017	12:56:07pm	41.38191	-73.15844	0.0002
174	PotCri		Point	0-1	2	7/19/2017	12:56:42pm	41.38181	-73.15844	0.0002
175	PotCri		Point	0-1	5	7/19/2017	01:10:40pm	41.38132	-73.15871	0.0002
176	PotCri		Point	0-1	5	7/19/2017	01:11:35pm	41.38120	-73.15868	0.0002

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FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
177	MyrSpi		Point	0-1	4	7/19/2017	01:12:23pm	41.38119	-73.15870	0.0002
178	MyrSpi		Point	0-1	5	7/19/2017	01:12:46pm	41.38108	-73.15872	0.0002
179	PotCri		Point	0-1	2	7/19/2017	01:13:09pm	41.38091	-73.15875	0.0002
180	PotCri		Point	0-1	3	7/19/2017	01:27:30pm	41.37620	-73.15653	0.0002
181	MyrSpi		Point	1-2	3	7/19/2017	01:31:53pm	41.37560	-73.15597	0.0002
182	MyrSpi		Point	1-2	5	7/19/2017	01:34:51pm	41.37498	-73.15551	0.0002
183	MyrSpi		Point	0-1	3	7/20/2017	09:23:57am	41.36874	-73.14948	0.0002
184	PotCri		Point	0-1	1	7/20/2017	09:25:46am	41.36861	-73.14929	0.0002
185	PotCri		Point	0-1	2	7/20/2017	09:26:32am	41.36864	-73.14940	0.0002
186	PotCri		Point	0-1	2	7/20/2017	09:29:21am	41.36834	-73.14900	0.0002
187	PotCri		Point	0-1	2	7/20/2017	09:38:33am	41.36814	-73.14871	0.0002
188	MyrSpi		Point	2-3	1	7/20/2017	09:39:43am	41.36806	-73.14818	0.0002
189	PotCri		Point	0-1	2	7/20/2017	10:08:51am	41.36573	-73.14565	0.0002
190	PotCri		Point	1-3	2	7/20/2017	10:12:22am	41.36453	-73.14388	0.0002
191	PotCri		Point	1-3	2	7/20/2017	10:12:31am	41.36445	-73.14382	0.0002
192	PotCri		Point	1-3	2	7/20/2017	10:12:39am	41.36440	-73.14373	0.0002
193	PotCri		Point	2-3	2	7/20/2017	10:13:00am	41.36425	-73.14343	0.0002
194	PotCri		Point	2-3	2	7/20/2017	10:13:10am	41.36416	-73.14329	0.0002
195	PotCri		Point	2-3	2	7/20/2017	10:13:20am	41.36407	-73.14315	0.0002
196	PotCri		Point	2-3	2	7/20/2017	10:13:28am	41.36400	-73.14303	0.0002
197	PotCri		Point	1-3	2	7/20/2017	10:13:54am	41.36372	-73.14271	0.0002
198	PotCri		Point	1-3	2	7/20/2017	10:14:12am	41.36353	-73.14247	0.0002
199	PotCri		Point	1-2	2	7/20/2017	10:29:21am	41.36164	-73.14083	0.0002
200	PotCri		Point	0-1	2	7/20/2017	10:29:48am	41.36173	-73.14090	0.0002
201	PotCri		Point	1-2	2	7/20/2017	10:30:11am	41.36169	-73.14084	0.0002
202	PotCri		Point	1-3	2	7/20/2017	10:30:18am	41.36166	-73.14076	0.0002
203	PotCri		Point	1-3	2	7/20/2017	10:31:44am	41.36067	-73.14023	0.0002
204	PotCri		Point	1-3	2	7/20/2017	10:32:11am	41.36037	-73.14009	0.0002
205	PotCri		Point	1-3	2	7/20/2017	10:32:30am	41.36016	-73.13993	0.0002
206	PotCri		Point	2-4	2	7/20/2017	10:37:52am	41.35661	-73.13923	0.0002
207	PotCri		Point	2-4	2	7/20/2017	10:38:37am	41.35615	-73.13922	0.0002
208	PotCri		Point	2-4	2	7/20/2017	10:38:48am	41.35609	-73.13928	0.0002
209	PotCri		Point	2-4	2	7/20/2017	10:39:55am	41.35532	-73.13930	0.0002
210	PotCri		Point	2-4	2	7/20/2017	10:40:03am	41.35524	-73.13930	0.0002
211	PotCri		Point	2-4	2	7/20/2017	10:40:12am	41.35513	-73.13932	0.0002
