

# WEBSTER LAKE

Aquatic Vegetation Management Program

2017 Final Report

December 2017

## PREPARED FOR:

Webster Lake Association

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Webster, MA 01570



## PREPARED BY:

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## INTRODUCTION

The Webster Lake Association contracted SŌLitude Lake Management (SŌLitude) to monitor and manage nuisance and non-native aquatic plant growth, primarily variable milfoil (*Myriophyllum heterophyllum*) and fanwort (*Cabomba caroliniana*) in Webster Lake during the 2017 growing season. Pre- and post-management surveys were performed to determine management areas and monitor the target species responses to the herbicide treatment program (Reward (diquat), Clipper (flumioxazin), and Sonar (fluridone) herbicides). Management objectives were to control non-native growth in all areas of the lake to maintain recreational uses, protect habitat and water quality and to limit the chances of fragmentation and additional spread of these invasive species.

The following report discusses: methodology, program results, summary, and management recommendations.

All work performed in 2017 was conducted in accordance with a License to Apply Chemicals from the MA DEP (#17199) and an Order of Conditions from the Webster Conservation Commission (#323-0720).

### Program Schedule

- Pre-management Survey .....May 3
- Received MA DEP License to Apply Chemicals.....May 25
- Herbicide Treatments
  - Initial Sonar herbicide treatment .....May 25
  - Reward/Clipper herbicide treatment ..... June 13
  - Follow-Up Sonar herbicide treatments ..... July 26, September 21
- Post-treatment Inspections ..... July-September
- Late season survey ..... September 25
- Year-End Report.....December 22

## METHODOLOGY

### Surveys

This year's monitoring program was conducted using the same protocols as previous surveys performed at Webster Lake. For both early- and late-season surveys, the littoral zone was systematically toured by boat, primarily to document the distribution of variable milfoil and fanwort. Additional notes were also collected on prominent areas of native plant growth. Aquatic plants were identified using visual observation and a throw-rake, and enhanced with an underwater camera. Relative vegetation cover and density was noted for each species. A hand-held GPS unit was used to record reference points for the various documented vegetation species to assist with later location and vegetation assemblage mapping.

Any aquatic plant specimen requiring further identification was collected for additional, more detailed observation in the lab.



## Herbicide Application

Please refer to the Treatment Program Summary section for specifics on the herbicide application methodology.

## PROGRAM RESULTS

### Early-Season Survey

On May 3<sup>rd</sup>, a SŌlitude Lake Management (SŌlitude) Biologist performed the pre-treatment survey, where the main objective was to document the presence of both non-native species, variable watermilfoil and fanwort, present in Webster Lake and determine management areas. Given the time of year, few dense areas were identified but presence was widespread in the expected areas (Figure 1). Notable areas were primarily in Middle and South Ponds. In Middle Pond: the channel between First and Second Lake, the cove by Indian Point Road, Indian Ranch Cove, and various locations outside of the Lakeview Marine Inc. marina. In South Pond: the two coves around Mark Avenue, the southern-most point of Lower Cedar Cove, Bates Cove, and the northwestern shoreline of South Pond.

The native aquatic vegetation was dominated by purple bladderwort (*Utricularia purpurea*) and stonewort (*Nitella* sp.). Other species were also present in trace quantities: tapegrass (*Vallisneria americana*), large-leaf pondweed (*Potamogeton amplifolius*), thin-leaf pondweed (*Potamogeton* sp. likely *P. pusillus*), Robbin's pondweed (*Potamogeton robbinsii*), slender spikerush (*Eleocharis acicularis*), and white and yellow lilies (*Nymphaea odorata* and *Nuphar variegata*).

Due to the early nature of the survey, only sparse coverage was reported across the three basins. Based on the lake characteristics, typical vegetation distribution was documented: low densities of native vegetation were observed along much of the exposed rocky shoreline and in higher densities within the shallow mucky coves of the lake. The wildlife habitat preservation areas supported non-native growth, but were identified as no-treatment zones.

