

Northeast Aquatic Research



Lake Waramaug 2020 Treatment Report

Prepared for the Lake Waramaug Task Force



December 2020

Introduction

Over the past 14 years, suction harvesting has been performed in Lake Waramaug to manage the invasive species Curly-leaf Pondweed (*Potamogeton crispus*).

Northeast Aquatic Research (NEAR) conducted two aquatic plant surveys of Lake Waramaug in 2020. The pre-removal survey, conducted on June 1st, consisted of traversing entire littoral zone of the lake and revisiting all waypoints at which Curly-leaf Pondweed had been found in previous years. This survey utilized a combination of visual assessments, hand-raking in shallow water, grappling rake tosses, and depth-soundings to view plants growing in deep water.

Following the June 1st survey, New England Aquatic Services used suction harvesting to remove all known Curly-leaf plants from the lake.

The post-removal survey, conducted on July 9th, involved revisiting all locations where the suction harvesters had operated, to search for any Curly-leaf plants that had been missed by the harvesters or had regrown from turions or fragments post-removal.

Lake Waramaug Aquatic Plant Survey Results

During the pre-removal survey in June, Curly-leaf Pondweed was present at several locations along the lake's northern shoreline, as well as two locations on the southern shoreline. Most plants were located at the inner ends of the coves, and most locations consisted of just one or two plants, though there were also a few larger beds (**Map 1, Table 1**). Consistent with prior years, Sucker Brook Cove contained a high density of Curly-leaf plants (see maps of historical Curly-leaf Pondweed locations in the Appendix). Curly-leaf was found at mostly the same locations in 2020 as in May 2019, though there were slightly more scattered plants this year. However, there was significantly less Curly-leaf in 2020 compared to 2018 and earlier years.

During the July 9th post-removal survey, no Curly-leaf was found in the lake. However, the invasive species Water Chestnut (*Trapa natans*) was discovered in Sucker Brook cove, which is the same location in which the species was found in 2018. One small, single plant was found and was removed immediately. There is a small pond upstream of Sucker Brook that is full of Water Chestnut. This pond drains into Sucker Brook just north of where the brook enters the lake. As a result, plants can flow from the pond into Lake Waramaug, which is why several Water Chestnut plants have been found (and removed) from this location in the lake over the years.

Water Clover (*Marsilea quadrifolia*) was discovered at the northwestern tip of the lake. The population consisted of a handful of small patches located directly along shore. Water clover is considered potentially invasive in Connecticut but is typically benign, as it does not grow aggressively and rarely out-competes native plant species.

Map 1. June/Pre-treatment 2020 *Potamogeton crispus* locations in Lake Waramaug.

