Hamburg Cove

2022 Invasive Aquatic Vegetation Survey

Prepared for the

Eightmile River Wild & Scenic Coordinating Committee

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CAES

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Introduction

The Connecticut Agricultural Experiment Station (CAES) Invasive Aquatic Plant Program (IAPP) conducted invasive aquatic vegetation surveys of the Connecticut River in 2019 and 2020, which together covered the stretch from Long Island Sound to Agawam, MA. The results from these surveys can be viewed through an interactive web app on the CAES website (survey results). These surveys were in response to the discovery of hydrilla (*Hydrilla verticillata*) in the river. Hydrilla is among the most troublesome invasive aquatic plants in many southern states. It crowds out native vegetation, harms fisheries, limits recreation, impedes navigation, and reduces property values. Often referred to as the perfect weed (Langeland, 1996), hydrilla can spread and persist by multiple methods including fragments, turions produced on stems, tubers produced on roots, and possibly seeds. The cyanobacteria, *Aetokthonos hydrillicola*, found in stands of hydrilla has been linked to avian vacuolar myelinopathy (AVM) and is thought to have caused the deaths of more than 100 bald eagles in South Carolina and Arkansas (Breinlinger et al., 2021). Morphological differences (e.g., darker, more robust, 5-10 leaves per whorl) in the hydrilla in the Connecticut River prompted concern that it is genetically different to the other strain found in Connecticut. Genetic testing found the hydrilla in the Connecticut River is a new strain of *Hydrilla verticillata* not similar to others previously found in North America and is most closely related to strains in eastern Asia (Tippery et al., 2020).

In addition to hydrilla, five other invasive aquatic plants are also a concern in the Connecticut River. These include Eurasian watermilfoil (*Myriophyllum spicatum*), fanwort (*Cabomba caroliniana*), curlyleaf pondweed (*Potamogeton crispus*), water chestnut (*Trapa natans*), and variable-leaf watermilfoil (*Myriophyllum heterophyllum*). A 1994-95 survey of aquatic vegetation in the Connecticut River found that curlyleaf pondweed, Eurasian watermilfoil, and fanwort were already present in the river at that time (Barrett et al., 1997). Thus hydrilla, variable-leaf watermilfoil, and water chestnut have been introduced since 1995.

Hamburg Cove is located in Lyme where the Eightmile River flows into the Connecticut River. In the summer months, the cove is heavily used for recreational activities. There is a summer camp, two marinas, a yacht club, and many boats moored in the cove. Numerous large homes with docks are also on the surrounding shoreline. Dense invasive aquatic vegetation has already begun to clog marina docks and impact recreation. Hamburg Cove was surveyed by CAES IAPP for invasive aquatic vegetation in 2019 and 2022.

Methods

On June 23 and August 18, 2022, CAES IAPP performed invasive aquatic plant surveys of Hamburg Cove in the Connecticut River. Invasive water chestnut was surveyed on June 23 and plants were simultaneously removed. The second survey, on August 18, included all invasive aquatic plant species. A combination of visual sightings, rake tosses, and sonar with rake toss confirmation were used to locate plants. Using ESRI® and Trimble® geospatial technology with sub-meter accuracy, invasive patches greater than one square meter (0.0002 acres) were marked with polygons and smaller areas were marked with points. Each stand of invasive plants was assigned a qualitative density ranking (1 = very sparse/single plant – 5 = dense/to surface), and depth was recorded. When field identifications were questionable, samples were brought back to the lab for review using the taxonomy of Crow and Hellquist (2000a, 2000b). Data were uploaded to a geographic information system (GIS) and digitized maps were created. The GPS data was post-processed in Pathfinder® 5.85 (Trimble Navigation Limited, Sunnyvale, CA) and then imported it into ArcGIS Pro 3.0.3 (ESRI, Redlands, CA) where it was geo-corrected.

To provide added quantitative data on the invasive and native aquatic plant community, two transects were established in 2019 and revisited in 2022. Each transect contained 10 points (0.5, 5, 10, 20, 30, 40, 50, 60, 70 and 80 m from shore), and efforts were made to include at least one point with each invasive and native plant species. Plant species, abundance, depth, and sediment type were recorded at each transect point. Each plant species found on transects in the Connecticut River in 2019 and 2020 was dried, pressed, mounted, and cataloged in the CAES IAPP herbarium where they can be viewed in digital format on our website (herbarium).

Water samples for pH, alkalinity, conductivity, total phosphorus, and total nitrogen testing were obtained from 0.5 m beneath the surface in two locations. The samples were stored at 38°C until testing. A Fisher AR20® meter was used to determine pH and conductivity, and alkalinity (mg/L $CaCO_3$) was quantified by titration with 0.016 N H_2SO_4 to an end point of pH 4.5. We determined total phosphorus using the ascorbic acid method preceded by digestion with potassium persulfate (APHA, 1995). Phosphorus was quantified using a Milton Roy Spectronic 20D® spectrometer with a light path of 2 cm and a wavelength of 880 nm. Total Nitrogen was determined with a O-I Analytical 1080® Total Organic Carbon Analyzer.

