

INTRODUCTION

Long Lake, Fond du Lac County, is an approximately 454-acre drainage lake (including the northwest basin known as Tittle Lake) with a maximum depth of 47 feet and a mean depth of 22 feet (Photo 1). In 2010, the Long Lake Preservation Association, Inc. (LLPA) contracted with Onterra, LLC to conduct a three-year aquatic invasive species (AIS) monitoring and control project. The objective of this project was to monitor and assess herbicide treatments aimed at controlling the non-native invasive plants curly-leaf pondweed (*Potamogeton crispus*; CLP) and Eurasian water milfoil (*Myriophyllum spicatum*; EWM) from 2011-2013. At the end of the three-year AIS monitoring and control project, the LLPA had remaining funds within the Wisconsin Department of Natural Resources (WDNR)-funded AIS-Established Population Control Grant, and along with additional funds requested from the WDNR through an amendment, they were able to extend the project into a fourth year to fund AIS monitoring and control through 2014.



Photo 1. Long Lake, Fond du Lac County.

The LLPA completed an update of their management plan in 2015 (*Long Lake Comprehensive Management Plan, Onterra, March 2015*). The updated plan created new thresholds and triggers for the continued control of CLP and EWM within Long Lake. The LLPA has outlined an aggressive approach to CLP management within their *Comprehensive Management Plan* whereas:

- All areas targeted the previous year would be considered for treatment. Based upon the pretreatment survey, these areas may be reduced or removed.
- All areas of colonized CLP will be considered for treatment during the following spring. The LLPA's treatment threshold (trigger) would also extend to immediately adjacent areas of CLP mapped with point-based techniques, with areas mapped as *small plant colonies* being targeted if possible.
- Areas containing AIS but not targeted for herbicide control will be considered for hand-removal. The LLPA is in the early stages of implementing this aspect of their control program and determining its applicability to managing AIS in Long Lake.

The goal of CLP management in Long Lake is to reduce the treatable acreage of CLP. This is accomplished through repeat treatments aimed at depleting the base of turions (vegetative reproductive structures) that have built up in the sediments over time. It is unknown exactly how long turions can remain viable in the sediment, but it is believed to be at least 3-5 years. Early season herbicide treatments have shown large reductions in CLP biomass and decreased recurrence of CLP populations after multiple consecutive treatments (Skogerboe et al. 2008). Johnson et al. (2012) investigated 9 midwestern lakes that received five consecutive annual large-scale endothall treatments to control CLP. The greatest reductions in CLP frequency, biomass, and turions was observed in the first 2 years of the control program, but continued reductions were observed following all five years of the project.

All of the areas that were treated in 2016 were proposed to be retreated in 2017 (Map 1). Multiple years of treatment over these same areas will likely need to occur to kill CLP sprouting from previously deposited turions. In total, 18.1 acres were initially proposed for treatment in 2017 (Map 1).

The LLPA outlined an EWM control strategy within the management plan which involved targeting EWM with spot-treatments or hand-harvesting as appropriate. A professionally-contracted EWM hand-harvest pilot program was initiated in 2017.

Background on Herbicide Treatment Strategies

From an ecological perspective, herbicide spot treatments are those where the herbicide is applied at a scale where dissipation will not result in significant lake wide concentrations; impacts are anticipated to be localized to in/around the application area. Ongoing studies are indicating that in small spot treatments (working definition is less than 5 acres) the herbicide dissipates too rapidly to cause mortality to the target species with some herbicides (e.g. 2,4-D, endothall) (Nault et al. 2015). Even in some cases where larger treatment areas can be constructed, their narrow shape or exposed location within a lake may result in insufficient herbicide concentrations and exposure times for control. In regards to CLP control, ongoing field trials are assessing the efficacy and selectivity (collateral native plant impacts) of herbicide combinations (2,4-D/endothall) that may be effective with a shorter exposure time.

Historic control of CLP in some parts of Long Lake have been effective, whereas areas of high flow, such as the outlet and near the inlet to Title Lake, have not met control goals. In some instances, smaller spot treatments (<5 acres) have been effective because of their protected location in the lake where dilution potential is less. Also, a higher herbicide dose has been applied on the smaller spots.

2017 AIS CONTROL STRATEGY

Pretreatment Confirmation and Refinement Survey

On April 25, 2017, Onterra ecologists conducted the Pretreatment Confirmation and Refinement Survey. The weather was favorable for the survey with full sun and air temperatures around 65°F. Water temperatures were around 54-55°F in the littoral depths and 50-51°F at deeper depths. A Secchi disk depth of 15.7 feet was recorded. During this survey, the crew visited all three proposed treatment sites to assess the level of CLP within each site and ascertain its current stage of growth. The CLP was readily visible from the surface and ranged from 1-3 feet tall. The crew also completed quantitative sub-sample point-intercept surveys within each of the proposed treatment sites. Overall, the abundance of CLP within these proposed areas was relatively low.

The level of CLP observed in proposed site A-17, was believed to warrant treatment. An additional lakeward buffer was added to this semi-protected site to assist in the site holding sufficient herbicide concentrations and exposure times for control. The acreage of this site was increased to 4.0 acres from the originally proposed 2.8 acres.

In proposed site C-17, sufficient CLP was observed within the northern portion of the site to warrant treatment. CLP within the southern portion of proposed site C-17 was very sparse, and it was not believed that this area warranted herbicide application. Site C-17 was reduced from the originally proposed 9.8 acres to 5.9 acres to include the northern half of this area.

Very little CLP was observed within proposed site D-17, and it was believed that the low level of CLP within this area did not warrant treatment the site area was removed from the final treatment strategy.

Based on the growth of the plants and the water temperatures, Onterra recommended the treatment happen as early as logistically possible by the applicator. The factors that influence water exchange within a lake are complex. It was recommended for the treatment to occur with the lowest winds possible as well as attention paid to the forecasted wind conditions for the 6 hours following treatment. Coordination between the association and the applicator would drive these logistics. Onterra provided the spatial data to the applicator to conduct the treatment.

The treatment was conducted by Aquatic Biologists, Inc on May 18, 2017. The applicator reported a near-surface water temperature of approximately 51.1°F and north/northeast winds of 0-5 mph at the time of application.

CLP Monitoring Results

The theoretical objective of an herbicide treatment strategy is to maximize target species (CLP) mortality while minimizing impacts to native aquatic plant species. Monitoring herbicide treatments and defining their success incorporates both quantitative and qualitative methods. As the name suggests, quantitative monitoring involves comparing number data (or quantities) such as plant frequency of occurrence before and after the control strategy is implemented. Qualitative monitoring is completed by comparing visual data such as AIS colony density ratings before and after the treatments.

It is important to note that there are no regulatory requirements nor hard-fast protocols that determine what needs to be done as a part of an AIS control program. The monitoring is completed to understand how well the actions are working to control the target species and to what levels those same actions may be affecting non-target species. The control actions, *and* the methods used to monitor their efficacy, are evolving, so flexibility in when and how these methods, both quantitative and qualitative, are used is important. Project goals change, funding sources are not always clear, and decisions are often made in the field; therefore, pretreatment data and post treatment data may not always match entirely, so judgements in treatment impacts and management decisions need to be made with limited data at times.

Curly-leaf pondweed naturally senesces (dies back) in early summer, making it is difficult to determine if a reduction in CLP following a spring treatment was caused by the treatment, natural senescence, or both. However, quantitative sub-sample point-intercept data collected annually in the spring prior to treatment within treatment areas allows for a determination if the CLP population is being reduced over time. The goal of CLP management is to annually kill the plants before they are able to produce and deposit new turions, and thus, overtime, deplete the existing turion bank within the sediment. Over the course of multiple annual CLP treatments, these annual sub-sample point-intercept surveys should quantitatively document a reduction in CLP occurrence as the turion base is depleted.