Based on findings from the late 2016 survey and this early 2017 survey, a map depicting areas of non-native growth was compiled. Including results from the 2016 late season survey is a key component of this exercise given that target plant growth is only in the beginning stages during the early season survey. Recommendations for areas that warranted treatment were created from the survey documentation. Focus areas were dense growth of fanwort and variable milfoil primarily in high-use locations and along developed shorelines (Figure 2).

### Treatment Program Summary

Thirty areas ranging from 0.6-20.6 acres, totaling 149.5 acres, were targeted for treatment with Reward herbicide for variable watermilfoil control. An additional eight areas ranging in size from 1-5.4 acres, totaling 20 acres, were targeted for treatment with Reward and Clipper herbicides for control of both variable milfoil and fanwort. Consideration on which areas have been treated with Clipper previously was required in selecting areas for this year's effort. Two areas totaling 20-acres were treated with Sonar herbicide, of which 15 acres were located in Sucker Brook Cove and 5 acres located in the southern-most portion of South Lake (Lower Cedar Cove).

Given the protocol for Sonar herbicide use, the initial treatment of those areas was conducted earlier in the season on May 25<sup>th</sup>. This was followed up with booster treatments on July 26<sup>th</sup>, and September 21<sup>st</sup> in order to maintain the target concentration over the desired exposure time of 90+ days. Pelletized herbicide was applied from a bow-mounted rotary spreader and on-board GPS was used to guide the applications.



Once the Reward/Clipper treatment areas were finalized with WLA, that herbicide treatment was scheduled, notified and performed on June 13<sup>th</sup>. Prior to treatment, the lake shoreline was posted with printed signs that showed the treatment areas outlined on a map of the lake along with the temporary water use restrictions to be imposed. Notices and maps were also published on the WLA website. The Conservation Commission was notified in advance of treatment, which is required in accordance with the permit for this work and the Webster Town Beach and Boat Ramp was closed for the day.

An airboat was utilized to perform the herbicide application. The concentrated herbicides were diluted in a mixing tank on board the airboat and a dilute herbicide solution was applied using a chemical injection system that meters the solution subsurface through weighted hoses. The treatment plots were pre-loaded into a GPS unit on board the board that provided real-time navigation and assured that the herbicide was applied in the proper locations at pre-determined doses.

### *Post-Treatment Inspections*

In the ensuing months, areas of the lake were inspected several times to monitor the effectiveness of the various treatments. Good control of the target species was observed in most locations. In areas that harbored dense variable milfoil growth prior to treatment, some evidence of sparse milfoil plants was still evident. Most of the milfoil plants remaining exhibited stalks stripped of almost all of the leaflets and were in the process of decaying. Good control of fanwort was seen in areas that were treated with the combination of Reward and Clipper herbicides. For the Sonar treatment areas specifically, the southernmost area (Area S1) responded better than last year but complete control was again not achieved in some sections, probably because of its location and small size, which allowed for more dilution. The treatments in Sucker Brook Cove worked well although there were some chlorotic (probably non-viable) biomass remaining along the outer fringes.

### *Late-Season Survey*

A late-season survey was performed on September 25<sup>th</sup>. Some considerable areas of fanwort and variable watermilfoil growth were supported within the littoral zone, both inside and outside the treatment areas (Figure 2). Some late-season recovery of these plants within treatment areas is predictable due to the fact that both Reward and Clipper are considered contact-herbicides that do not control the root structures. The majority of target growth was greatly reduced and was lower in the water column, limiting effects on recreation and minimizing the potential for fragmentation and spread. Milfoil remains more widespread than fanwort.

Control within the main high-use areas (the marinas) was achieved. Very little regrowth was documented, if any.

