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Date: June 23, 2014

To: Joanna Bilotta; President, Lake Shirley Improvement Corporation

From: Gerry Smith, Aquatic Biologist & Dominic Meringolo, Environmental Engineer

Re: **Aquatic Plant Surveys/Inspections of June 14th & June 20th and Management Recommendations – Lake Shirley - 2014**

This memo summarizes the findings of Aquatic Plant Surveys/ Inspections of Lake Shirley performed by me on June 14th and again on June 20th. Two surveys of the lake were necessary this year in view of the late spring and cool water temperatures which acted to delay the growth of the aquatic plants. The growth of Spiny naiad and tapegrass had just begun in most areas of the lake at the time of our first survey. I was joined on both surveys by Jay Simoneau from the lake association. The weather during both surveys was good with partly or mostly sunny skies. Secchi Disk visibility in all three lake basins was estimated to be in excess of 6-7 feet. Overall, conditions allowed for good visibility into the water to identify and locate the aquatic plants.

The two surveys were performed from a Pontoon Boat, while traveling around the entire shoreline and littoral (shallow water) zone of Lake Shirley. 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 were utilized, including; visual observation and use of a "throw-rake". Invasive watermilfoil, curlyleaf pondweed, spiny naiad and fanwort, along with the native but nuisance forming tapegrass/ wild celery and other aquatic plants, were noted and recorded.

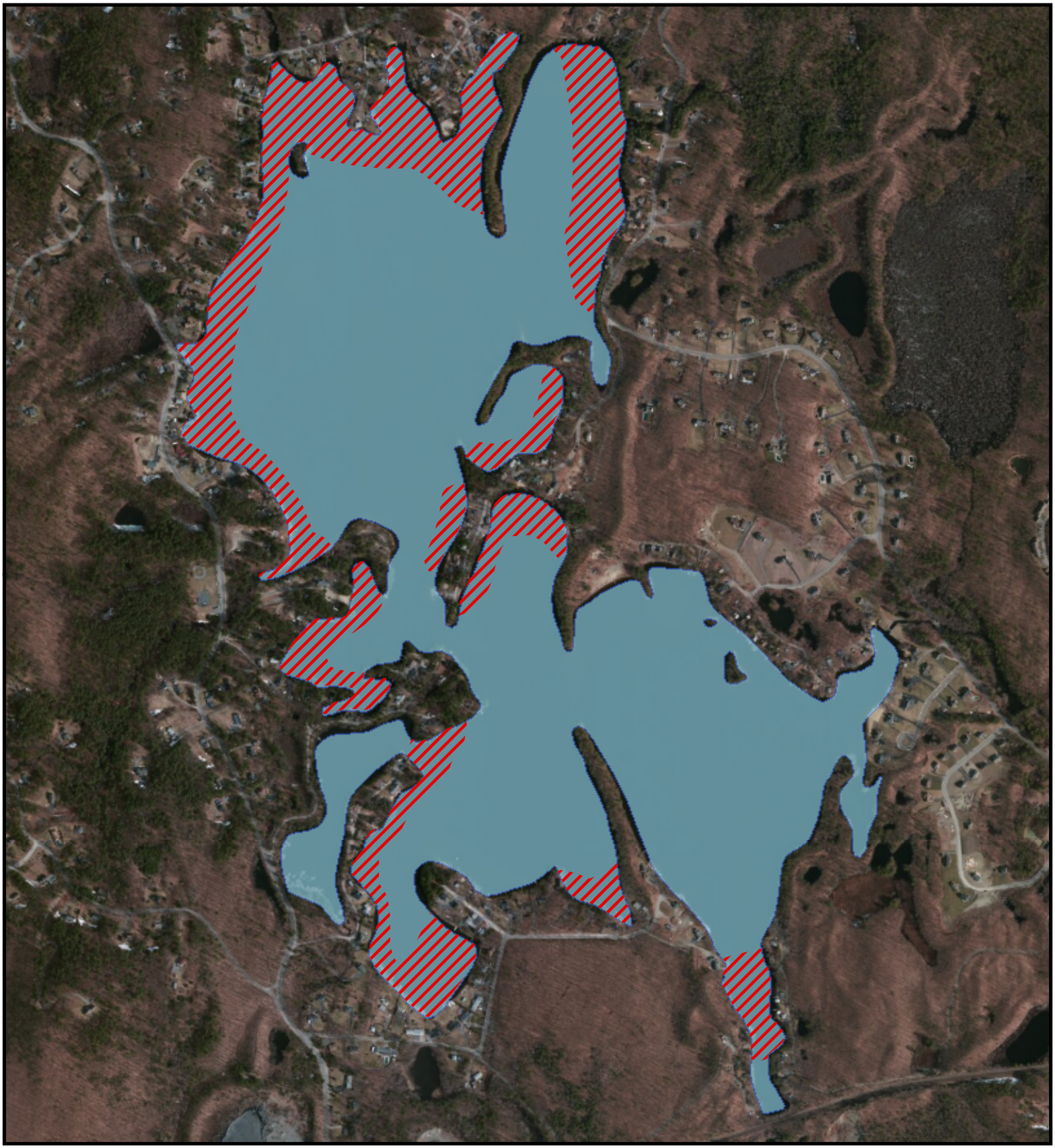
We observed very little Eurasian watermilfoil, with its growth confined primarily to just an approximate two acre area along the lake's eastern shoreline in the southern lake basin. Invasive Curlyleaf pondweed that was targeted for treatment (along with milfoil in 2012 and also in some prior years) was found in limited but somewhat increasing distribution. The higher density areas of Curlyleaf pondweed were primarily found throughout the north central area of the northern lake basin. Consideration should be given to chemically treating a larger area of the northern basin in 2015. Doing so may require two separate treatments for optimal effectiveness and control of these two plants; 1) the first treatment in late May/early June that would target growth of curlyleaf pondweed and 2) the second treatment in late June that primarily targets the Spiny Naiad and tapegrass - the latter two plants that grow/develop more slowly than does the pondweed. Hopefully, permits will also be in place for "Clipper" (Flumioxazin) herbicide and additional funding available to initiate treatment of the invasive fanwort (Cabomba) weed. The fanwort becomes a nuisance in a number of the lake's coves in water depths greater than about 5.5 ft., which we understand is the maximum limit/depth the lake can be lowered during the winter "drawdown".

