

**2021 AQUATIC MANAGEMENT PROGRAM
ANNUAL REPORT
Lake Singletary
Millbury and Sutton, MA**

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Please accept the following as our 2021 Year-End Report for the Aquatic Management Program performed at Lake Singletary in Millbury and Sutton. The focus of this year's program was to monitor the fanwort (*Cabomba caroliniana*), Eurasian watermilfoil (*Myriophyllum spicatum*), and variable watermilfoil (*Myriophyllum heterophyllum*) infestations and manage the growth with spot-treatment using USEPA/MA DEP registered herbicides. Activities completed as part of this project during the 2021 season are presented in the following sections.

All management activities were consistent with the Order of Conditions (DEP #303-503), and the License to Apply Chemicals issued by the MA DEP – Office of Watershed Management (#WM04-0000535).

INTRODUCTION

Monitoring and management of vegetation in Lake Singletary has been conducted annually since 1997 as part of an ongoing aquatic management program developed to address non-native, invasive fanwort, Eurasian milfoil, and variable milfoil. Annual monitoring helps to track target plant distribution and abundance; monitor changes in the native plant composition, assess effectiveness of invasive plant control efforts, and guide future management goals and actions.

Recent in-lake management has consisted of targeted Reward (diquat) and Clipper (flumioxazin) herbicide treatments in 2014-2020. Half-lake copper sulfate algaecide treatments have been applied periodically to reduce algal cell densities. The following report has been prepared to document the 2021 treatment and the survey work performed by SÖLitude Lake Management this past year.

2021 TREATMENT PROGRAM

A chronology of this past year's management and brief description of events follows.

- | | |
|--|------------|
| ● Pre-treatment vegetation survey | 06/02/2021 |
| ● Received approved permit | 06/03/2021 |
| ● Submersed vegetation treatment and Half Lake Algaecide Treatment | 08/23/2021 |
| ● Post-treatment vegetation survey | 10/15/2021 |

PRE-TREATMENT SURVEY

On June 2nd, a SOLitude Lake Management biologist conducted a shoreline survey of Lake Singletary. The littoral zone was toured by 10 foot boat and observations were made utilizing a throw-rake and underwater camera system to confirm the vegetation assemblage. Native species observed throughout the lake included thin-leaf pondweed (*Potamogeton pusillus*), tapegrass (*Vallisneria americana*), Robbins' pondweed (*Potamogeton robbinsii*), bushy naiad (*Najas flexilis*), clasping-leaf pondweed (*Potamogeton perfoliatus*), snail-seed pondweed (*Potamogeton bicupulatus*), stonewort (*Nitella sp.*), bladderwort (*Utricularia sp.*), and ribbon-leaf pondweed (*Potamogeton epihydrus*).

Sparse growth of fanwort was observed in the historical areas of the lake, primarily in the southern-most end of the lake, the mid-western cove, and the north-eastern cove, with patchy growth along the eastern shoreline (see **Figure 1**). Those specific areas are consistently shallow (<13 feet) and therefore provide stable habitat for fanwort growth. Variable watermilfoil was present in the southern-most cove of the reservoir and no new infestations were observed. No Eurasian watermilfoil was observed at this time.

HERBICIDE TREATMENT SUMMARY

A single herbicide application was completed on August 23rd for fanwort, nuisance pondweed species, and algae. Approximately 38-acres, coinciding with the presence of these species (shown in **Figure 2**), were selected for treatment with the herbicides Tribune (diquat) and Clipper (flumioxazin). Additionally, based on the sporadic observations of blue-green algae and the warm weather conditions expected to continue, a half lake copper algaecide treatment was also conducted on this day.

Treatments were performed using a 20-foot jon boat with a calibrated spray system. On-board GPS was utilized to provide real-time tracking of the treatment boat and ensure even application of the herbicide throughout the designated treatment areas. Prior to treatment, notification was submitted to both the Millbury and Sutton Conservation Commissions. SOLitude provided the LSWA with hi-visibility posters to put up around the lake detailing the treatment date and water-use restrictions to be imposed following treatments.

