



# Wachusett Reservoir

## Aquatic Invasive Species Summary Historical Update and Ongoing Actions



Spring 2016

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Massachusetts Department of Conservation and Recreation  
Division of Water Supply Protection  
Office of Watershed Management

**Wachusett Reservoir Aquatic Invasive Species Summary**  
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**Acknowledgements**

This report was prepared by the MA Department of Conservation and Recreation, Division of Water Supply Protection, Office of Watershed Management. The principal authors are Joy Trahan-Liptak and Jamie Carr, Aquatic Biologists. Cover photo by Joy Trahan-Liptak: Eurasian Milfoil (*Myriophyllum spicatum*) in Muddy Pond, Sterling.















### **5.0 CLIMATE CHANGE AND FUTURE AQUATIC INVADERS**

Since the late nineteenth century, temperatures in southern New England have warmed consistently, with winter temperatures rising more than summer temperatures (Blue Hill Observatory 2015, NOAA 2015). Average snow cover has also decreased, ice over on lakes and ponds tends to arrive later and ice-out tends to arrive earlier. Additionally, precipitation has increased approximately 25 percent during the same period. Climate change models suggest that these trends will continue and may intensify through the twenty-first century (New England Regional Assessment 2002).

Climate change may increase the likelihood of invasion by new aquatic macrophyte species. Climate change may also spur some of the species that are already present to become more aggressive. Although the reasons for this are complex, the following list presents some of the most direct causes:

1. Lengthened growing season for aquatic macrophytes, which provides a wider seasonal window for introduction, growth and reproduction
2. Warmer water temperatures during the growing season, increasing the growth rate of some species
3. Extended season of active in-water use by principal vectors (humans and wildlife)
4. Increased frequency and magnitude of weather-related ecosystem disturbances
5. More intense precipitation events, which would be expected to increase the mobilization of soils and nutrients into aquatic ecosystems

### **3. Addressing AIS in the Future: Objectives, Strategies, Actions**

The overarching goals for aquatic invasive species management in Wachusett Reservoir are **to prevent new introductions of non-native species** and **to limit the spread of introductions that have already occurred**. In general, the strategies to meet these goals fall under four general categories: public outreach and education, exclusion/decontamination, detection, and response. These efforts are generally overseen by the aquatic biologists in the Wachusett EQ Section with a large portion of public education/outreach and enforcement undertaken by the DCR Watershed Rangers. Each category is discussed in the sections that follow.

#### **3.1 Public Education/Outreach**

While the Division has much control over potential introductions of non-native species to the reservoir from equipment such as boats and trailers, there is a greater challenge in preventing introductions from anglers fishing from shore, as well as introductions to water bodies in the watersheds. The approach to providing public outreach on the threats from non-native species must be multifaceted to reach the general public as well as user groups.

DCR Watershed Rangers are the primary source of public interface in the immediate vicinity of the reservoir. They are regularly updated (annual training and as needed) on the latest non-native species concerns and thus they are well equipped to educate the reservoir users they encounter as part of their daily patrol duties and in educational settings. A law against transportation of aquatic nuisance species (M.G.L. c. 21, § 37B) was passed in 2013. The implementing regulations (302 CMR 18.00) give DCR Rangers (as well as other designated law enforcement officials) authority to issue citations for "Knowingly or intentionally placing, or causing to be placed, an ANS [aquatic nuisance species] in or upon Inland Waters," and other related violations of the law on all properties owned or managed by DCR.

Educational brochures and signage are a key element in any public outreach and DCR has developed both to highlight threats from non-native species and the steps needed to protect against

them. Entities targeted for distribution of brochures/signage include the following: bait shops, libraries, sportsman clubs, boat ramps, water access areas, anglers, etc.