In Long Lake, quantitative evaluation was made through the collection of data at point-intercept sub-sample locations located within CLP treatment areas (Figure 1). Data was collected in the spring prior to the herbicide treatment where at each of these locations, the presence (or absence) of CLP was recorded. The survey was replicated during June of 2017 to correspond with the peak growth stage of CLP. Comparing the spring pretreatment point-intercept survey data with the June post treatment data is difficult to determine CLP control due to factors of natural die off (senescence) discussed above. But certainly, if CLP exist within the treatment areas following treatment, a failed treatment is likely to have occurred.

During the April 2017 pretreatment sub-sample point-intercept survey, three (7.3%) of the 41 sampling locations that were within the final extents of the treatment application area contained CLP. Following the treatment, CLP was found on zero sampling locations during the June 2017 survey.

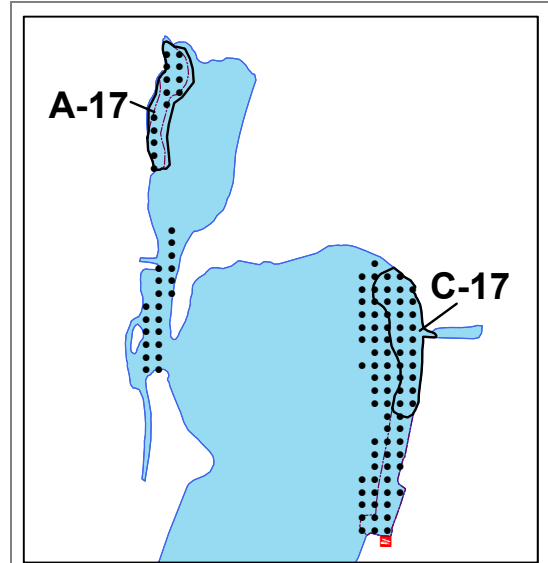


Figure 1. Sub-sample point-intercept survey locations within two 2017 CLP treatment sites. (A-17 n=14, C-17 n=27)

Curly-leaf pondweed was mapped during a June 9 and June 12, 2017 Early Season AIS (ESAIS) Survey. During the June ESAIS Survey, the 2017 herbicide treatment areas were visited to conduct the sub-sample point-intercept survey and to map all observed CLP to assess the spring 2017 treatment. Within site A-17, a combination of point-based CLP occurrences consisting of *single or few plants* and *clumps of plants* were located in the northern end of the site during the ESAIS Survey, and no colonized CLP was mapped in the site (Map 2). This suggests that CLP control was achieved in the southern part of the site, but not in the northern part near the inlet from the Watercress Creek where water dilution was likely higher. Within site C-17, only two *clumps of plants* and four *single or few* CLP occurrences were located in the northern portion of the site suggesting successful control in 2017 (Map 2).

Low-density CLP was located in many other areas the lake during the June 2017 survey (Map 2). A total of 29.9 acres of colonized CLP was mapped throughout the lake of which the majority (25.2 acres) consisted of relatively lower density ratings of either *highly scattered* or *scattered*.

EWM Monitoring Results

Early-Season AIS Survey

The EWM population in Long Lake was targeted for control with a professional hand-harvesting effort in 2017. A set of EWM mapping surveys were used within this project to coordinate and qualitatively monitor the hand-harvesting efforts (Figure 2). The first monitoring event on Long Lake in 2017 was the Early Season Aquatic Invasive Species Survey (ESAIS). This late-spring/early-summer survey provides an early look at the lake to help guide the hand-harvesting management to occur on the system. Following the hand-harvesting, Onterra ecologists completed the Late-Summer EWM Peak-Biomass Survey, the results of which serve as a post-treatment assessment of the hand-harvesting. The hand-removal program would be considered successful if the density of EWM within the hand-removal areas was found to have decreased from the ESAIS Survey to the Late-Summer Peak-Biomass Survey.

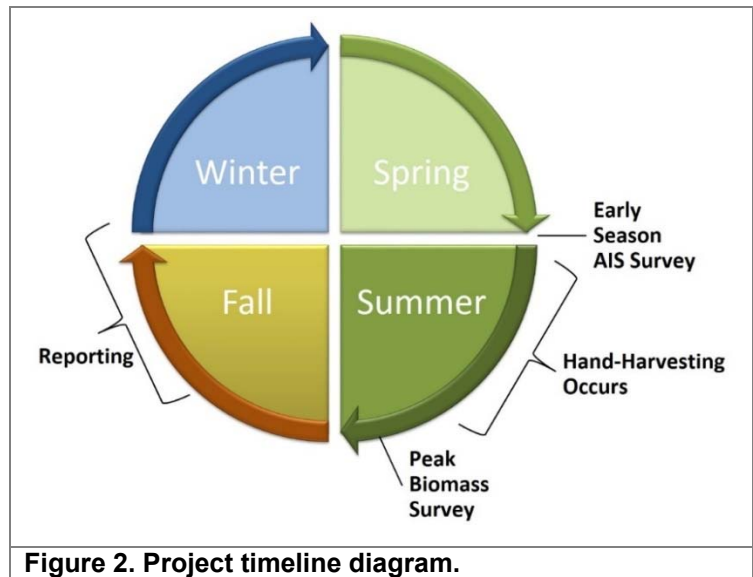


Figure 2. Project timeline diagram.