212	PotCri		Point	2-4	2	7/20/2017	10:40:37am	41.35488	-73.13921	0.0002
213	PotCri		Point	3-4	2	7/20/2017	10:41:28am	41.35444	-73.13923	0.0002
214	PotCri		Point	3-4	2	7/20/2017	10:43:35am	41.35320	-73.13881	0.0002
215	PotCri		Point	1-3	2	7/20/2017	10:48:38am	41.35297	-73.13671	0.0002
216	PotCri		Point	1-3	2	7/20/2017	10:54:54am	41.35343	-73.13683	0.0002
217	PotCri		Point	1-3	2	7/20/2017	10:55:04am	41.35352	-73.13686	0.0002
218	PotCri		Point	1-3	2	7/20/2017	10:55:24am	41.35373	-73.13699	0.0002
219	PotCri		Point	1-2	2	7/20/2017	11:01:12am	41.35578	-73.13732	0.0002
220	PotCri		Point	1-2	2	7/20/2017	11:01:24am	41.35572	-73.13727	0.0002

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FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
221	PotCri		Point	1-2	2	7/20/2017	11:01:33am	41.35568	-73.13725	0.0002
222	PotCri		Point	1-2	2	7/20/2017	11:06:14am	41.35609	-73.13738	0.0002
223	PotCri		Point	1-2	2	7/20/2017	11:06:53am	41.35640	-73.13746	0.0002
224	PotCri		Point	1-2	2	7/20/2017	11:07:09am	41.35648	-73.13749	0.0002
225	PotCri		Point	2-4	2	7/20/2017	11:29:16am	41.35668	-73.13859	0.0002
226	PotCri		Point	2-3	2	7/20/2017	11:29:59am	41.35582	-73.13855	0.0002
227	PotCri		Point	2-3	2	7/20/2017	11:30:28am	41.35523	-73.13850	0.0002
228	PotCri	Plotted from notes	Point	0-1	1	7/20/2017		41.32537	-73.10471	0.0002
229	PotCri	Plotted from notes	Point	0-1	2	7/20/2017		41.32988	-73.11283	0.0002
230	PotCri	Plotted from notes	Point	0-1	2	7/20/2017		41.32997	-73.11297	0.0002
231	PotCri	Plotted from notes	Point	0-1	2	7/20/2017		41.33001	-73.11302	0.0002
232	PotCri	Plotted from notes	Point	1-3	2	7/20/2017		41.33912	-73.12244	0.0002
233	MyrSpi		Point	3-4	2	7/18/2017	10:43:53am	41.32663	-73.10333	0.0002
234	MyrSpi		Point	3-4	2	7/18/2017	10:44:46am	41.32651	-73.10318	0.0002
235	MyrSpi		Point	3-4	2	7/18/2017	10:45:11am	41.32665	-73.10291	0.0002
236	MyrSpi		Point	2-3	2	7/18/2017	10:45:49am	41.32697	-73.10294	0.0002
237	MyrSpi		Point	3-4	2	7/18/2017	10:46:52am	41.32705	-73.10374	0.0002
238	MyrSpi		Point	3-4	3	7/18/2017	10:47:21am	41.32679	-73.10395	0.0002
239	MyrSpi		Point	3-4	3	7/18/2017	10:47:31am	41.32671	-73.10398	0.0002
240	PotCri		Point	0-2	2	7/18/2017	11:57:34am	41.32934	-73.10774	0.0002
241	PotCri		Point	0-2	2	7/18/2017	11:58:11am	41.32939	-73.10780	0.0002
242	PotCri		Point	0-2	2	7/18/2017	11:59:04am	41.32969	-73.10857	0.0002
243	PotCri		Point	0-2	2	7/18/2017	11:59:23am	41.32975	-73.10876	0.0002
244	PotCri		Point	0-2	2	7/18/2017	11:59:32am	41.32978	-73.10887	0.0002
245	MyrSpi		Point	1-3	2	7/19/2017	12:28:27pm	41.38400	-73.16066	0.0002
246	MyrSpi		Point	1-3	2	7/19/2017	12:28:43pm	41.38402	-73.16077	0.0002
247	MyrSpi		Point	1-3	2	7/19/2017	12:34:18pm	41.38386	-73.15982	0.0002
248	MyrSpi		Point	0-1	2	7/19/2017	12:35:39pm	41.38377	-73.15881	0.0002
249	MyrSpi		Point	0-1	2	7/19/2017	12:37:56pm	41.38353	-73.15823	0.0002
