

## Lake Wickaboag West Brookfield, Massachusetts 2021 Year-End Report

Prepared On: November 5, 2021

Report Prepared for: West Brookfield Board of Health – [boh@wbrookfield.com](mailto:boh@wbrookfield.com)  
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In accordance with the aquatic plant management contract between SOLitude Lake Management, the West Brookfield Board of Health and the Lake Wickaboag Preservation Association for Lake Wickaboag in West Brookfield, the following document serves to provide this year's treatment and survey results and the management recommendations for next season.

All management activities were consistent with the Order of Conditions (DEP File #329-094), and the License to Apply Chemicals issued by the MA DEP – Office of Watershed Management (#WM04-0000615).

### 2021 Management Program Summary

- Project Award 4/13/2021
- Early Season Survey 6/4/2021
- Submitted Permit Application to MADEP 6/21/2021
- Formal Contract Approved by Board of Health 6/28/2021
- Received approved License to Apply Chemicals 6/28/2021
- Herbicide Treatment 6/29/2021
- Interim Survey 7/29/2021
- Follow-Up Herbicide Treatment 8/31/2021
- Waterlily Treatment 9/30/2021
- Late Season Survey 10/21/2021

### Early Season Survey

The pre-treatment survey was conducted on July 4th by a SOLitude Biologist accompanied by Mr. David Brown and Mrs. Mary Beth Czaja of the Lake Wickaboag Preservation Association. The entire littoral zone was surveyed using a combination of visual observation and throw rake sampling. **Figure 1** shows the locations of target species observed during the survey and designated for treatment. At the time of the early season survey, the target species, non-native variable watermilfoil (*Myriophyllum heterophyllum*), was observed at trace to dense abundances at the northernmost section of the Lake, with one other area of growth occurring in the southeastern section of the lake. Target species, large-leaf pondweed (*Potamogeton amplifolius*) was observed at trace to moderate abundances in numerous locations (see **Figure 1**). Native plant species



observed included: large-leaf pondweed, muskgrass (*Chara sp.*), ribbon-leaf pondweed (*Potamogeton epihydrus*), snailseed pondweed (*Potamogeton bicupulatus*), bladderwort (*Utricularia*), waterweed (*Elodea canadensis*), waterlilies (*Nymphaea* & *Nuphar*), and watershield (*Brasenia schreberi*) Floating-leaf species were observed along parts of the shoreline in relatively small patches of trace to sparse abundances with the majority of the dense growth in the northern, shallow part of the waterbody.

The small pond near the boat launch and Mr. Callahan's pond were also surveyed at this time, but no milfoil was observed.

### Herbicide Treatment

Based on conditions observed during the pre-treatment survey, treatment of Lake Wickaboag was scheduled and performed on June 29th. In accordance with the Order of Conditions for this project, written notification of the scheduled treatment date was sent to the West Brookfield Conservation Commission. Printed signs warning of the treatment and the associated temporary water-use restrictions were also sent to members of the Association for posting around the lake.

Treatment was performed using SOLitude's specially designed airboat. The herbicide is mixed with lake water in an onboard storage tank, it then travels through a pump system and out through a submersed boom behind the stern. Diquat (Tribune) herbicide was applied to specific areas of target growth within the lake for variable milfoil while a combination of diquat and Aquathol K (endothall) were applied to target areas of large-leaf pondweed shown in **Figure 1**. The GPS tracks recorded during this treatment are shown in **Figure 2**. A total of 41 gallons of Tribune and 42 gallons of Aquathol-K were applied.

### Interim Survey/Follow-Up Herbicide Treatment

An interim survey was performed on July 29<sup>th</sup> by a SOLitude Engineer, accompanied by Mr. David Brown and Mary-Beth Czaja of the Association. Excellent control of large-leaf pondweed was observed in the treatment areas. Areas of variable milfoil displayed positive results however some variable milfoil stems had begun to re-grow in the northwestern and northeastern corner of the lake. Native species present at the time included waterlilies (*Nymphaea sp.* & *Nuphar sp.*), bladderwort (*Utricularia sp.*), large-leaf pondweed (*Potamogeton amplifolius*), naiad (*Najas spp.*) and filamentous alga. Although naiad growth was relatively sparse in most areas, there was a section of more dense, problematic growth along the eastern shoreline which was recommended for treatment. **Figure 3** shows the vegetation distribution based on the July survey and recommended areas for treatment.