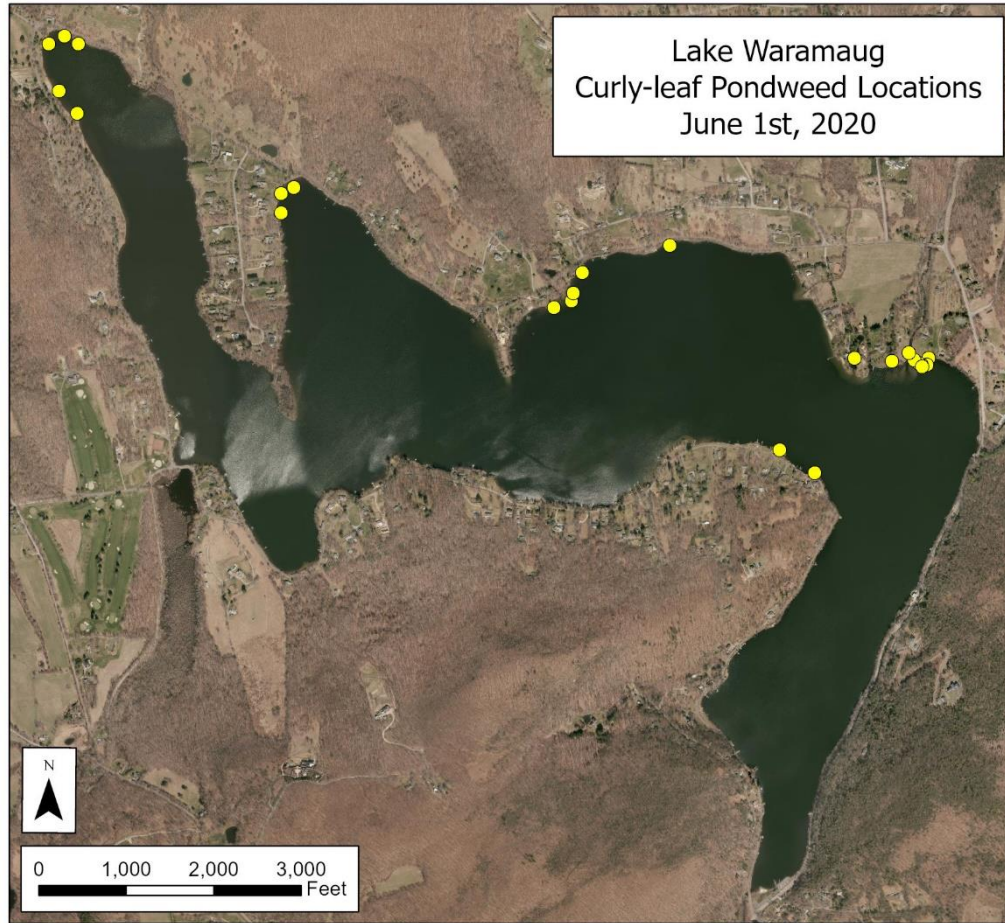
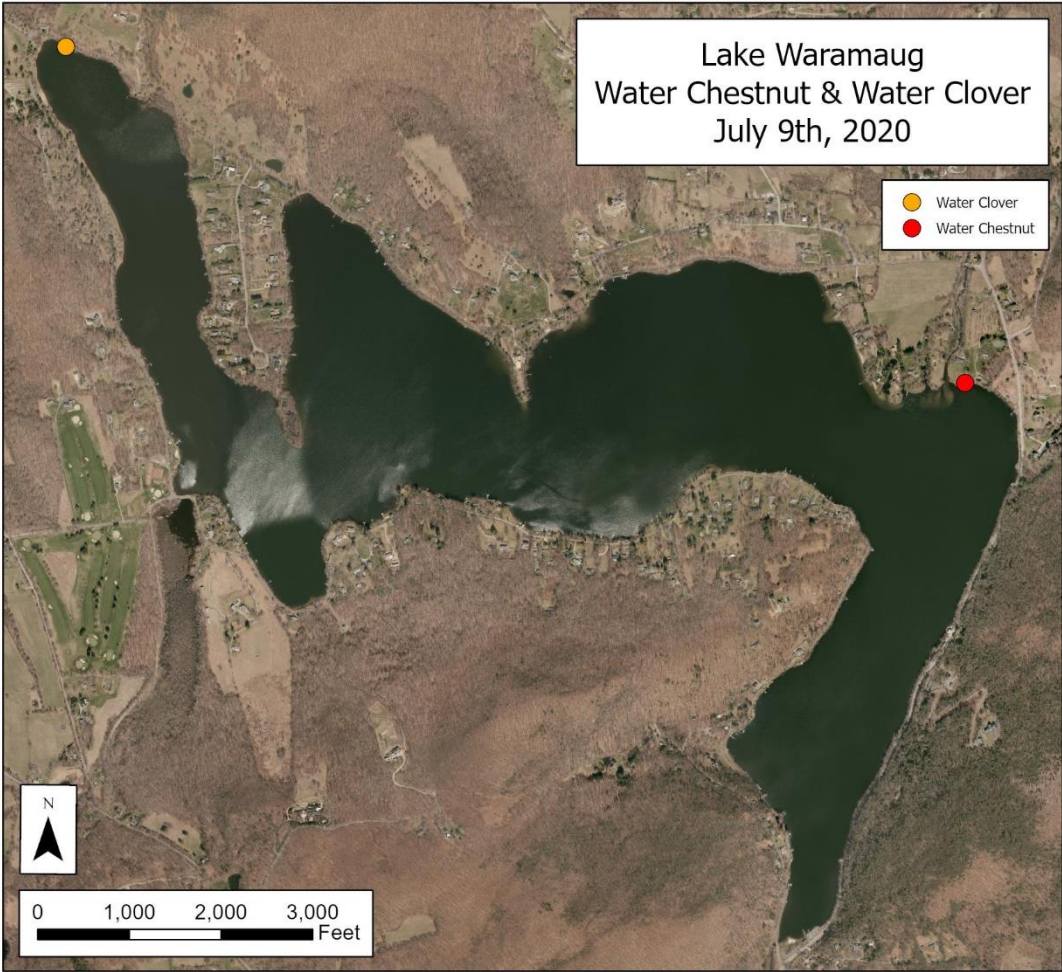


