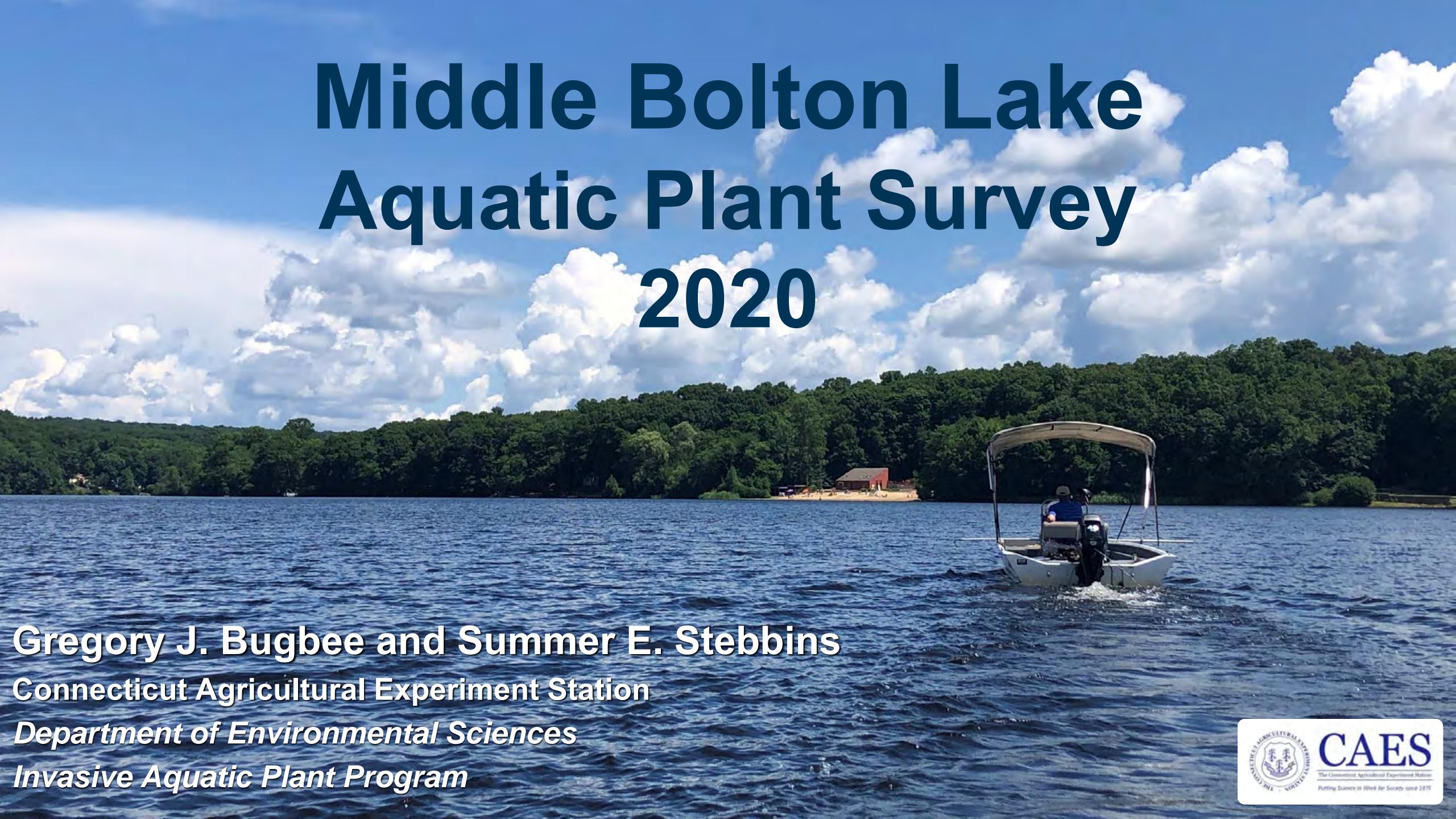


# Middle Bolton Lake Aquatic Plant Survey 2020



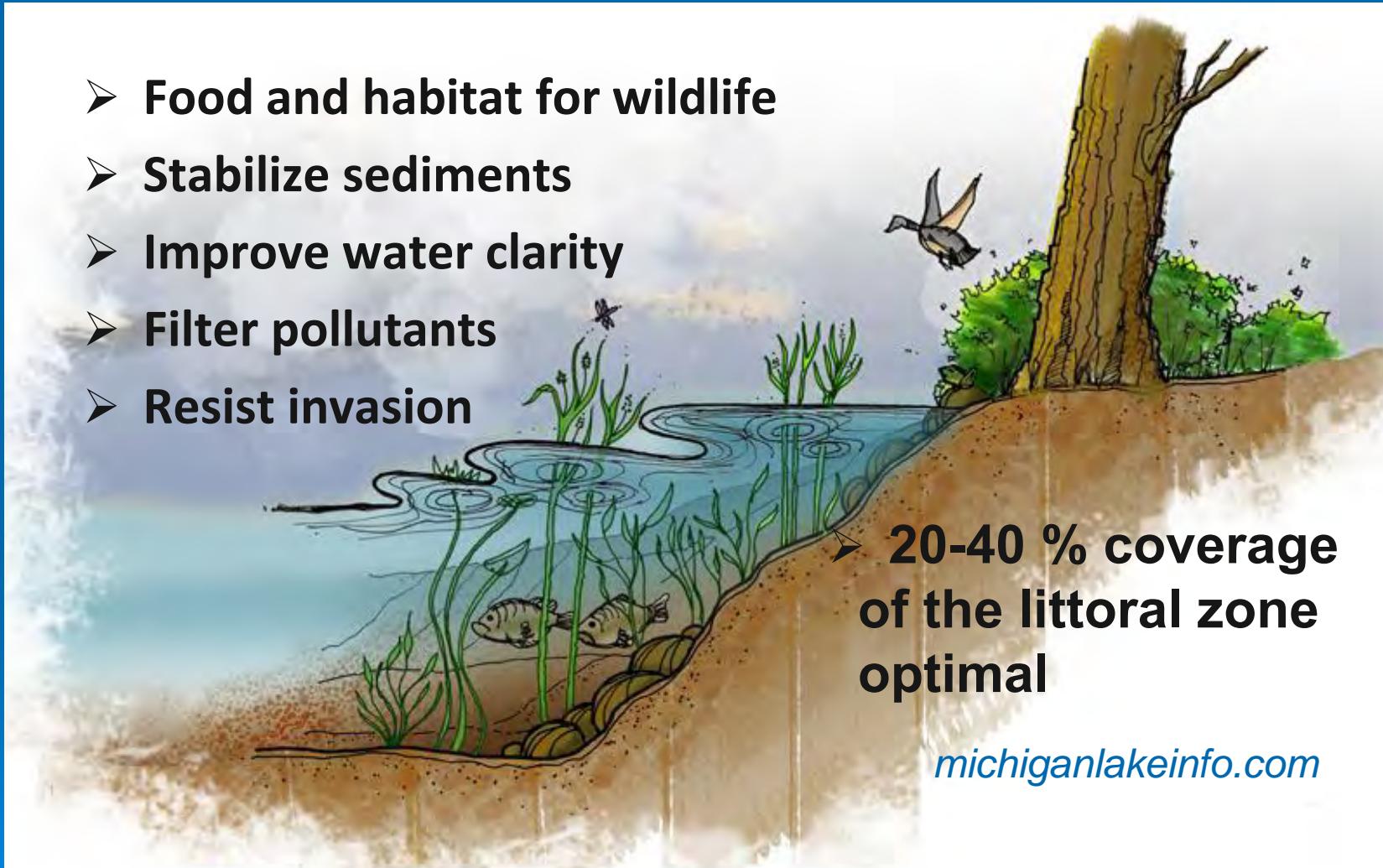
**Gregory J. Bugbee and Summer E. Stebbins**  
Connecticut Agricultural Experiment Station  
*Department of Environmental Sciences*  
*Invasive Aquatic Plant Program*

