

November 23, 2011

Lake Singletary Watershed Association
C/o Mr. Tim Vanderlinden, President
103 West Sutton Rd.
Sutton, MA 01590

Re: 2011 Project Completion Report - Aquatic Management Program at Lake Singletary.

Dear Tim:

Aquatic Control Technology Inc. has collaborated with the Lake Singletary Watershed Association in managing Lake Singletary since 1997. Annual monitoring and timely management techniques have helped to maintain aquatic plants and algae below nuisance levels. Provided below is a summary of the 2011 Aquatic Management Program at Lake Singletary.

2011 Program Chronology

- File MA DEP "License To Apply Chemicals" 4/1/11
- Receipt of approved DEP "License" 4/28/11
- Early Season Inspections 7/1/11 & 7/14/11
- Reward (diquat) treatments of invasive milfoil weed 7/27/11
- Copper Sulfate treatment of nuisance algae 7/27/11
- Late Season Inspection..... 8/17/11

Early Season Inspections:



An initial inspection of Lake Singletary was conducted on July 1st by ACT president and biologist, Gerald Smith, along with LSWA member, Wayne Junnilla. The entire shoreline was inspected utilizing a combination of field survey techniques with special focus given to areas of historical invasive plant growth.

The survey revealed patchy, and dispersed fanwort throughout the littoral zone. Fanwort was common in water depths greater than 9 feet and could be found in depths as great as 14-15 feet. Eurasian milfoil was observed primarily in the cove located to the south of the small island with the red bridge. A small low

density patch of variable milfoil was observed on the southwestern shore.. Dominant native plant species observed included snailseed pondweed (*Potamogeton bicupulatus*), thin-leaf pondweed (*Potamogeton pusillus*), Robbin’s pondweed (*Potamogeton robbinsii*), naiad (*Najas flexilis*) and tapegrass (*Vallisneria americana*). Macro-algae, stonewort (*Nitella* sp) and filamentous algae were also observed in moderate densities throughout the littoral zone (figure 1).

On July 14th the lake was re-visited in order to assess whether an algae treatment would be necessary. In the two weeks since the initial inspection algal densities had increased and the water clarity had dropped approximately two feet. In a sample collected during the inspection overall moderate densities of algae were observed and the blue-green algae species, *Microcystis*.

Chemical Treatment Program:

Based upon the results of the early season inspection and discussions with the association, a Reward (diquat) herbicide treatment was performed on July 27th. The treatment targeted control of all invasive Eurasian milfoil and select areas nuisance level growth of native species where recreation was being negatively impacted. Approximately 14 acres were treated in total.

Due to concerns over declining water clarity during the pre-treatment inspections a half-lake copper algaecide treatment was performed around the outer perimeter of the lake on July 27th concurrently with the Reward herbicide program. This treatment was conducted following a decline in secchi disk readings to an average of approximately 9 feet and prior to severe deterioration in clarity. It is best if algal treatments are performed prior to severe bloom conditions so as to avoid noxious drops in oxygen levels. Due to the presence of blue-green algae in Lake Singletary extra caution should be taken to prevent bloom conditions from developing.

Prior to treatment all treated shorelines were thoroughly posted with signs depicting treated areas and water use restrictions. These signs were also made available in the kiosks at the public access points to the lake. The treatments proceeded smoothly and without incident.

Late Season Inspection:

A late season post-treatment inspection was conducted on August 17, 2011 by ACT Biologist Erika Haug and Field Technician Drew Kelosis. The objective of this survey was to assess the efficacy of the July 27th treatments, mark potential areas for hand-pulling, and to record the expansion of fanwort.

The Reward treatment program effectively controlled target species in all treatment areas. While some regrowth of native species was noted within treatment area the growth was all well below the surface and should not have had a negative impact of recreation for the remainder of the season. The Eurasian milfoil in the cove to the south of Fire-Island was completely controlled.



Fanwort reaching the surface in the shallow water of Harris Cove

The July algaecide treatment had held in most places. At one location on the southwestern shore of the Lake a small localized bloom was occurring at the time of the survey. This bloom appeared as if it would likely dissipate quickly and did not appear to be affecting recreation.

