



MASSACHUSETTS DEPARTMENT OF
CONSERVATION AND RECREATION

**Partnerships Matching Funds Program
Fiscal Year 2018 FINAL APPLICATION**

Please Complete All Sections and Return by September 8, 2017

PARTNER INFORMATION

Name: Clinton Conservation Commission

Name of Primary DCR Contact Joy Trahan-Liptak

Address Town Hall, 242 Church Street

2ndAddress _____

City/Town/Village Clinton Zip 01510

Primary Phone 978-365-4127 Other Phone N/A

Twitter/Facebook/Instagram N/A N/A

Email Contact person: Dinorah Caraballo: dcaraballo@clintonma.gov

PARK AND/OR FACILITY INFORMATION

Name of DCR Park/Facility where project is proposed	Clamshell Pond
Location of Park/Facility (Town or City)	Clamshell Road, Clinton, MA 01510

PROPOSED PROJECT INFORMATION

Brief Description of Project **Please attach additional information (e.g., photos, maps, drawings) for background	Treatment of Clamshell Pond, Clinton MA, with a low-dose of herbicide Diquat for the control of Brazilian Elodea (Egeria densa) that has been found in 70% of the pond. Please see attached for maps, photos, etc.
Budget Estimate for Project **Please attach supporting documentation. NOTE: Final budget estimates shall be verified by DCR Professional staff	\$8,000.00
Dollar Amount you will Contribute to Project (\$) Funds will be deposited into DCR Conservation Trust account	\$2,666.67



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Amount of Matching Funds Requested (\$) DCR will consider a 2:1 match on contributions up to and including \$25,000, and a 1:1 match on those of more than \$25,000.	\$5,333.33
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PROPOSED PROJECT CATEGORY

Project Category	CONSTRUCTION		LANDSCAPING		OTHER	X
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PERMITTING

Permits Required – request guidance from DCR staff	YES X	NO	
Has permitting been factored into budget estimate?	YES X	NO	

BIDDING & PROCUREMENT

Check that you understand that DCR will manage the procurement process and ensuing contract(s).	Yes
If the bid comes in higher than anticipated, do you agree to assume up to 50 % or more of the overage?	Yes

RIBBON CUTTING EVENT

Are you anticipating a ribbon cutting event? If YES, please review the Program Standards section on ribbon cutting.	YES		NO	X
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AGENCY CONTACT HISTORY

Please list all DCR staff with whom you have communicated regarding this proposed project.	JOY TRAHAN-LIPTAK & JAMIE CARR, DCR AQUATIC BIOLOGISTS
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ADDITIONAL PARTNERS

List additional partners (if any) & their roles.	JOY TRAHAN-LIPTAK & JAMIE CARR, MA DCR DIVISION OF WATER SUPPLY PROTECTION, WACHUSETT RESERVOIR, 180 BEAMAN STREET, WEST BOYLSTON, MA 01583 (PROJECT MANAGERS); TOM FLANNERY, DCR LAKES AND PONDS PROGRAM, 251 CAUSEWAY STREET, SUITE 800, BOSTON, MA 02114 (DCR PROJECT ADVISOR); CLINTON CONSERVATION COMMISSION (PERMITS AND NOTICES); RAUSCHER FARM MANAGEMENT SUBCOMMITTEE (LIASON BETWEEN PARTNERS); CLINTON GREENWAY CONSERVATION TRUST, INC. (LOCAL LAND TRUST; ADDITIONAL SUPPORT AS REQUIRED)
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PRIOR PARTNER INFORMATION

List prior projects funded through the Partnerships Matching Funds Program.	N/A
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CONSERVATION AND RECREATION

ADDITIONAL INFORMATION

Please list information **not included above.**

SEE ATTACHMENTS.

Clamshell Pond, Clinton, MA

Project Description:

The project is an application of the herbicide diquat to treat the invasive aquatic plant *Egeria densa* (Brazilian elodea), which is growing in about 70% of Clamshell Pond in Clinton. Control of this invasive species is important for a healthy bio-system and to prevent its spread to neighboring Wachusett Reservoir. At its closest point, Clamshell Pond is around 1,300 feet away from the Wachusett Reservoir. Mechanical removal, diver assisted suction harvesting, and pond water drawdowns are not efficient, feasible, or cost-effective remedies for this invasive species at our location.