POST-TREATMENT SURVEY

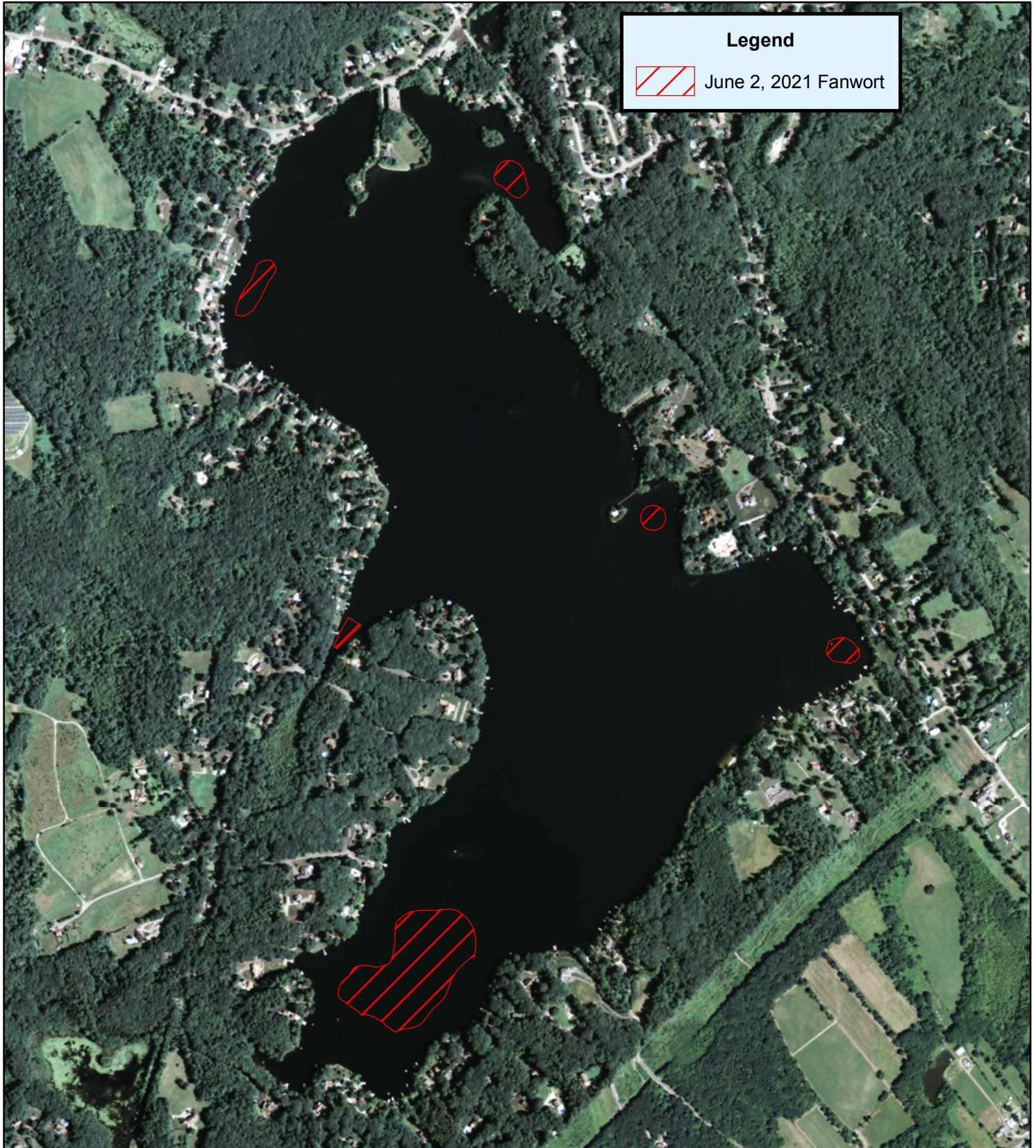
The post-treatment survey was conducted on October 15th (**Figure 3 & 4**). At this time, Fanwort was observed in the historical areas of the lake, but was found in large patches in the trouble area of the southernmost end of the lake. No variable or Eurasian watermilfoil was observed. Occasional patches of thin-leaf pondweed were observed on the eastern and southernmost ends of the lake. Otherwise, all native species were once again observed growing in healthy abundances throughout the littoral zone of the lake.

SUMMARY AND ONGOING MANAGEMENT RECOMMENDATIONS

Once again, the spot-treatment of herbicides provided sustainable management of the target species throughout the 2021 season. Native plant species were maintained in non-nuisance densities throughout the summer months; however, thin-leaf and clasping-leaf pondweed are gaining ground along the eastern cove between Old Country Road and Tuttle Road. We anticipate treating historical areas of fanwort infestation, based upon survey results, and any milfoil growth in 2022. Additionally, we recommend being prepared to perform an algaecide treatment next year, if bloom conditions arise.