# Aquatic Plants are Important

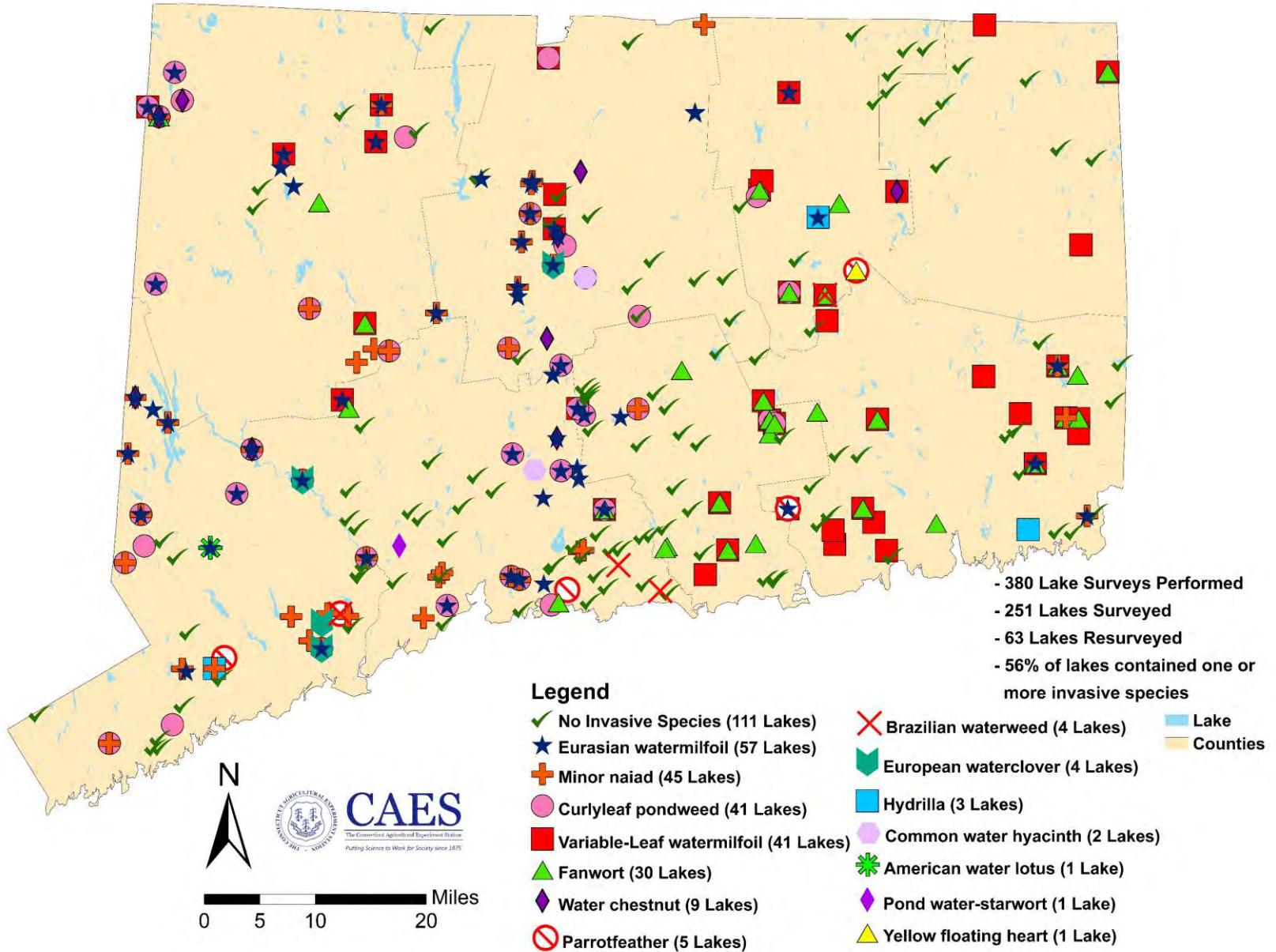
- Food and habitat for wildlife
- Stabilize sediments
- Improve water clarity
- Filter pollutants
- Resist invasion

➤ 20-40 % coverage  
of the littoral zone  
optimal

[michiganlakeinfo.com](http://michiganlakeinfo.com)

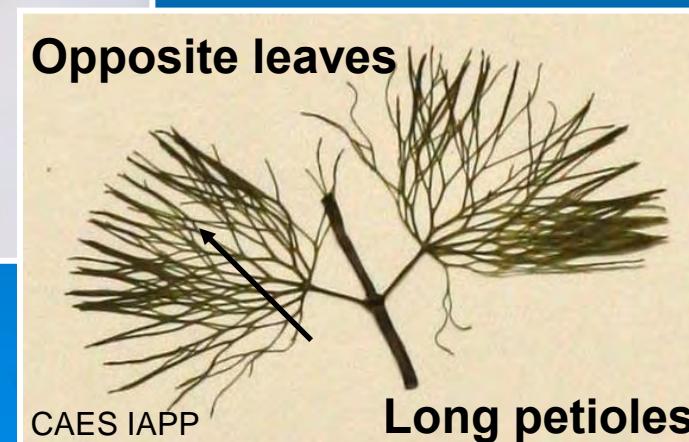
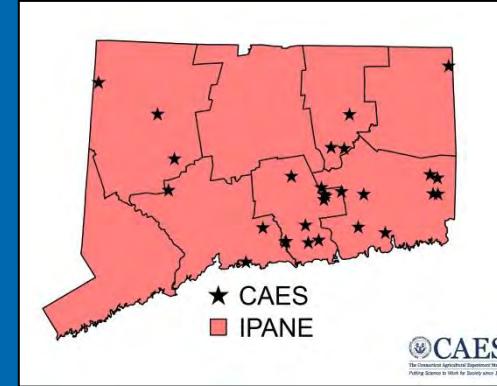