At a meeting with the Clinton Conservation Commission on April 19, 2017, Joy Trahan-Liptak and Jamie Carr, aquatic biologists with the MA DCR Division of Water Supply Protection, Wachusett Reservoir, illustrated how diquat has proven to be an effective treatment for *E. densa*, a very aggressive invasive plant. The DCR biologists base their diquat recommendation on diquat/*E. densa* research conducted by the Connecticut Agricultural Experiment Station. At that time, the DCR's ballpark cost for a single application for one year for Clamshell Pond was \$7,000 - \$8,000. Based on a 2:1 match, this meant the cost to the Town of Clinton would be an estimated \$2,600.

Please see also attached file: FY18 Final App_Clamshell_Addendum_part2.pdf
Excerpted DCR Presentation April 19, 2017: Invasive Species in Clamshell Pond Biology, History, and Potential Management Strategies

Budget Estimate:

Based on the April 2017 meeting with DCR, \$2,666.66 has been allocated in the FY2018 budget for the Town of Clinton's portion of the now confirmed not-to exceed \$8,000 Diquat application costs.

Invasive Species in Clamshell Pond

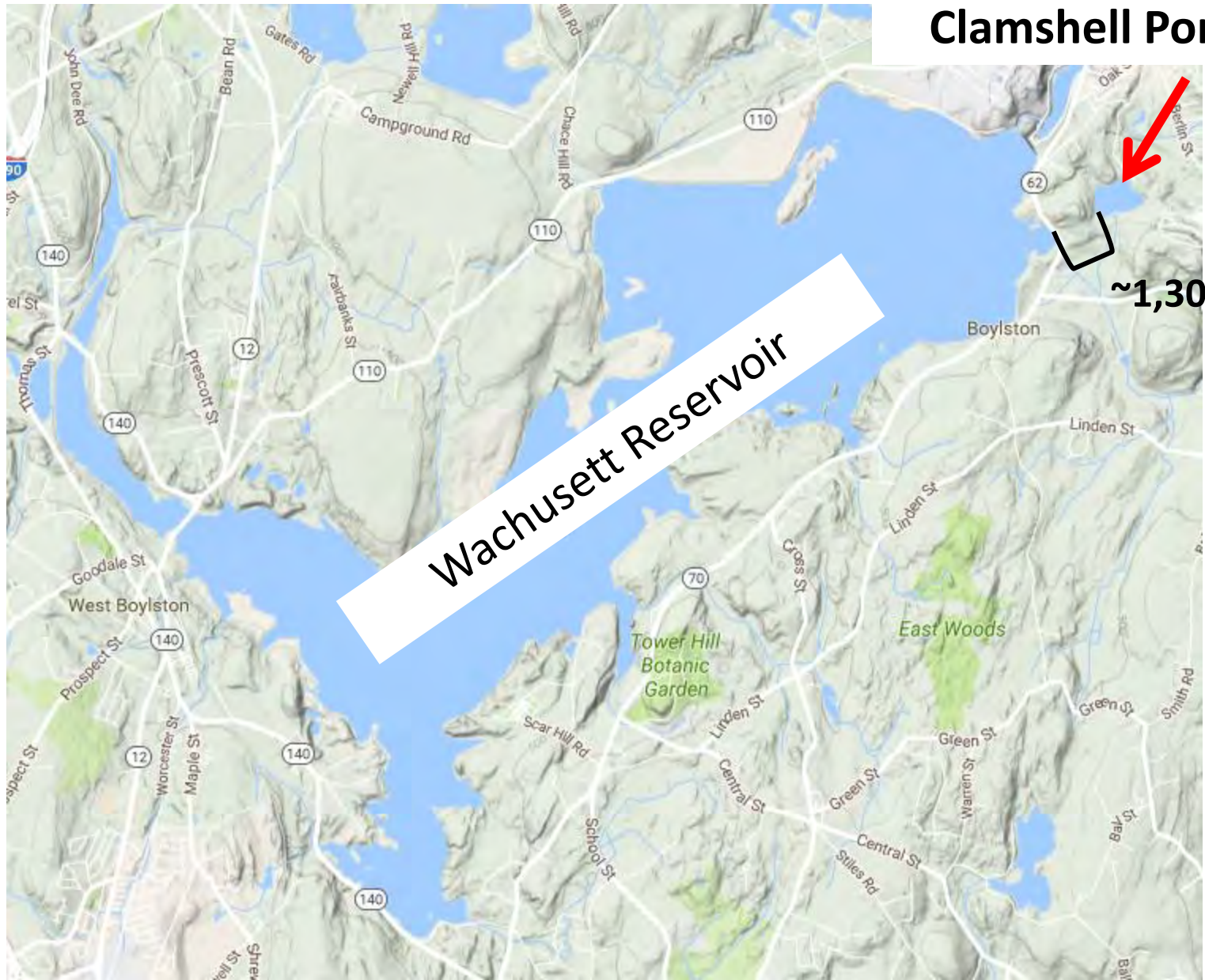
Biology, History, and Potential Management Strategies