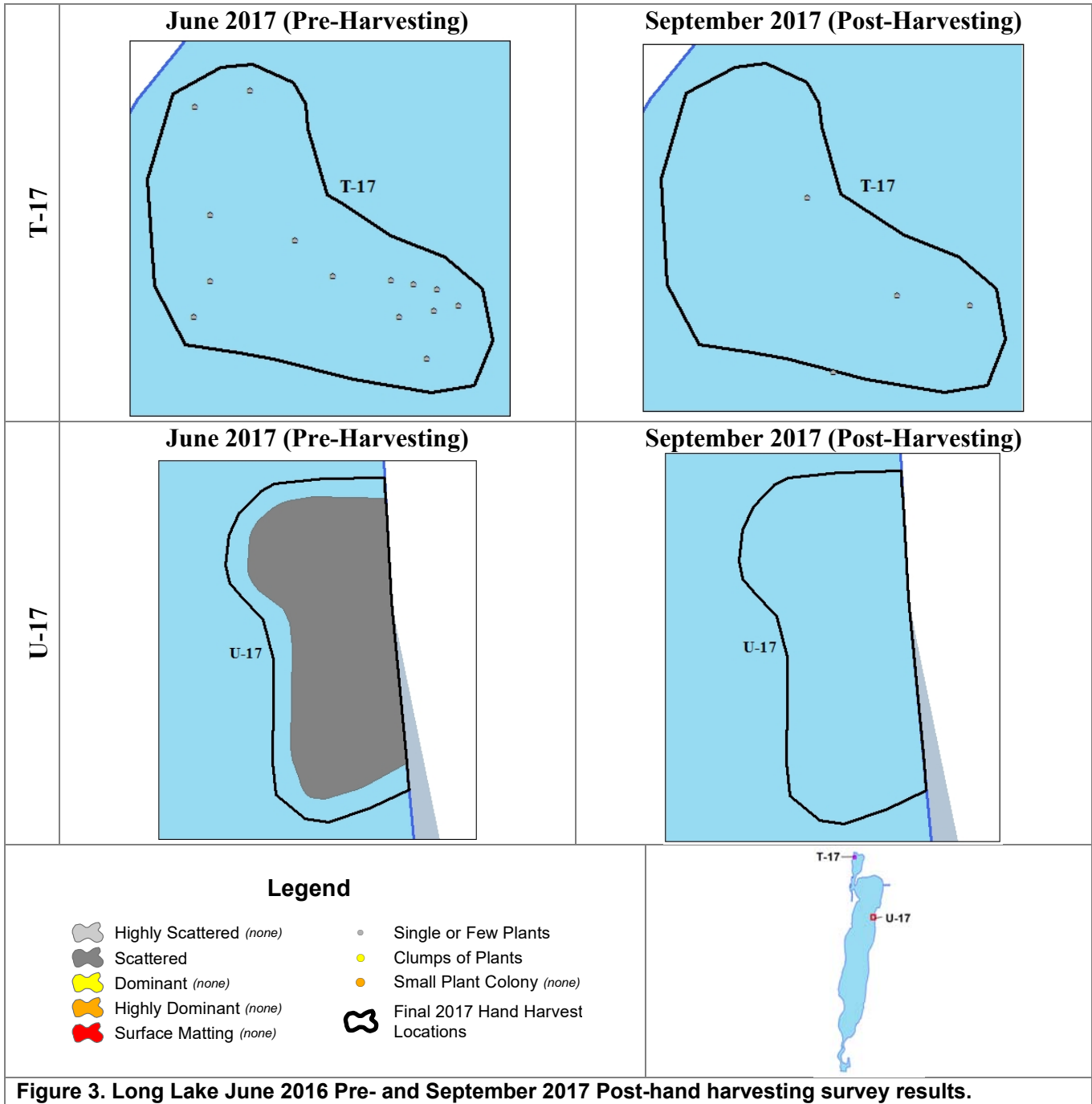
On June 9 & 12, 2017, Onterra ecologists conducted the ESAIS Survey on Long Lake during which the EWM population was mapped. The EWM population was found to be sparse in Long Lake with one small *scattered* colony located along the eastern shore and a few small concentration of point-based occurrences consisting of *single or few plants* or *clumps of plants* (Map 3). From the results of the ESAIS survey, the EWM hand-harvesting control strategy was finalized to include targeting four sites totaling 1.7 acres where the largest known concentrations of EWM were located in the lake (Map 3). Onterra provided the spatial data from the survey to the professional hand-harvesting firm to aid in the removal efforts.

Professional-Based Hand-Harvesting

The LLPA contracted with Ecowaterway Services, LLC in 2017 to provide professional hand-harvesting services of EWM. Ecowaterway deploys a Diver Assisted Suction Harvest (DASH) unit. A DASH system involves divers removing plants and feeding them into a suction hose for delivery to the deck of the harvesting vessel. The DASH methodology is considered a form of mechanical harvesting and thus requires a WDNR-approved permit. Divers from Ecowaterway completed three days of DASH harvesting (20 total dive hours) from June 19-21, 2017 and removed approximately 7,250 pounds of vegetation from two work areas in the lake (Appendix A). Removal efforts were completed at sites T-17 near the inlet location from Watercress Creek in Tittle Lake and site U-17 along the eastern shoreline of the lake (Map 3, Appendix A). Approximately 80% of the plant harvest was comprised of EWM with an additional 5% comprised of CLP. Native plant incidental by-catch included common waterweed, muskgrasses and lily pads. Additional details of the DASH harvesting efforts are included within a summary report created by Ecowaterway Services and are included as an appendix to this report.

Late-Summer Peak-biomass Survey

The Late-Summer EWM Peak-Biomass Survey was conducted on September 25, 2017 to qualitatively assess the hand-harvesting efforts as well as to understand the peak growth (peak-biomass) of the EWM population throughout lake. Within the sites that were targeted for professional hand-harvesting, a reduction in EWM was observed since the early summer survey. At site T-17, a concentration of *single or few* EWM plants that were observed in June was reduced to a smaller amount of occurrences of the same density (Figure 3). Within site U-17, no EWM was observed during the late-summer survey where a *scattered* colony had been mapped in the June (Figure 3). The hand-harvesting efforts in 2017 met the control expectations in the targeted areas.



The lake-wide EWM population was found to be low with no colonized areas identified during the late-summer survey. All of the known EWM occurrences in the lake consisted of *single or few plants* with the exception of one *clump of plants* occurrence (Map 4).

2017 MECHANICAL HARVESTING ACTIVITIES

In 2017, the LLPA hired a mechanical harvesting contractor to harvest areas of dense aquatic vegetative growth in order to maintain navigability in portions of the lake. The final mechanical harvesting areas were determined following the June ESAIS survey as to ensure that harvesting activities in areas known to contain EWM or CLP were minimized. It was advised to postpone harvesting until at least a few weeks after the ESAIS survey to allow time for the CLP plants that overlapped in portions of the harvest lanes to senesce or die off. Harvesting activities occurred from July 10 to 14 and resulted in the harvest of approximately 105 cubic yards of plant material over the course of 57 hours. The majority of the harvested plant biomass was of a native watermilfoil (85%), with approximately another 10% composed of bladderwort species and lesser amounts of common waterweed, coontail, muskgrasses, pondweeds, and water lilies (Appendix B).

CONCLUSIONS AND DISCUSSION

The 2017 herbicide treatments on Long Lake appear to have been successful in controlling the CLP population within the targeted areas. No colonized areas of CLP were located within the 2017 treatment areas and quantitative data indicate that the occurrence of CLP remains low within areas that have been targeted for control. Curly-leaf pondweed was found to have expanded in many areas throughout the littoral zone during the June 2017 survey but mostly at low densities that are not causing measurable impacts to the ecosystem nor recreational impediments to lake users. Much of the areas that showed CLP expansion in 2017 were at locations that have historically contained CLP and some of which had been targeted for herbicide control in previous years. It is theorized that within many of these areas, CLP grew from turions deposited in past years and that conditions in 2017 were favorable for CLP turion propagation in Long Lake.

Consistent with the strategy outlined within *Long Lake Comprehensive Management Plan* (March 2015), the two 2017 final treatment areas are proposed to be part of the preliminary strategy in 2018. In addition to the sites carried over from the 2017 strategy, two additional sites in which some of the largest concentrations of CLP were mapped in 2017 are proposed for herbicide control in 2018 (Map 5). Despite having some of the densest CLP colonies in the lake, the channelized portion at the southern end of the lake is not included in the proposed control strategy due to a low likelihood for meeting control expectations as a result of the water flow causing rapid directional herbicide dissipation. The results of the 2018 Pretreatment Confirmation and Refinement Survey will ultimately determine the final treatment acreage, particularly if insufficient CLP warranting treatment is observed in parts (or all) of the treatment sites.

The proposed CLP treatments in 2018 will be evaluated through an ESAIS survey during which the CLP population will be mapped lake-wide in addition to completing a sub point-intercept survey to quantitatively assess the treatment sites.

The currently known EWM population in the lake remains low such that it is not causing any significant negative impacts to the ecology of the lake. Given the low density of EWM once again

within Long Lake in 2017, no herbicide treatment that targets EWM is proposed for 2018. The EWM population should be monitored in 2018 with consideration for implementing a targeted hand-harvesting effort once again to continue to evaluate what role this management technique may have in its integrated approach moving forward. An Early Summer AIS Survey (ESAIS) will be conducted in June 2018 from which a final EWM hand-harvesting strategy could be derived. If EWM hand-harvesting is implemented, Onterra would provide the hand-harvesting firm with the spatial data from the June survey to aid the removal efforts. Following the hand removal efforts, a Late-Summer EWM Peak Biomass Survey would qualitatively assess the hand harvesting efforts.