Table 1. *Potamogeton crispus* waypoints and associated patch sizes.

Waypoint	# of Plants	Growth Form
703	9	3.5
704	1	5
705	1	5
706	1	5
707	1	5
708	1	5
709	1	5
710	30	4.5
715	7	4.5
718	1	2
720	1	2
722	1	2
723	1	2

724	1	2
729	1	3
730	2	2
731	1	1
732	4	3
733	1	4
734	1	2
735	12	5
736	1	3
739	1	3
740	1	3

Map 2. Locations of Water Clover and Water Chestnut during July 2020 survey.



Recommendations

The amount of Curly-leaf Pondweed in the lake has been reduced for two consecutive years, suggesting that the annual suction harvesting operation is effectively managing the Curly-leaf population and diminishing the species' seed bank. Continued annual suction harvesting of Curly-leaf Pondweed can lead to complete eradication of the species from the lake.

Annual pre-removal surveys are necessary for locating all Curly-leaf plants that need to be removed, along with searching for any other invasive species and removing them immediately, when possible.

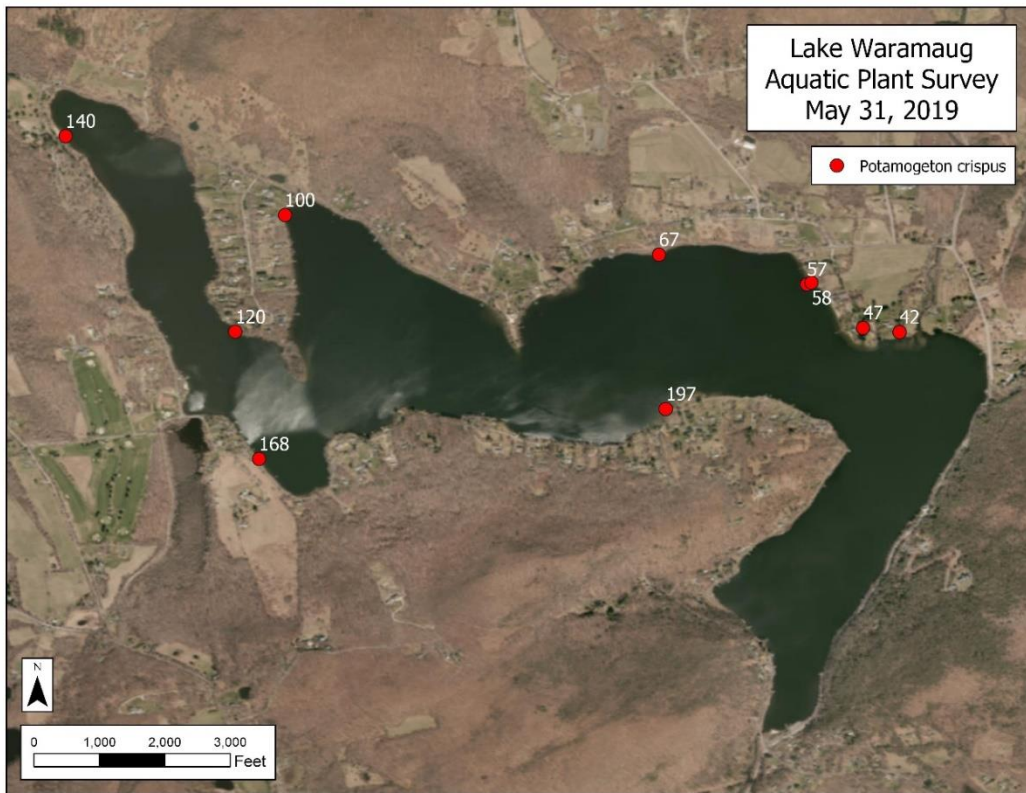
The small pond that drains into Sucker Brook is full of Water Chestnut plants, which leads to Water Chestnut infestations in Lake Waramaug. The Water Chestnut plant in the pond should either be treated with Glyphosate to kill the plants, or a hand pulling program should be established remove the plants manually. Whether the plants are removed via herbicide or hand-pulling, it will require a multi-year management program because the pond almost certainly has a large Water Chestnut seed bank from which plants can resprout for many years. However, treating this small, contained pond will ultimately avoid a much larger, and more expensive, removal operation if Water Chestnut become established in Lake Waramaug.

