

**2019 Aquatic Plant Management Report
Sunset Lake
Ashburnham, Massachusetts**

Prepared On: November 26, 2019
Revised On: February 26, 2020

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In accordance with the existing aquatic plant management contract between SOLitude Lake Management (SLM) and the Far Hills Association for Sunset Lake in Ashburnham/Winchendon, MA, the following document serves to provide this year's treatment and survey results and the management recommendations for next season. Management goals for the 2019 season included conducting pre-and post-management surveys, as well as treatments to manage nuisance and invasive species within the water body.

All management activities were consistent with the Order of Conditions DEP# 092-852 (Ashburnham) and DEP# 345-0598 (Winchendon), and the License to Apply Chemicals issued by the MA DEP – Office of Watershed Management (# 19234).

2019 MANAGEMENT SUMMARY

- Submitted Permit Application to MADEP June 12
- Received approved License to Apply Chemicals..... June 14
- Pre-Treatment Survey June 4
- Herbicide Treatment June 26
- Interim Survey July 8
- Post-Treatment SurveyOctober 16

EARLY SEASON SURVEY

Consistent with the 2018-2020 contract, a littoral survey is conducted every management season by freshwater biologist, Amanda Mahaney. A Jon-boat was used to tour the littoral zone of Sunset Lake. During the littoral zone survey, six submersed species, one floating leaf species (watershield), and one macro-alga (stonewort) were observed (refer to table 1) along with various areas of benthic filamentous algae (refer to Figure 1 for pre-treatment distribution of aquatic vegetation).



Table 1: Observed species in Sunset Lake

Classification	Common Name	Scientific Name
Submersed	Variable Watermilfoil	<i>Myriophyllum heterophyllum</i>
	Common Bladderwort	<i>Utricularia vulgaris</i>
	Purple Bladderwort	<i>Utricularia purpurea</i>
	Humped Bladderwort	<i>Utricularia gibba</i>
	Thin-leaf Pondweed	<i>Potamogeton pusillus</i>
Macro-alga	Leafy Pondweed	<i>Potamogeton foliosus</i>
Macro-alga	Stonewort	<i>Nitella spp.</i>
Floating-leaf	Watershield	<i>Brasenia schreberi</i>

HERBICIDE TREATMENTS

A single herbicide treatment was conducted on June 26, 2019 for the management of variable watermilfoil, bladderwort, and nuisance pondweed species (refer to Figure 2 for June treatment areas). The herbicide application was conducted through an airboat, utilizing the herbicide Tribune (diquat), which was then dispersed evenly throughout the treatment areas from the onboard mixing tank via a pump system and submersed hoses attached to a boom system. As with all treatment events that occur at Sunset Lake, the Far Hills Association, the Ashburnham Conservation Commission and the Winchendon Conservation Commission were notified at least 48 hours prior to the treatment date. Information pertaining to the listed treatment events, including treatment date, product used, and amount used is provided in table 2 below.

Table 2: Herbicide treatment summary

Treatment Date	Product Used	Amount Used	Acreage Treated	Target Species
6/26/2019	Tribune (Diquat)	80 Gallons	50	Bladderwort, Stonewort, & Milfoil

Printed signs warning of the treatment and the associated temporary water-use restrictions were also posted along the shoreline of the pond. The treatment was completed by SŌLitude's state certified applicators, and was conducted in accordance with the product label and permits issued by MA DEP. At no time during the treatment program were fish mortalities or significant non-target impacts to other aquatic organisms or wildlife either observed or reported.

INTERIM SURVEY

An interim survey of Sunset Lake was performed on July 8, 2019 to determine treatment efficacy. At this time, bladderwort and stonewort were both observed coinciding in trace densities. Plant density in the treatment areas was significantly reduced and no areas of problematic vegetation were observed.

POST-TREATMENT INSPECTION

A post-management vegetation survey was conducted on Sunset Lake on October 16, 2019. A Jon-boat was used to tour the littoral zone in depths between two and fifteen feet. A throw-rake and underwater camera were used to assist in gaining view of the entire water column. At the time of the survey, the bladderwort and stonewort were at significantly lower densities



than in June. Variable watermilfoil was observed, but growth was evidently impaired and low in the water column. Please refer to Figure 3 for post-management survey results.

WATER QUALITY OBSERVATIONS

Dissolved oxygen, temperature, clarity, and pH readings were taken on June 4th and October 16th (refer to Table 3 below). These readings were collected at the “deep spot” in front of the dam (**Figure 1**).

Secchi clarity was typical for this region, at an average depth of 5.5 feet throughout the season. The pH was also within desirable range at the two sample dates. pH is consistently fluctuating throughout the day; therefore, variation is typical and should remain between 6.0 and 8.0 pH units to maintain a healthy environment for aquatic wildlife. Dissolved oxygen levels and water temperature during the spring and fall sampling events displayed typical values for the time of season the measurements were collected.