The follow-up herbicide treatment was conducted to the remaining areas of problematic growth on August 31st. A total of 11 gallons of diquat were applied. **Figure 4** shows the GPS tracks of the follow-up herbicide treatment. A spot-treatment of the waterlilies in designated areas of the lake was conducted on September 30th, using 0.75 gallons of AquaPro (glyphosate) and an approved aquatic surfactant.

### Copper Treatments

No copper sulfate treatments were needed this year as water clarity remained good for most of the summer and there was no visual evidence of cyanobacteria blooms.

### Late-Season Inspection

A late-season inspection was conducted by a SOLitude Engineer on October 21st. The survey showed an overall reduction in the distribution and densities of target vegetation species variable milfoil, large-leaf pondweed and naiad within the treatment areas. At the time of the late-season survey, variable milfoil re-growth was again observed at trace to moderate densities in the shallow area of the northern portion of the lake. Another, less aggressive non-native species, spiny naiad (*Najas minor*) was also observed in the



same general areas. Also noted during the survey were beneficial vegetation such as tapegrass (*Vallisneria* sp.), bladderwort (*Utricularia* spp.) and Robbins pondweed (*Potamogeton robbinsii*). These species help with water quality as they filter out some of the nutrients otherwise utilized by algae species, and are beneficial to the wildlife species who utilize the waterbody.

Both the small pond and Callahan's Pond had no observed milfoil. Trace lilies were also observed as well as some beneficial pondweed species and duckweed.

### **Ongoing Management Recommendations**

Results of the early- and late-season inspections suggest that the 2021 herbicide treatments for variable milfoil, large-leaf pondweed and naiad were largely successful in reducing distribution and density of these species. In 2022, we recommend continued treatment of invasive, non-native variable milfoil, nuisance pondweed and nuisance floating-leaf species with aquatic herbicides.