The assemblage of native species observed throughout the lake was consistent with those observed during the early season survey. Dominant native species included snailseed pondweed, thin-leaf pondweed, Robbin's pondweed, naiad tapegrass and bladderwort (*Utricularia sp.*).

Overall the fanwort growth had expanded significantly since the July surveys (figure 2). Infestations not observed in the July surveys were noted adjacent to 23 Singletary Road, in the cove bounded by Singletary Ave and Point Way and in the shallow end of Harris Cove. A guide for prioritizing hand-pulling was provided to the Association. The Association elected not to pursue hand-pulling this past year.

2012 Recommendations:

Based on the distribution of invasive plant species observed during throughout 2011, the following considerations should be given to future management efforts:

Drawdown

- Moderately good control over fanwort is being maintained within the zone of drawdown with the best control occurring at depths of less than 5 feet.
- As mentioned in past years, caution should be taken if considering an early (September) drawdown. Based on our observations in other waterbodies, the practice of lowering the pond while fanwort plants are still actively growing can sometimes allow for fanwort plants to colonize and establish a foothold in deeper water, where limited light penetration may have discouraged colonization prior.

Hand-pulling

- We continue to recommend hand-pulling for low density fanwort growth in order to hinder its spread and to complement the drawdown effort. Hand-pulling areas should be prioritized to prevent low density areas of fanwort from becoming well established and expanding.
- During the late season survey a few purple loosestrife plants were noted along the shore. Due to the widely scattered density of the current infestation, we recommend residents look for these shoreline invasives and remove them before the populations become dense.

Herbicide and Algaecide Treatment

- We would recommend continuing with the use of Reward for the control of milfoil and native plants reaching nuisance densities as this has been successful in the past
- We recommend the use of a copper-based algaecide treatment to maintain desirably low levels of microscopic algae on an as needed basis.
- Flumioxazin (trade name: Clipper) was federally registered for aquatic use this past winter. The registration process in Massachusetts will need be completed prior to use in Lake Singletary. Aquatic Control Technology utilized Clipper in several lakes and ponds outside of Massachusetts this summer for the control of fanwort with great success.

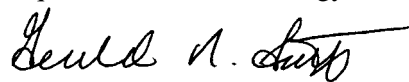
Monitoring

- We would suggest repeating the point intercept survey in 2012 in addition to the annual pre and post-treatment surveys.

We hope this report will be of assistance to LSWA. It has been a pleasure working with you and we look forward to continuing the successful management program on the lake next year. Please be sure that the respective Conservation Commissions receive a copy of this report. Thank you.