Native macrophytes were evident throughout the littoral zone at the time of the late-season survey (Figure 2). Dominant plants observed included various bladderwort species (*U. vulgaris*, *U. purpurea*, *U. gibba*, and *U. radiata*) and native pondweed species (*P. bicupulatus*, *P. robbinsii*, and *P. foliosus*). Slender and southern naiad (*Najas flexilis* and *N. guadalupensis*), and yellow and white waterlilies were also found at various locations throughout the three basins. Single locations of low watermilfoil (*Myriophyllum humile*), greater water starwort (*Callitriche heterophylla*), quillwort (*Isoetes* sp.), and stonewort were documented.



## SUMMARY

- Macrophyte diversity and abundance appears to be thriving within the littoral zone.
- Significant reduction of biomass and overall good control of targeted non-native fanwort and variable milfoil growth was achieved in the 2017 management areas.
- The combination herbicide areas using Reward and Clipper herbicides provided good, season-long control of target plants in high-use areas.
- Some late season regrowth was noted, mostly in Reward-only treatment areas.
- Non-native growth outside of management areas was observed.
- South Lake appears to support the most fanwort and variable milfoil growth.

## MANAGEMENT RECOMMENDATIONS

Based on the extent of non-native vegetation and regrowth in managed areas, we recommend that the Webster Lake Association budget for continued maintenance spot-treatments of invasive fanwort and variable milfoil growth. Reward herbicide is still the recommended herbicide for variable milfoil control and Clipper and/or Sonar herbicide is recommended for continued spot-treatment of fanwort. There continue to be some state restrictions on the use of Clipper that only allow for a maximum of 25% of the waterbody to be treated during any year and rotating treatment areas, so that the same areas are not retreated within a subsequent three-year period. It should be manageable to rotate use of Clipper and Sonar herbicides for fanwort control under the current regulations and the 4-year cycle will allow for re-treatment of areas previously treated in 2014 in the coming year. Work by the WLA and within MA DEP may result in the lifting or modification of these regulations for Webster Lake. Specifically, the WLA and SOLitude have drafted a Clipper Evaluation Study, which DEP may accept to evaluate and address on-going regulatory concerns.