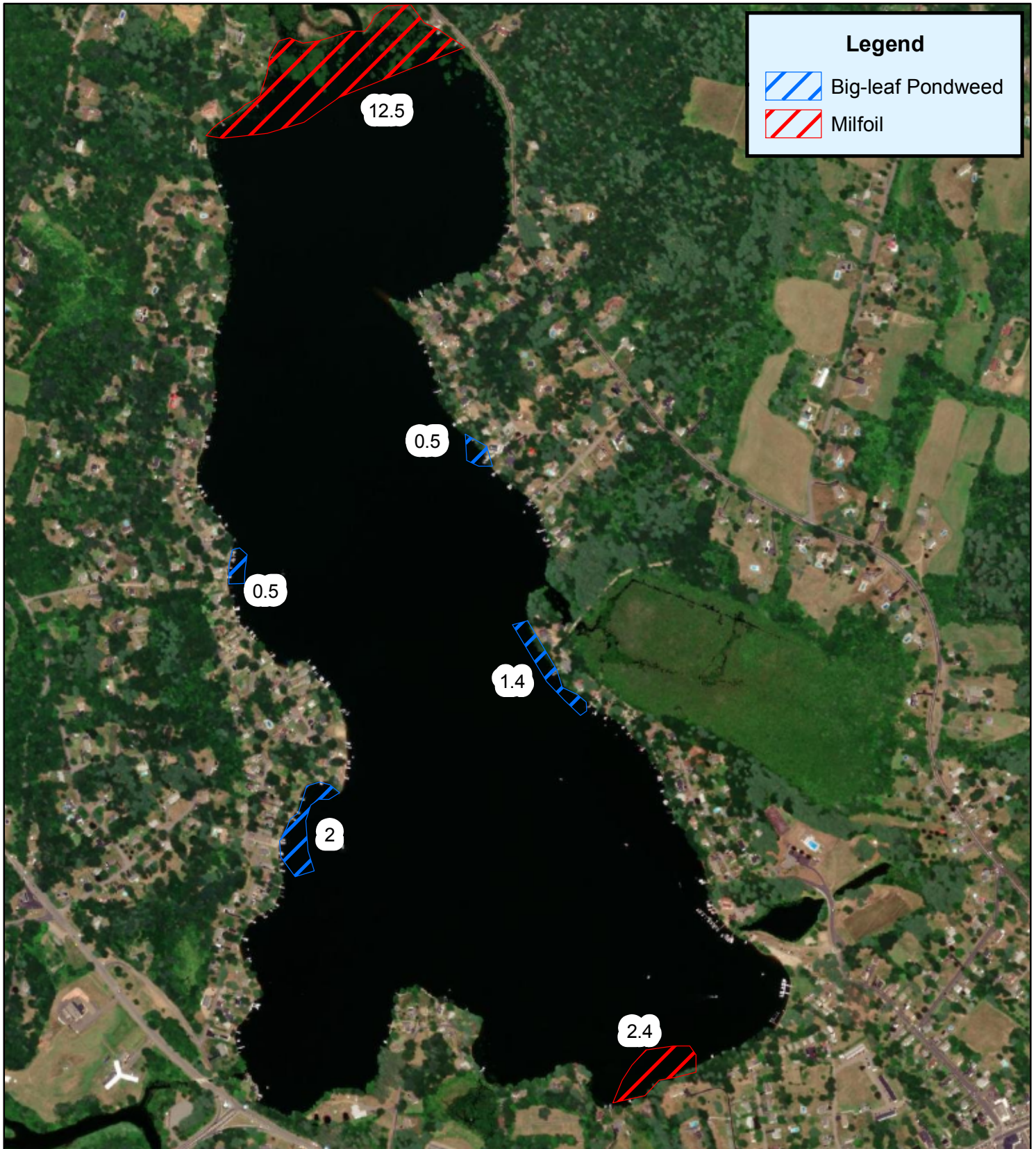
The shallow, nutrient rich conditions in the northern end of the lake, along with the the fact that operating the boat in this area suspends sediment which reduces the effectiveness of the treatment, create a situation where milfoil regrowth occurs more quickly, especially when using a contact herbicide like diquat. For this reason, we recommend moving to a systemic product, ProcellaCOR, which will provide more effective, multiple year control. This herbicide has long lasting systemic properties, while also having the fast-acting effects on biomass as that of a contact herbicide. If desired moving forward, this product can be included in pricing options for 2022. If this product is to be employed, a minor change/amendment will have to be made to the current Order of Conditions for the use of the new herbicide.

For control of other species, like large-leaf pondweed, naiad and waterlilies, we recommend continuing with the use of diquat, endothall and glyphosate, as needed based on monitoring. Copper sulfate algacide treatments at Lake Wickaboag were not needed this year, but algae monitoring should be conducted as necessary so treatments can be performed if bloom conditions develop. Please keep in mind that algal growth is not consistent year to year and is dependent on many factors both within and outside the lake.

Yearly monitoring during early- and late-season inspections will continue to help in determining when nuisance levels have been reached and further guide the management of Lake Wickaboag.



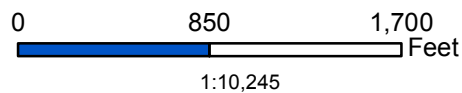
# FIGURE 1 - 2021 Pre-Treatment Survey and Recommended Treatment Areas