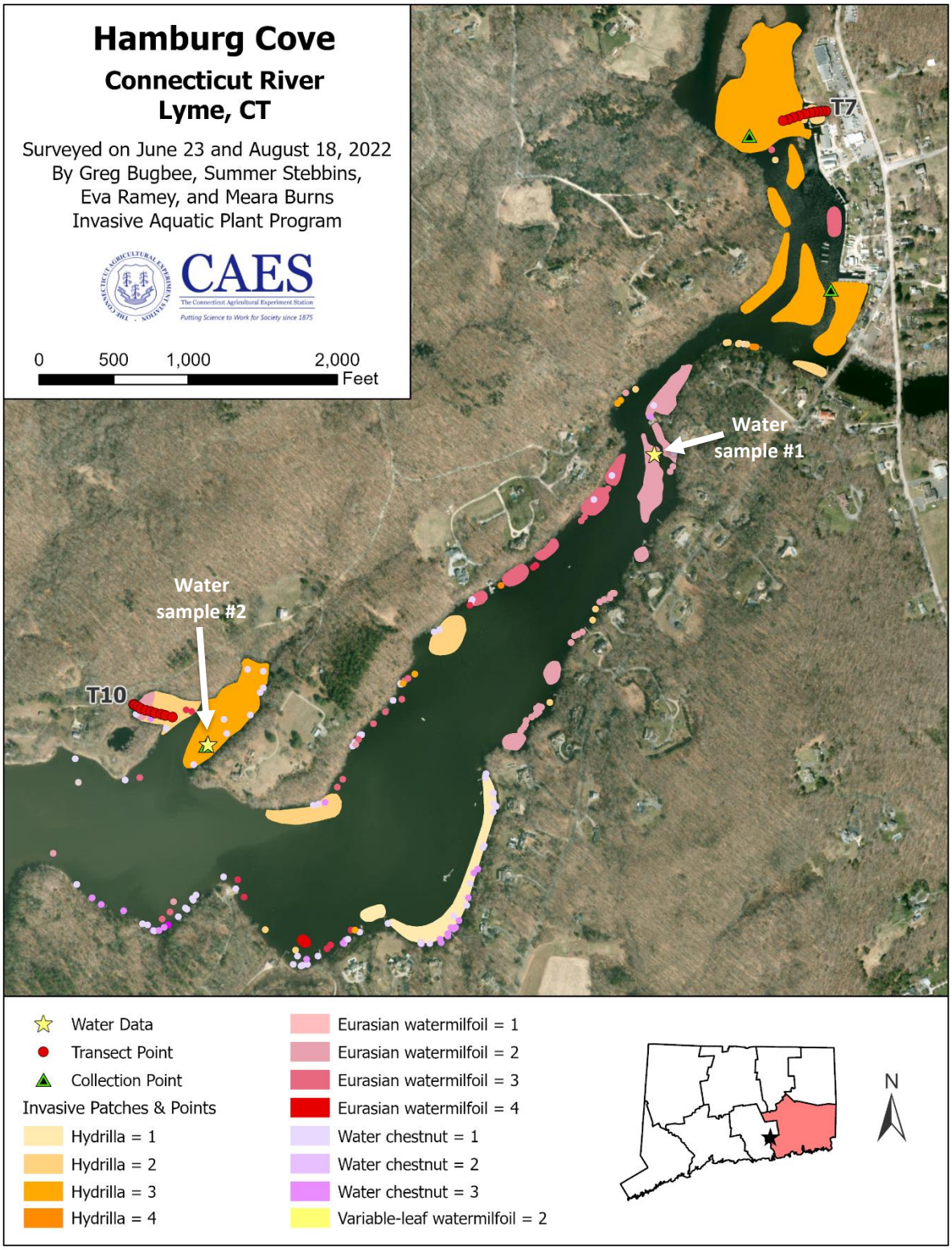


Figure 1. Survey map of all invasive aquatic plant species, established transect points, plant collection points, and water data points in Hamburg Cove. Locations of aquatic plant species are broken out in the following maps.