### **3.2 Exclusion and Decontamination**

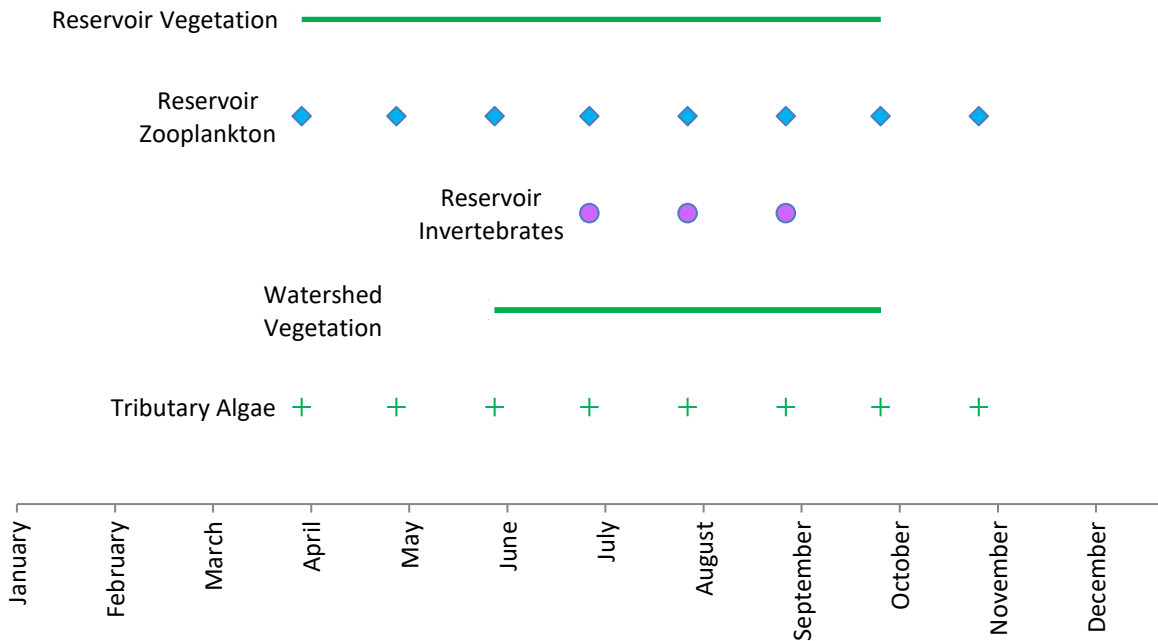
Public boating is not allowed on Wachusett Reservoir. Certain situations require that contractors, law enforcement agencies, and staff from Division of Fisheries and Wildlife use their agency's vessels on the reservoir. These vessels and any equipment utilized on or in the reservoir must comply with the 'Aquatic Invasive Species Decontamination Protocol for MWRA/DCR Reservoirs' included in the Appendix. This requirement will be included in all RFPs and agreements with other agencies. DCR Aquatic Biologists or MWRA personnel are present on site to perform a visual inspection of each vessel and associated equipment before it enters the reservoir. In addition to the inspection, completed decontamination certifications forms are collected and approved/denied at that time. Recognizing that procedures for decontamination may change based on the introduction of new non-native species, this document will be updated as needed.

### **3.3 Detection/Monitoring**

Monitoring of the aquatic communities within a water body is an essential component to any program that strives to reduce the risk for establishment of non-native species. Knowledge of baseline conditions facilitates early detection of new introductions and provides for future assessments of how these introductions affect the native community over time. Early detection of introductions allows for response measures that are often successful in eradication or control at a lower cost and effort due to the limited extent of the initial infestation.

Wachusett Reservoir, including all five basins, is the first priority for monitoring. Additional water bodies are added and prioritized based on several criteria, including: connection and proximity to the reservoir, use by the public, and proximity to known populations of non-native species. Specific monitored parameters, timing, and protocols will vary depending on the water body. The following graphic presents the expected time-frames for monitoring programs.

**Figure 5: Wachusett Reservoir and Watershed Expected Annual Monitoring Schedule**



Standard protocols for these monitoring activities will be developed as needed and appended to this document. Results will be catalogued electronically in a standardized format and brief reports will be developed for each water body/area as assessments are completed.