## Locations of Invasive Plants Found by CAES IAPP 2004-2020



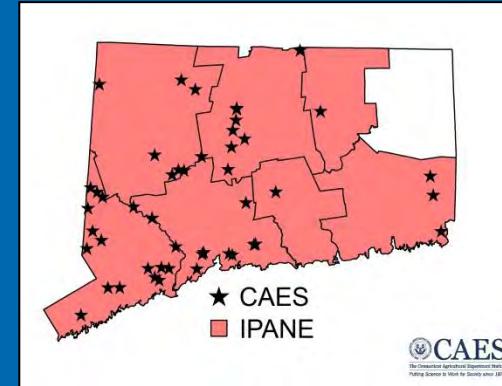
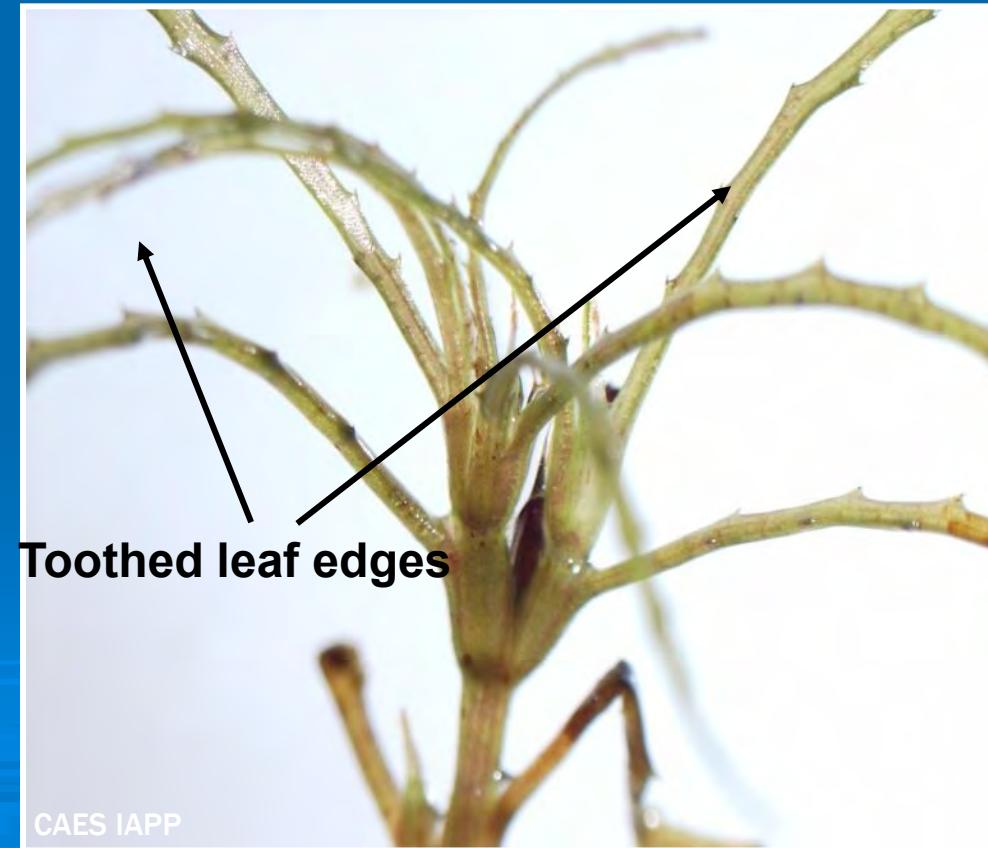
# Fanwort

## *Cabomba caroliniana*



# *Brittle Waternymph*

## *Najas minor*



# *Myriophyllum heterophyllum* (Variable Watermilfoil)

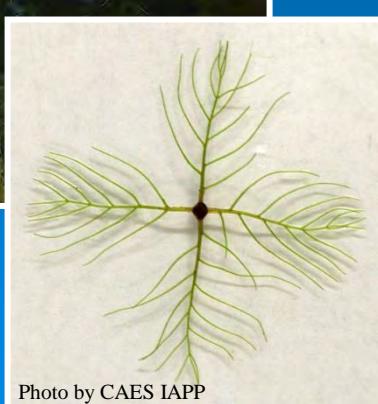


Photo by CAES IAPP

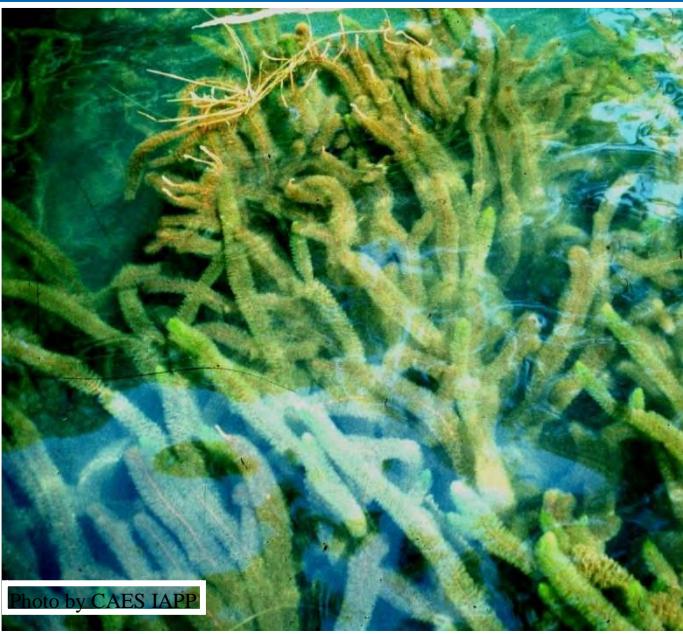
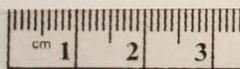


Photo by CAES IAPP



CAES IAPP



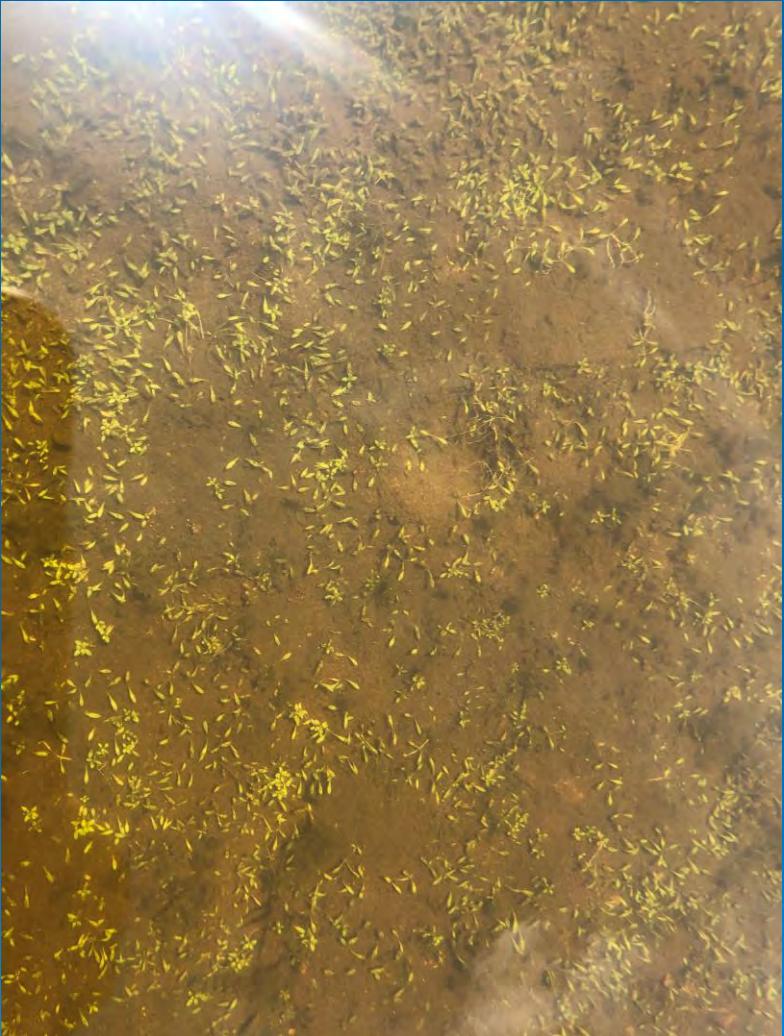
Leaves < 1 inch apart  
≤ 11 pairs of leaflets  
Triangular leaf