Joy Trahan-Liptak and Jamie Carr, Aquatic Biologists
MA DCR Division of Water Supply Protection
Wachusett Reservoir

Invasive Species

- Species that are not native to the region where they exist
- Rapidly displace native vegetation, form dense monocultures with large amounts of biomass
- Increase the rate of eutrophication
- Impact water quality including increases in:
 - water color,
 - turbidity,
 - phytoplankton growth,
 - production of trihalomethane (THM) precursors
- Impede recreation



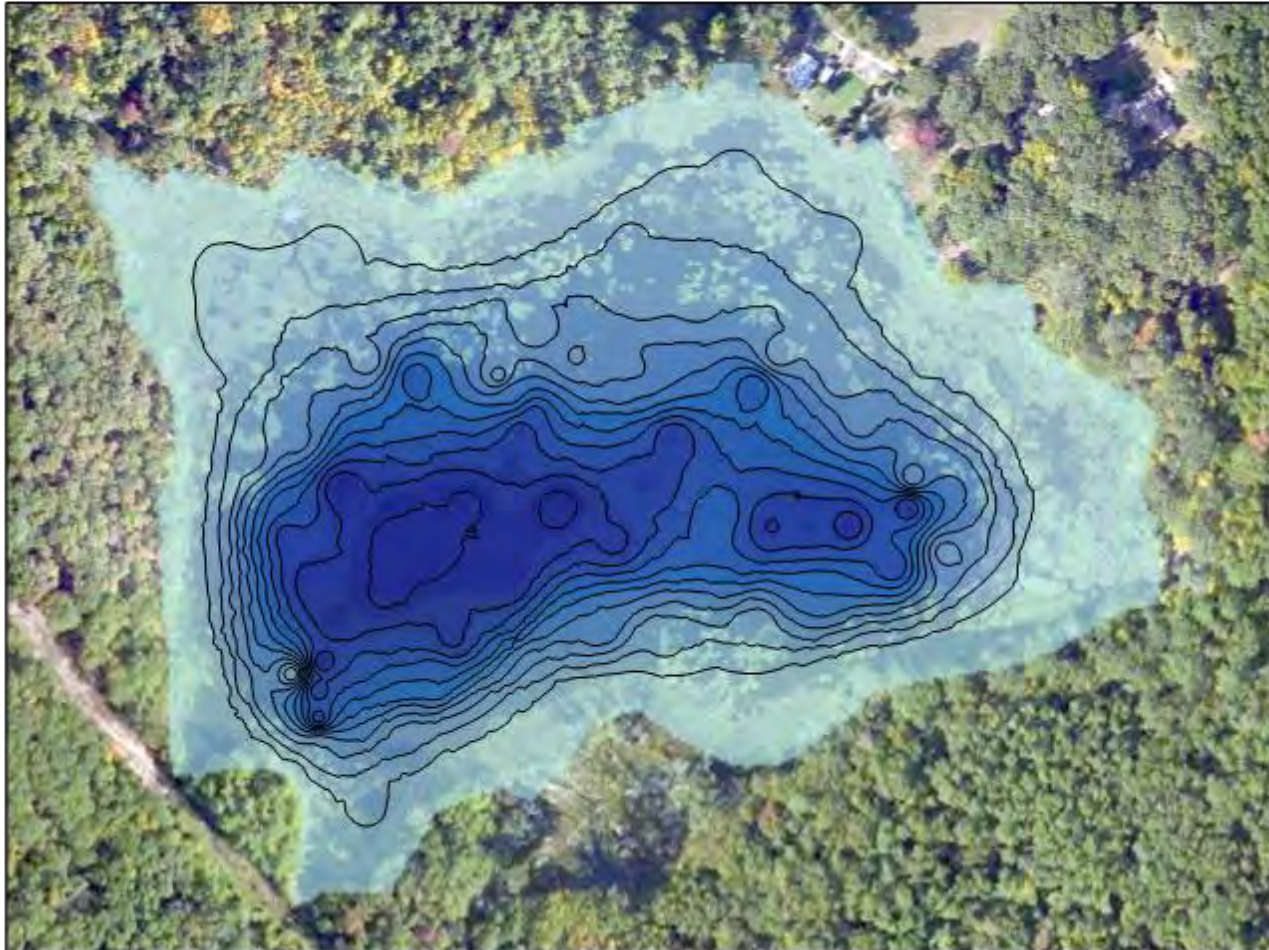


Clamshell Pond

~1,300 feet

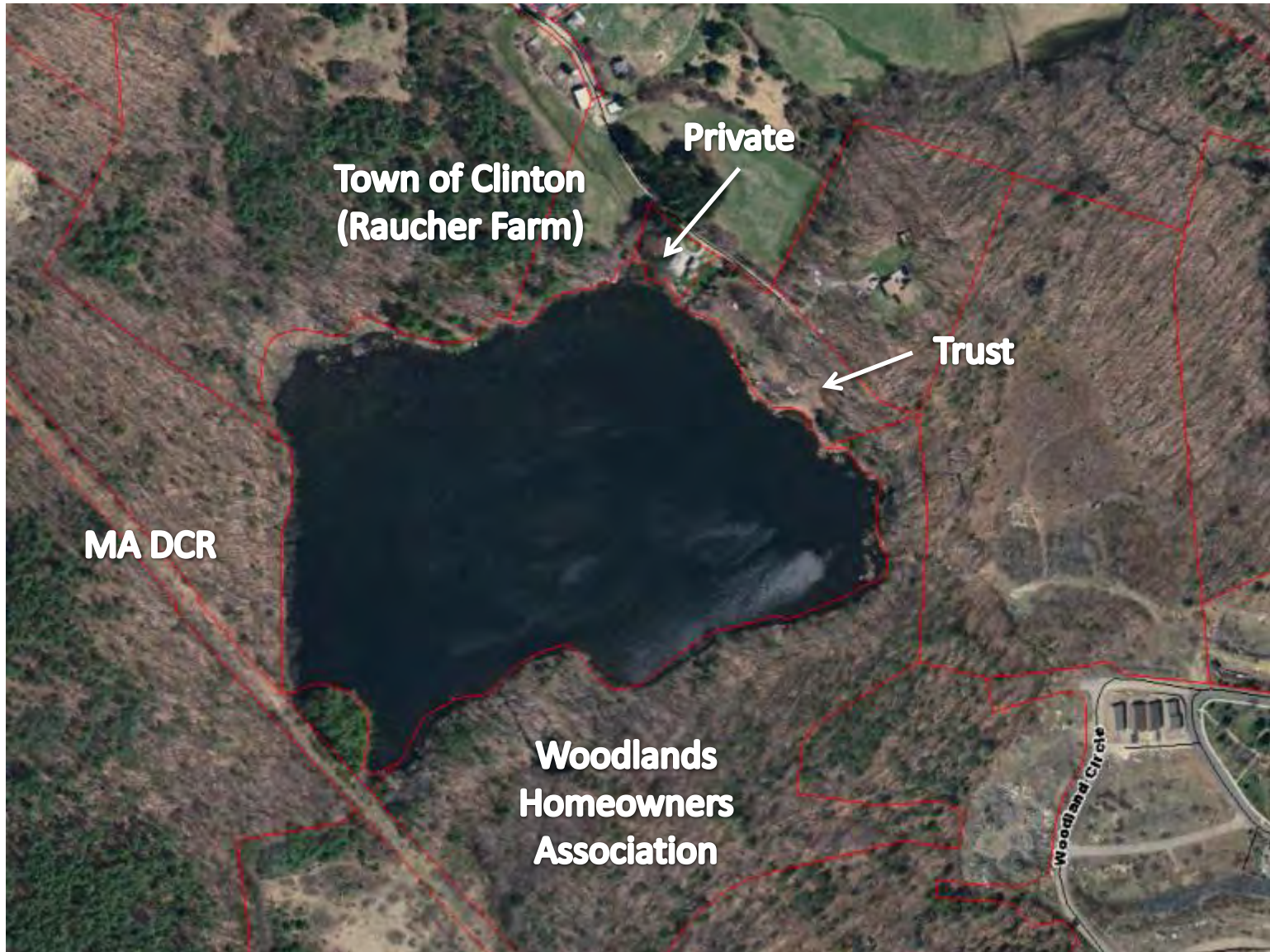
Clamshell Pond