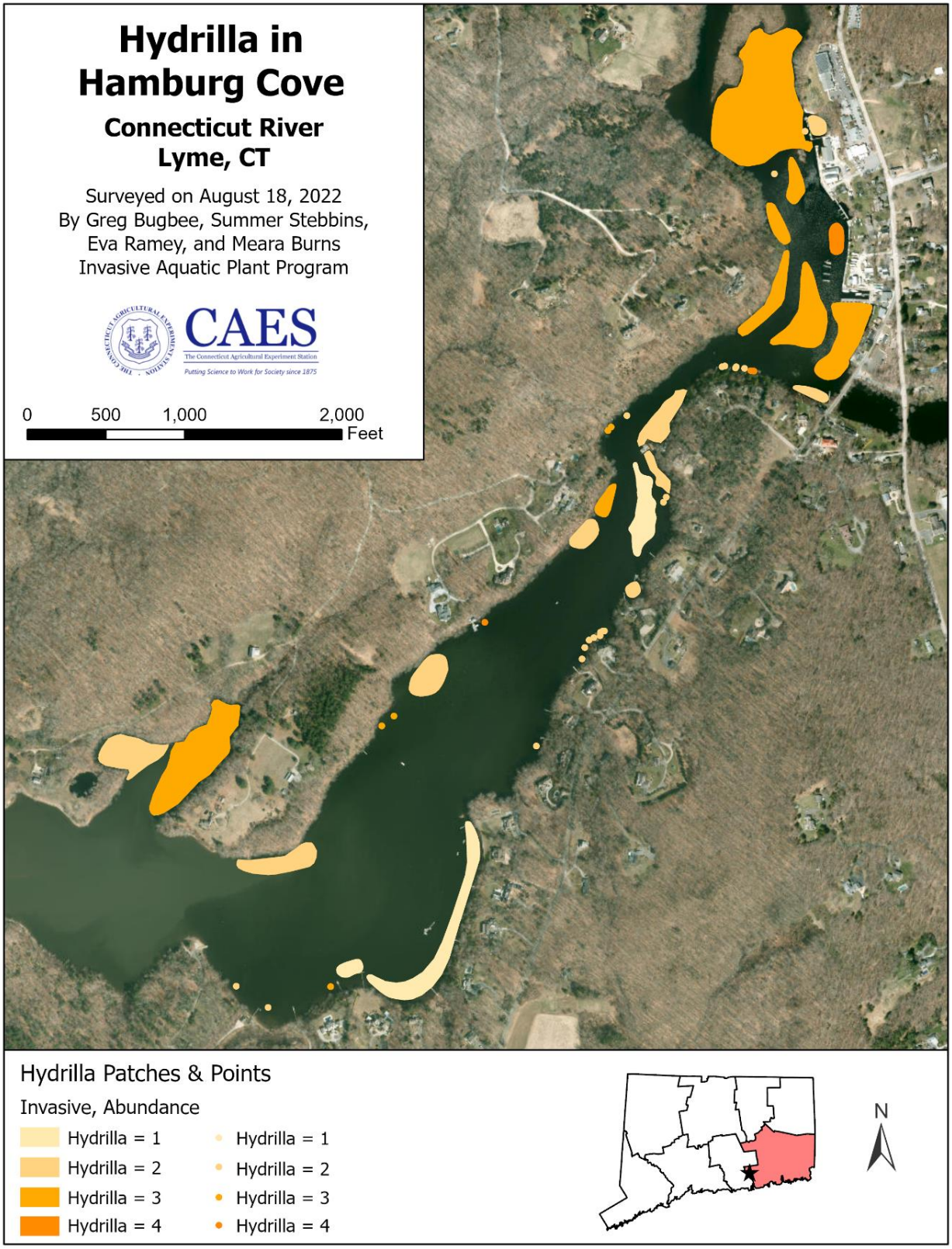


Figure 2. Survey map of hydrilla locations in Hamburg Cove in 2022.

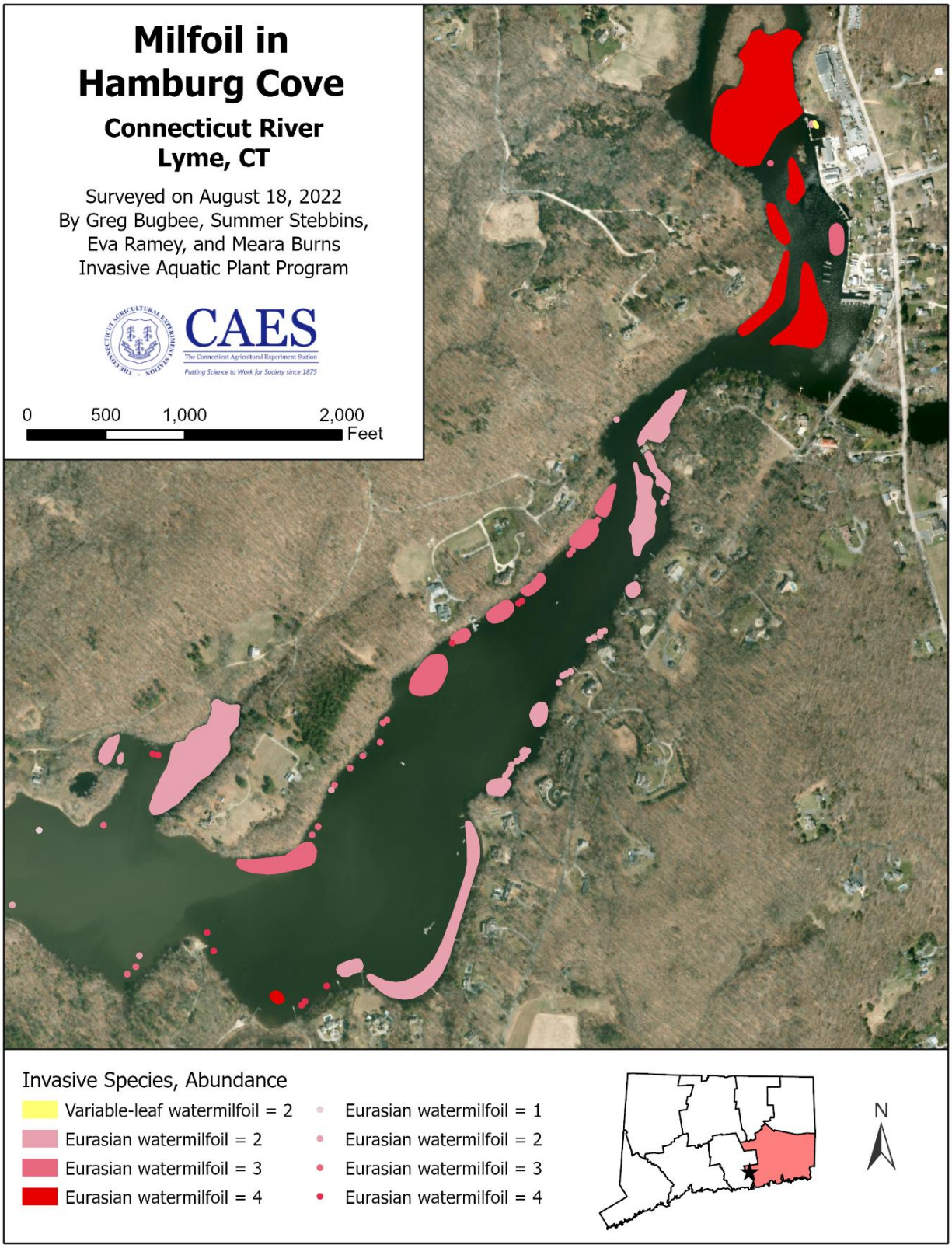


Figure 3. Survey map of Eurasian watermilfoil and variable-leaf watermilfoil locations in Hamburg Cove in 2022.

