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Date: May 27, 2016  
To: Joanna Bilotta; President, Lake Shirley Improvement Corporation  
From: Dominic Meringolo, Senior Environmental Engineer/Territory Leader  
Re: **Pre-Treatment Aquatic Plant Survey/Inspection and Management Recommendations – Lake Shirley - 2016**

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This memo summarizes the findings of the Aquatic Plant Survey of Lake Shirley performed on Monday, May 23<sup>rd</sup>. Jay Simoneau and Les Smith from the LSIC and Richard Bursch from the Lunenburg Conservation Commission were also present during the survey.

Weather and water clarity were favorable on the day of the survey and all three basins of the lake were surveyed. As planned, data was collected at defined GPS points in addition to an overall survey of the lake's plant assemblage. The GPS points used are the same as used in past surveys by Geosyntec and as used in last year's late season survey. The plan moving forward is to use these data points during each pre-treatment and late season plant survey. Due to new scheduling parameters and required Commission approval of the treatment plan, this year's survey was conducted about 3-4 weeks earlier than in past years. For various reasons, it is desired to treat the lake in mid-late June and avoid delaying treatment until July.

The survey was performed from SOLitude's 18-foot Jon Boat, while traveling around the entire shoreline and littoral (shallow water) zone of Lake Shirley. The GPS data points are shown in Figure 1. Given the overall shallow depth of the lake, additional transects were made across some of the coves and open-water portions of the lake in order to characterize the distribution of both invasive and native plants. A combination of survey techniques was utilized, including; visual observation and use of a "throw-rake". Both non-native and native species were included in the collection of point data, but non-native species in other areas of the lake were also recorded with additional GPS points.

This year, curlyleaf pondweed (*Potamogeton crispus*) dominated the assemblage at the time of the survey. Curlyleaf pondweed was widespread in the North Basin of the lake and was observed across considerably more area than seen in recent years. No occurrences of variable or Eurasian watermilfoil were observed during the survey. Also, no spiny naiad (*Najas minor*) was observed, likely due to the early timing of the survey. Tapegrass or wild celery (*Vallisneria americana*), was present but limited in cover and biomass, also likely due to the timing of the survey. Fanwort (*Cabomba caroliniana*) was observed in number of areas, however this species is not currently a target of the treatment program.

Historically, treatments of Lake Shirley have focused on controlling variable/Eurasian watermilfoil, curlyleaf pondweed, spiny naiad and localized areas of tapegrass in high use areas of the lake. Given the predominance and expansion of curlyleaf pondweed this year, the absence of any milfoil and the early growth stage of tapegrass and spiny naiad, curlyleaf pondweed will be the primary management target for this year's treatment.

The following table presents the point data collected during the survey.



A map of Proposed Treatment Areas is attached. Treatment areas were determined by covering all areas of significant curlyleaf pondweed growth and also areas with data points exhibiting a density or biomass index of 3 or greater and in proximity to populated sections of shoreline. This level of plant density or biomass was judged to represent a probable impairment to the habitat and recreational uses of Lake Shirley come mid/late summer if control measures were not implemented. The total treatment area is 96-acres which is mostly due to the expansion of curlyleaf pondweed. Many areas of the lake that have historically been treated due to the presence of spiny naiad or concern over the density of native species, will not be treated this year.