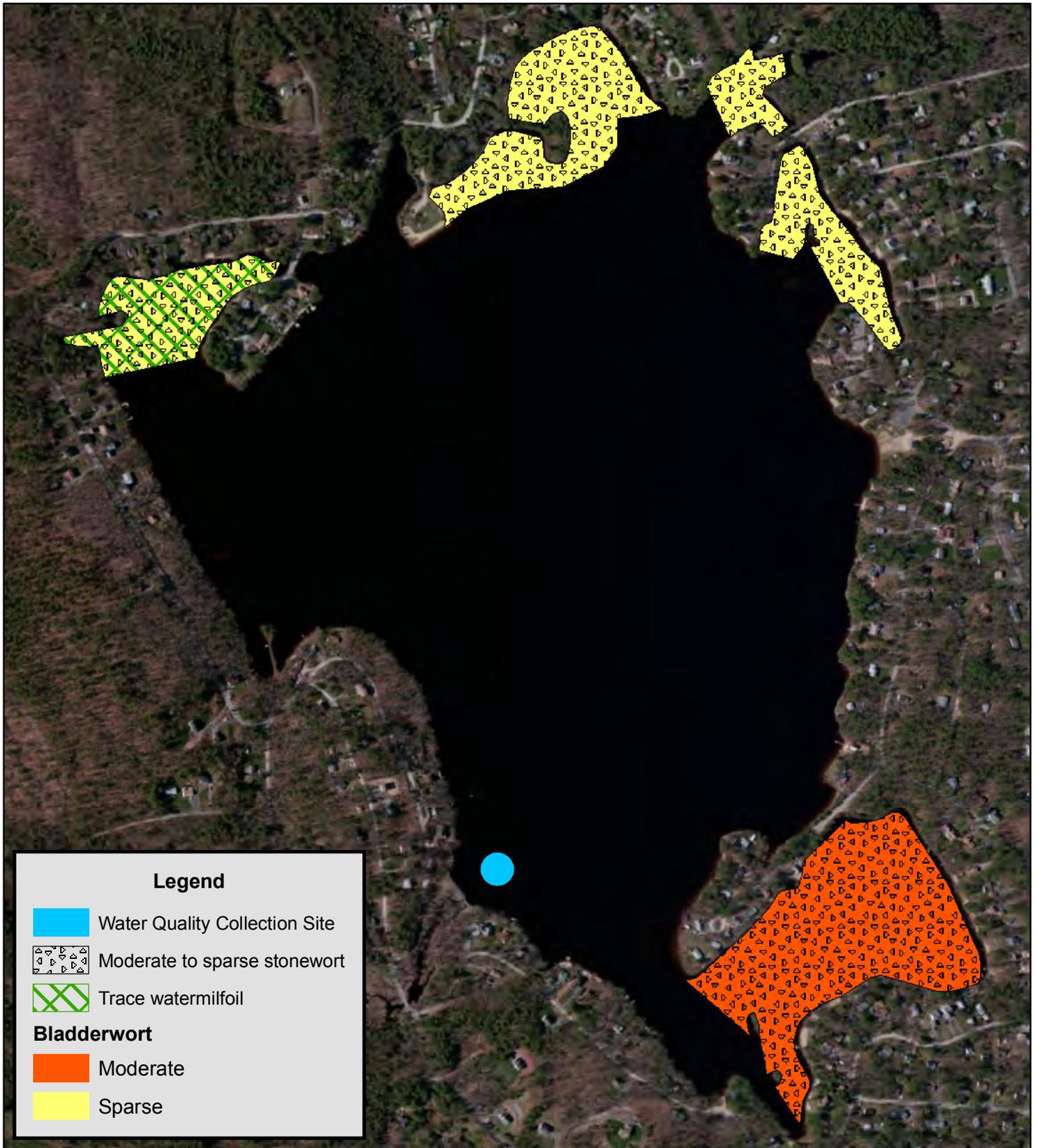
Table 3: Dissolved oxygen, temperature, clarity, and pH results

Water Quality Measurements								
Depth (feet)	Dissolved Oxygen (mg/L)		Temperature (°C)		Secchi (Ft) (Clarity)		pH (pH units)	
	Date: 6/4	10/16	6/4	10/16	6/4	10/16	6/4	10/16
SW	8.31	9.51	18.02	12.8	4.5	5.2	6.5	6.8
1	8.34	9.47	18.01	12.8				
2	8.36	9.44	17.99	12.7				
3	8.40	9.45	17.86	12.7				
4	8.41	9.41	17.80	12.7				
5	8.37	9.39	17.80	12.7				
6	8.28	9.39	17.71	12.6				
7	8.27	9.36	17.70	12.6				
8	8.18	9.36	17.65	12.6				
9	8.11	9.35	17.57	12.6				
10	8.08	9.35	17.56	12.6				
11	7.79	9.34	17.54	12.6				
12	6.82	9.23	17.25	12.5				

CONCLUSIONS/RECOMMENDATIONS

The 2019 treatment provided good control of the targeted vegetation within Sunset Lake. Preventative spot-treatments in areas of historic watermilfoil and bladderwort presence will continue to be recommended to combat possible re-growth. Utricularia is a hearty plant species, which typically will remain at low-biomass along the bottom of the lake even after herbicide treatment. Treatment is important however to prevent the plant from attaining higher, nuisance levels of growth which would be problematic for users of the lake.