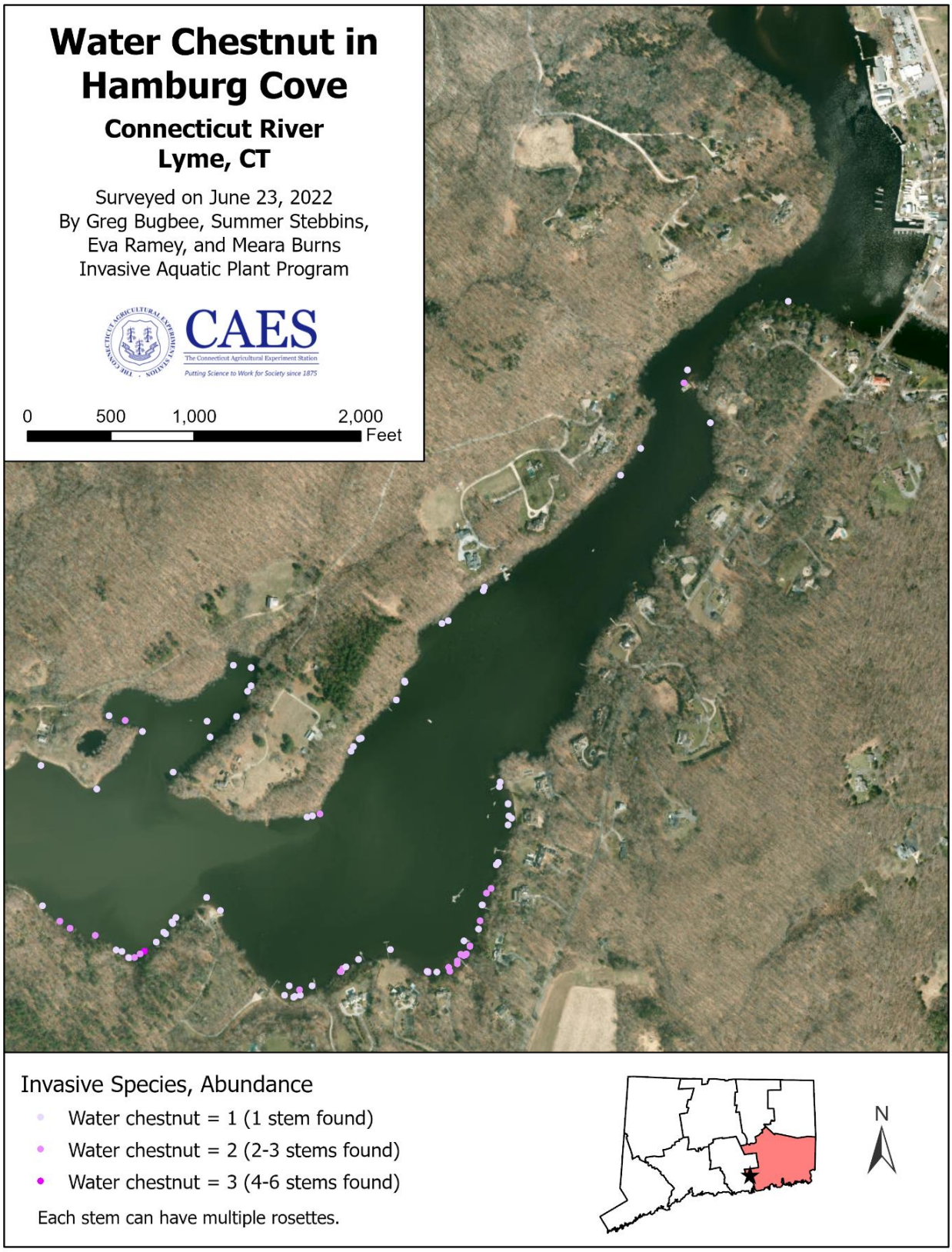


Figure 4. Survey map of water chestnut found (and pulled) in Hamburg Cove in 2022.

Results

There are four invasive, non-native aquatic plant species found in Hamburg Cove including Eurasian watermilfoil, hydrilla, water chestnut, and variable-leaf watermilfoil (see appendix for plant descriptions). Of these species, hydrilla is of highest concern. Hydrilla and Eurasian watermilfoil are often found growing together in large patches. Visually, it appears their abundances have increased in the upper part of the cove and decreased in the lower part of the cove since 2019 (Figures 2 & 3). The United States Army Corps of Engineers (USACE) in collaboration with CAES has begun research into the ecology and phenology of this new strain of hydrilla (Figure 5) as well as a suitable herbicide for future management in the Connecticut River. Demonstration treatments should take place in the summer of 2024.

Figure 5. CAES IAPP herbarium mount of hydrilla (*Hydrilla verticillata*) collected from Hamburg Cove on September 25, 2019.

Only a small patch of variable-leaf watermilfoil (Figure 6) was found in 2022 by Reynolds' Marina (Figure 7). The abundance of variable-leaf watermilfoil in 2022 appears similar to 2019. Due to low tide in 2022, CAES IAPP was not able to survey north of Reynolds' Subaru. There were likely plants in this part of the cove that were not recorded. Interestingly, Hamburg Cove is the only location in the Connecticut River where variable-leaf watermilfoil is found.

Figure 6. CAES IAPP herbarium mount of Variable-leaf watermilfoil (*Myriophyllum heterophyllum*) collected from Hamburg Cove on September 25, 2019. Found growing in 0.3 m (1 ft) of water.

Water chestnut was found for the first time in Hamburg Cove in 2022 (Figure 4). Water chestnut is a rooted annual aquatic plant with a floating rosette that can be successfully controlled by hand pulling. It is found in other coves in the Connecticut River and efforts to control it by local organizations happen each year. The water chestnut found in Hamburg Cove may have spread from a release from a Hartford flood control pond in August 2021. During the June survey, CAES IAPP hand harvested all water

chestnut plants in Hamburg Cove. Water chestnut seeds can be viable for up to 12 years on the river bottom. It is recommended that the Hamburg Cove community stewardship group survey the cove and harvest water chestnut every June and August to keep it under control and eradicate it from the cove.