250	MyrSpi		Point	0-1	2	7/19/2017	12:38:43pm	41.38339	-73.15806	0.0002
251	MyrSpi		Point	0-1	2	7/19/2017	12:38:52pm	41.38330	-73.15799	0.0002
252	MyrSpi		Point	0-1	2	7/19/2017	12:45:45pm	41.38154	-73.15798	0.0002
253	MyrSpi		Point	0-2	2	7/19/2017	12:47:41pm	41.38098	-73.15758	0.0002
254	MyrSpi		Point	0-2	3	7/19/2017	12:48:11pm	41.38093	-73.15763	0.0002
255	MyrSpi		Point	0-2	3	7/19/2017	12:49:12pm	41.38096	-73.15766	0.0002
256	MyrSpi		Point	0-2	1	7/19/2017	01:01:17pm	41.37992	-73.15902	0.0002
257	MyrSpi		Point	0-2	1	7/19/2017	01:01:30pm	41.37989	-73.15902	0.0002
258	MyrSpi		Point	0-2	1	7/19/2017	01:02:14pm	41.37967	-73.15892	0.0002
259	MyrSpi		Point	0-2	1	7/19/2017	01:03:03pm	41.37949	-73.15867	0.0002
260	MyrSpi		Point	0-1	2	7/19/2017	01:03:20pm	41.37951	-73.15858	0.0002
261	MyrSpi		Point	0-1	2	7/19/2017	01:03:41pm	41.37954	-73.15862	0.0002
262	MyrSpi		Point	0-1	2	7/19/2017	01:03:45pm	41.37957	-73.15859	0.0002
263	MyrSpi		Point	0-1	2	7/19/2017	01:03:50pm	41.37960	-73.15855	0.0002
264	MyrSpi		Point	0-1	2	7/19/2017	01:05:41pm	41.37942	-73.15860	0.0002

Lake Housatonic Invasive Plant Location Data (Page 7 of 8)

FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
265	MyrSpi		Point	0-1	2	7/19/2017	01:05:51pm	41.37934	-73.15866	0.0002
266	MyrSpi		Point	0-1	2	7/19/2017	01:06:06pm	41.37924	-73.15869	0.0002
267	MyrSpi		Point	0-1	2	7/19/2017	01:06:10pm	41.37921	-73.15871	0.0002
268	MyrSpi		Point	1-2	4	7/20/2017	09:37:12am	41.36997	-73.14992	0.0002
269	MyrSpi		Point	0-1	4	7/20/2017	10:49:46am	41.36708	-73.14590	0.0002
270	MyrSpi		Point	0-1	4	7/20/2017	10:50:25am	41.36681	-73.14540	0.0002
271	MyrSpi		Point	0-1	4	7/20/2017	10:50:39am	41.36679	-73.14535	0.0002
272	MyrSpi	Plotted from notes	Point	0-1	2	7/20/2017		41.32730	-73.10878	0.0002
273	MyrSpi	Plotted from notes	Point	0-1	2	7/20/2017		41.32710	-73.10853	0.0002
274	MyrSpi	Plotted from notes	Point	0-1	2	7/20/2017		41.33015	-73.11327	0.0002
275	NajMin	Plotted from notes	Point	0-1	2	7/20/2017		41.33462	-73.11875	0.0002
276	PotCri	Plotted from notes	Point	1-2	2	7/18/2017		41.32978	-73.10910	0.0002
277	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32971	-73.10913	0.0002
278	PotCri	Plotted from notes	Point	0-2	3	7/18/2017		41.32985	-73.10905	0.0002
279	PotCri	Plotted from notes	Point	3-4	1	7/18/2017		41.34780	-73.12691	0.0002
280	PotCri	Plotted from notes	Point	3-4	2	7/18/2017		41.33009	-73.11059	0.0002
281	PotCri	Plotted from notes	Point	3-4	2	7/18/2017		41.33011	-73.11034	0.0002
282	PotCri	Plotted from notes	Point	3-4	2	7/18/2017		41.32986	-73.11010	0.0002
283	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32975	-73.10961	0.0002
284	PotCri	Plotted from notes	Point	3-4	2	7/18/2017		41.32953	-73.10950	0.0002
285	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32947	-73.10898	0.0002
286	PotCri	Plotted from notes	Point	2-4	2	7/18/2017		41.32922	-73.10842	0.0002