Lake Wickaboag  
West Brookfield, MA



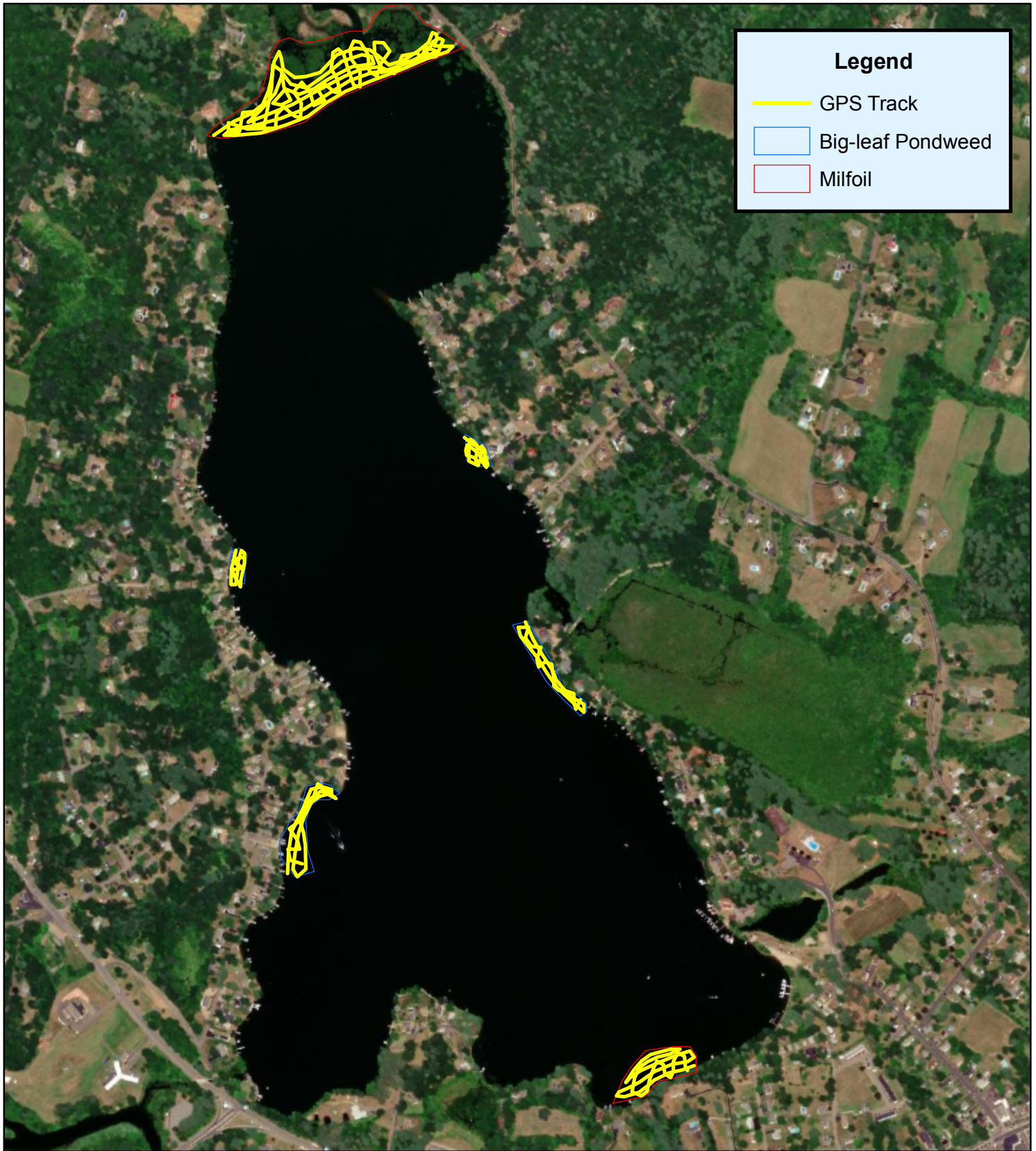
## Lake Wickaboag



Map Date: 06/15/2021  
Prepared by: AM  
Office: SHREWSBURY, MA



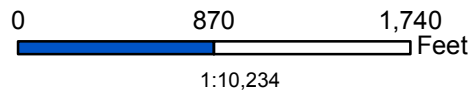
FIGURE 2 - June 2021 Treatment Tracks



Lake Wickaboag  
West Brookfield, MA



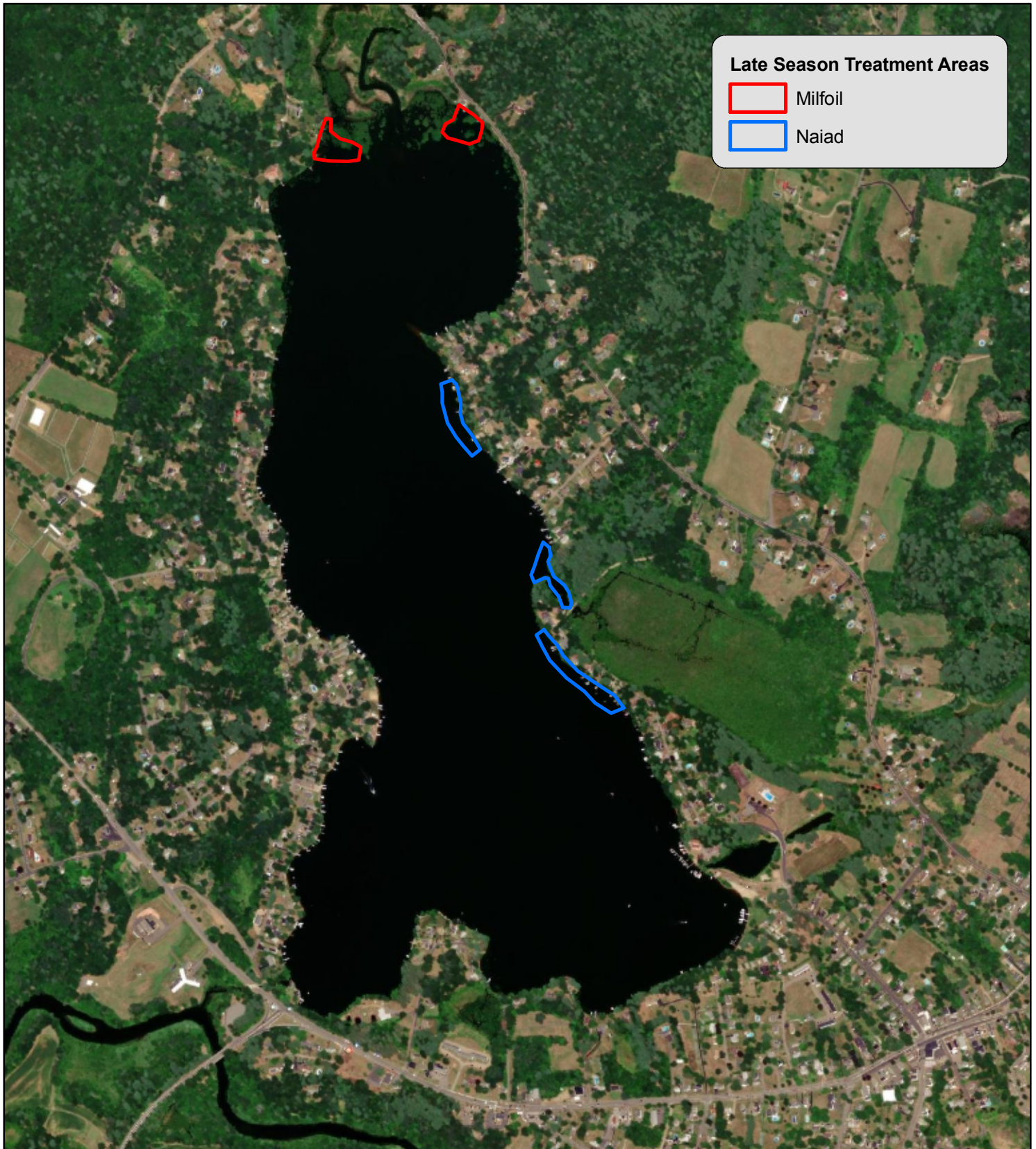