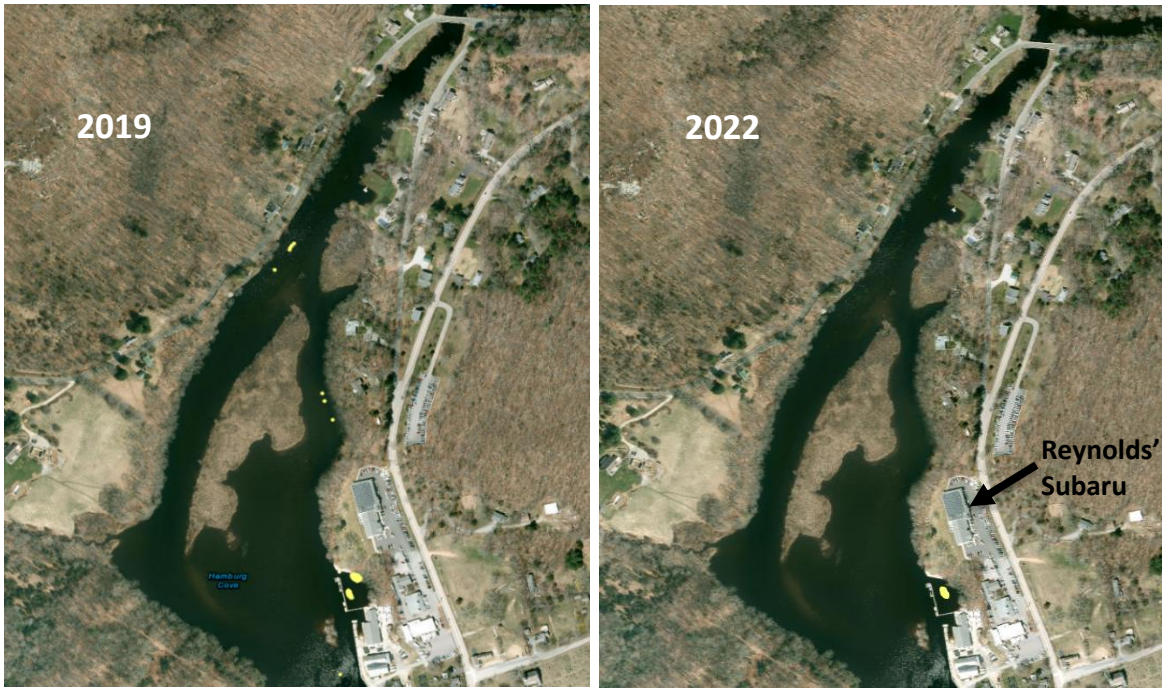


Figure 7. Variable-leaf watermilfoil locations in 2019 (left) and 2022 (right) in yellow. Due to low tide in 2022, CAES IAPP could not survey past Reynolds' Subaru.

Table 1. Aquatic plant species frequency of occurrence on transect points in Hamburg Cove.

Hamburg Cove			
Common Name*	**Scientific Name**	**FOQ** (%/transect point)	
		2019	**2022**
Canadian waterweed	*Eoldea canadensis*	0%	10%
Clasping-leaf pondweed	*Potamogeton perfoliatus*	50%	0%
Coontail	*Ceratophyllum demersum*	55%	75%
Eelgrass	*Vallisneria americana*	60%	25%
Eurasian watermilfoil	***Myriophyllum spicatum***	**60%**	**25%**
Horned pondweed	*Zannichellia palustris*	50%	0%
Hydrilla	***Hydrilla verticillata***	**45%**	**80%**
Pickerelweed	*Pontederia cordata*	0%	5%
Primrose-willow	*Ludwigia* species	0%	5%
Slender naiad	*Najas flexilis*	0%	10%
Variable-leaf watermilfoil	***Myriophyllum heterophyllum***	**5%**	**5%**
Western waterweed	*Elodea nuttallii*	25%	35%
White water lily	*Nymphaea odorata*	35%	30%
Yellow water lily	*Nuphar variegata*	0%	5%
Total Species Richness	14	9	12
Total Native Species Richness	11	6	9
Total Invasive Species Richness	3	3	3
***Invasive species in bold**			

Frequency of occurrence (FOQ) refers to how often a plant species was found on transect points. Between the two transects in Hamburg Cove, 12 different aquatic plant species were recorded in 2022 (Table 1). Of those 12 species, 9 species are native, and 3 species are invasive. The three invasive species found on transects were Eurasian watermilfoil, hydrilla, and variable-leaf watermilfoil. From 2019 to 2022, Eurasian watermilfoil decreased from 60% to 25%, while hydrilla increased from 45% to 80%, and variable-leaf watermilfoil remained the same at 5%. The most common native species on transect points in 2022 was coontail, which increased from 55% in 2019 to 75% in 2022. In 2019, the most common native species on transect points was eelgrass (Figure 8), which has decreased from 60% in 2019 to 25% in 2022. Eelgrass is considered a prime habitat for juvenile fish, and its potential replacement by invasive species is a concern.

Figure 8. CAES IAPP herbarium mount of eelgrass (*Vallisneria americana*) collected from the Connecticut River in 2020.

Table 2. Water chemistry data for two samples taken on August 18, 2022.

Hamburg Cove Water Chemistry							
Sample ID	Date	Depth (m)	Conductivity (µS/cm)	pH	Alkalinity expressed as Calcium Carbonate (mg/L)	Phosphorous (µg/L)	Nitrogen (µg/L)
#1	8/18/2022	0.5	740	6.8	13.5	16	1143
#2	8/18/2022	0.5	2100	6.8	21.8	17	1121

Water Chemistry

The Connecticut River is tidal up to Hartford, thus Hamburg Cove is affected by tides and the salt wedge. Two water samples were collected around low tide in Hamburg Cove on August 18, 2022. Both samples were collected from 0.5 m below the surface. Conductivity, pH, alkalinity, phosphorus, and nitrogen were measured in the laboratory (Table 2). 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.). Freshwater waterbodies in Connecticut have conductivities that range from 50 - 250 µS/cm. The conductivity of sample #2 (closer to the main stem of the Connecticut River) was 2100 µS/cm, more than double the conductivity of sample #1 (740 µS/cm), which demonstrates the mixing of the Eightmile River

with the lower Connecticut River. Invasive aquatic plant species were not found south of Essex (see 2019 results in web app), likely because of increased salinity. In future surveys of the Connecticut River, additional water samples will be analyzed to help determine the salt limit of hydrilla.