- 30 acres
- Max depth ~25 feet
- Average depth ~8 feet
- Littoral area (<10 feet) ~21 acres
- Sudbury River Watershed



Abutting Properties

5 landowners



Invasive Plant Species Known in Clamshell Pond



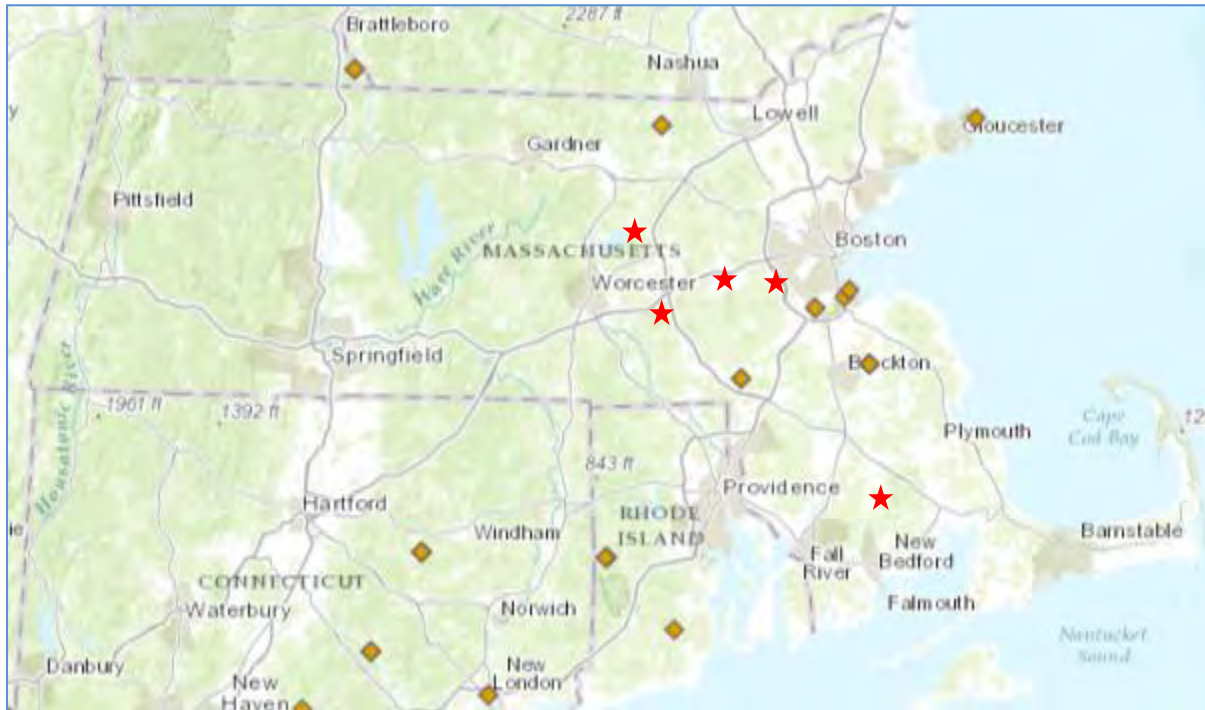
Trapa natans (Water Chestnut)



Egeria densa (Brazilian elodea)