Lake Wickaboag



Map Date: 11/5/21  
Prepared by: DM  
Office: SHREWSBURY, MA




Figure 3 - Late Season Herbicide Treatment Areas



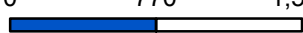
**Late Season Treatment Areas**

-  Milfoil
-  Naiad


**Wickaboag Lake**  
West Brookfield, MA



**Wickaboag Lake**

0      770      1,540  
 Feet

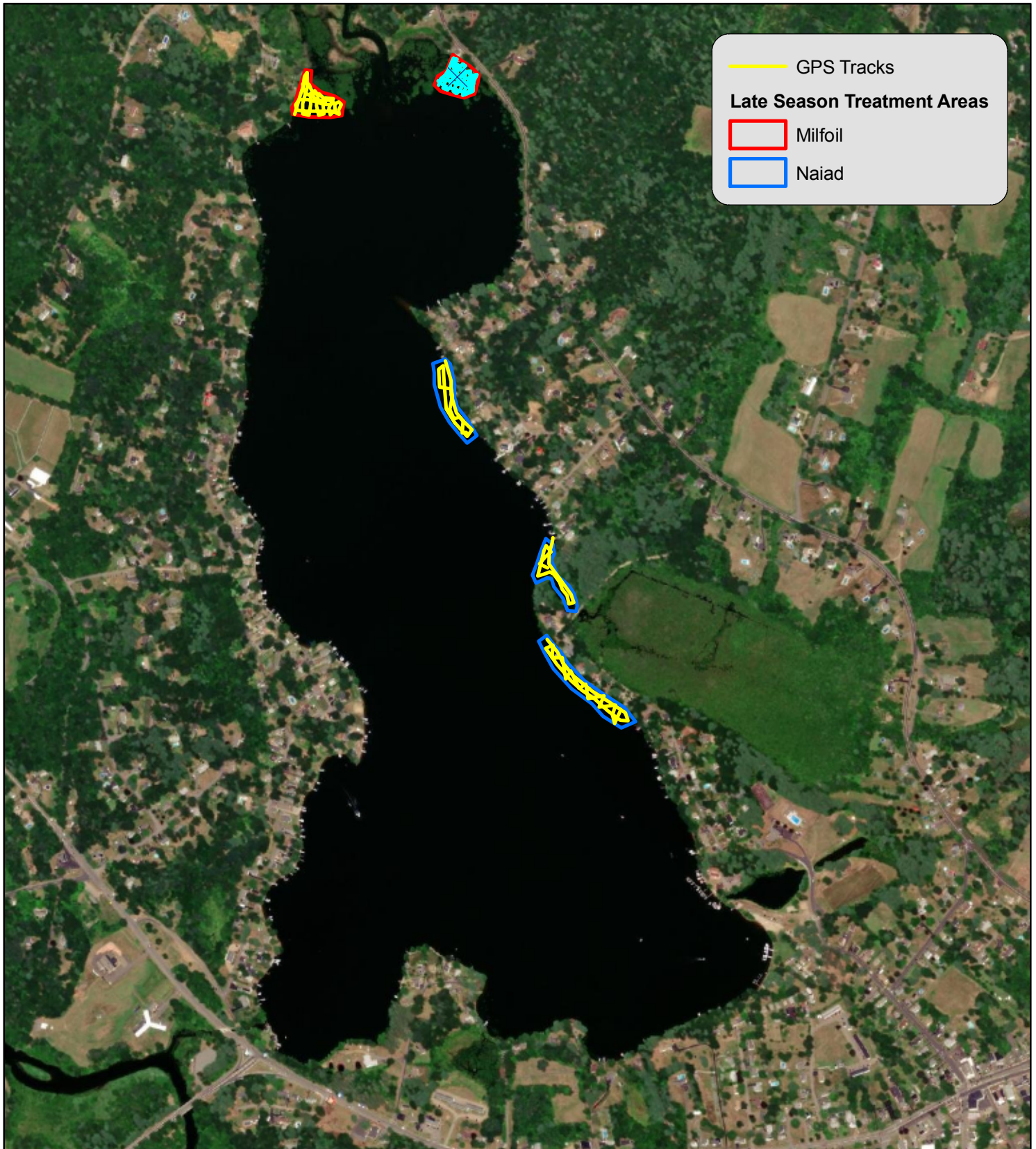
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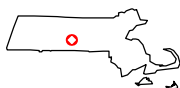
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Prepared by: DM  
Office: SHREWSBURY, MA



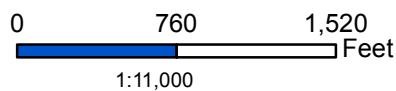
Figure 4 - Late Season Herbicide GPS Treatment Tracks