We trust this report provides a concise summary of the 2021 Aquatic Management Program at Lake Singletary. We look forward to assisting the LSWA again in 2022 to manage Lake Singletary through monitoring and herbicide and/or algaecide treatments. Please feel free to contact us if you have any questions or require additional information.

Figure 1: June Density & Distribution of Target Species



Lake Singletary
Sutton/Millbury, MA



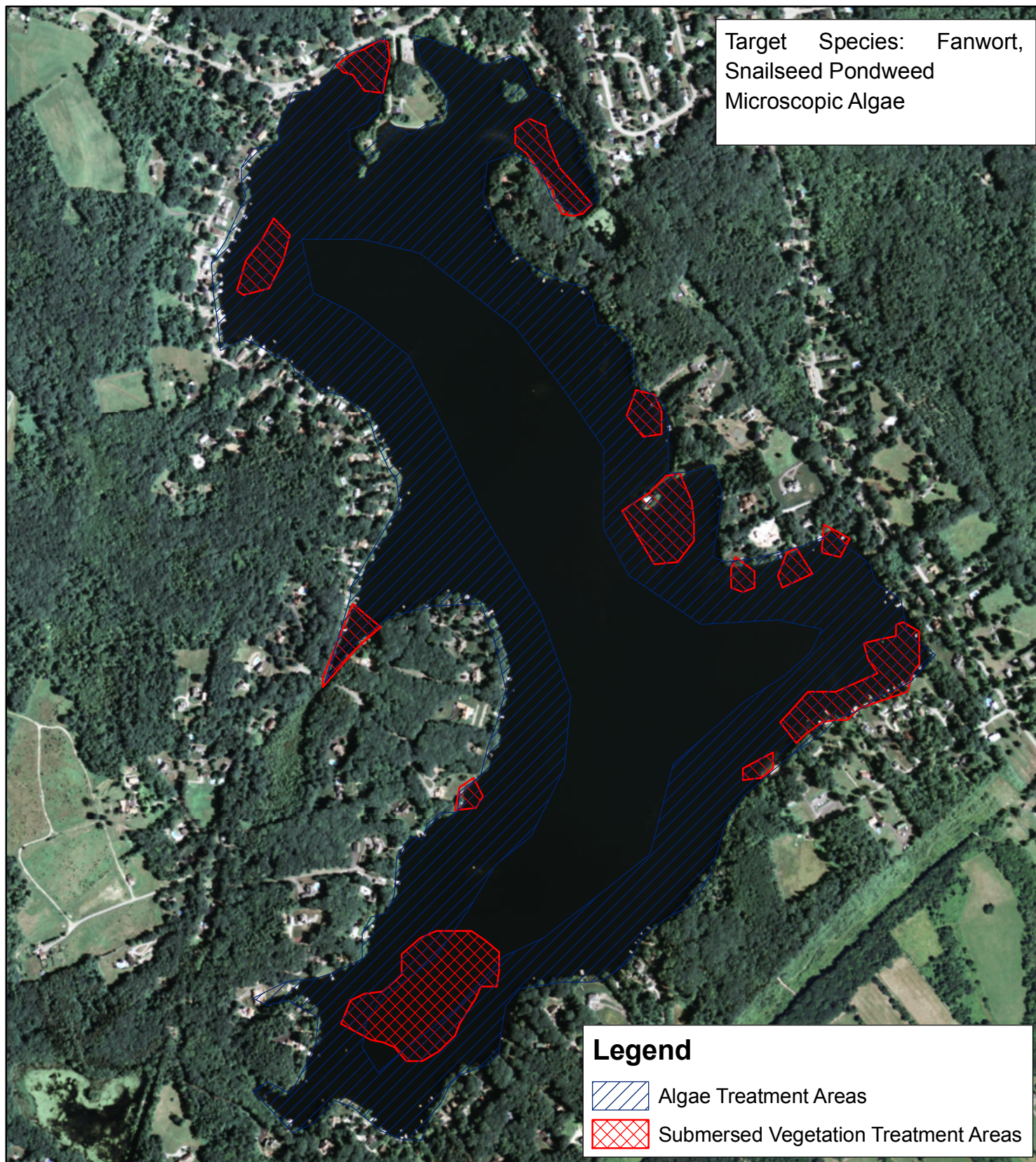
Lake Singletary

0 925 1,850
1:11,813 Feet



Map Date: 06/02/2021
Prepared by: ALM
Office: SHREWSBURY, MA

Figure 2: Lake Singletary Treatment Map 08 - 23 - 2021



Lake Singletary
Sutton/Millbury, MA



Lake Singletary

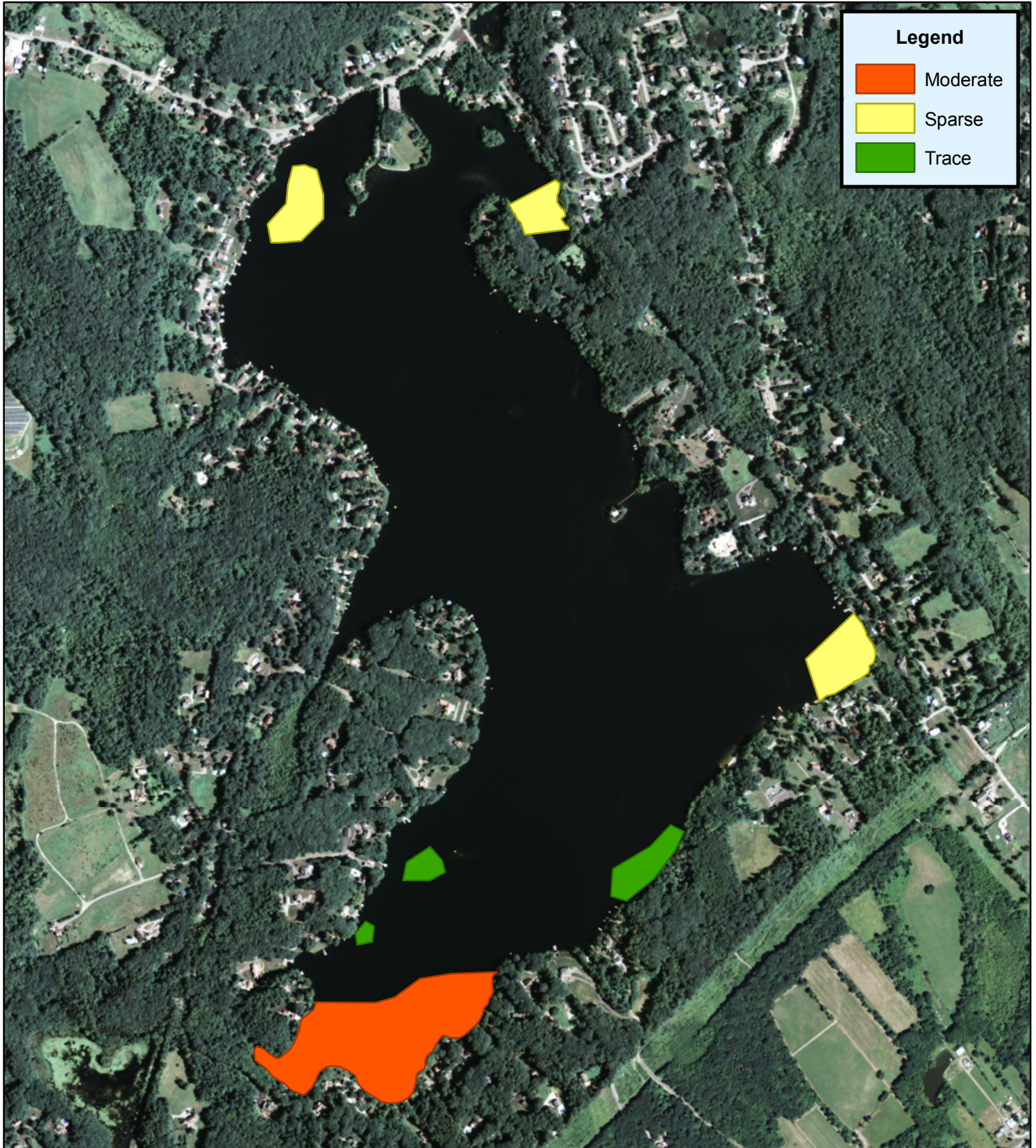
0 850 1,700
Feet
1:11,000



Date: 08 - 23 - 21

Applicators: JAM & TAP