287	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32899	-73.10852	0.0002
288	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32889	-73.10809	0.0002
289	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32876	-73.10758	0.0002
290	PotCri	Plotted from notes	Point	3-4	2	7/18/2017		41.32855	-73.10755	0.0002
291	PotCri	Plotted from notes	Point	3-4	2	7/18/2017		41.32820	-73.10714	0.0002
292	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32848	-73.10694	0.0002
293	PotCri	Plotted from notes	Point	1-3	2	7/18/2017		41.32822	-73.10642	0.0002
294	PotCri	Plotted from notes	Point	1-3	2	7/18/2017		41.32801	-73.10647	0.0002
295	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32759	-73.10602	0.0002
296	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32757	-73.10554	0.0002
297	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32731	-73.10528	0.0002
298	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32707	-73.10498	0.0002
299	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32699	-73.10455	0.0002
300	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.32680	-73.10415	0.0002
301	PotCri	Plotted from notes	Point	2-4	2	7/18/2017		41.32666	-73.10370	0.0002
302	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33437	-73.11845	0.0002
303	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33431	-73.11829	0.0002
304	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33416	-73.11820	0.0002
305	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33410	-73.11808	0.0002
306	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33397	-73.11812	0.0002
307	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33390	-73.11799	0.0002
308	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33376	-73.11785	0.0002

Lake Housatonic Invasive Plant Location Data (Page 8 of 8)

FID	Invasive Plant Name	Notes	Feature Type	Depth Range (m)	Relative Abundance	Date	Time	Latitude	Longitude	Area (acres)
309	PotCri	Plotted from notes	Point	0-2	1	7/18/2017		41.33366	-73.11771	0.0002
310	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34655	-73.12721	0.0002
311	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34640	-73.12704	0.0002
312	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34618	-73.12678	0.0002
313	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34633	-73.12666	0.0002
314	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34661	-73.12696	0.0002
315	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34674	-73.12746	0.0002
316	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34684	-73.12773	0.0002
317	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34697	-73.12801	0.0002
318	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34715	-73.12812	0.0002
319	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34717	-73.12835	0.0002