Wickaboag Lake  
West Brookfield, MA



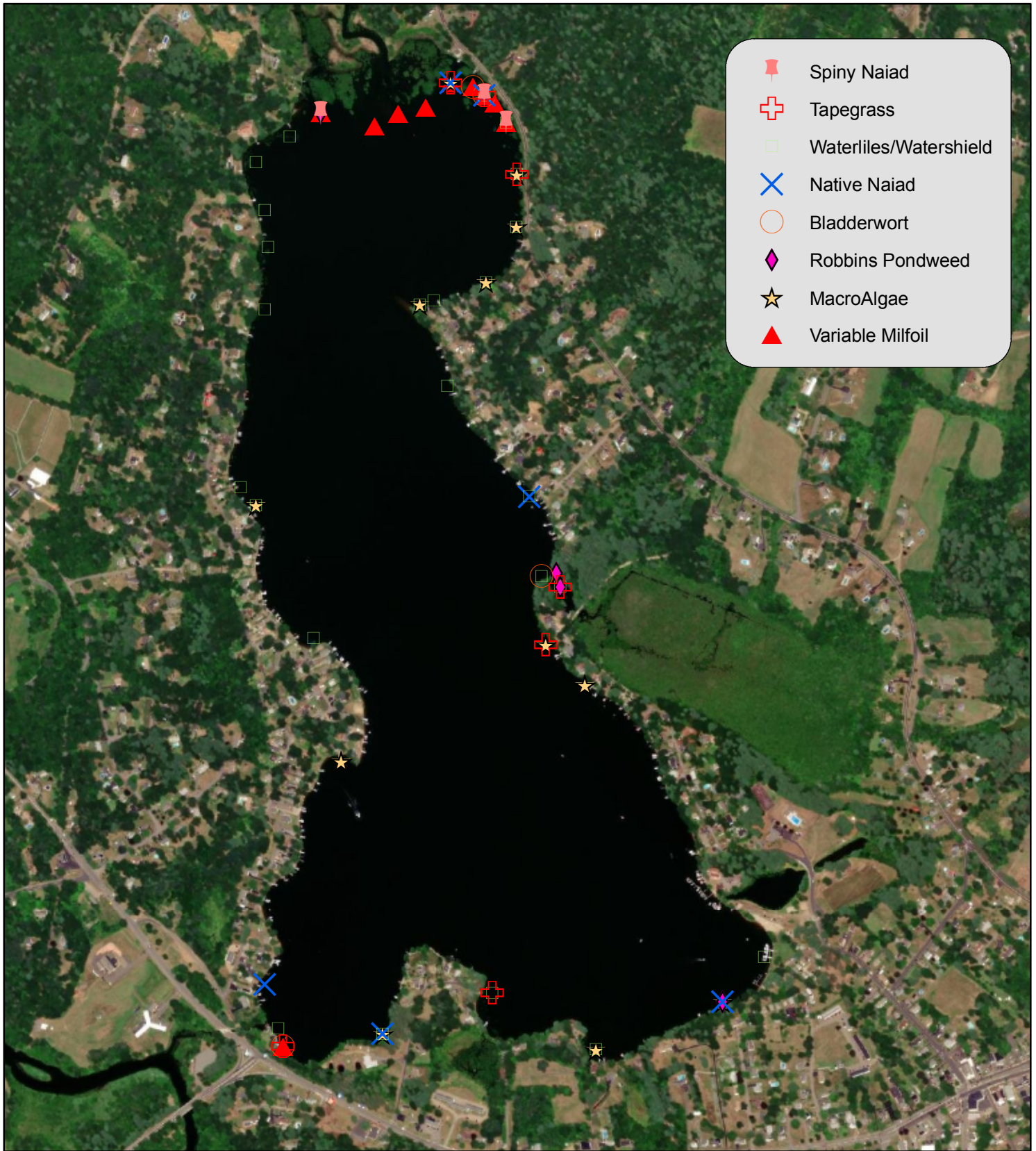
**Wickaboag Lake**



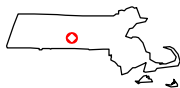
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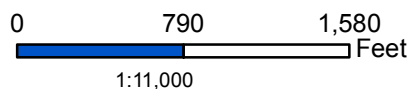
Figure 5 - Late Season Vegetation Assemblage



Wickaboag Lake  
West Brookfield, MA



### Wickaboag Lake



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