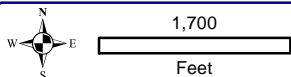
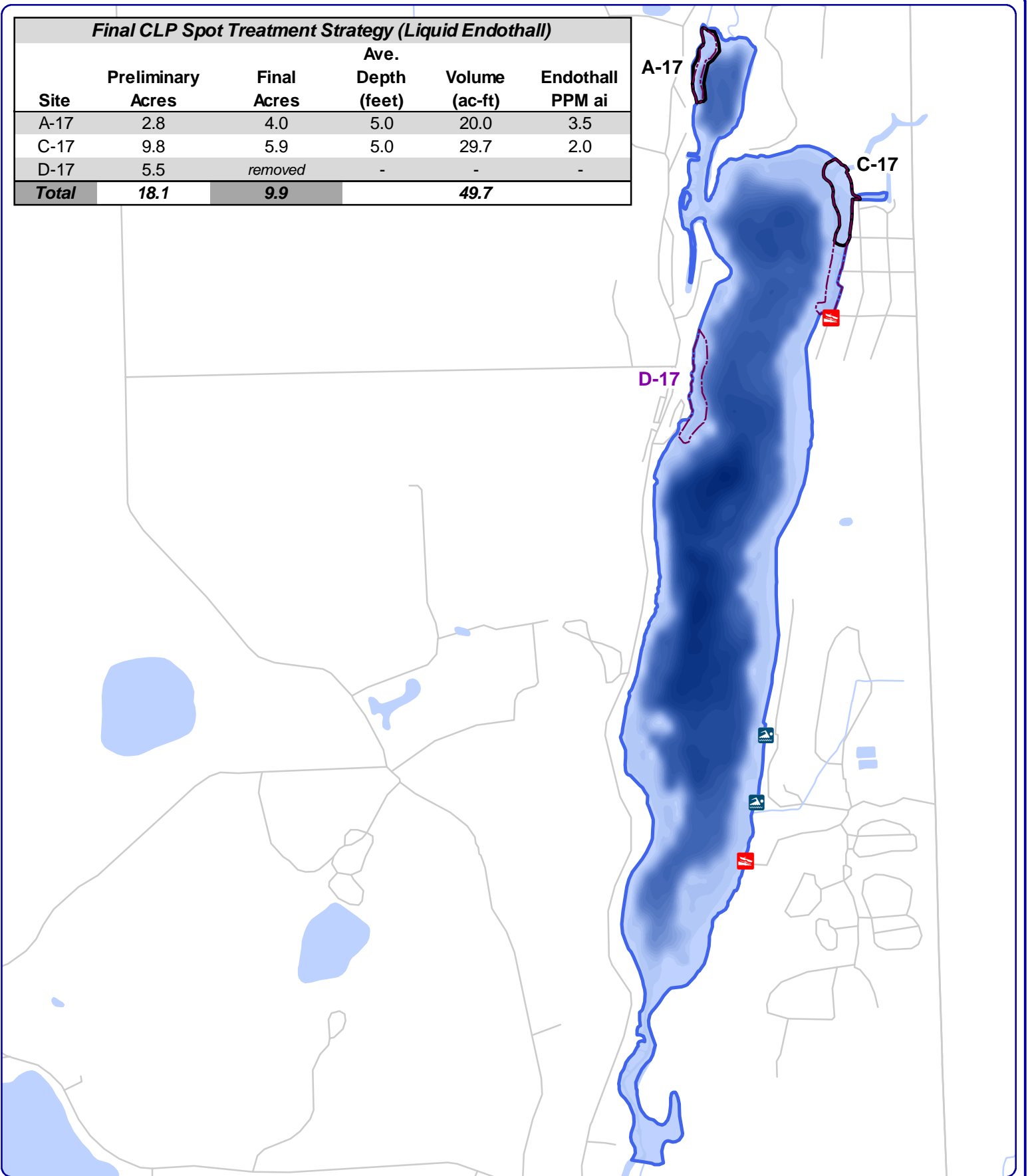
2018 is the final year of the current AIS-EPC grant project (ACEI-159-15) and includes additional monitoring components to endcap the project and will serve to keep the aquatic plant management portion of the existing comprehensive management plan up to date. Figure 4 shows the project timeline for 2018.

Task	2018				
	W	Sp	Su	F	W
AIS Pretreatment Survey					
Quantitative Monitoring (PI Sub-sample)					
Herbicide Treatment					
Early Season AIS Survey					
Professional Hand-harvesting					
EWM Peak-biomass Survey					
Whole-lake Point-intercept Survey					
Stakeholder User Survey					
Acoustic Survey (Submersed Aquatic Vegetation Modeling)					
Planning Committee Meeting or Teleconference					
Final Report (Includes Revised AIS Goals/Actions Section)					

Figure 4. 2018 Project Timeline for Long Lake

Final CLP Spot Treatment Strategy (Liquid Endothall)

Site	Preliminary Acres	Final Acres	Ave. Depth (feet)	Volume (ac-ft)	Endothall PPM ai
A-17	2.8	4.0	5.0	20.0	3.5
C-17	9.8	5.9	5.0	29.7	2.0
D-17	5.5	removed	-	-	-
Total	18.1	9.9		49.7	