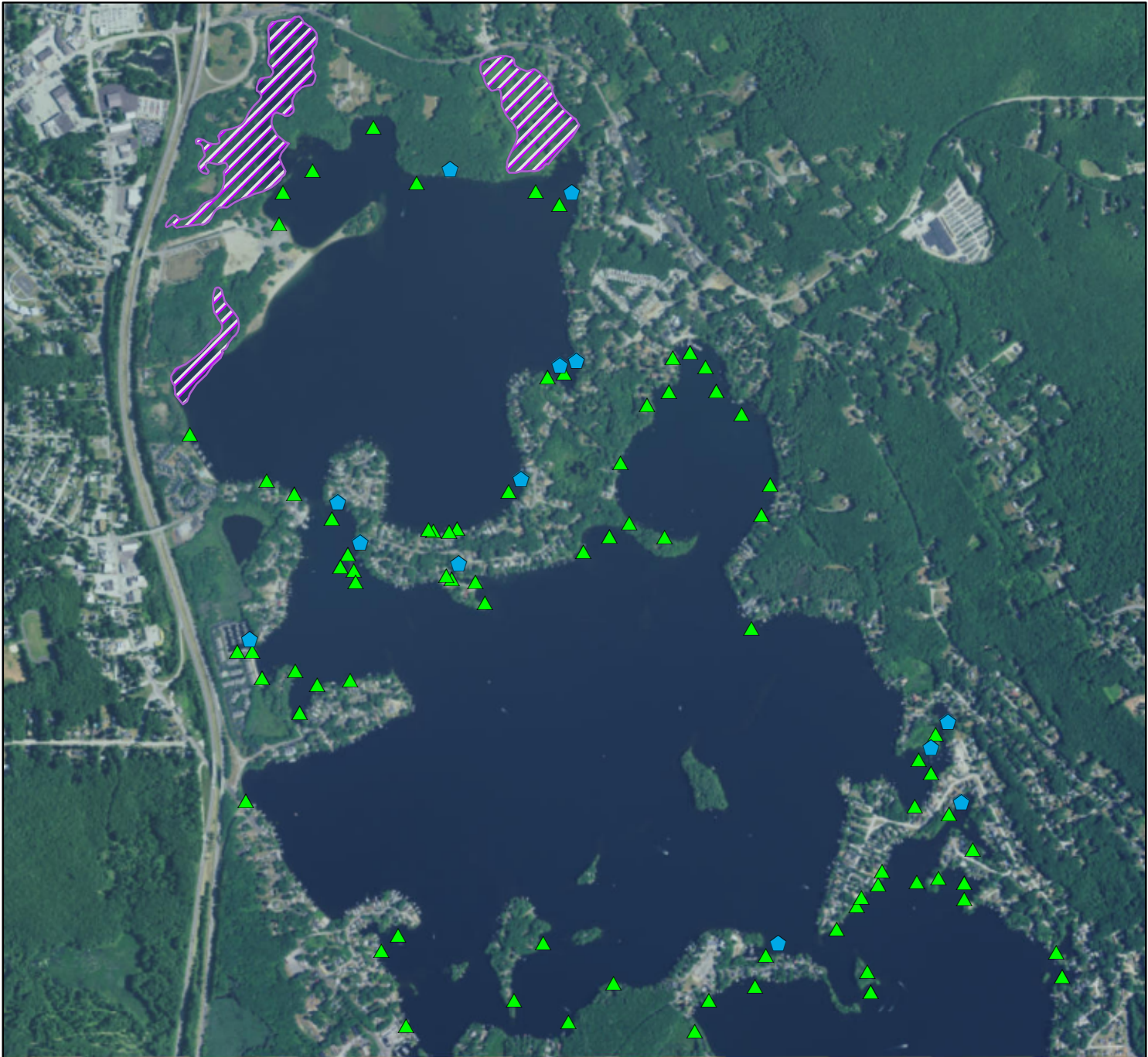
We hope you find this helpful in making your lake management decisions. If you have any questions or need anything further, please contact our office.