***Egeria densa* (Brazilian waterweed)**

12 (Known) Occurrences in Massachusetts

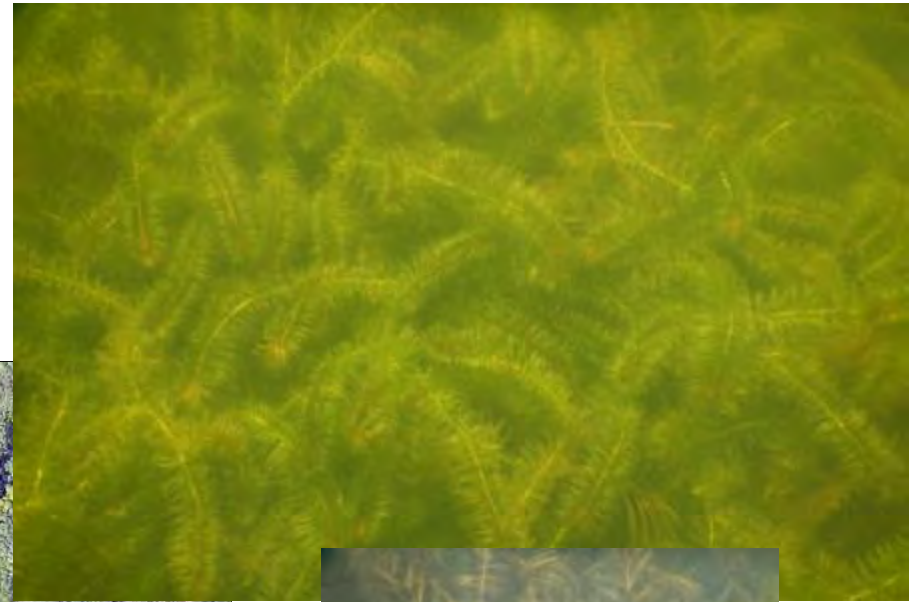
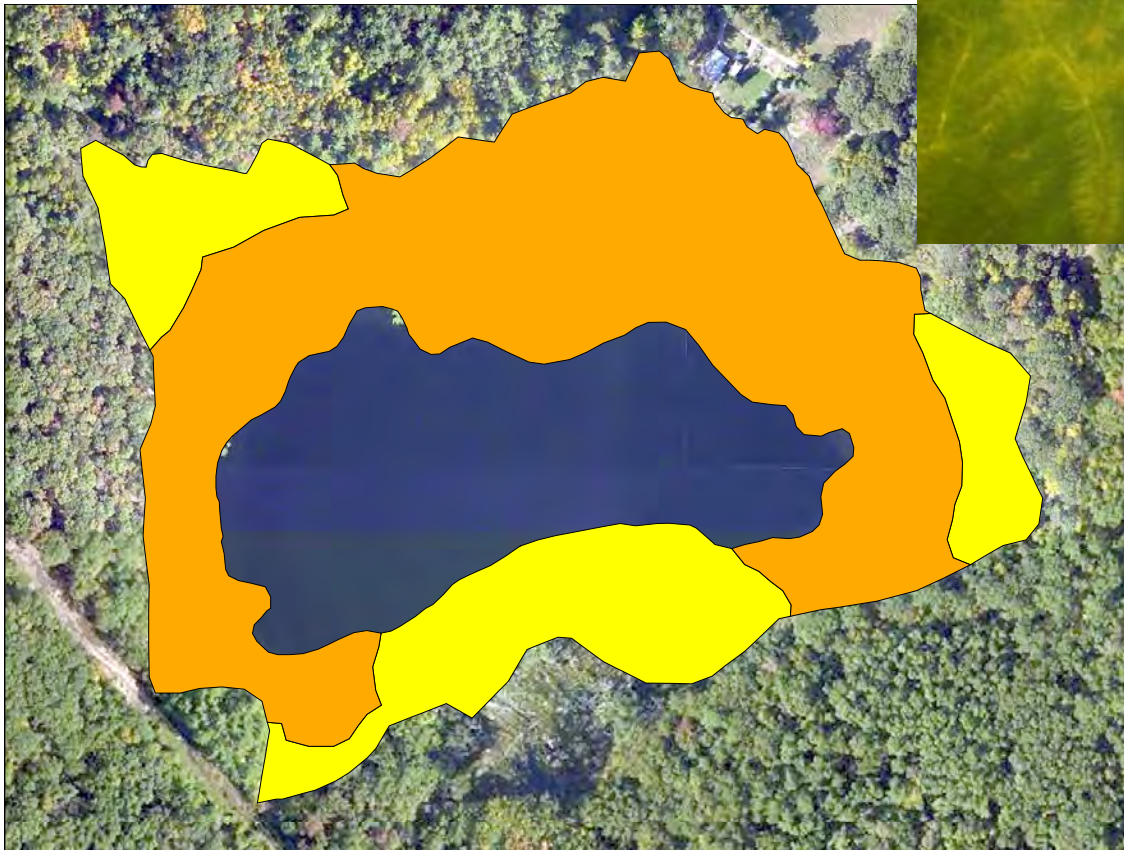