Photo by  
CAES IAPP

# Mudmat

## (*Glossostigma cleistanthum*)



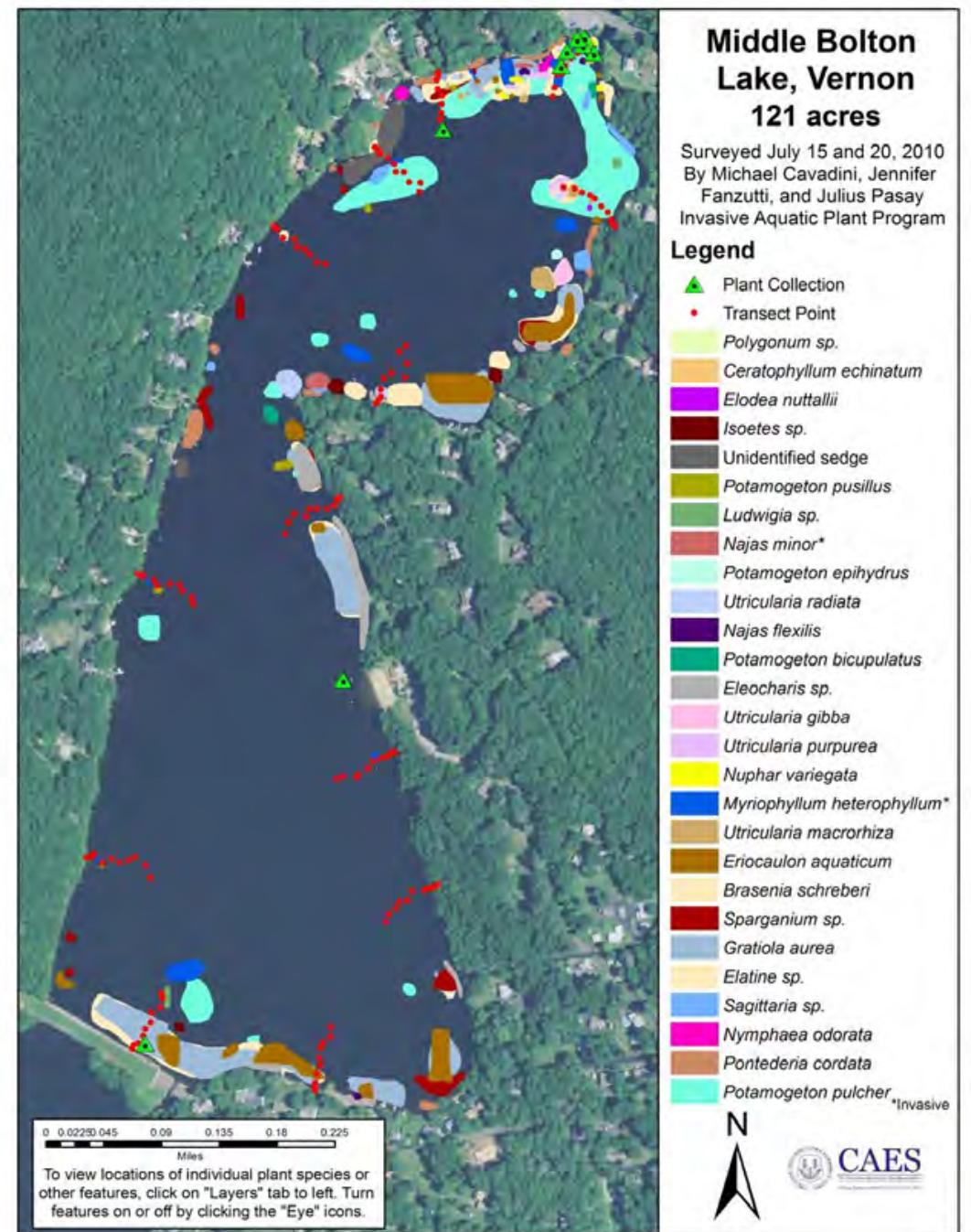
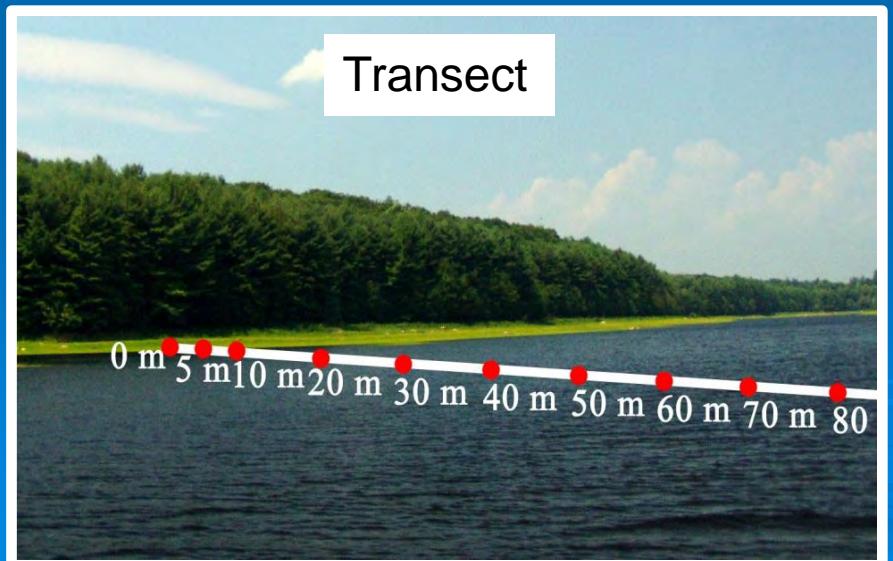
CONNECTICUT AGRICULTURAL EXPERIMENT STATION  
INVASIVE AQUATIC PLANTS SURVEY