Appendix

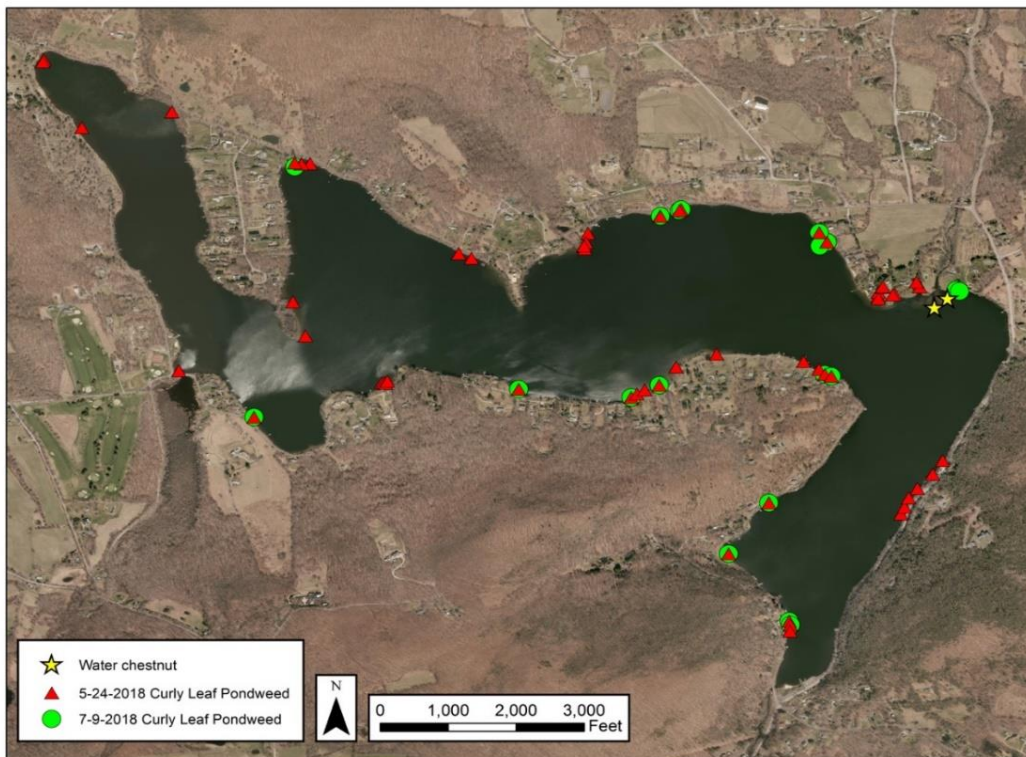
Table 3. Aquatic plant survey dates, 2007 – 2020.