◆ USGS database

★ DCR data

***Egeria densa* (Brazilian waterweed)**

- DCR conducted survey in June 2016
- *E. densa* present in 70+% of pond
 - 6.5 acres Trace/Sparse
 - 14.8 acres Moderate/Dense



***Egeria densa* (Brazilian waterweed)**

Why is management necessary?

- Impact to native plants and wildlife
- Impact to boating and fishing
- Increases rate of eutrophication, decreasing life of the pond



- Decreases in water quality including oxygen depletion with negative impacts to fish, increasing potential for winter fish kills
- Threat of expansion to other area water bodies

***Egeria densa* (Brazilian waterweed)**

Management Options

Type	Pros	Cons
Mechanical	•Removes biomass	•Does not remove entire plant, will not address reproduction. •Will likely spread plant to any area of the pond not already infested. •Costly and time consuming - yearly program would be required.
D.A.S.H.	•Removes biomass •Targets entire plant •Reduce reproductive potential •Can be selective – harvest around native plants	•Labor intensive and time consuming – would require an on-going effort for many years. •Costly (see Stillwater Basin) •Fragmentation unavoidable
Drawdown	•Target species is susceptible to drawdown	•No controllable outlet structure •Would require drawdown in excess of 10 ft , >50% of the pond's surface area. •Negative impacts to non-target species.
Herbicide	•Targets entire plant •Control possible within several years •Removes threat of spread in a relatively short period of time.	•Cost? •May require multiple applications •Landowner cooperation? •Large amount of decomposition may cause algae blooms
Nothing	•No permitting •Minimal effort	•Impact to native plants and wildlife, boating and fishing •Increases rate of eutrophication, decreasing life of the pond •Decreases in water quality including oxygen depletion •Potential for spread to Wachusett Reservoir by waterfowl or anglers remains •If spread occurs, management in reservoir would be costly/time consuming/labor intensive/ineffective etc.