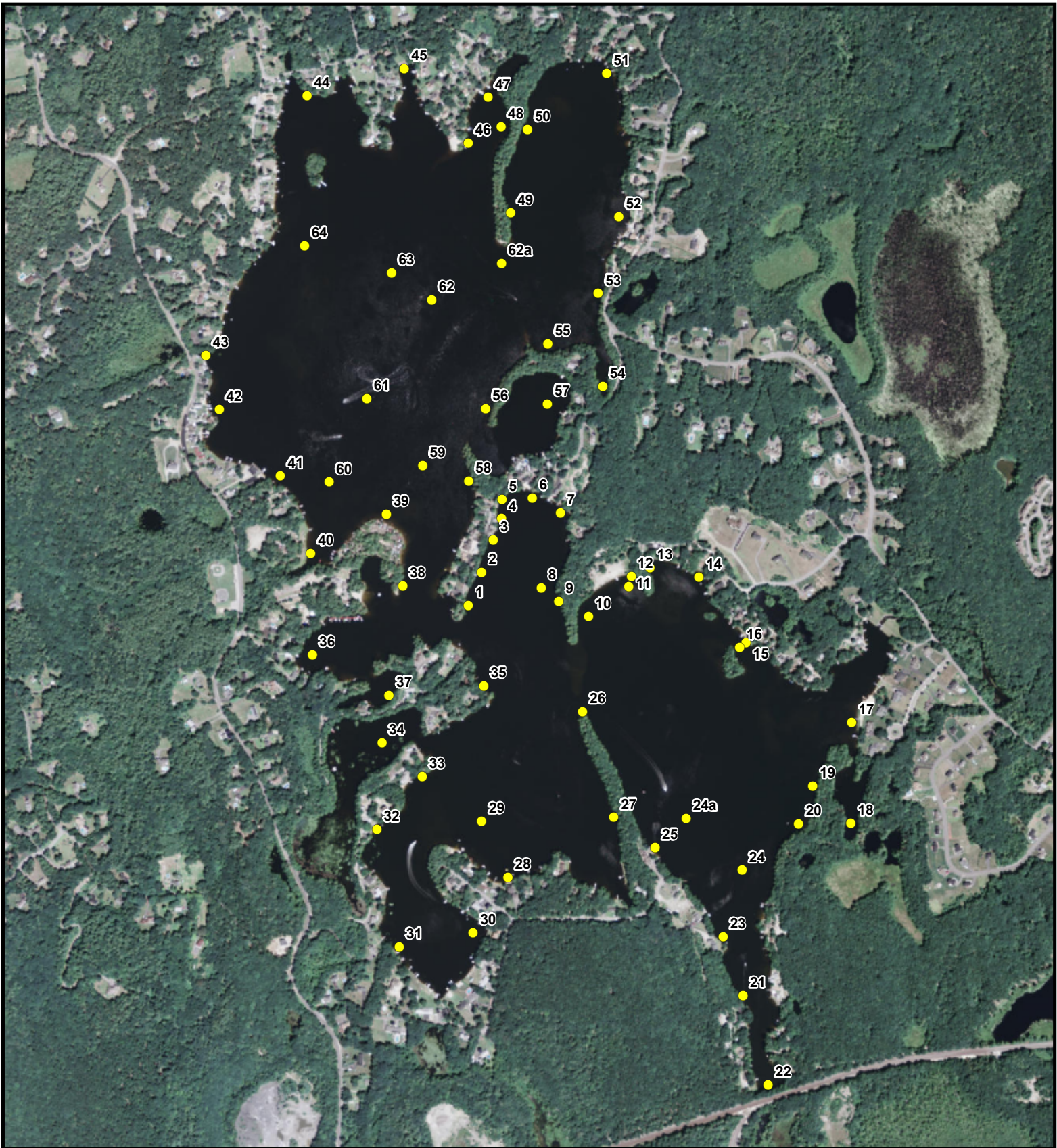
We are targeting chemical treatment of Lake Shirley for Tuesday, June 14th. The lake will be closed to all water uses, including swimming, fishing and boating on the day of treatment only. There will be an additional restriction on water use for irrigation, watering livestock and drinking purposes for 5 days. We will be sending you a written "notice of treatment" for you to publish in the local paper(s) and will also mail you printed signs for you to post around the lake shoreline prior to treatment. We will again be chemically treating with Reward (diquat) at rate of 1-1.5 gal/acre which is substantially less than the maximum label rate of 2.0 gals/acre. Maximum USEPA label rate for Reward is 2.0 gals/acre.

As a final note and for discussion, if curlyleaf pondweed continues to dominate the lake in May, we should consider moving to a two-treatment approach beginning in 2017. This would be preferable for two reasons. First, the curlyleaf pondweed could and should be treated earlier in the season (early-mid May) to control the plants at a lower biomass and help to reduce reproductive structures and hopefully reverse the expansion of curlyleaf pondweed moving forward. Secondly, using a second, later season treatment to target areas of other invasive plants (i.e. spiny naiad) and dense growth of native plants (bushy pondweed and tapegrass) will allow for surveying at a time when the growth is more active and potential nuisance areas can be better assessed.

Please contact me to review the report and recommendations at your earliest convenience.

Thank you.