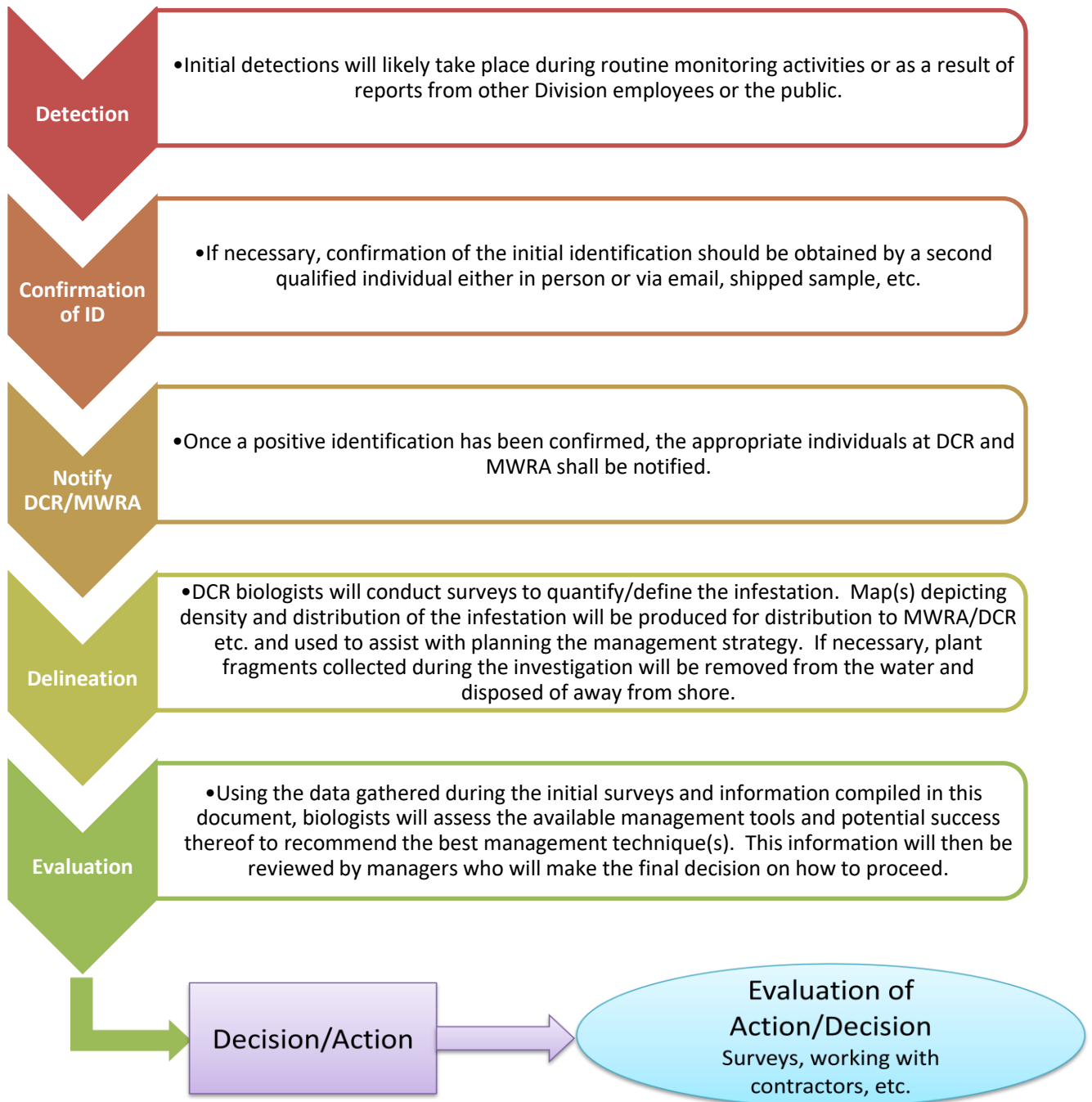
### 3.4 Response

As discussed above (see Section 2), the number of non-native aquatic species and the viability of species currently present in the region is expected to increase. It is expected that the number of non-native species present within the reservoir and its watershed could show a corresponding increase. The detection of these species will most likely correspond with the level of effort allocated toward monitoring activities.