320	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34734	-73.12858	0.0002
321	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34743	-73.12877	0.0002
322	PotCri	Plotted from notes	Point	1-4	1	7/18/2017		41.34760	-73.12899	0.0002
323	PotCri	Plotted from notes	Point	0-1	2	7/18/2017		41.33534	-73.11942	0.0002
324	PotCri	Plotted from notes	Point	0-1	2	7/18/2017		41.33626	-73.12038	0.0002
325	MyrSpi	Plotted from notes	Point	0-1	1	7/20/2017		41.33923	-73.12299	0.0002
326	PotCri	Plotted from notes	Point	0-4	3	7/18/2017		41.38154	-73.15798	0.0002
327	PotCri	Plotted from notes	Point	0-4	3	7/18/2017		41.38098	-73.15758	0.0002
328	PotCri	Plotted from notes	Point	2-3	2	7/18/2017		41.34164	-73.12202	0.0002
329	PotCri	Plotted from notes	Point	3-4	2	7/18/2017		41.34023	-73.12132	0.0002
330	PotCri	Plotted from notes	Point	2-4	2	7/18/2017		41.33970	-73.12085	0.0002
331	PotCri	Plotted from notes	Point	1-2	2	7/18/2017		41.33939	-73.12041	0.0002
332	MyrSpi	Plotted from notes	Point	3-4	4	18991230		41.32933	-73.10902	0.0002

Transect Data

Surveyor	Depth (m)	Substrate	Transect	Point	Distance from shore (m)	Notes	*Ceratophyllum demersum*	*Elodea nuttallii*	*Myriophyllum spicatum*	*Najas guadalupensis*	*Najas minor*	*Potamogeton* hybrid species	*Potamogeton amplifolius*	*Potamogeton crispus*	*Potamogeton nodosus*	*Potamogeton perfoliatus*	*Potamogeton pusillus*	*Potamogeton zosteriformis*	*Sagittaria* species	*Sparganium* species	*Spirodela polyrhiza*	Unidentified sedges	*Vallisneria americana*	*Zosterella dubia*	Date	Latitude	Longitude
Greg Bugbee	0.2	Sand	1	1	0.5	shaded by oak, filamentous algae	2														2				7/20/2017	41.33730	-73.11614
Greg Bugbee	1.0	Muck	1	2	5.0		2		2									2			2				7/20/2017	41.33729	-73.11623
Greg Bugbee	1.5	Muck	1	3	10.0		3		2												2				7/20/2017	41.33729	-73.11629
Greg Bugbee	1.8	Muck	1	4	20.0		2		3																7/20/2017	41.33726	-73.11638
Greg Bugbee	1.9	Muck	1	5	30.0	filamentous algae	2		3														2		7/20/2017	41.33720	-73.11643
Greg Bugbee	1.5	Muck	1	6	40.0	filamentous algae	2		3														2		7/20/2017	41.33717	-73.11655
Greg Bugbee	1.5	Muck	1	7	50.0	filamentous algae	3		3									2					2		7/20/2017	41.33713	-73.11668
Greg Bugbee	1.5	Muck	1	8	60.0	filamentous algae	3	2	3					2				2					2		7/20/2017	41.33707	-73.11677
Greg Bugbee	1.1	Muck	1	9	70.0	filamentous algae	3	2	3					2				2					3		7/20/2017	41.33705	-73.11688
Greg Bugbee	0.9	Muck	1	10	80.0		3	2	3					2				3					3		7/20/2017	41.33702	-73.11701
Summer Stebbins	0.1	Sand	2	1	0.5						2		3				2		2					2	7/21/2017	41.33193	-73.11645
Summer Stebbins	0.2	Sand	2	2	5.0						3		4				2							2	7/21/2017	41.33198	-73.11640
Summer Stebbins	0.2	Silt	2	3	10.0			3			3		3	2			4						2		7/21/2017	41.33201	-73.11635
Summer Stebbins	1.2	Sand	2	4	20.0		2	3	2					4			3						3	2	7/21/2017	41.33211	-73.11633