Date	Map #	Number of curly leaf locations
2020 – June 1 and July 9	1	24
2019 – May 31 and July 24	2	10
2018 – May 24 and May 25	7	63
2017 – June 1	8	50
2016 – May 31 and June 2	8	104
2015 – June 8	9	48
2014 – June 10	9	120
2013 – September 13	9	5
2013 – June 4	9	33
2012 – May 30, and May 31	9	19
2011 – June 15	9	5
2010 – June 7, 8, and 9	9	45
2009 – May 21, June 16, and June 25	9	16
2008 – June 18, July 2 (first spring curly-leaf survey)	10	5
2007 – August 17, and August 20 (last summer survey)	~	~

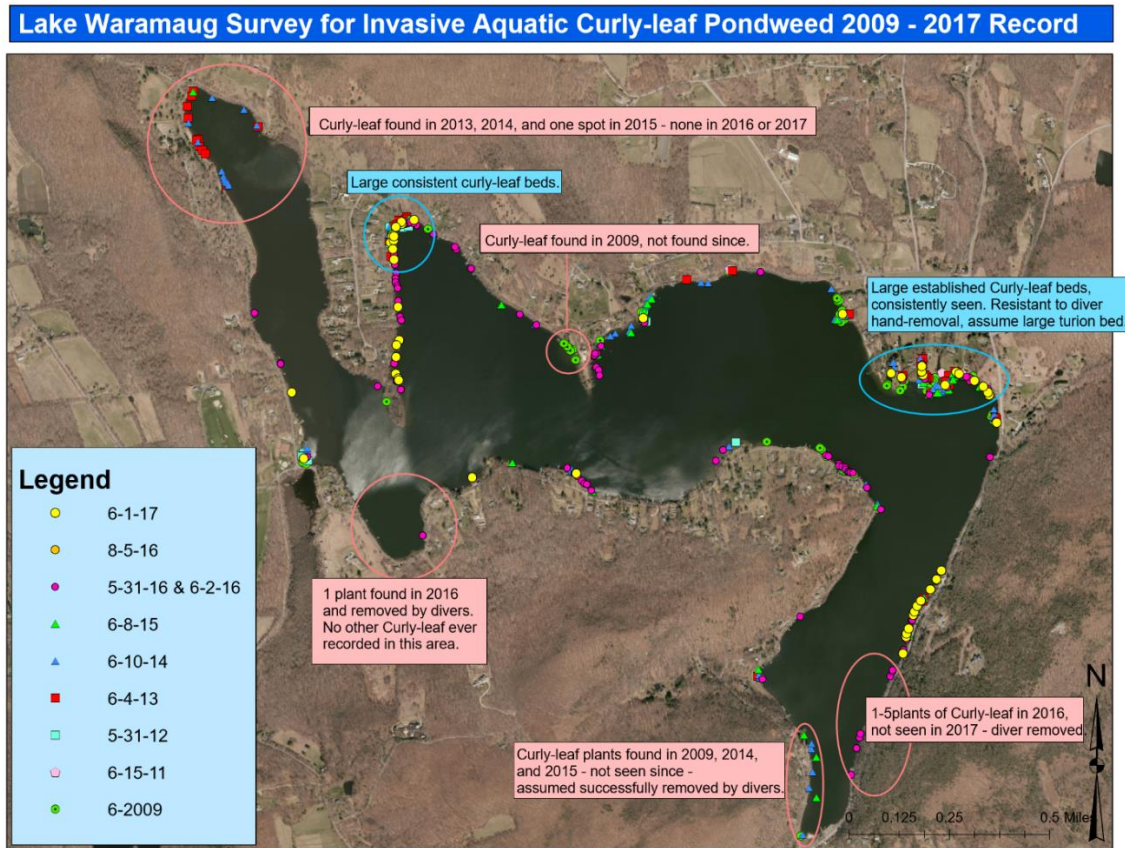
Map 3. Locations of Curly-leaf Pondweed plants found in Lake Waramaug during May 2019 survey.



Map 4. Locations of Curly-leaf Pondweed and Water chestnut during 2018 surveys.



Map 9. Locations of Curly-leaf Pondweed plants found in Lake Waramaug during aquatic plant surveys, 2009 – 2017.



Map 10. Lake Waramaug showing sites where curly-leaf pondweed was observed during June 18, and July 2, 2008 surveys.