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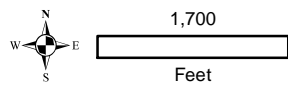
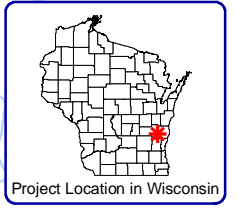
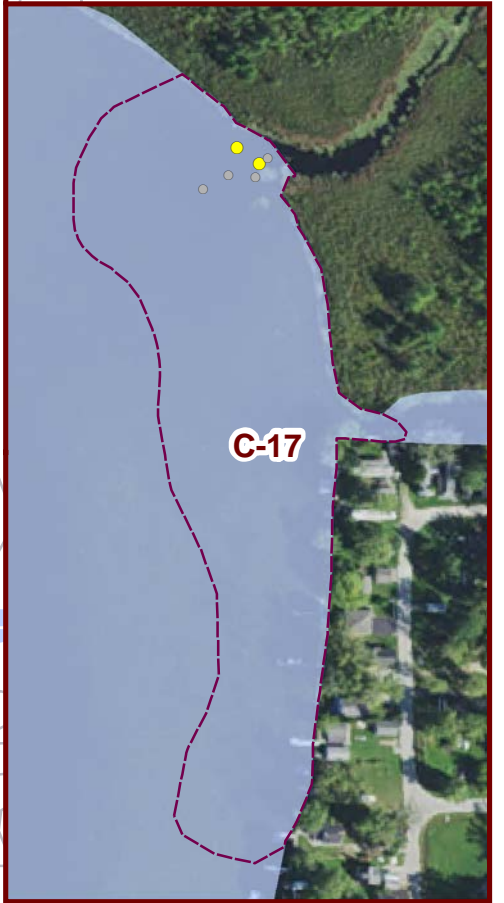
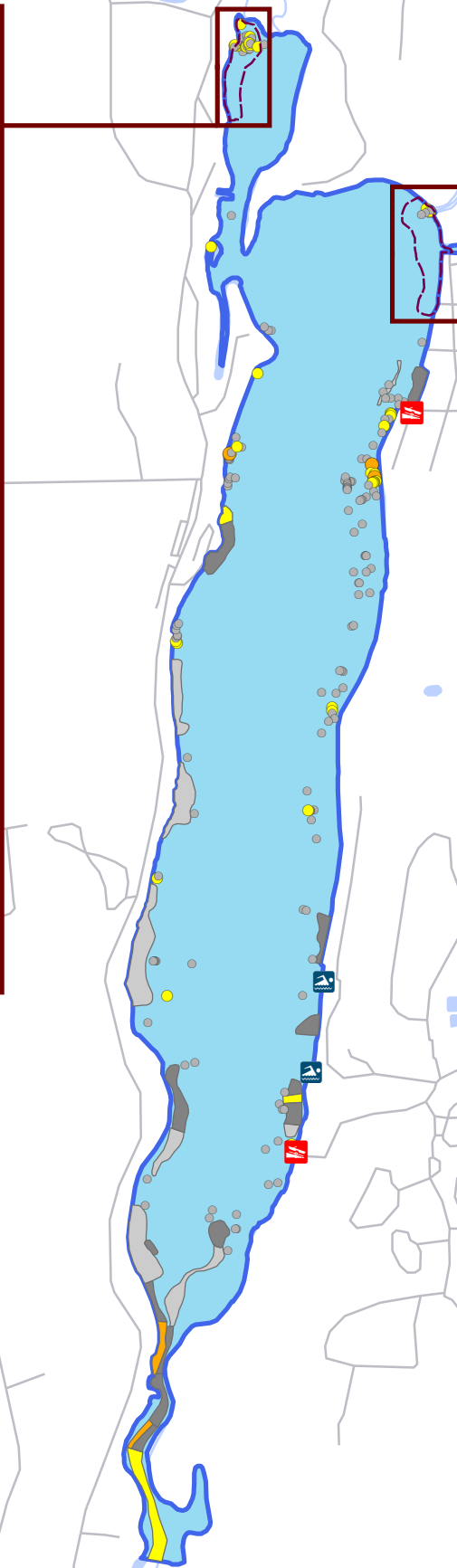
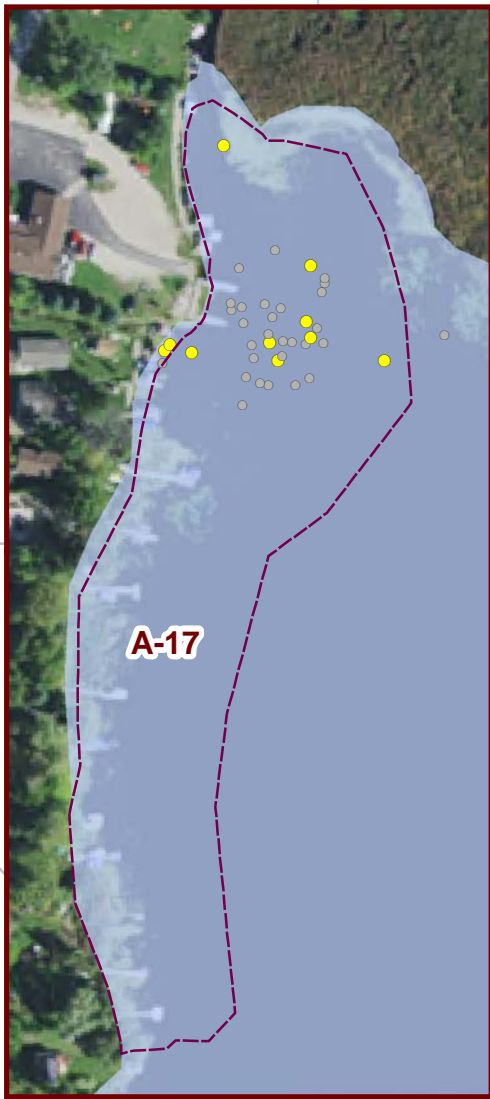
Sources:
 Roads and Hyrd: WDNR
 Bathymetry: Onterra 2015
 Aquatic Plants: Onterra, June 2016
 Map Date: April 28, 2017
 Filename: LongFDL_CLP_T2017_Perm1.mxd



Project Location in Wisconsin

- Legend**
- 2017 Proposed CLP Treatment Area
 - 2017 Final CLP Treatment Area

Map 1
Long Lake
 Fond du Lac County, Wisconsin
2017 Final CLP
Treatment Strategy

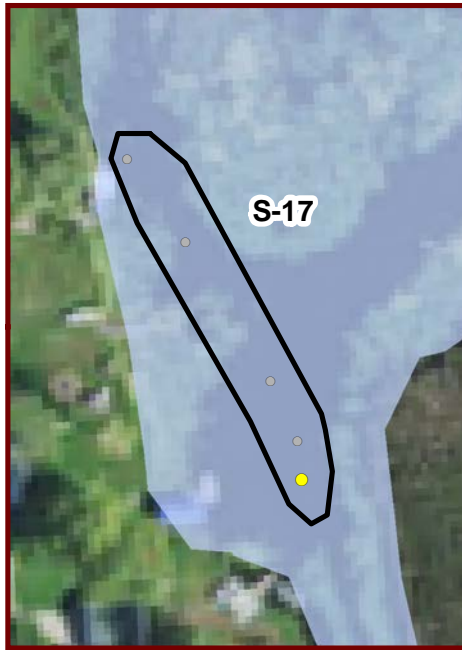
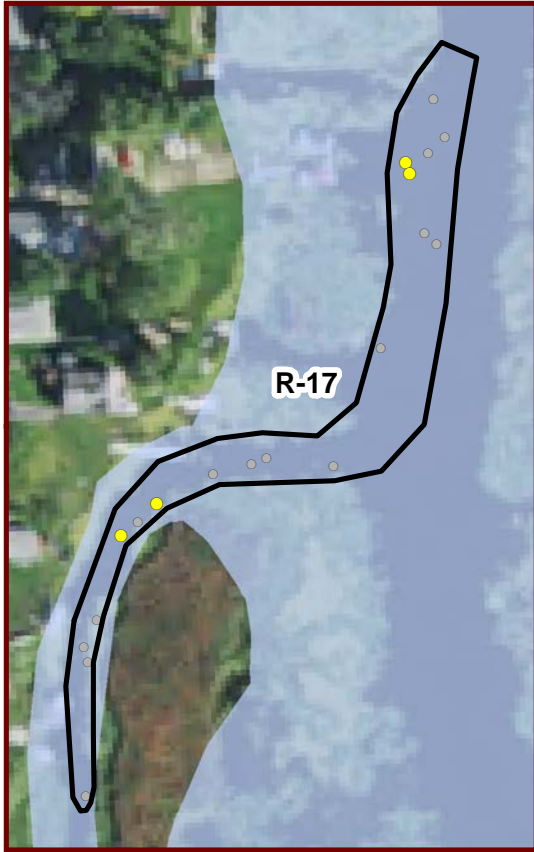
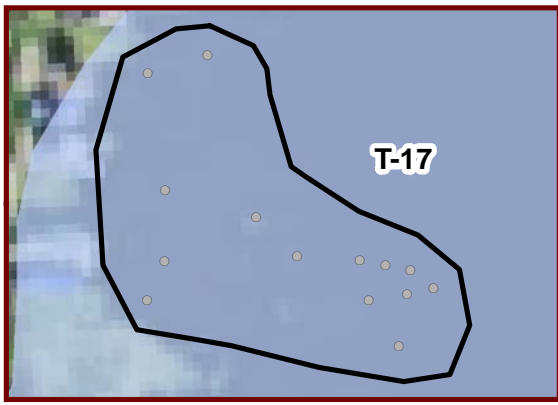