The pH of both samples was near neutral at 6.8. Alkalinity was between 13.5 - 21.8 mg/L $CaCO_3$, which is moderately low. Low alkalinity waterbodies are more prone to pH change due to outside influences such as watershed activities and acid rain. Excess nutrients can cause toxic algal blooms and hypoxic conditions (Frink and Norvell, 1984; Wetzel, 2001). In fresh waterbodies, the limiting nutrient is usually phosphorus, while in saltwater systems, like Long Island Sound, the limiting nutrient is usually nitrogen (Blomqvist et al., 2004). Sample #1 had a P concentration of 16 µg/L and sample #2 had a P concentration of 17 µg/L. When P concentrations reach between 15 - 25 µg/L in lakes, they are classified as moderately fertile or mesotrophic (Frink and Norvell, 1984). Sample #1 had a TN concentration of 1143 µg/L and sample #2 had a concentration of 1121 µg/L. Frink and Norvell (1984) found TN in Connecticut lakes ranged from 193 - 1830 µg/L and averaged 554 µg/L.

Conclusions

The 2022 CAES IAPP invasive aquatic vegetation surveys of Hamburg Cove found four invasive species: Eurasian watermilfoil, hydrilla, water chestnut, and variable-leaf watermilfoil. CAES surveys in 2019 found the same species except for water chestnut. It appears that hydrilla and Eurasian watermilfoil have increased in the upper part of the cove and decreased in the lower part of the cove since 2019. Ongoing research will determine the best aquatic herbicide for future management of hydrilla in the Connecticut River. Water chestnut was found for the first time in the cove in 2022 and was hand pulled during the June survey. Water chestnut can be managed by hand harvesting in June and August each year. Variable-leaf watermilfoil is extremely sparse in the upper reaches of Hamburg Cove and has not spread since 2019.

References

American Public Health Association. 1995. Standard methods for the examination of water and wastewater. 19th ed. American Public Health Association, 1015 Fifteenth St. NW Washington, DC 2005. 4:108-116.

Barrett JM, Prisloe M, Giannotti L, Barrett N. 1997. Distribution and abundance of submerged aquatic vegetation in the lower, tidal Connecticut River. Long Island Sound Foundation Center, 1406. 308 pp.

Blomqvist S, Gunnars A, Elmgren R. 2004. Why the limiting nutrient differs between temperate coastal seas and freshwater lakes: A matter of salt. Limnol. Oceanogr. 49(6): 2236-2241.

Breinlingger TE, Phillips TJ, Haram BN, Mares J, Yerena AM, Hrouzek P, Sobatka R, Henderson WM, Schmieder P, Williams SM, Lauderdale JD, Wilde DH, Gerrin W, Kust A, Washington JW, Wagner C, Geier B, Leibeke M, Enk H, Niedermeyer THJ, Wilde S. 2021. Science 371(6536). https://www.science.org/doi/10.1126/science.aax9050

Crow GE, Hellquist CB. 2000a. Aquatic and Wetland Plants of Northeastern North America. Volume One Pteridophytes, Gymnosperms, and Angiosperms: Dicotyledons. Madison, Wisconsin. The University of Wisconsin Press. 480 pp.

Crow GE, Hellquist CB. 2000b. Aquatic and Wetland Plants of Northeastern North America. Volume Two Angiosperms: Monocotyledons. Madison, Wisconsin. The University of Wisconsin Press. 400 pp.

Frink CR, Norvell WA. 1984. Chemical and physical properties of Connecticut lakes. Conn. Agric. Exp. Sta. Bull. 817.

Langeland KA. 1996. Hydrilla verticillata (L.F.) Royle (Hydrocharitaceae), "The Perfect Aquatic Weed." Castenea. 61(3):293-304.

Tippery NP, Bugbee GJ, Stebbins SE. 2020. Evidence for a genetically distinct strain of introduced *Hydrilla verticillate* (Hydrocharitaceae) in North America. J. Aquat. Plant Manage. 58: 1-6.

Wetzel RG. 2001. Limnology: Lake and River Ecosystems 3rd ed. Academic Press, San Diego, CA. http://www.academicpress.com.

Appendix

Invasive Plant Descriptions

*Hydrilla verticillata**

Common name:
Hydrilla

Origin:
Asia

Key features:
Plants are submersed

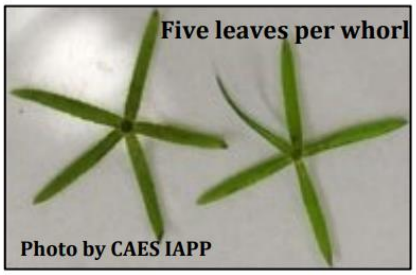
Stems: Slender, branched and up to 25 feet (7.5 m) long

Leaves: Whorled leaves approx. 0.7 inches (1.5 cm) long, whorls often have 5 leaves (range 4-8); leaf margins are visibly toothed

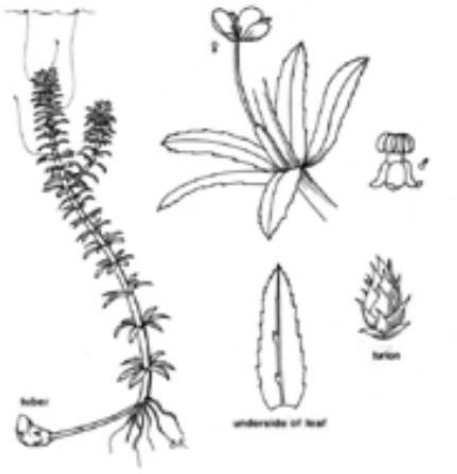
Flowers: Female flowers have three translucent petals that have reddish streaks; male flowers have three petals and can be white to red in color

Fruits/Seeds: Small tubers (key feature) can be found in the sediment, turions form along the stem

Reproduction: Fragmentation, turions, tubers and seeds



Easily confused species:
Waterweeds (Native): *Elodea nuttallii* and *Elodea canadensis*
Brazilian waterweed: *Egeria densa*



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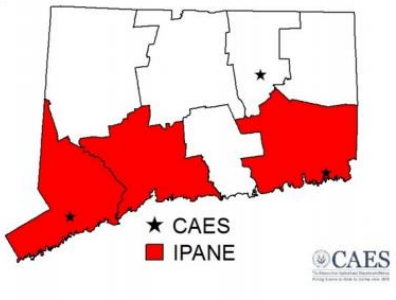
*This plant is extremely aggressive in the south-eastern U.S.. It is now established in the Connecticut and Silvermine river systems and is of great concern.