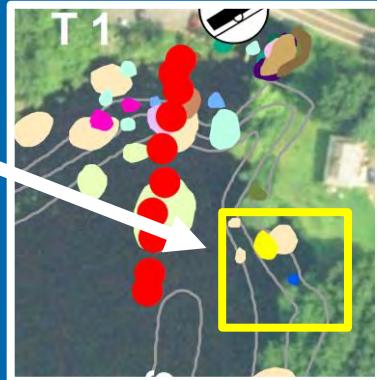
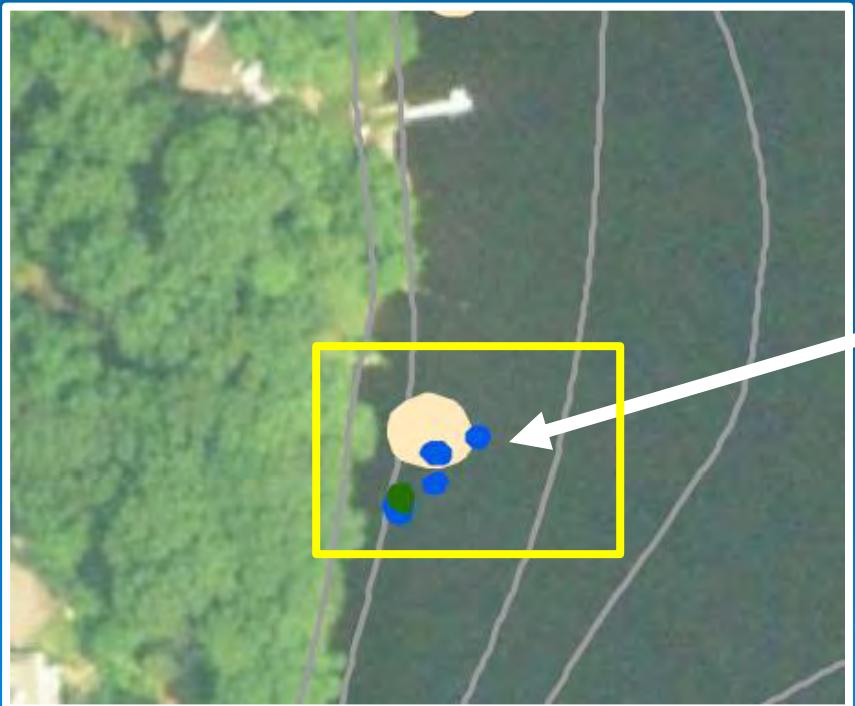
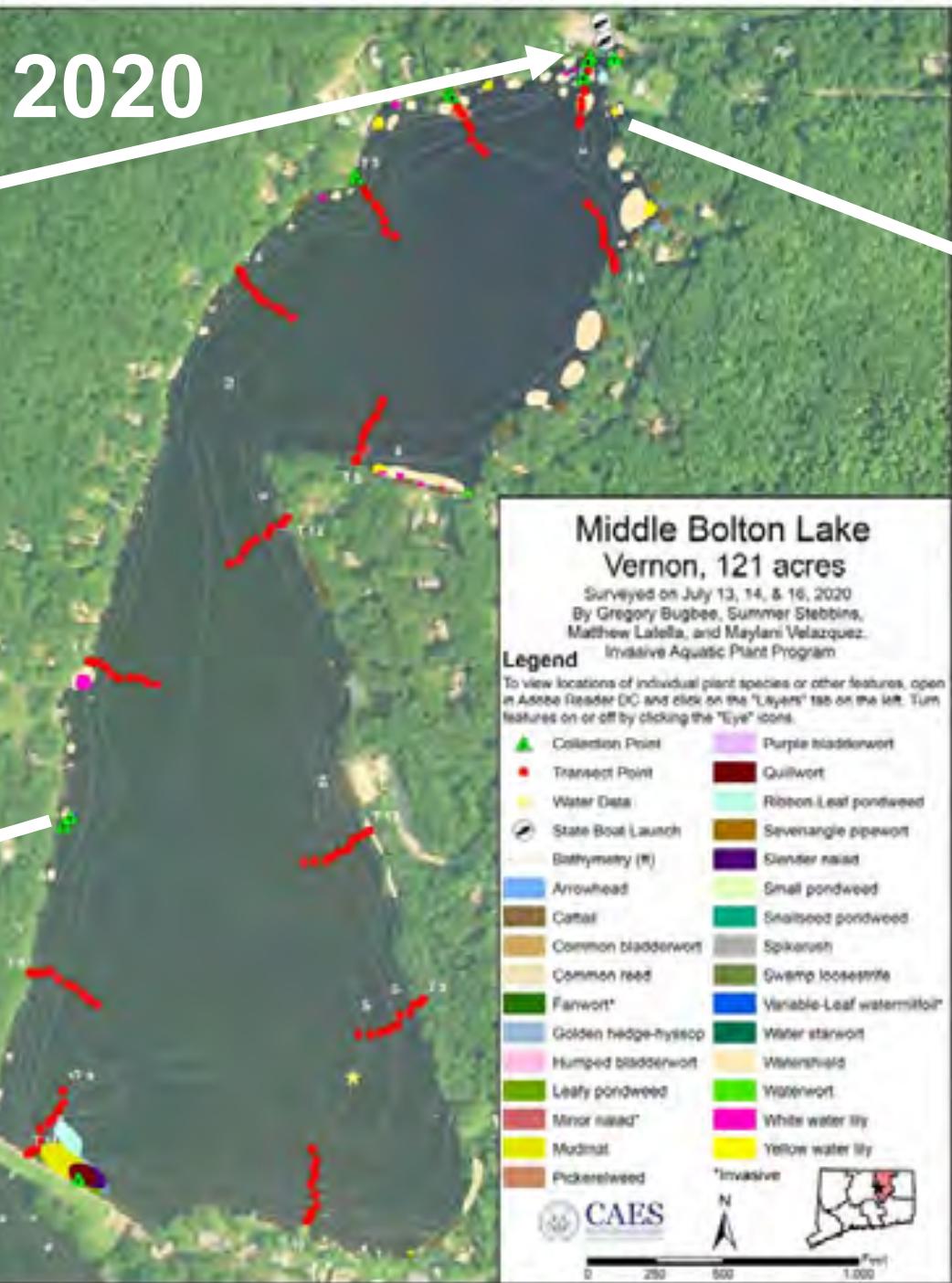
*Glossostigma cleistanthum* W.R.Barker  
SCROPHULARIACEAE

Lower Bolton Lake  
Bolton, CT  
Tolland County  
41.79892° N, 72.43085° W ± 1 m

Growing in 0.25 m of water. Found with *Eleocharis acicularis*.  
September 07, 2011  
Coll.: Mark June-Wells with Brian Hart  
Herbarium ID: GlosCle0504599072011