Egeria densa Research by CT Agricultural Experiment Station

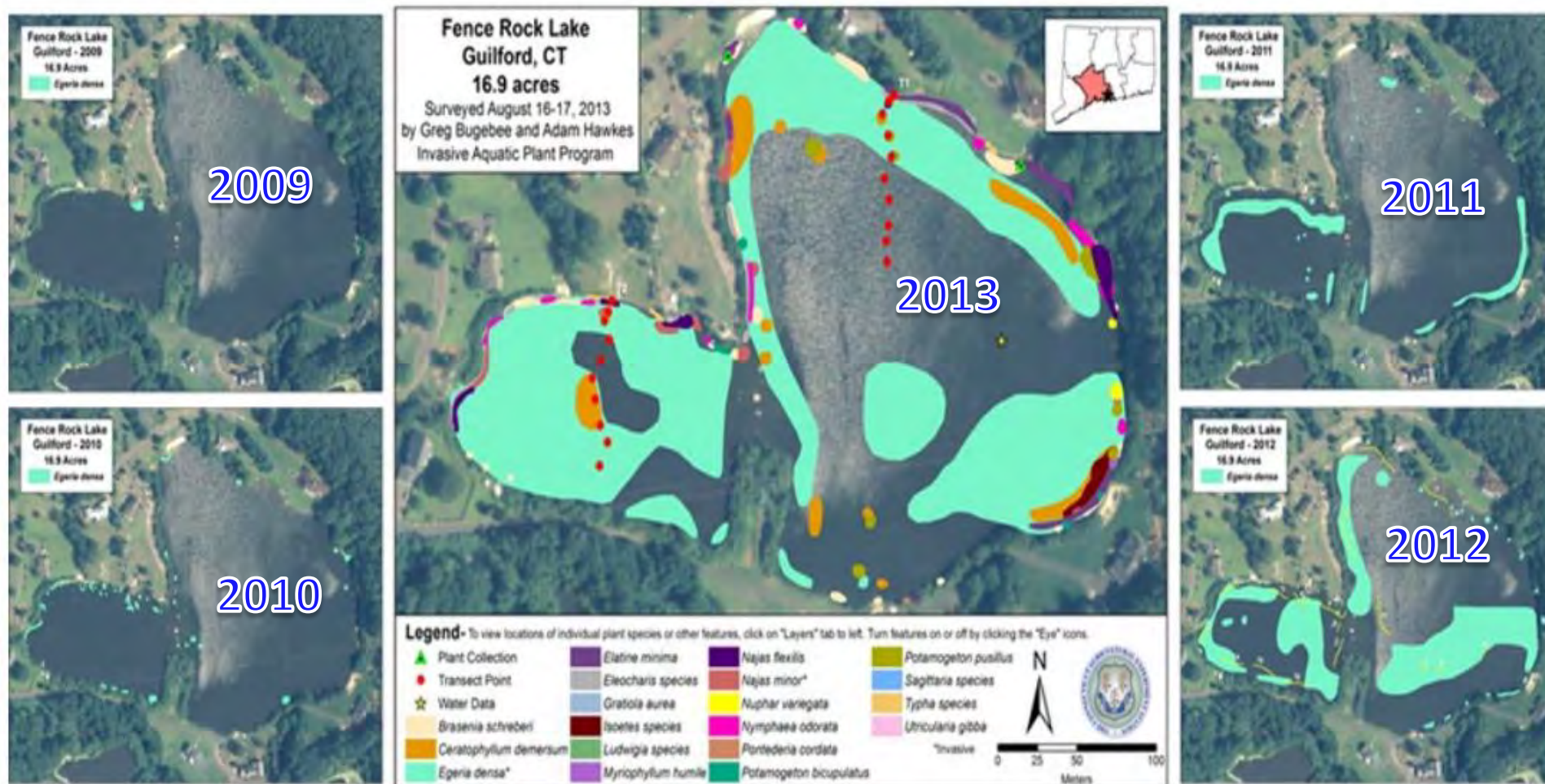


Photo 2. Rapid spread of *Egeria* from 2009 to 2013 in Fence Rock Lake

***Egeria densa* Research by CT Agricultural Experiment Station**

- 2014
 - Pre-treatment survey: *E. densa* present at 57 survey points
 - Treated *Egeria densa* in July with diquat at a rate of 1 gallon per acre
- 2015
 - Pre-treatment survey: *E. densa* present at 1 survey point
 - Follow-up treatment conducted in hopes of complete eradication
- 2016
 - Pre-treatment survey: ***E. densa* NOT DETECTED** at any of the 250 survey points!
 - No treatment conducted

Egeria grows fast and spreads quickly, but spreads vegetatively and by fragmentation. It does not produce reproductive structures such as tubers or turions and this explains the success of contact herbicide treatment.

Impacts to native plants was minimal: no impact at this application rate to water lilies. In Clamshell Pond possible short term negative impact to Pondweeds and Bladderworts.

Ballpark cost for a single application for one year for Clamshell Pond is \$7,000 - 8,000

Treatment Information

- All aquatic herbicide treatments in MA must be conducted by licensed applicators using only US EPA registered and state-approved herbicides.
- Diquat is applied at a rate of 0.5-2 gallons per acre depending on target species (1 - 1.5 gal)
- Aqueous application made by mixing herbicide with water onboard boat and injecting it under the water surface with a pump and trailing hoses.
- Water use restrictions:
 - Recreation – no restrictions*
 - Livestock consumption – 1 day
 - Direct drinking – 3 days
 - Irrigation for grass – 3 days
 - Irrigation for crops – 5 days



* Possible restriction on day of treatment for logistical reasons at contractor request

Management Timeline

Summer '17

- Vegetation survey to identify pre-management conditions

**Winter
'17/'18**

- File Notice of Intent with Conservation Commission/DEP
- Public Hearing
- Issue RFP for contractor

Spring '18

- Initiate monitoring for *E. densa* to identify optimum treatment time

Summer '18

- Contractor conducts treatment
 - Application permit from DEP
 - Notifications as required by OOC, Posting of water body
 - Basic water quality
- Post-management vegetation surveys