# FIGURE 1: PRE-MANAGEMENT TARGET SPECIES LOCATIONS

May 3, 2017




**Legend**

-  Fanwort
-  Variable Milfoil
-  Wildlife Preservation Zones

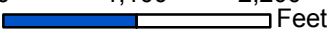


**Webster Lake**  
Webster, MA




**Webster Lake**

0 1,100 2,200 Feet



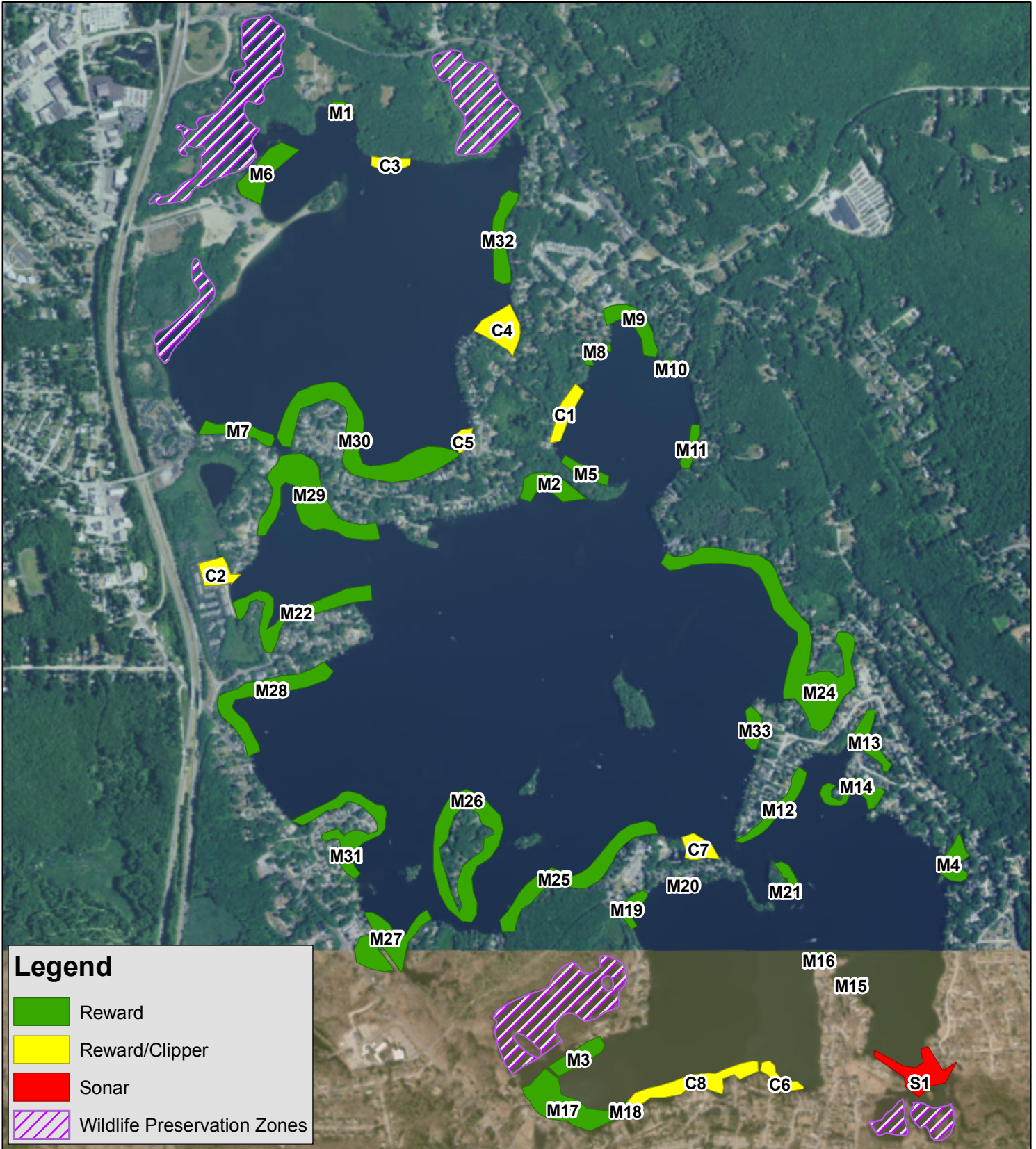
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Map Date: 12/18/2017  
Prepared by: BNA  
Office: SHREWSBURY, MA