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Sources:
 Roads and Hyrd: WDNR
 Bathymetry: Onterra, 2015 -
 processed by C-Map USA
 Aquatic Plants: Onterra, 2017
 Map Date: June 13, 2017
 Filename: Long_FDL_CLP_June17.mxd

- Legend**
- | | | |
|------------------------------|----------------------|-----------------------------------|
| Highly Scattered | Single or Few Plants | 2017 CLP Herbicide Treatment Area |
| Scattered | Clumps of Plants | |
| Dominant | Small Plant Colony | |
| Highly Dominant | | |
| Surface Matting (none found) | | |

Map 2
Long Lake
 Fond du Lac County, Wisconsin
June 2017 CLP
Survey Results

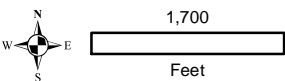


2017 Final EWM Hand-Harvest Areas					
Site	Preliminary Acres	Final Acres	Ave Depth (feet)	Sediment	Obstructions
R-17	0.36	0.41	3 (2-4)	Marly Mucky	No Physical, Heavy Native Plants
S-17	0.14	0.15	3 (2-4)	Marly Mucky	No Physical, Heavy Native Plants
T-17	0.33	0.25	3 (2-5)	Marly Mucky	No Physical, Heavy Native Plants
U-17	-	0.86	2 (0.5-3)	Marly Mucky	No Physical, Heavy Native Plants
Total	0.83	1.67			

Legend

Eurasian Water Milfoil (June 2017)

- Highly Scattered (*none found*)
- Scattered
- Dominant (*none found*)
- Highly Dominant (*none found*)
- Surface Matting (*none found*)
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony (*none found*)
- Final 2017 Hand Harvest Locations

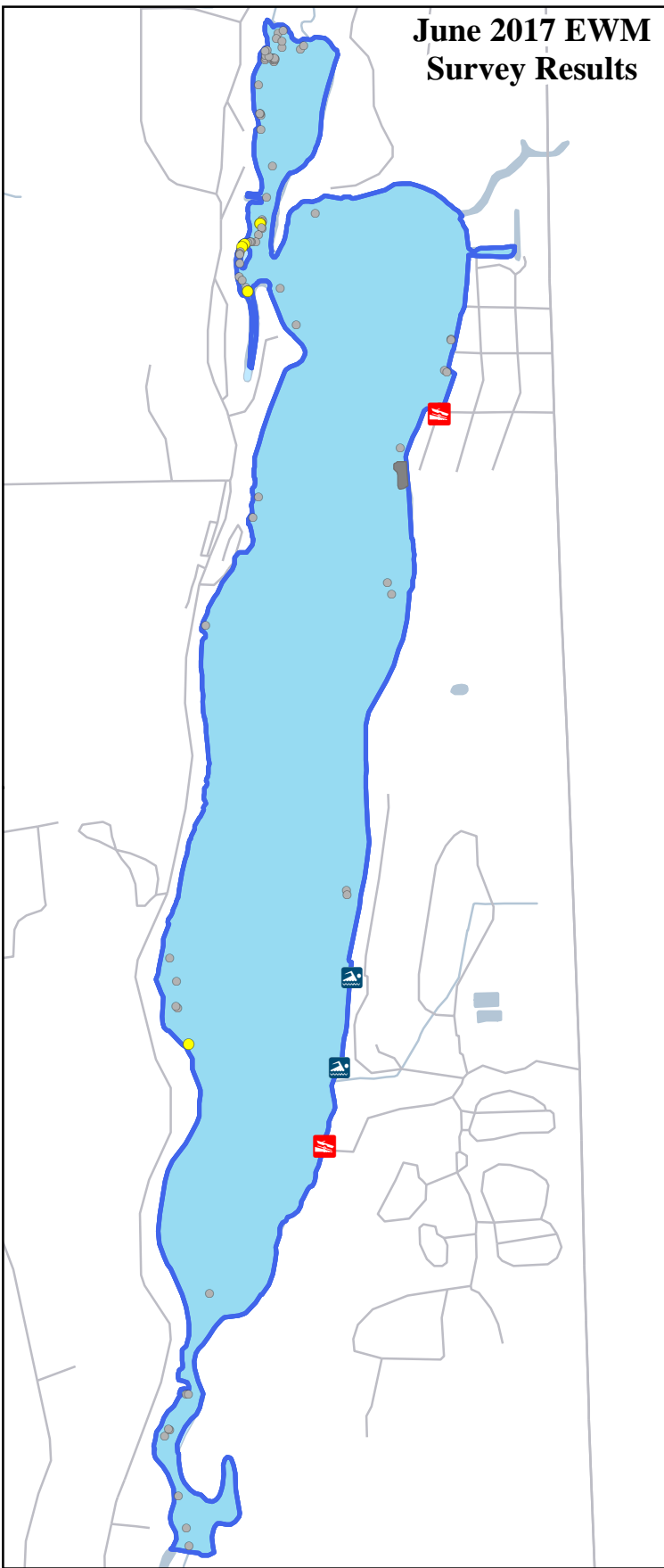


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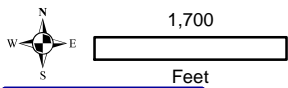
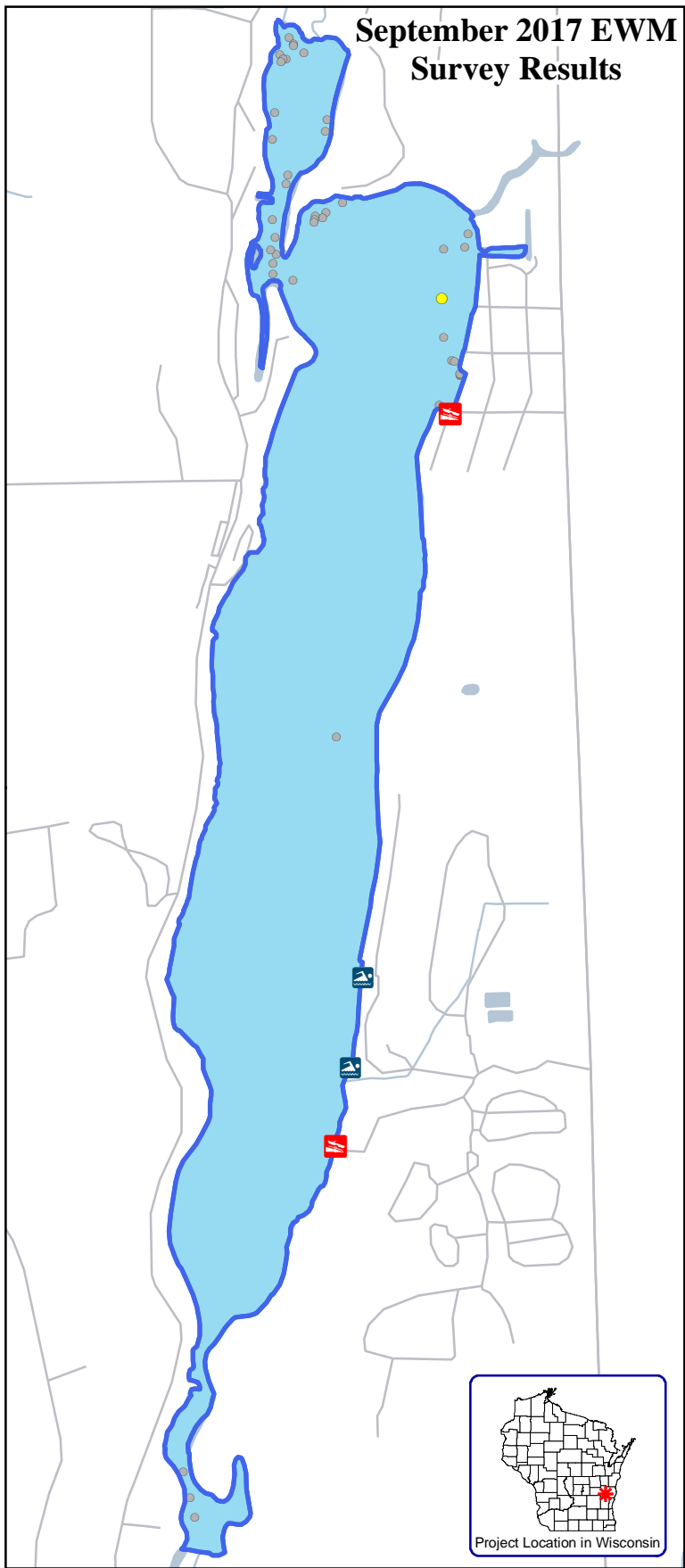
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Bathymetry: Onterra, 2015
Orthophotograph: NAIP, 2015
Aquatic Plants: Onterra, 2017
Map Date: June 13, 2017
Filename: Long_FDL_EWM_June17.mxd