Myriophyllum heterophyllum

Common names:
Variable-leaf watermilfoil
Variable watermilfoil
Two-leaf watermilfoil

Origin:
Southern United States

Key features:
Plants are submersed

Stems: Dark brown stems extend to the water's surface and spread to form large mats

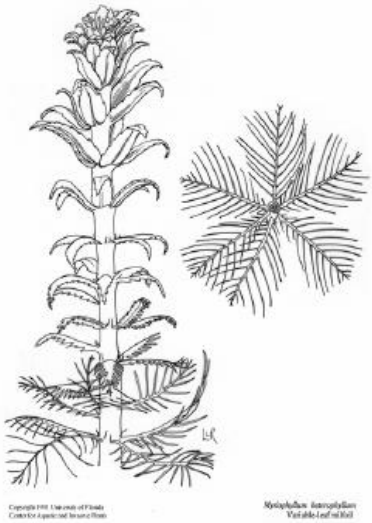
Leaves: Triangular with ≤ 11 pairs of leaflets. Leaves are dissected and whorled (4-6 leaves/whorl) resulting in a feathery appearance with leaf whorls < 1 inch apart giving it a ropy appearance

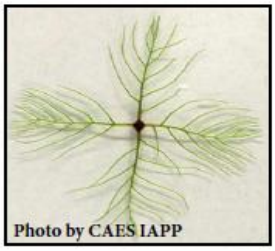
Flowers: Inflorescence spike 2-14 inches (5-35 cm) long extend beyond the water's surface with flowers in whorls of four with reddish petals

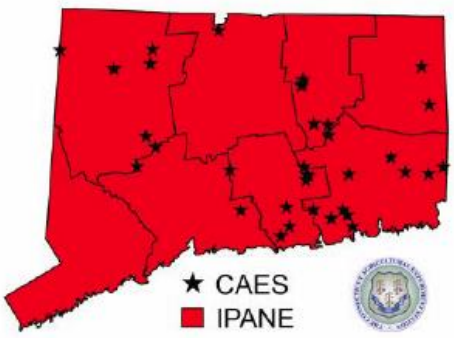
Fruits/Seeds: Fruits are almost round, with a rough surface

Reproduction: Fragmentation and seeds

Easily confused species:
Eurasian watermilfoil: *Myriophyllum spicatum*
Low watermilfoil: *Myriophyllum humile*







Myriophyllum spicatum

Common name:
Eurasian watermilfoil

Origin:
Europe and Asia

Key features:
Plants are submersed

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

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

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

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

Reproduction: Fragmentation and seeds

Easily confused species:
Variable-leaf watermilfoil: *Myriophyllum heterophyllum*
Low watermilfoil: *Myriophyllum humile*
Northern watermilfoil: *Myriophyllum sibiricum*
Whorled watermilfoil: *Myriophyllum verticillatum*

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

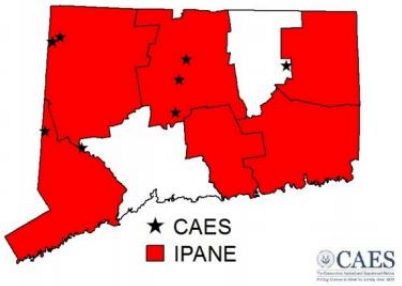
Leaves: Leaves 0.8-0.16 inches (2-4 cm) long are triangular and toothed along the front edge with inflated petioles, leaves float in a rosette pattern