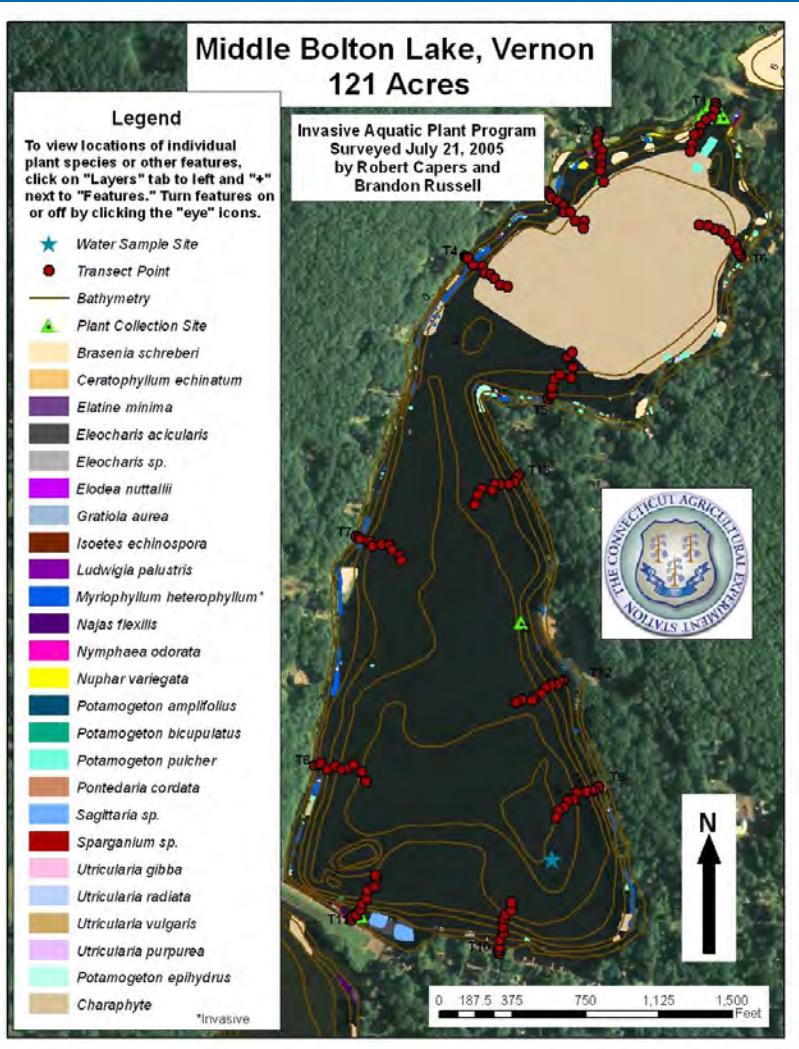
# Aquatic Vegetation Survey



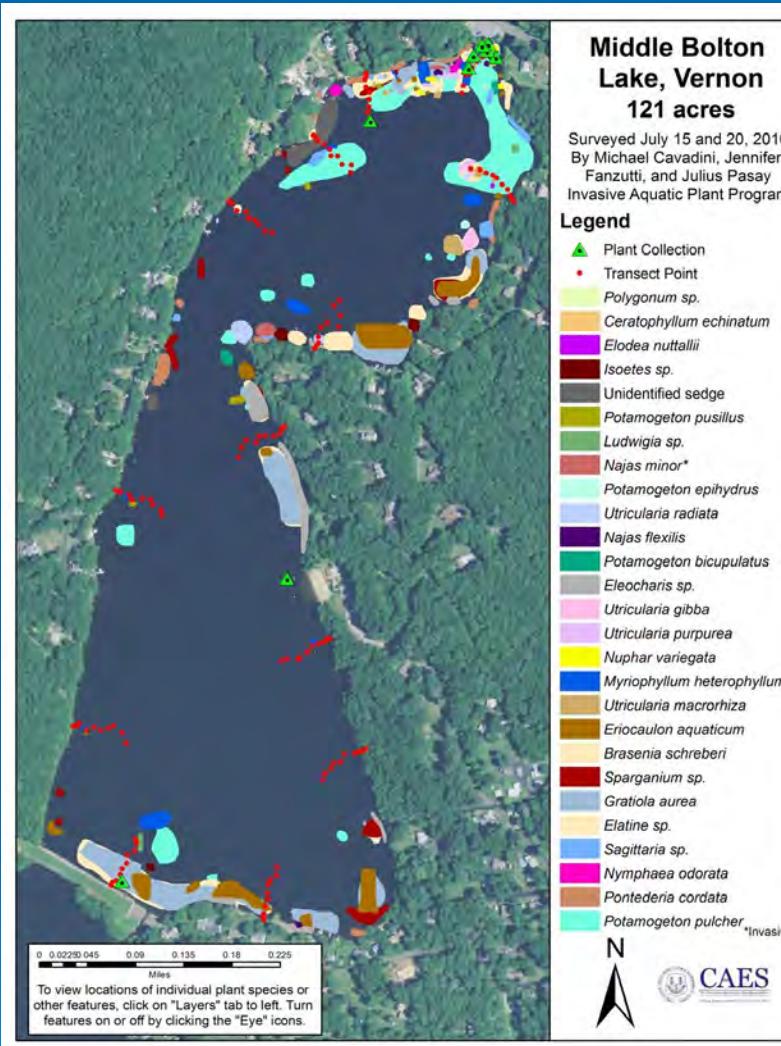




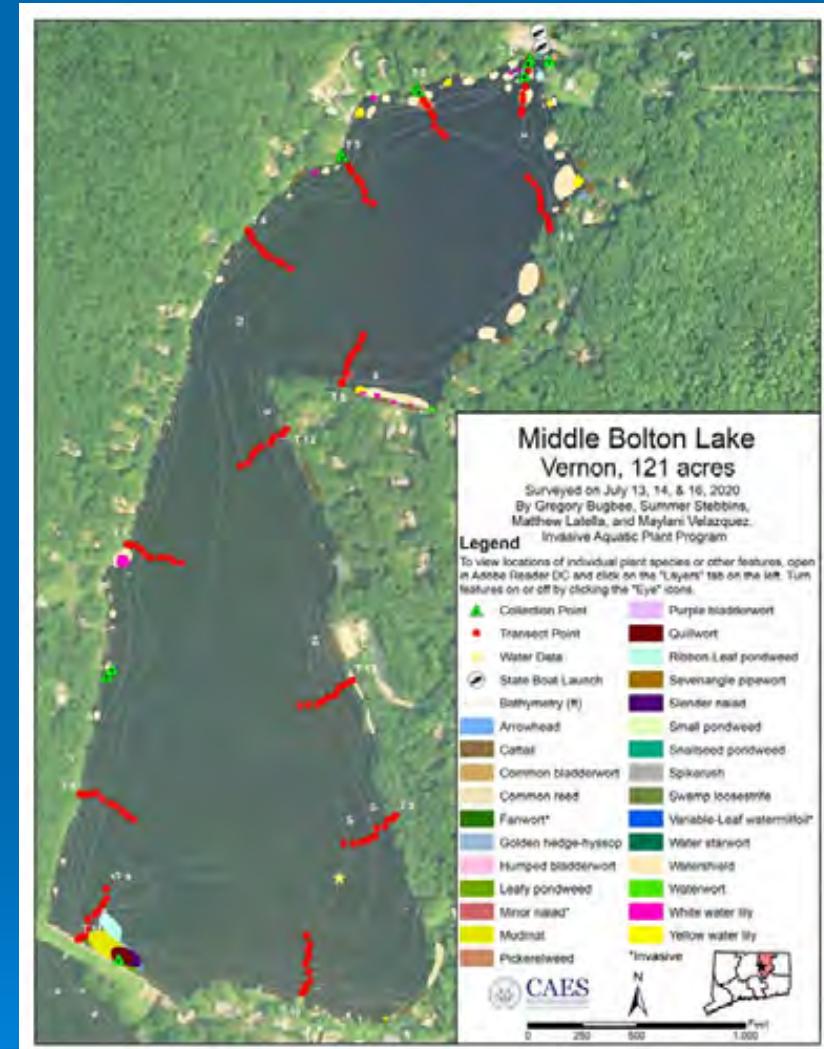
# 2005



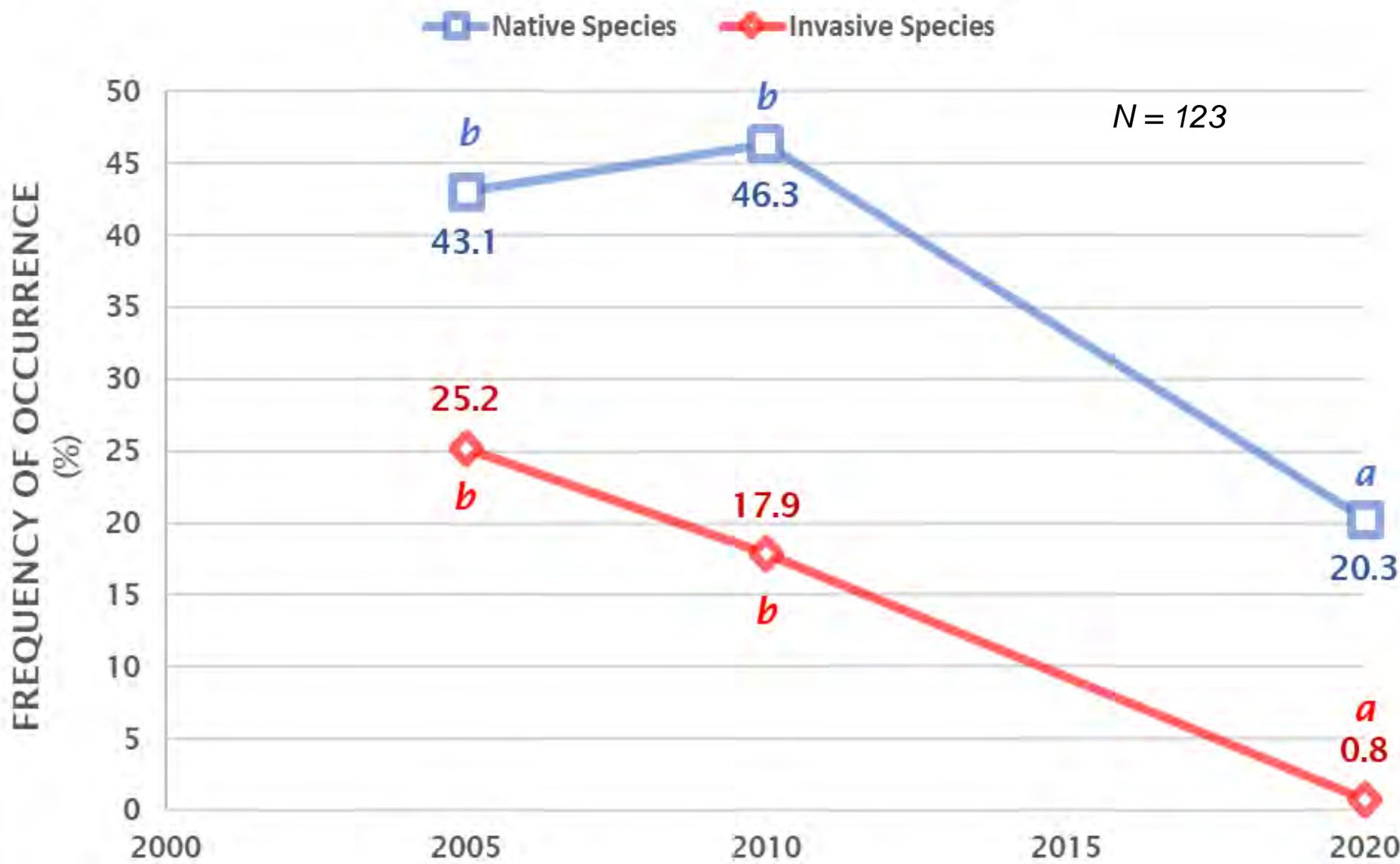
# 2010



# 2020

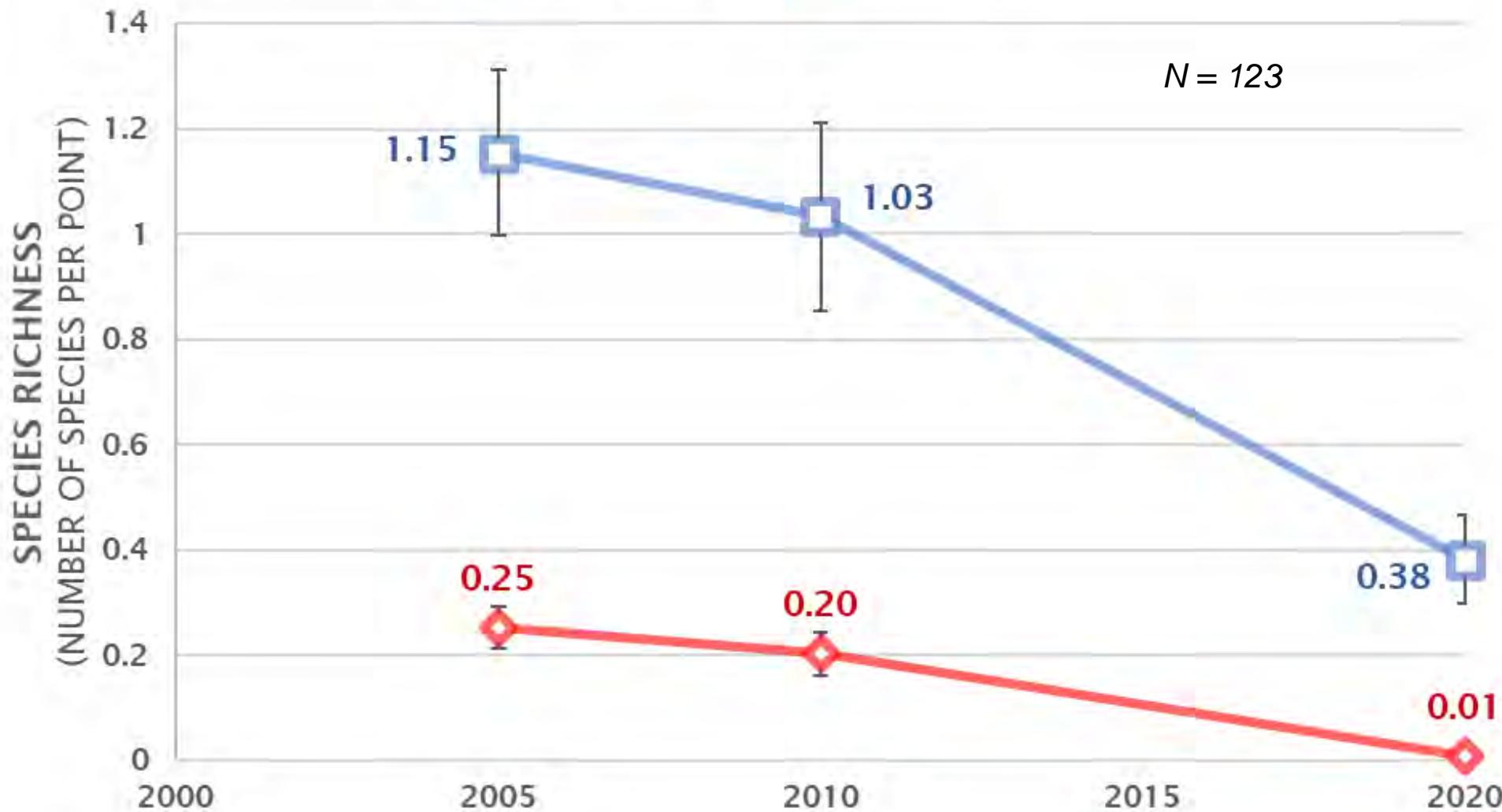


## Frequency of Occurrence



# Species Richness

Native Species      Invasive Species



# Middle Bolton Lake Aquatic Plants

Common Name*	Scientific Name	2005		2010		2020	
		Presence	FOQ	Presence	FOQ	Presence	FOQ
Arrowhead	<i>Sagittaria</i> species	X	6.5%	X	4.1%	X	6.5%
Bur-Reed	<i>Sparganium</i> species	X	0.0%	X	2.4%		
Common bladderwort	<i>Utricularia macrorhiza</i>	X	4.1%	X	2.4%	X	0.0%
<b>Fanwort*</b>	<b><i>Cabomba caroliniana</i></b>					X	0.0%
Floating bladderwort	<i>Utricularia radiata</i>	X	13.0%	X	6.5%		
Golden hedge-hyssop	<i>Gratiola aurea</i>	X	4.9%	X	3.3%	X	0.8%
Humped bladderwort	<i>Utricularia gibba</i>	X	6.5%	X	3.3%	X	0.0%
Knotweed	<i>Polygonum</i> species			X	0.8%		
Large-Leaf pondweed	<i>Potamogeton amplifolius</i>	X	0.0%				
Leafy pondweed	<i>Potamogeton foliosus</i>					X	1.6%
<b>Minor naiad*</b>	<b><i>Najas minor</i></b>			X	2.4%	X	0.8%
Mudmat	<i>Glossostigma cleistanthum</i>					X	0.0%
Pickerelweed	<i>Pontederia cordata</i>	X	4.9%	X	3.3%	X	8.1%
Primrose-Willow	<i>Ludwigia</i> species	X	0.8%	X	0.8%		
Purple bladderwort	<i>Utricularia purpurea</i>	X	2.4%	X	3.3%	X	0.0%
Quillwort	<i>Isoetes</i> species	X	3.3%	X	0.0%	X	0.0%
Ribbon-Leaf pondweed	<i>Potamogeton epihydrus</i>	X	3.3%	X	0.0%	X	0.0%