Map 3
Long Lake
Fond du Lac County, Wisconsin
June 2017 EWM Survey
Results & Final Hand-
Harvesting Control Plan

June 2017 EWM Survey Results



September 2017 EWM Survey Results



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Sources:
 Roads and Hyrdo: WDNR
 Aquatic Plants: Onterra, 2017
 Map Date: February 21, 2018
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Legend Eurasian Water Milfoil

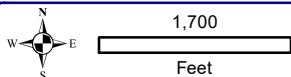
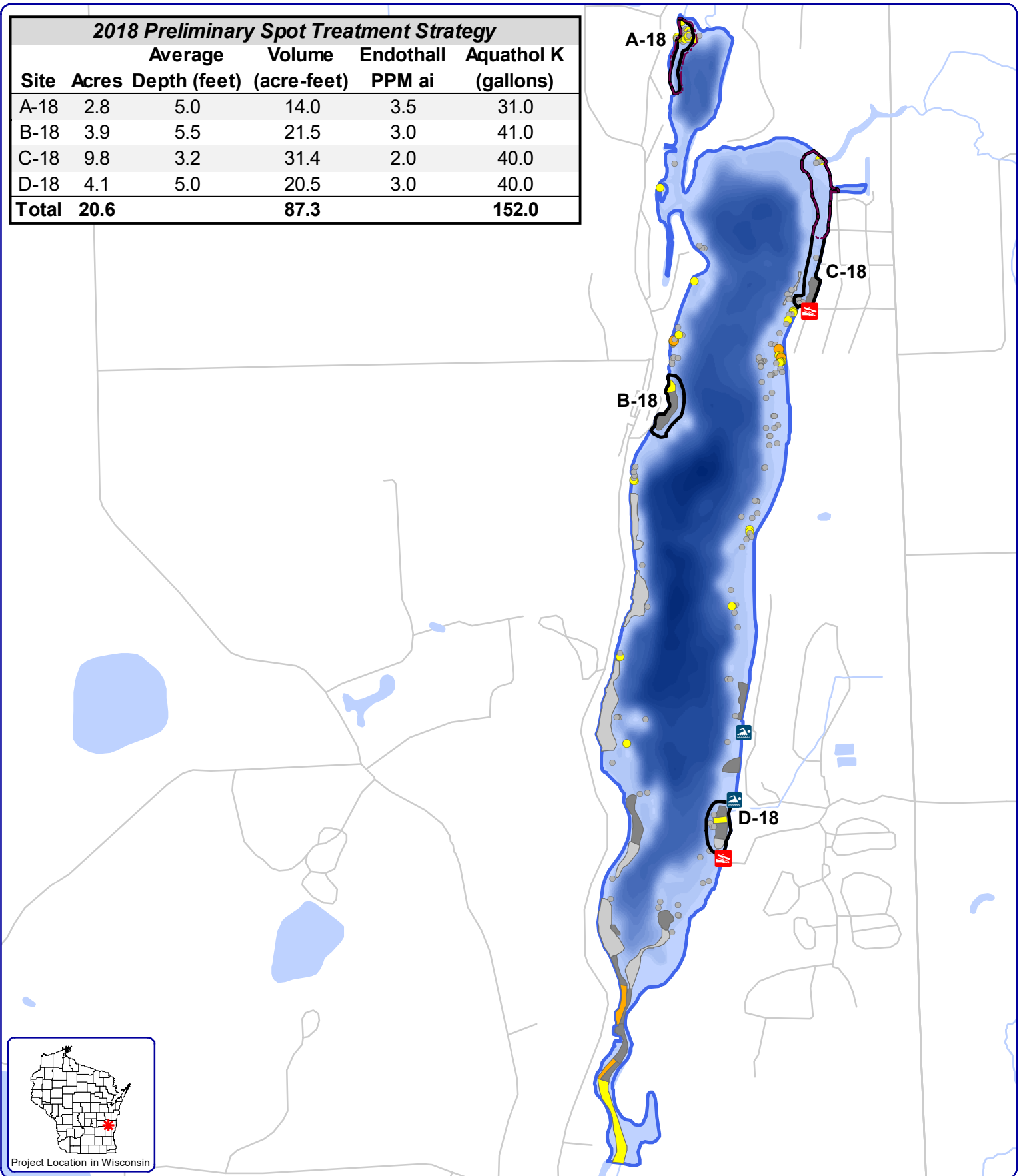
- | | | | |
|--|------------------|--|----------------------|
| | Highly Scattered | | Single or Few Plants |
| | Scattered | | Clumps of Plants |
| | Dominant | | Small Plant Colony |
| | Highly Dominant | | |
| | Surface Matting | | |

Map 4
 Long Lake
 Fond du Lac County, Wisconsin

2017 EWM Survey Results

2018 Preliminary Spot Treatment Strategy

Site	Average Acres	Average Depth (feet)	Volume (acre-feet)	Endothall PPM ai	Aquathol K (gallons)
A-18	2.8	5.0	14.0	3.5	31.0
B-18	3.9	5.5	21.5	3.0	41.0
C-18	9.8	3.2	31.4	2.0	40.0
D-18	4.1	5.0	20.5	3.0	40.0
Total	20.6		87.3		152.0



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Sources:
 Roads and Hydro: WDNR
 Bathymetry: Onterra, 2015
 Aquatic Plants: Onterra, June 2017
 Map Date: February 19, 2018
 Filename: LongFDL_CLP_T2018_Prelim1.mxd

- Legend**
- Curly-leaf pondweed (June 2017)
 - Highly Scattered
 - Scattered
 - Dominant
 - Highly Dominant
 - Surface Matting (None)
 - Single or Few Plants
 - Clumps of Plants
 - Small Plant Colony
 - 2017 Final CLP Treatment Area
 - 2018 Preliminary CLP Treatment Area

Map 5
 Long Lake
 Fond du Lac County, Wisconsin
**2018 Preliminary
 CLP Treatment
 Strategy**