The primary nuisance aquatic plants experienced during 2012 and prior to treatment last year were the invasive Spiny naiad along with native tapegrass or wild celery. These two plants are once again the primary species that will be targeted for treatment in 2014.

Some other native aquatic plants also observed during the survey, included, coontail, bushy pondweed, ribbon-leaf pondweed, bladderwort, sago pondweed, waterlilies and a macro-alga called muskgrass or chara.

A map of Proposed Treatment Areas is attached. The specific areas of treatment and total acreage are quite similar to last year. Based upon our survey findings, we recommend chemical treatment of approximately 91 acres. The attached map represents invasive and nuisance plant cover in most treatment areas, of generally between > 10% and 100% and was judged during the survey to represent a probable impairment to the recreational uses of Lake Shirley come mid/late summer. Management with "hand-pulling" or other non-chemical techniques are either not cost/effective, practical or feasible over such large areas of abundant weed growth.

We are targeting chemical treatment of Lake Shirley for Tuesday, July 1st. 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. The Reward (diquat) may be tank-mixed with a low dose of copper based algaecide to enhance uptake and efficacy for control of the tapegrass/wild celery. I hope this information is helpful to LSIC. Feel free to forward this memo to the Conservation Commissions and other appropriate parties. Thank you.



Lake Shirley

Lunenburg/Shirley, MA

2014

Treatment Area

FIGURE:	SURVEY DATE:	MAP DATE:
1		6/23/14

N

Proposed 2014 Treatment Areas - 91 ac

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

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