Sincerely,

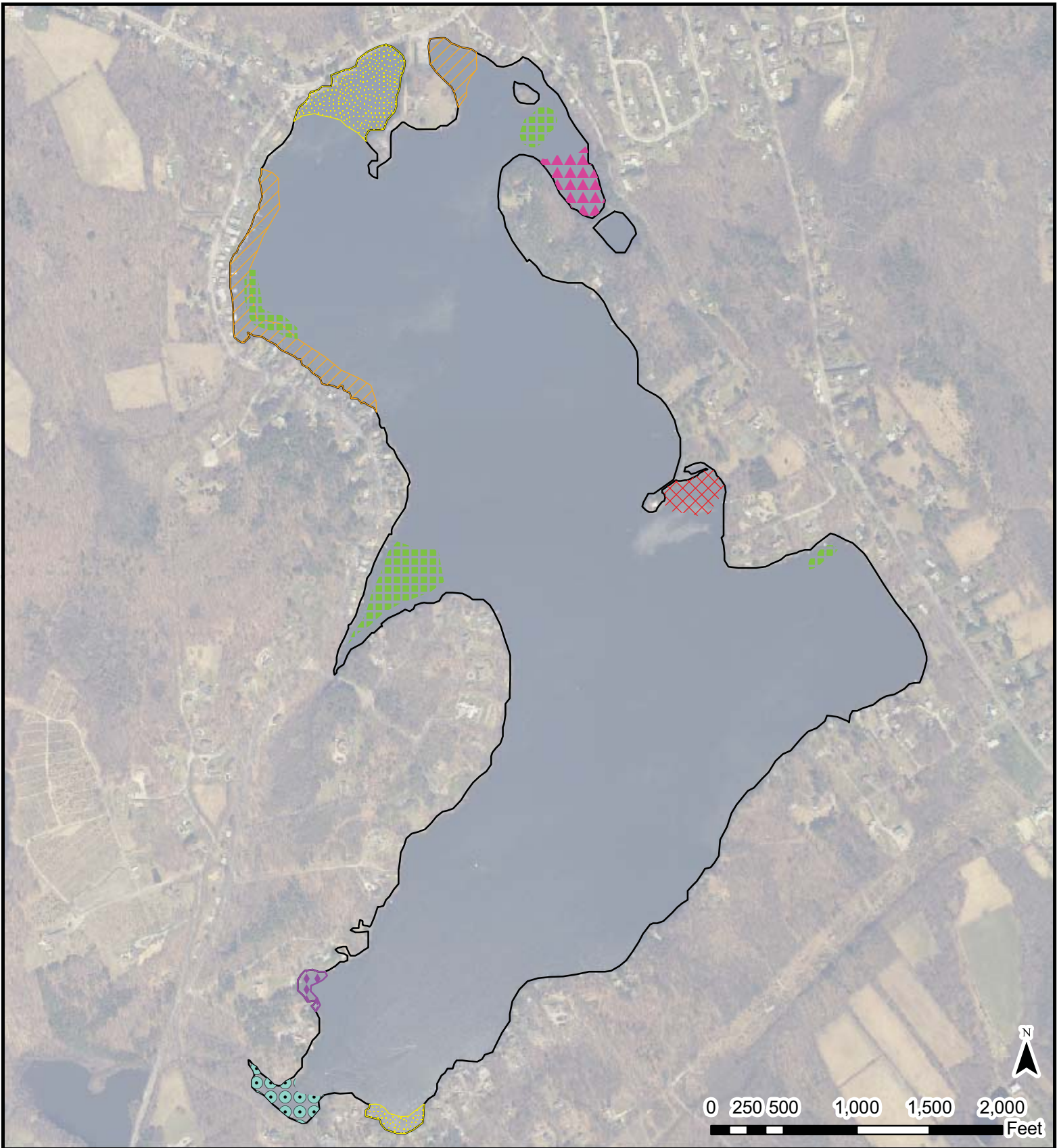
Aquatic Control Technology, Inc.



Gerald N. Smith
President/Aquatic Biologist



Erika Haug
Biologist










Lake Singletary

Milbury / Sutton, MA

Early Season Survey - Observed
Aquatic Plant Assemblages

Legend

-  Fanwort
-  Fanwort, variable milfoil and nitella
-  Eurasian milfoil
-  Snailseed pondweed, naiad, tapegrass, robbin's pondweed, thin-leaf pondweed, filamentous algae
-  Naiad, nitella, tapegrass
-  Snailseed pondweed, naiad, nitella
-  Robbin's pondweed and snailseed pondweed