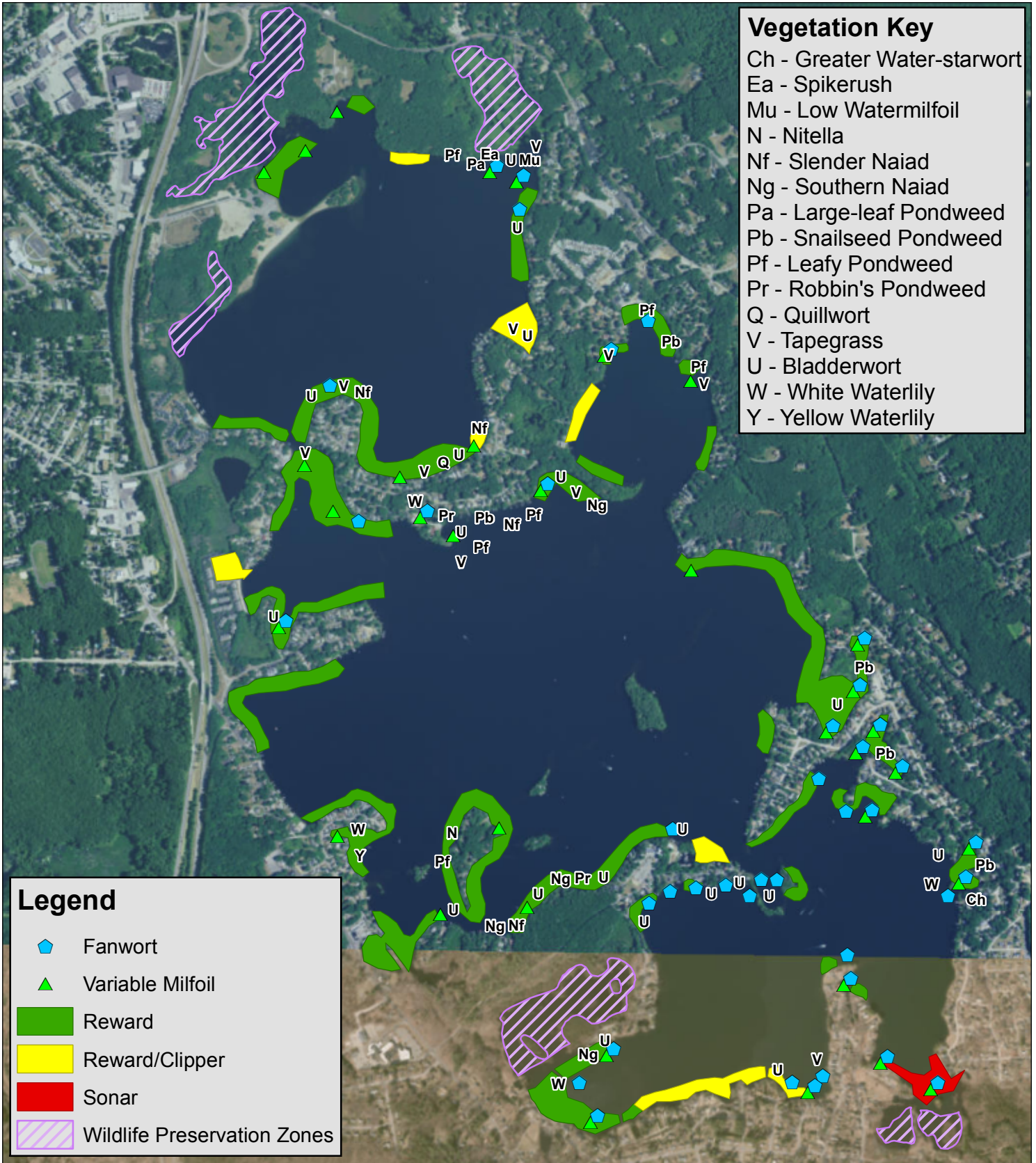


FIGURE 2: 2017 TREATMENT LOCATIONS





**FIGURE 3: POST-MANAGEMENT SURVEY**  
September 25, 2017



**Legend**

- ◆ Fanwort
- ▲ Variable Milfoil
- Reward
- Reward/Clipper
- Sonar
- Wildlife Preservation Zones

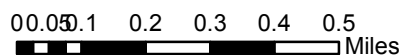
**Vegetation Key**

- Ch - Greater Water-starwort
- Ea - Spikerush
- Mu - Low Watermilfoil
- N - Nitella
- Nf - Slender Naiad
- Ng - Southern Naiad
- Pa - Large-leaf Pondweed
- Pb - Snailseed Pondweed
- Pf - Leafy Pondweed
- Pr - Robbin's Pondweed
- Q - Quillwort
- V - Tapegrass
- U - Bladderwort
- W - White Waterlily
- Y - Yellow Waterlily

**Webster Lake**  
Webster, MA



**Webster Lake**



Map Date: 12/18/17  
Prepared by: BNA  
Office: SHREWSBURY, MA