Given the longstanding history of these species within the water body, ongoing management will continue to be required to control these target species. As such, SLM recommends continuing the aquatic plant management program – both monitoring and herbicide treatments – in 2020. SLM recommends, as in 2019, commencing the herbicide treatments early in the growing season when vegetative biomass is low, allowing less time for reproduction and fragmentation.



Legend

- Water Quality Collection Site
- Moderate to sparse stonewort
- Trace watermilfoil
- Bladderwort**
 - Moderate
 - Sparse

Sunset Lake
Ashburnham, MA

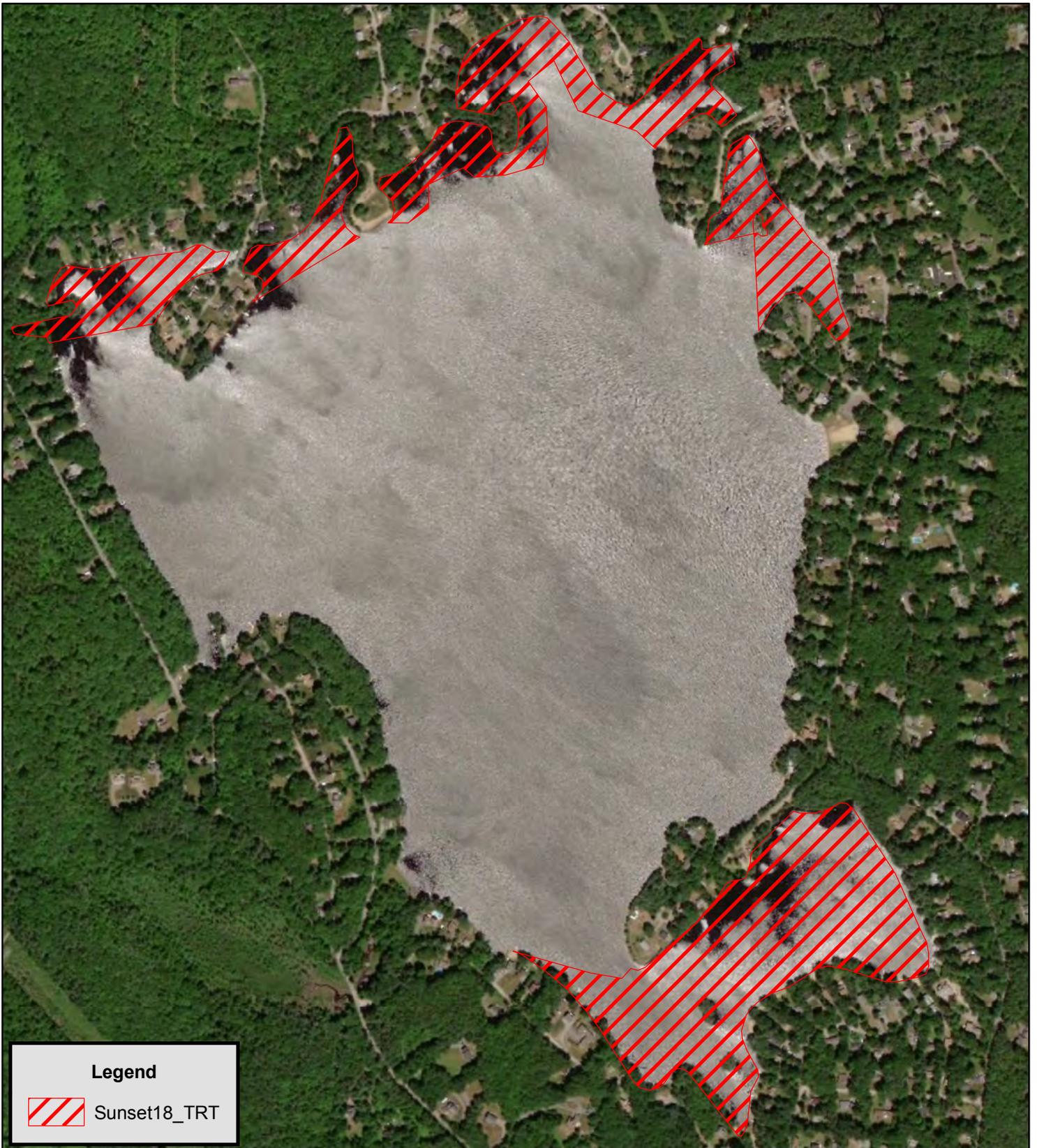
Sunset Lake

0 600 1,200

1:8,000 Feet

Map Date: 11/21/2019
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Figure 2: June Treatment Areas