A

APPENDIX A

Eco Waterway Services 2017 Hand-Harvesting Report

September 26, 2017

**State of Wisconsin
Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54313-6727**

Annual Summary Report - DASH HARVESTING

Permit # NE-2017-20-48M

**Holder: Long Lake Preservation Association
Dave Murphy
N4163 Boy Scout Road
Campbellsport, WI, 53010**

Lake: Long Lake

Starting and Ending Dates of Project:

DASH Weed Harvesting took place on 6/19 – 6/21

Dive Hours: 20 hours

Map of the area harvested:

Attached

Total Acreage of the lake harvested:

423 acres lake surface area

.84 Acres harvested area of lake

Total amount of plant material removed:

(145) 19" x 32" onion bags at 50 lbs each or 7,250 lbs of weeds

Types of plants harvested by area:

EWM(80%), CLP(5%), algae(3%), elodea(6%), chara(5%), Lily Pads (1%)

Targeted EWM and CLP

Weather Conditions

6/19 – 66 Degrees, Thunderstorm (delays), 9 mph West winds, little wave action, average depth 4 ft

6/20 – 55 Degrees, Rain, 7 mph WSW winds, little wave action, average depth 4 ft

6/21 – 77 Degrees, Calm, 5 mph South Winds, little wave action, Average depth 4 ft

Submitted by: Pat Dalman

Eco Waterway Services, LLC
W346 S4109 Virgin Forest Drive
Dousman, WI 53118

6/15/2017 11:19 am



© 2017 Google

1992

Imagery Date: 6/1/2015 lat 43.693154°

6/15/2017 11:19 am

U17-5

U17-4

U17-3

U17-2

U17-6

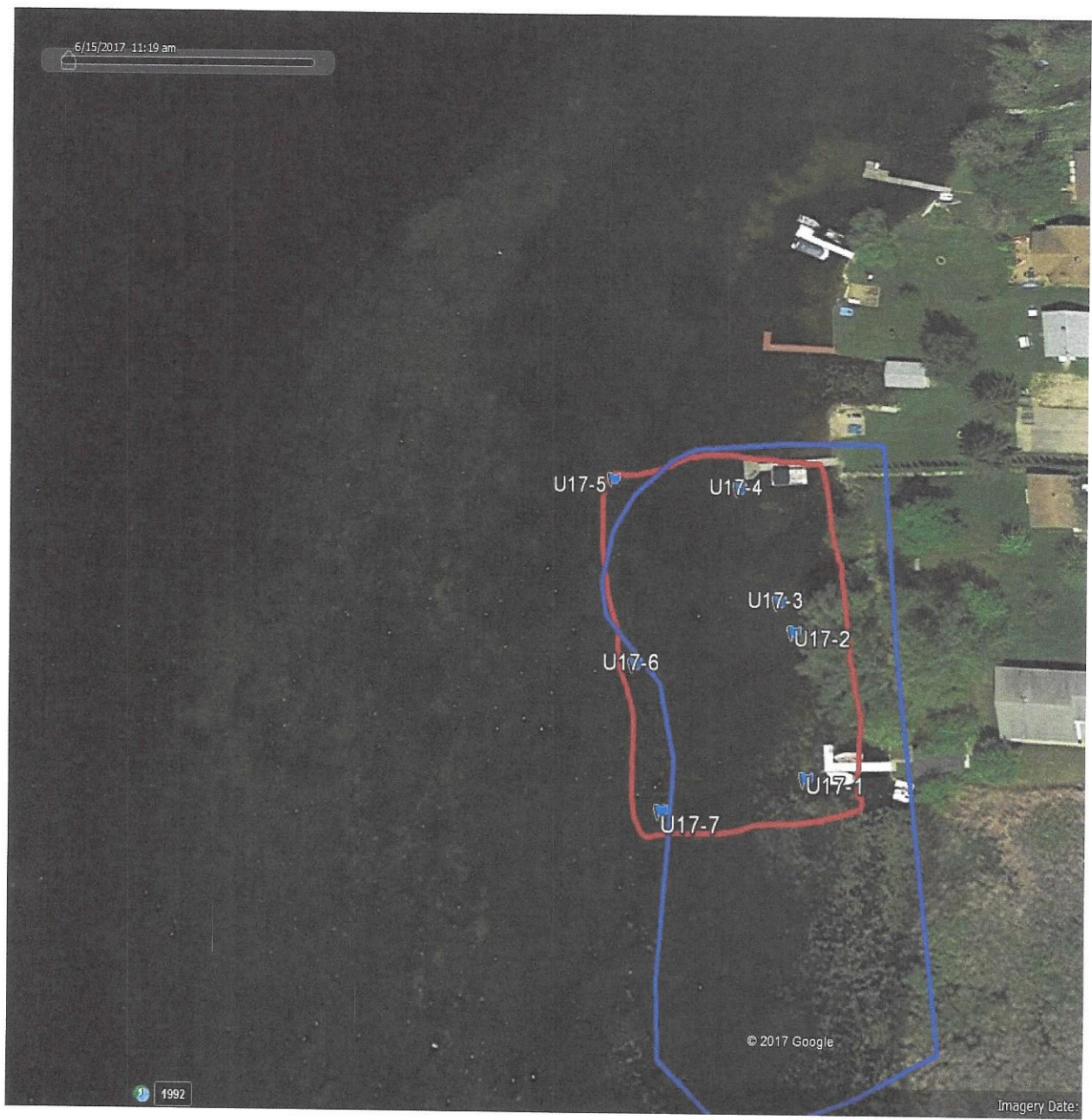
U17-1

U17-7

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1992

Imagery Date:



Latitude	Longitude	Sym	name
43.68136	-88.166385	Flag, Blue	U17-1
43.681551	-88.166408	Flag, Blue	U17-2
43.681592	-88.166437	Flag, Blue	U17-3
43.681757	-88.16652	Flag, Blue	U17-4
43.681771	-88.166773	Flag, Blue	U17-5
43.681505	-88.166706	Flag, Blue	U17-6
43.681319	-88.166643	Flag, Blue	U17-7

Latitude	Longitude	Sym	name
43.692892	-88.170894	Flag, Blue	LL1
43.693048	-88.171	Flag, Blue	LL2
43.693221	-88.170831	Flag, Blue	LL3
43.693237	-88.171074	Flag, Blue	LL4

B

APPENDIX B

Midwest Aquatics 2017 Mechanical Harvesting Report



2017 Mechanical Harvesting Report



Funded by 60 Riparian owners (Individuals and Businesses), The Long Lake Preservation Association contracted with Midwest Aquatics, Inc. to create a near-shore navigation lane around populated areas of the lake. No outward spoke navigation lanes were created as it was determined they would not be required.

Where navigation lanes parallel with shore were not near enough to private boat access points to allow unimpeded access, additional lanes were harvested to those private piers.

The map at left provides a view of GPS captured tracks during harvesting activity.

Overview

Start Date: July 10, 2017

Completion Date: July 14, 2017

Total Hours on the Water: 53.5

Approximate Acres Harvested: 14.5

Plant Material Removed: 105 Cubic Yards

Disposal: Permit Designated Location East of Chinatown and two truck loads delivered to a private property to be used as garden fertilizer

Weed Types Harvested

Northern Milfoil – 85%

Bladderwort – 10%

Elodea – 3%

Coon tail – Trace Amounts

Pondweed – Trace Amounts

Lily – Trace Amounts

During harvesting operations, 14 turtles, five Northern Pike and eight Bass and a number of mixed smaller species of fish were captured by the harvester and successfully released back into the water by reversing the machine's track.