Summer Stebbins	2.7	Muck	2	5	30.0				1									4			2			2	7/21/2017	41.33215	-73.11621
Summer Stebbins	4.3	Muck	2	6	40.0	nothing																			7/21/2017	41.33219	-73.11609
Summer Stebbins	5.5	Muck	2	7	50.0	nothing																			7/21/2017	41.33224	-73.11597
Summer Stebbins	5.2	Muck	2	8	60.0	nothing																			7/21/2017	41.33228	-73.11587
Summer Stebbins	5.2	Muck	2	9	70.0	nothing																			7/21/2017	41.33231	-73.11575
Summer Stebbins	5.3	Muck	2	10	80.0	nothing																			7/21/2017	41.33235	-73.11563
Greg Bugbee	0.2	Gravel	3	1	0.5		2																		7/21/2017	41.32988	-73.10903
Greg Bugbee	1.6	Organic	3	2	5.0		2	2						3				2						2	7/21/2017	41.32985	-73.10905
Greg Bugbee	2.0	Organic	3	3	10.0		2							2										2	7/21/2017	41.32978	-73.10910
Greg Bugbee	2.5	Organic	3	4	20.0		2	2	2					2				3							7/21/2017	41.32971	-73.10913
Greg Bugbee	2.5	Organic	3	5	30.0		2	2	4									2					2	2	7/21/2017	41.32966	-73.10922
Greg Bugbee	1.8	Organic	3	6	40.0		3	2	4									2					3	2	7/21/2017	41.32960	-73.10929
Greg Bugbee	1.8	Organic	3	7	50.0		2		4															2	7/21/2017	41.32951	-73.10932
Greg Bugbee	2.2	Organic	3	8	60.0		3		4															2	7/21/2017	41.32941	-73.10934
Greg Bugbee	3.0	Organic	3	9	70.0		3		4																7/21/2017	41.32932	-73.10940
Greg Bugbee	3.2	Organic	3	10	80.0		3	2	3								2	2						2	7/21/2017	41.32923	-73.10941
Abigail Wiegand	0.1	Sand	4	1	0.5		2																		7/20/2017	41.34108	-73.12363
Abigail Wiegand	0.1	Sand	4	2	5.0		1	2	1	2	3			2			2			2	2	2	4	3	7/20/2017	41.34109	-73.12357
Abigail Wiegand	0.1	Sand	4	3	10.0			3	2	2	3			2		2	2				2	2	2	2	7/20/2017	41.34109	-73.12350
Abigail Wiegand	0.5	Sand	4	4	20.0			4	2		2			2	2	1	2				1		2	2	7/20/2017	41.34111	-73.12341
Abigail Wiegand	0.5	Organic	4	5	30.0			2	2									2							7/20/2017	41.34111	-73.12321

Surveyor	Depth (m)	Substrate	Transect	Point	Distance from shore (m)	Notes	*Ceratophyllum demersum*	*Elodea nuttallii*	*Myriophyllum spicatum*	*Najas guadalupensis*	*Najas minor*	*Potamogeton* hybrid species	*Potamogeton amplifolius*	*Potamogeton crispus*	*Potamogeton nodosus*	*Potamogeton perfoliatus*	*Potamogeton pusillus*	*Potamogeton zosteriformis*	*Sagittaria* species	*Sparganium* species	*Spirodela polyrhiza*	Unidentified sedges	*Vallisneria americana*	*Zosterella dubia*	Date	Latitude	Longitude
Summer Stebbins	3.9	Muck	4	6	40.0	nothing																			7/20/2017	41.34118	-73.12315
Summer Stebbins	4.7	Muck	4	7	50.0	nothing																			7/20/2017	41.34123	-73.12305
Summer Stebbins	5.0	Muck	4	8	60.0	nothing																			7/20/2017	41.34121	-73.12293
Summer Stebbins	5.2	Muck	4	9	70.0	nothing																			7/20/2017	41.34121	-73.12281
Summer Stebbins	5.6	Muck	4	10	80.0	nothing																			7/20/2017	41.34122	-73.12266
Greg Bugbee	0.1	Gravel	5	1	0.5	nothing																			7/21/2017	41.34802	-73.12666