Due to the wide-ranging nature of invasive species, the water quality and/or ecologic impacts these species may have on the reservoir will be evaluated and responded to on an individual basis. Some species, such as Water Chestnut (*Trapa natans*) may have clear negative impacts on both water quality and ecologic function as well as a straightforward and accepted approach to management (physical removal). The impacts and management of others, such as the mudmat and Asian waterwort discovered in the reservoir in 2014, may be less clear and require additional monitoring or research in order to determine if management is necessary upon discovery or becomes necessary in the future.

The following graphic provides an example of the progression of response activities.

**Figure 6: AIS Response Example**



#### 4. Appendices

##### AIS Watch List

This list will be updated as necessary – last updated 09/2023

Vegetation/Algae			
Scientific Name	Common Name(s)	Type of Organism	Closest known occurrence
<i>Myriophyllum spicatum</i>	Eurasian milfoil	Macrophyte	Wachusett Reservoir
<i>Cabomba caroliniana</i>	Fanwort	Macrophyte	Wachusett Reservoir
<i>Myriophyllum heterophyllum</i>	Variable milfoil	Macrophyte	Wachusett Reservoir
<i>Trapa natans</i>	Water chestnut	Macrophyte	Clamshell Pond (Clinton, MA)
<i>Glossostigma cleistanthum</i>	Mudmat	Macrophyte	Wachusett Reservoir
<i>Elatine ambigua</i>	Asian waterwort	Macrophyte	Wachusett Reservoir
<i>Hydrilla verticillata</i>	Hydrilla	Macrophyte	South Meadow Ponds (Clinton, MA)
<i>Egeria densa</i>	Brazilian waterweed	Macrophyte	Clamshell Pond (Clinton, MA)
<i>Najas minor</i>	Brittle / European naiad	Macrophyte	Lily Ponds (W. Boylston, MA)
<i>Potamogeton crispus</i>	Curly-leaf Pondweed	Macrophyte	South Meadow Ponds (Clinton, MA)
<i>Didymosphenia geminata</i>	Didymo / “rock snot”	Diatom Alga	West Branch of the Westfield River (Chester, MA)
<i>Aldrovanda vesiculosa</i>	Waterwheel	Macrophyte	Pelham, NH <sup>1</sup>
<i>Nymphoides peltata</i>	Yellow floating heart	Macrophyte	South Meadow Ponds (Clinton, MA)
<i>Marsilea quadrifolia</i>	European water-clover	Macrophyte	Sudbury River (Framingham, MA)
<i>Myriophyllum aquaticum</i>	Parrot feather	Macrophyte	Unnamed Pond (SW intersection of Chestnut Street and South Street, Needham, MA)
<i>Nitellopsis obtusa</i>	Starry stonewort	Macroalgae	Otsego Lake, Blackbird Bay (Cooperstown, NY)
Emergent Vegetation			
<i>Phragmites australis</i>	Common Reed	Wetland Plant	Wachusett Reservoir
<i>Lythrum salicaria</i>	Purple Loosestrife	Wetland Plant	Wachusett Reservoir
<i>Nelumbo lutea</i>	American lotus	Wetland Plant	Sudbury Reservoir (Southborough, MA)
<i>Pistia stratiotes</i>	Water lettuce	Emergent Plant	Stillwater River (Sterling, MA)
Fauna			
<i>Corbicula fluminea</i>	Asian clam	Bivalve Mollusk	Fort Meadow Reservoir (Marlborough, MA)
<i>Dreissena polymorpha</i>	Zebra mussel	Bivalve Mollusk	Laurel Lake and Housatonic River (Lee and Lenox, MA)
<i>Bythotrephes longimanus</i>	Spiny water flea	Micro-crustacean	[Feeder canal] Hudson River (Glens Falls, NY)
<i>Cipangopaludina chinensis malleata</i>	Chinese mystery snail	Gastropod	Wachusett Reservoir
<i>Orconectes virilis</i>	Virile crayfish	Crustacean	Wachusett Reservoir
<i>Channa argus</i>	Snakehead	Fish	Newton Pond (Boylston/Shrewsbury, MA)
<i>Tilapia</i>	<i>Tilapia</i>	Fish	Wachusett Reservoir

<sup>1</sup> Nov 18, 2019. Via email. M. P. Charpentier, Field Botanist, Oxbow Associates Inc.