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



Transect Data

Plant abundance is on scale of 1 – 5: 1 = present but rare (1 plant), 2 = occasional (a few plants), 3 = common (more than a few plants), 4 = abundant, 5 = extremely abundant or dominant								**Follow this link to convert decimal degrees to degrees minutes seconds http://www.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html												
Transect	Point	Distance from shore (m)	Surveyor	Date	Latitude	Longitude	Depth (m)	Substrate	Canadian waterweed	Coontail	Eelgrass	Eurasian watermilfoil	Hydrilla	Pickerelweed	Primrose-willow	Slender naiad	Variable-leaf watermilfoil	Western waterweed	White water lily	Yellow water lily
7	1	0.5	Greg Bugbee	8/18/2022	41.38791	-72.35188	0.3	Sand	0	0	0	0	0	2	2	0	0	0	0	0
7	2	5	Greg Bugbee	8/18/2022	41.38792	-72.35197	0.3	Sand	0	0	0	0	2	0	0	0	0	2	2	2
7	3	10	Greg Bugbee	8/18/2022	41.38791	-72.35206	0.3	Sand	0	0	0	0	2	0	0	0	0	2	2	0
7	4	20	Greg Bugbee	8/18/2022	41.38790	-72.35215	1.1	Sand	0	0	0	0	2	0	0	0	2	2	2	0
7	5	30	Greg Bugbee	8/18/2022	41.38789	-72.35225	1.1	Sand	0	2	1	2	2	0	0	0	0	2	3	0
7	6	40	Greg Bugbee	8/18/2022	41.38786	-72.35238	2.3	Sand	0	2	0	0	0	0	0	0	0	1	0	0
7	7	50	Greg Bugbee	8/18/2022	41.38783	-72.35253	1.1	Sand	0	0	0	0	1	0	0	0	0	0	0	0
7	8	60	Greg Bugbee	8/18/2022	41.38780	-72.35266	1.1	Sand	0	2	0	0	2	0	0	2	0	0	0	0
7	9	70	Greg Bugbee	8/18/2022	41.38777	-72.35279	1.1	Sand	1	2	0	0	2	0	0	0	0	0	2	0
7	10	80	Greg Bugbee	8/18/2022	41.38774	-72.35291	1.1	Sand	1	2	2	0	2	0	0	2	0	0	2	0
10	1	0.5	Greg Bugbee	8/18/2022	41.37707	-72.36885	0.3	Muck	0	1	0	0	0	0	0	0	0	0	0	0
10	2	5	Greg Bugbee	8/18/2022	41.37705	-72.36882	1.0	Muck	0	4	0	0	0	0	0	0	0	0	0	0
10	3	10	Greg Bugbee	8/18/2022	41.37702	-72.36875	1.4	Muck	0	3	2	2	2	0	0	0	0	0	0	0
10	4	20	Greg Bugbee	8/18/2022	41.37699	-72.36867	1.4	Muck	0	4	2	2	2	0	0	0	0	0	0	0
10	5	30	Greg Bugbee	8/18/2022	41.37696	-72.36856	1.4	Muck	0	4	2	2	2	0	0	0	0	0	0	0
10	6	40	Greg Bugbee	8/18/2022	41.37693	-72.36843	1.8	Muck	0	3	0	0	3	0	0	0	0	0	0	0
10	7	50	Greg Bugbee	8/18/2022	41.37691	-72.36832	1.8	Muck	0	3	0	2	3	0	0	0	0	0	0	0
10	8	60	Greg Bugbee	8/18/2022	41.37688	-72.36818	1.8	Muck	0	4	0	0	3	0	0	0	0	0	0	0
10	9	70	Greg Bugbee	8/18/2022	41.37686	-72.36807	1.8	Muck	0	4	0	0	2	0	0	0	0	2	0	0
10	10	80	Greg Bugbee	8/18/2022	41.37683	-72.36790	1.8	Muck	0	4	0	0	2	0	0	0	0	2	0	0

Hamburg Cove, Lyme | 2019 Transect Data | Surveyed by Summer Stebbins, Michael Modica, Deanna Rackie, and Greg Bugbee

Plant abundance is on scale of 1 – 5: 1 = present but rare (1 plant), 2 = occasional (a few plants), 3 = common (more than a few plants), 4 = abundant, 5 = extremely abundant or dominant							**Follow this link to convert decimal degrees to degrees minutes seconds http://www.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html										
Transect	Point	Distance from shore (m)	Surveyor	Date	Latitude	Longitude	Depth (m)	Substrate	Clasping-leaf pondweed	Coontail	Eelgrass	Eurasian watermilfoil	Horned pondweed	Hydrilla	Variable-leaf watermilfoil	Western waterweed	White water lily
7	1	0.5	Greg Bugbee	9/25/2019	41.38794	-72.35192	0.2	Muck	0	0	0	0	0	2	0	0	2
7	2	5	Greg Bugbee	9/25/2019	41.38790	-72.35201	0.2	Muck	0	0	2	1	0	2	0	0	2
7	3	10	Greg Bugbee	9/25/2019	41.38794	-72.35207	0.3	Muck	0	0	2	1	0	2	2	0	2
7	4	20	Greg Bugbee	9/25/2019	41.38794	-72.35218	0.4	Muck	0	0	2	2	0	2	0	0	2
7	5	30	Greg Bugbee	9/25/2019	41.38794	-72.35224	1.5	Muck	0	0	0	0	0	0	0	0	2
7	6	40	Greg Bugbee	9/25/2019	41.38789	-72.35242	2.5	Silt	0	0	0	0	0	0	0	0	0
7	7	50	Greg Bugbee	9/25/2019	41.38777	-72.35254	0.5	Sand	0	2	2	0	0	2	0	0	0
7	8	60	Greg Bugbee	9/25/2019	41.38779	-72.35264	0.5	Sand	0	0	2	0	0	2	0	0	0
7	9	70	Greg Bugbee	9/25/2019	41.38774	-72.35275	0.3	Sand	0	0	0	0	0	2	0	0	3
7	10	80	Greg Bugbee	9/25/2019	41.38771	-72.35287	0.3	Muck	0	0	0	2	0	2	0	0	2
10	1	0.5	Greg Bugbee	9/28/2019	41.37706	-72.36886	0.3	Silt	2	2	0	2	2	2	0	0	0
10	2	5	Greg Bugbee	9/28/2019	41.37704	-72.36880	1.3	Rock	2	4	0	0	2	0	0	3	0
10	3	10	Greg Bugbee	9/28/2019	41.37701	-72.36876	1.4	Rock	2	3	3	0	2	0	0	2	0
10	4	20	Greg Bugbee	9/28/2019	41.37699	-72.36863	1.7	Rock	2	3	3	2	2	0	0	2	0
10	5	30	Greg Bugbee	9/28/2019	41.37697	-72.36855	1.7	Rock	2	3	3	2	2	0	0	2	0
10	6	40	Greg Bugbee	9/28/2019	41.37694	-72.36842	1.7	Rock	2	3	0	2	2	0	0	2	0
10	7	50	Greg Bugbee	9/28/2019	41.37691	-72.36833	1.7	Rock	2	3	2	2	2	0	0	0	0
10	8	60	Greg Bugbee	9/28/2019	41.37692	-72.36821	1.7	Rock	2	3	2	2	2	0	0	0	0
10	9	70	Greg Bugbee	9/28/2019	41.37686	-72.36805	1.7	Rock	2	3	2	3	2	0	0	0	0
10	10	80	Greg Bugbee	9/28/2019	41.37683	-72.36793	1.7	Rock	2	3	2	3	2	0	0	0	0