Greg Bugbee	3.0	Gravel	5	2	5.0		3		2															2	7/21/2017	41.34800	-73.12673
Greg Bugbee	4.0	Gravel	5	3	10.0	nothing																			7/21/2017	41.34796	-73.12676
Greg Bugbee	4.8	Gravel	5	4	20.0	nothing																			7/21/2017	41.34791	-73.12683
Greg Bugbee	3.9	Gravel	5	5	30.0			2	2					1			2	2						2	7/21/2017	41.34780	-73.12691
Greg Bugbee	4.1	Gravel	5	6	40.0	fontenella	2	2									2								7/21/2017	41.34774	-73.12694
Greg Bugbee	4.1	Gravel	5	7	50.0	fontenella	2										2	2							7/21/2017	41.34765	-73.12696
Greg Bugbee	4.3	Gravel	5	8	60.0	nothing																			7/21/2017	41.34759	-73.12711
Greg Bugbee	4.5	Gravel	5	9	70.0	nothing																			7/21/2017	41.34754	-73.12718
Greg Bugbee	4.5	Gravel	5	10	80.0	fontenella	2										2								7/21/2017	41.34748	-73.12728
Summer Stebbins	0.1	Sand	6	1	0.5						2												3		7/21/2017	41.34868	-73.13127
Summer Stebbins	0.6	Silt	6	2	5.0		4	3	3								2	2					4	2	7/21/2017	41.34873	-73.13121
Summer Stebbins	1.0	Silt	6	3	10.0		3	2	2								2	2						2	7/21/2017	41.34876	-73.13120
Summer Stebbins	5.1	Silt	6	4	20.0	nothing																			7/21/2017	41.34883	-73.13115
Summer Stebbins	5.2	Silt	6	5	30.0	nothing																			7/21/2017	41.34889	-73.13105
Summer Stebbins	5.2	Silt	6	6	40.0	nothing																			7/21/2017	41.34899	-73.13101
Summer Stebbins	5.2	Silt	6	7	50.0	nothing																			7/21/2017	41.34908	-73.13093
Summer Stebbins	5.0	Silt	6	8	60.0	nothing																			7/21/2017	41.34915	-73.13087
Summer Stebbins	4.9	Silt	6	9	70.0	nothing																			7/21/2017	41.34921	-73.13083
Summer Stebbins	4.5	Silt	6	10	80.0	nothing																			7/21/2017	41.34931	-73.13074
Greg Bugbee	0.2	Gravel	7	1	0.5				3								2						2		7/21/2017	41.35852	-73.13796
Greg Bugbee	2.0	Gravel	7	2	5.0		2		2								2	2					2		7/21/2017	41.35853	-73.13801
Greg Bugbee	3.5	Gravel	7	3	10.0	nothing																			7/21/2017	41.35850	-73.13812
Greg Bugbee	4.7	Sand	7	4	20.0	nothing																			7/21/2017	41.35847	-73.13819
Greg Bugbee	4.7	Sand	7	5	30.0	nothing																			7/21/2017	41.35845	-73.13833
Greg Bugbee	4.0	Gravel	7	6	40.0	fontenella											2								7/21/2017	41.35840	-73.13843
Greg Bugbee	4.0	Gravel	7	7	50.0	fontenella											2								7/21/2017	41.35838	-73.13855
Greg Bugbee	4.3	Gravel	7	8	60.0	fontenella											2								7/21/2017	41.35839	-73.13866
Greg Bugbee	4.3	Gravel	7	9	70.0	fontenella											2								7/21/2017	41.35841	-73.13880
Greg Bugbee	4.3	Gravel	7	10	80.0	fontenella											2								7/21/2017	41.35838	-73.13895

Surveyor	Depth (m)	Substrate	Transect	Point	Distance from shore (m)	Notes	*Ceratophyllum demersum*	*Elodea nuttallii*	*Myriophyllum spicatum*	*Najas guadalupensis*	*Najas minor*	*Potamogeton* hybrid species	*Potamogeton amplifolius*	*Potamogeton crispus*	*Potamogeton nodosus*	*Potamogeton perfoliatus*	*Potamogeton pusillus*	*Potamogeton zosteriformis*	*Sagittaria* species	*Sparganium* species	*Spirodela polyrhiza*	Unidentified sedges	*Vallisneria americana*	*Zosterella dubia*	Date	Latitude	Longitude