### Aquatic Invasive Species Decontamination Protocol for MWRA/DCR Reservoirs

Please complete and submit this checklist before deploying a boat/equipment to MWRA/DCR reservoirs (For Quabbin Reservoir, including O’Loughlin Pond and Pottapaug Pond, please comply with the Quabbin Boat Seal Program requirements):

- 1.  **CLEAN:** Carefully inspect boat, trailer, and equipment for any possible contamination (this includes all interior and exterior boat surfaces, engines, anchors, lines, downriggers, fishing gear, boots, clothing, wetsuits, dive gear, nets, buckets, tools, and any other items exposed to water). **Remove all plant fragments (even those that are native), mud, and debris.** Dispose of these materials in an upland area well away from open water and catch basins or watercourses that might discharge into a water body. If a boat or motor were used in a water body that contains zebra mussels, feel the surface for any rough spots. Any rough areas should be thoroughly cleaned until smooth to the touch (see below).
- 2.  **DRAIN:** Drain all water from boat, bilge, engines, jet drives, live wells, and other equipment, and remove standing water from every nook and cranny that cannot be drained. Water should be released in an area that is “high and dry” just as with disposal of removed plant fragments, mud, and debris.
- 3.  EACH piece of equipment to be utilized must be subjected to one of the following, depending on the equipment to be used and time available.

#### DRY

*OR*

#### DECONTAMINATE

If time permits, impose downtime for boat, trailer, and all equipment so that they are **FULLY DRY** for the time periods listed below:

If drying downtime is not practicable and a visit to another water body is planned, use one, or a combination of the following methods:

Time of Year	Duration
July and August	1 week
June and September	2 weeks
Before and after these dates	4 weeks
Winter Exposure to freezing temperatures over the winter is considered to be sufficient for decontamination*	

Disinfectant	Concentration	Contact Time
Steam/scalding hot water*	>140°F	10 seconds
Chlorine/Bleach Solution	1 oz. per gallon water	10 minutes
Lysol	1% solution	10 minutes
Vinegar	As sold - 100%	20 minutes
Freezing	<32°F	24 hours

\* preferred method

- 4.  Please fill out and submit following checklist for each set of equipment to be utilized for the duration of the project.



### Decontamination Certification

Last water body visited: \_\_\_\_\_  
*name, town, state*

The following pieces of equipment that will be utilized in/on \_\_\_\_\_  
 have been decontaminated as follows: *name of MWRA/DCR reservoir*

Please check each decontamination method used. Note 'n/a' if listed equipment will not be used.

		Dry	Frozen	Steam/scalding water >140°F*	Chlorine/Bleach Solution	Lysol	Vinegar
		___/___/___ to ___/___/___	___/___/___ to ___/___/___				
Boat	Hull / engine housing						
	Deck						
	Bilge and live well						
	Transom well						
	Rope, anchors						
	Engine cooling system						
	Plant collection equipment						
Trailer	Frame						
	Wheels						
	Bunks/rollers						
Survey Equipment	Throw rake including rope						
	Secchi disk including rope						
	Boots						
	Nets						
	Water samplers						
Dive Gear	Wetsuit						
	Weights						
	BCD						
	Mask, fins, snorkel						
	Air hoses and tanks						
	Plant collection bags/tools						
Other	Please list:						

\* preferred method

**I hereby certify that the water craft and all other equipment to be utilized on this MWRA/DCR reservoir have been decontaminated as listed above.**

\_\_\_\_\_ *Print name*                      \_\_\_\_\_ *Company/Position*                      \_\_\_\_\_ *Signature*

5.

<b>DCR Personnel</b>	Project/Contract: _____
	<input type="checkbox"/> Pass Inspection: _____ Reason: _____

## 5. Works Cited

Carr, J. (2015). *Wachusett Reservoir Creel Survey Report: Survey Years 2011 and 2012*. Massachusetts Department of Conservation and Recreation, Division of Watershed Management.

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McVoy, R., & Brank, E. (1996). *Wachusett Reservoir Macrophyte Observations*.