# Lake Shirley

Lunenburg/Shirley, MA

## Survey Points

● Survey points developed by Geosyntec



0 250 500 1,000 1,500 2,000 Feet

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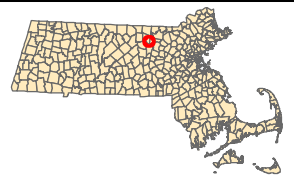
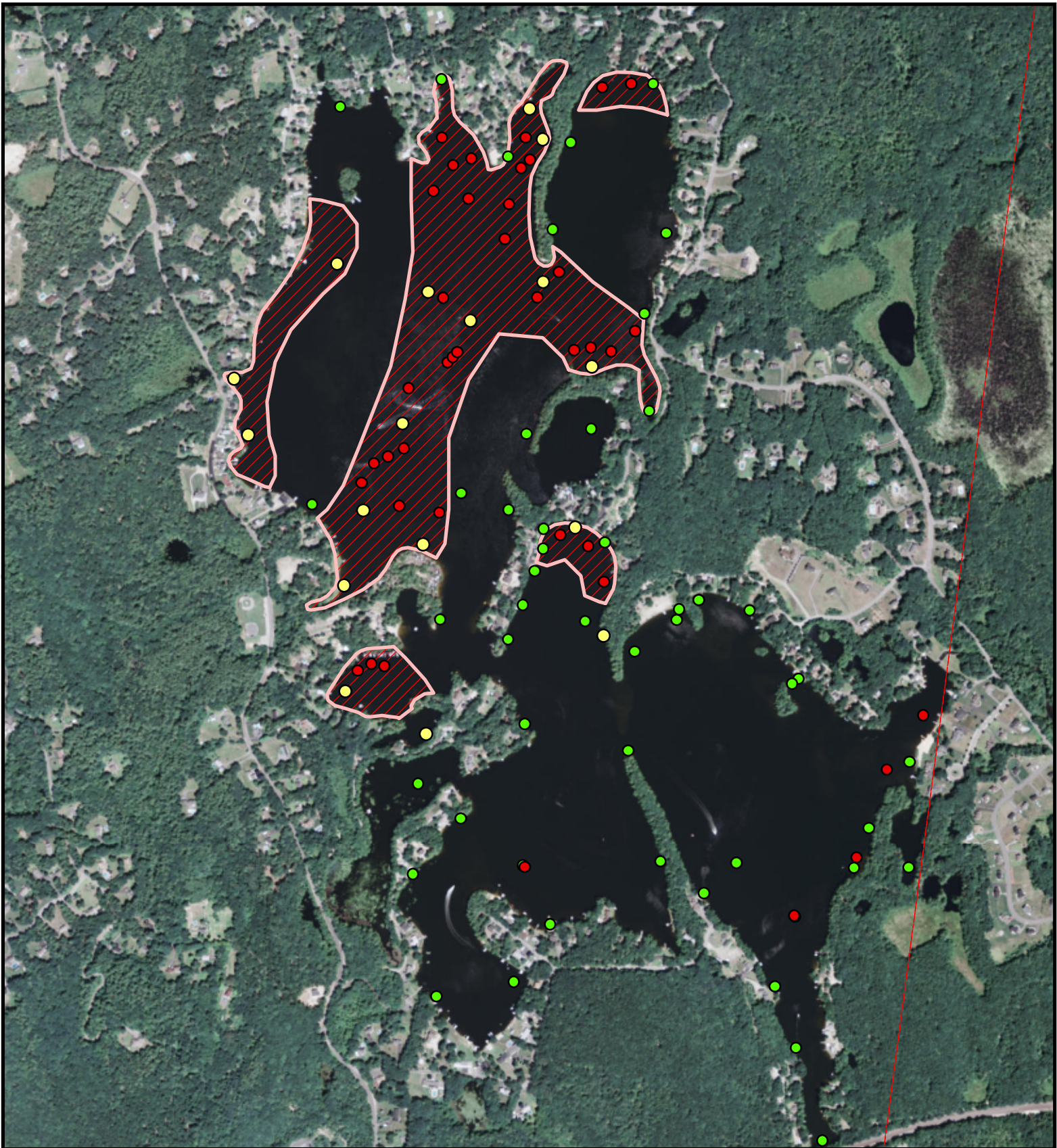


FIGURE:	SURVEY DATE:	MAP DATE:
2	10/2/15	11/27/15





# Lake Shirley

Lunenburg/Shirley, MA

## 2016 Treatment Area



Proposed 2016 Treatment Areas - 95 acres



Curlyleaf Pondeed Points



Data Points with Density or Biomass Index over 3



Data Points with Low Density/Biomass



0 250 500 1,000 1,500 2,000  
Feet

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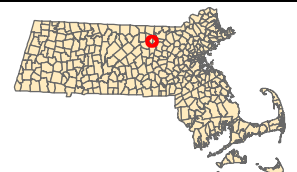


FIGURE:	SURVEY DATE:	MAP DATE:
1	5/23/16	5/27/16