Abigail Wiegand	0.1	Sand	8	1	0.5				4	2				2			3						2		7/21/2017	41.36267	-73.14178
Abigail Wiegand	0.4	Sand	8	2	5.0	algae			4					2			2						3	3	7/21/2017	41.36271	-73.14173
Abigail Wiegand	0.6	Sand	8	3	10.0	algae	2	2	4														2	3	7/21/2017	41.36274	-73.14170
Abigail Wiegand	1.7	Sand	8	4	20.0			2	2								2							3	7/21/2017	41.36279	-73.14156
Abigail Wiegand	2.7	Silt	8	5	30.0				2															2	7/21/2017	41.36284	-73.14148
Abigail Wiegand	2.3	Silt	8	6	40.0				2															2	7/21/2017	41.36290	-73.14139
Abigail Wiegand	2.1	Silt	8	7	50.0				3																7/21/2017	41.36293	-73.14126
Abigail Wiegand	2.2	Silt	8	8	60.0				3								2								7/21/2017	41.36297	-73.14118
Abigail Wiegand	2.2	Silt	8	9	70.0				3						2										7/21/2017	41.36295	-73.14113
Abigail Wiegand	2.0	Silt	8	10	80.0				3			2			2										7/21/2017	41.36307	-73.14095
Greg Bugbee	0.2	Gravel	9	1	0.5																		2		7/21/2017	41.36908	-73.14845
Greg Bugbee	2.0	Gravel	9	2	5.0		2	2	3								2						2	2	7/21/2017	41.36903	-73.14847
Greg Bugbee	3.5	Gravel	9	3	10.0	fontenella			3								2								7/21/2017	41.36902	-73.14855
Greg Bugbee	3.5	Gravel	9	4	20.0	fontenella			3			2					2								7/21/2017	41.36897	-73.14862
Greg Bugbee	3.5	Gravel	9	5	30.0	fontenella			3			2					2								7/21/2017	41.36888	-73.14869
Greg Bugbee	3.5	Gravel	9	6	40.0	fontenella			3								2								7/21/2017	41.36882	-73.14878
Greg Bugbee	3.7	Gravel	9	7	50.0	fontenella			3								3								7/21/2017	41.36876	-73.14884
Greg Bugbee	3.8	Gravel	9	8	60.0	fontenella			3								3								7/21/2017	41.36873	-73.14900
Greg Bugbee	4.0	Gravel	9	9	70.0				3								2								7/21/2017	41.36865	-73.14908
Greg Bugbee	4.0	Gravel	9	10	80.0				3								2								7/21/2017	41.36862	-73.14917
Abigail Wiegand	0.1	Sand	10	1	0.5				2	2	2			2			1			2			3	2	7/21/2017	41.37632	-73.15677
Summer Stebbins	0.4	Sand	10	2	5.0			3	3		2			2		2	3						4		7/21/2017	41.37634	-73.15673
Abigail Wiegand	0.6	Silt	10	3	10.0		3	3	4														3		7/21/2017	41.37637	-73.15667
Abigail Wiegand	3.7	Silt	10	4	20.0	nothing																			7/21/2017	41.37644	-73.15656
Abigail Wiegand	5.0	Silt	10	5	30.0	nothing																			7/21/2017	41.37645	-73.15645
Abigail Wiegand	4.1	Silt	10	6	40.0	nothing																			7/21/2017	41.37656	-73.15638
Abigail Wiegand	4.4	Silt	10	7	50.0	nothing																			7/21/2017	41.37663	-73.15636
Abigail Wiegand	2.5	Silt	10	8	60.0	nothing																			7/21/2017	41.37663	-73.15617
Abigail Wiegand	2.5	Silt	10	9	70.0				2																7/21/2017	41.37666	-73.15611
Abigail Wiegand	0.5	Silt	10	10	80.0				4			2		2			3								7/21/2017	41.37670	-73.15595

Notes