Legend

 Sunset18_TRT

Sunset Lake
Ashburnham, MA



Sunset Lake

0 575 1,150

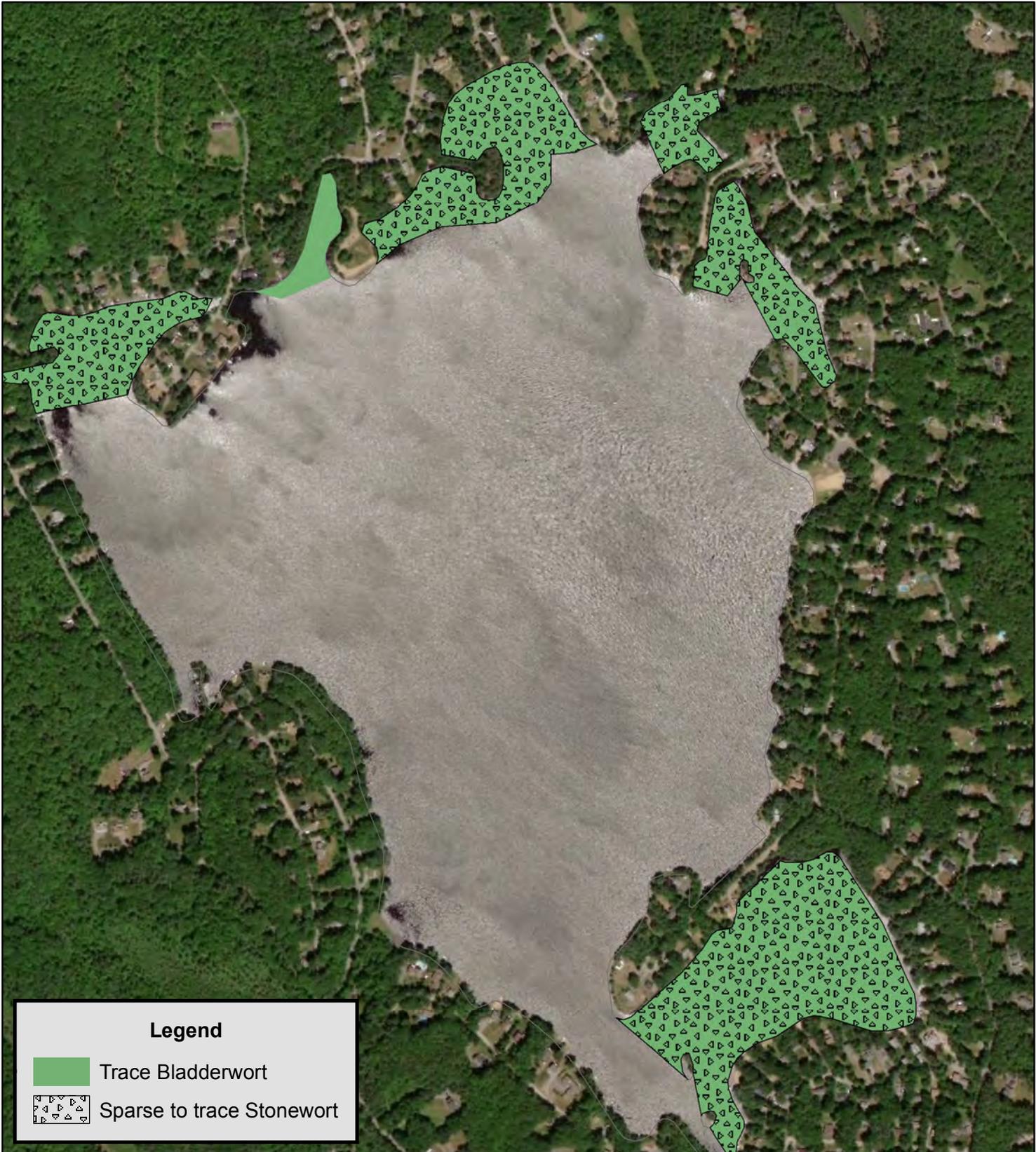


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Figure 3: October Distribution of Aquatic Vegetation



Legend

-  Trace Bladderwort
-  Sparse to trace Stonewort

Sunset Lake
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Sunset Lake

0 575 1,150



1:8,000 Feet



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