Figure 3: October Density & Distribution of Fanwort



Lake Singletary
Sutton/Millbury, MA



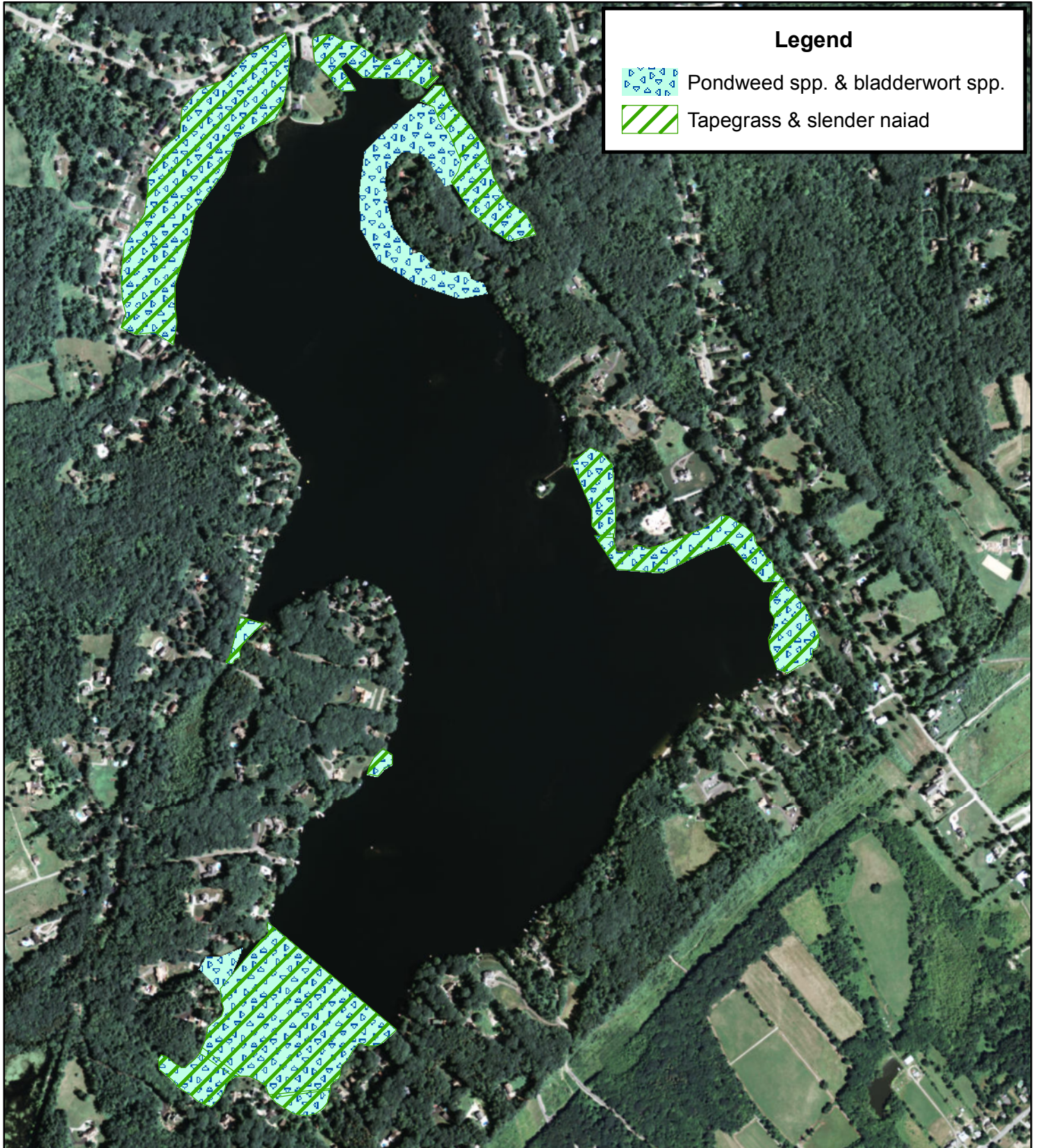
Lake Singletary

0 925 1,850
1:11,813 Feet



Map Date: 11/29/2021
Prepared by: ALM
Office: SHREWSBURY, MA

Figure 4: Distribution of Native Aquatic Vegetation



Lake Singletary
Sutton/Millbury, MA



Lake Singletary

0 900 1,800
1:11,115 Feet



Map Date: 11/29/2021
Prepared by: ALM
Office: SHREWSBURY, MA