Sedge	<i>Carex</i> species			X	11.4%		
Sevenangle pipewort	<i>Eriocaulon aquaticum</i>			X	4.9%	X	1.6%
Slender naiad	<i>Najas flexilis</i>	X	12.2%	X	1.6%	X	0.8%
Small pondweed	<i>Potamogeton pusillus</i>			X	18.7%	X	2.4%
Snailseed pondweed	<i>Potamogeton bicupulatus</i>	X	7.3%	X	2.4%	X	0.0%
Spikerush	<i>Eleocharis</i> species	X	11.4%	X	2.4%	X	0.8%
Spineless hornwort	<i>Ceratophyllum echinatum</i>	X	4.9%	X	4.1%		
Spotted pondweed	<i>Potamogeton pulcher</i>	X	11.4%	X	11.4%		
Swamp loosestrife	<i>Decodon verticillatus</i>					X	0.0%
<b>Variable-Leaf watermilfoil*</b>	<b><i>Myriophyllum heterophyllum</i></b>	X	25.2%	X	17.9%	X	0.0%
Water starwort	<i>Callitrichia</i> species					X	0.0%
Watershield	<i>Brasenia schreberi</i>	X	4.9%	X	5.7%	X	8.9%
Waterwort	<i>Elatine</i> species	X	8.9%	X	7.3%	X	2.4%
Western waterweed	<i>Elodea nuttallii</i>	X	2.4%	X	3.3%		
White water lily	<i>Nymphaea odorata</i>	X	0.0%	X	0.0%	X	2.4%
Yellow water lily	<i>Nuphar variegata</i>	X	2.4%	X	0.0%	X	0.8%
Total Species Richness	33		23		27		24
Invasive Species Richness	3		1		2		3
Native Species Richness	30		22		25		21

\*Invasive Species in Bold



# CAES IAPP Website

[portal.ct.gov/caes-iapp](http://portal.ct.gov/caes-iapp)

The screenshot shows the homepage of the CAES IAPP website. The top navigation bar includes links for Apps, CAES, CAES IAPP, Sitecore, Sitecore Training, Color Blindness Sim., Core-CT, Trap Map, and GISCafe. The main header features the Connecticut State logo and the text "The Connecticut Agricultural Experiment Station". Below the header is a large banner image of a lake. The left sidebar contains a navigation menu with links to Invasive Aquatic Plant Program, Program Information, Survey Results, Control Studies, Plant Information, Publications, Herbarium, Links, and Contact Us. A search bar at the bottom of the sidebar allows users to search by keyword. The main content area is titled "Invasive Aquatic Plant Program (CAES IAPP)". It includes two photographs showing a lake with aquatic plants and a close-up view of a plant specimen. Below the images is a descriptive text block about the program's history and objectives.

In 2002, scientists at the Connecticut Agricultural Experiment Station began surveying Connecticut lakes and ponds for invasive aquatic plants and investigating novel management options. Surveillance focuses on both invasive and native vegetation to quantify the effects of invasive species on aquatic ecosystems. This research allows us to track the spread and record the arrival of invasive aquatic plants. Surveys also provide baseline information to determine if the frequency and magnitude of invasions may be related to water chemistry, sediment type, boat launches, watershed development



# Questions?

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Invasive Aquatic Plant Program

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