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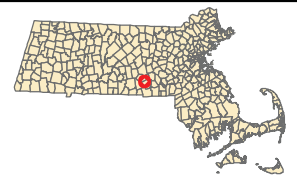
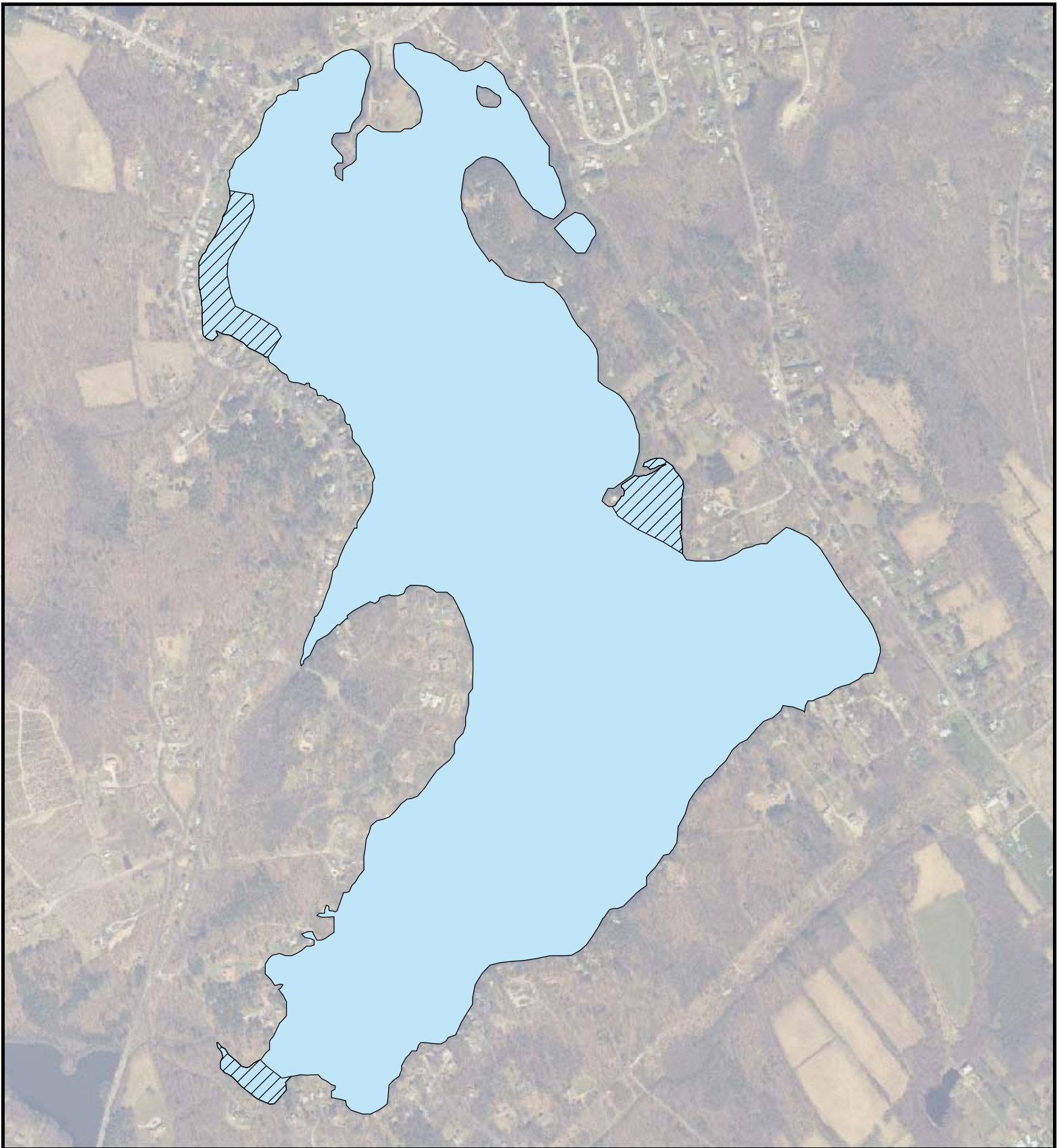


FIGURE:	SURVEY DATE:	MAP DATE:
1	7/1/11	11/23/11



Lake Singletary

Milbury / Sutton, MA

2011 Milfoil and Native
Vegetation Treatment

Legend:

 Treatment Areas



0 500 1,000 2,000 Feet



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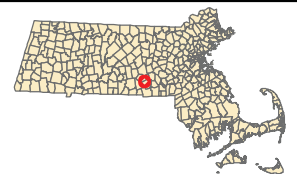
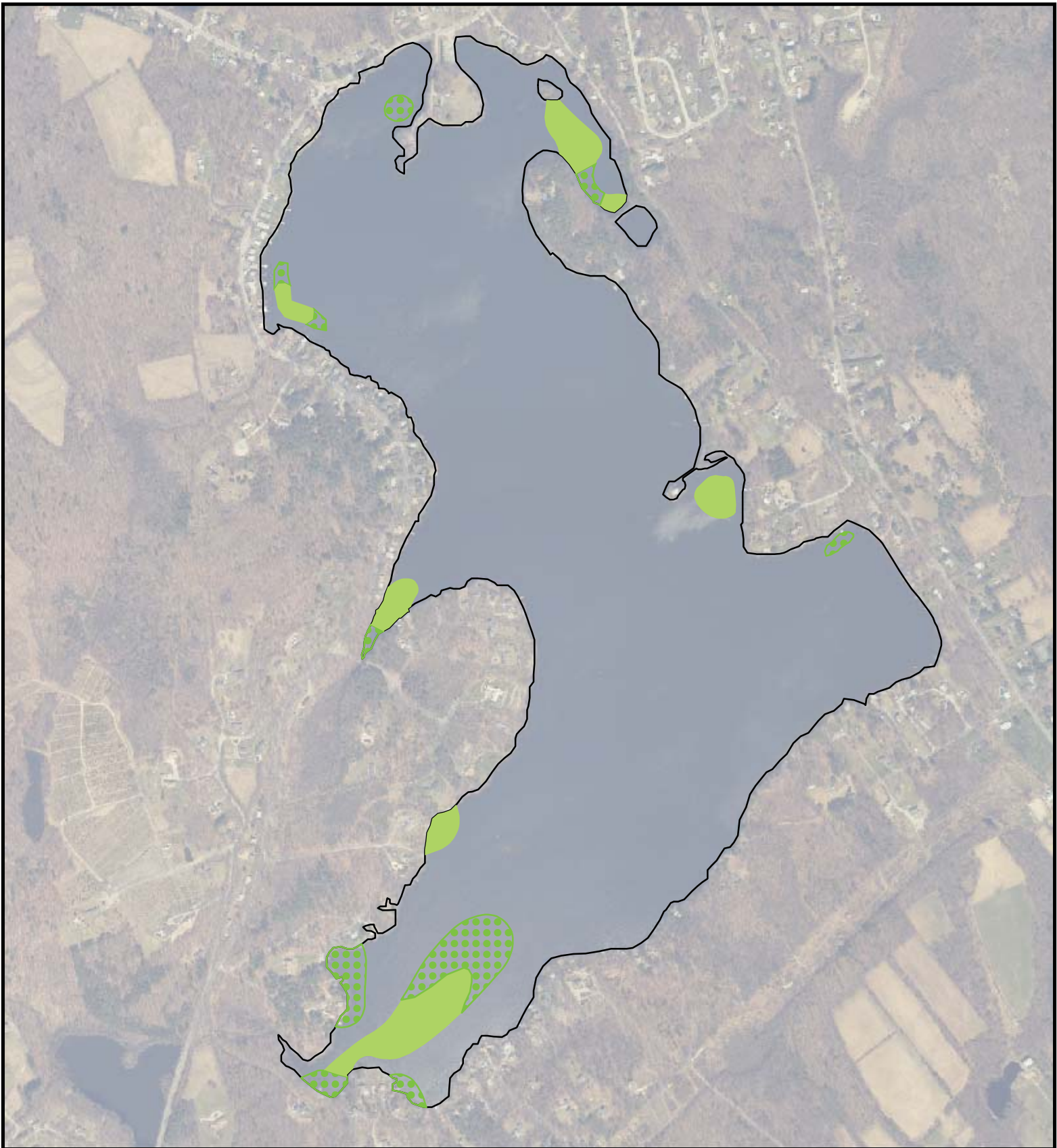


FIGURE:	SURVEY DATE:	MAP DATE:
2	07/27/11	11/08/11



Lake Singletary

Milbury / Sutton, MA

2011 Fanwort Observations

Legend



High Density Fanwort



Low Density Fanwort



0 500 1,000 2,000 Feet



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FIGURE:	SURVEY DATE:	MAP DATE:
3	08/17/11	11/23/11

3

08/17/11

11/23/11