

2019 AIS Management Assessment and Summary Report: ACEI-21618 Long Trade Lake

Prepared for:

Round Trade Lakes Improvement Association

Trade Lake, Wisconsin

Polk and Burnett Counties

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Introduction

This summary report discusses the 2019 aquatic invasive species education, management planning, and management implementation completed on Long Trade Lake. Curly-leaf pondweed (CLP) and Eurasian Watermilfoil (EWM) management was planned on Long Trade Lake in 2019, but only CLP management was completed. These actions were guided by Lake Education and Planning Services (LEAPS) and completed in part by volunteers from the Round Trade Lakes Improvement Association (RTLIA).


The following actions from the 2018-21 AIS Control of an Established Infestation (ACEI) grant funded project on Long Trade Lake are included in this project summary.

- 2019 LEAPS Contracting with the RTLIA
- 2019 CLP and EWM Management Planning
- 2019 CLP Management Implementation
- 2019 Aquatic Plant Survey Work
- 2019 AIS Education
- 2019 Water Quality Sampling
- 2019 Native Plant Reestablishment

2019 LEAPS Contracting with the RTLIA

A contract was drawn up between LEAPS and the RTLIA covering the time frame from April 1, 2019 to March 31, 2020. Table 1 reflects the tasks that were included in that contract and the extent of completion for each as of the end of February 2020.

Table 1: Contracted LEAPS Services and Completion Status for Long Trade Lake in 2019

 Post % Complete to Historical Tab							
Earned Value Table -- Calculation of Estimated Progress							
Lake Education and Planning Services							
2019 RTLIA-LongTrade-AIS							
						Enter date as mm/dd/yy	
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Cost Code	Task Description	Manager	Start Date	Finish Date	Task Budget	Percent Complete	Earned Value
1	2019 CLP/EWM Management Planning	DLB			\$ 3,990	72.4%	\$ 2,888
1.1	CLP/EWM management planning		1-Apr-19	30-Jun-19	900	x 100.0%	900
1.2	Preparation of WDNR permit		1-Apr-19	30-May-19	300	x 100.0%	300
1.3	Applicator support		1-May-19	30-Jun-19	150	x 100.0%	150
2	2019 Aquatic Plant Survey Support	DLB				x	
2.1	Pre-Post Survey Support		1-May-19	30-Jun-19	150	x 90.0%	135
2.2	CLP Bedmapping Support		1-Jun-19	31-Jul-19	120	x 90.0%	108
2.3	Summer EWM survey and physical removal		1-Jul-19	30-Sep-19	160	x 100.0%	160
2.4	Fall Bedmapping Support		2-Jul-19	31-Oct-19	150	x 90.0%	135
3	2018 AIS Education Support	DLB				x	
3.1	AIS Workshop		1-Jun-19	30-Sep-19	160	x 75.0%	120
3.2	ZM Dock-Out Day		1-Sep-19	31-Oct-19	240	x 0.0%	
4	2018 Water Quality Monitoring Support	DLB				x	
4.1	Preparation of bottles, labslips, coolers		1-Apr-19	31-Oct-19	160	x 100.0%	160
5	2018 Project Management Support	DLB				x	
5.1	End of Year Summary Report		1-Oct-19	31-Mar-20	600	x 0.0%	
5.2	Meetings		1-Apr-19	31-Mar-20	450	x 80.0%	360
5.3	General Expenses		1-Apr-19	31-Mar-20	450	x 80.0%	360
TOTALS					3,990		2,888
Total Project Progress:					\$ 2,888	/ \$ 3,990 = 72.4%	

In 2019, contracting between LEAPS and the RTLIA was set up with equal monthly payments throughout the project. This was done to provide the RTLIA with a consistent and unchanging invoice payment allowing them to plan accordingly. Billing was done in a way where each invoice sent was the same increase in the percentage of completion for every task in the project, even though in reality, tasks are completed at different times. As an example, CLP and EWM planning is 100% completed early in the year, but is billed the same way that the End of Year Summary is which is not completed until near the end of the project. Table 1 reflects the actual percent completion of each task as of February 2019. The invoices included in the 2019 Reimbursement Request for this project reflect a 56.69% for all tasks through the end of November 2019.

Completion of the 2019 Summary Report (this document) and small percentages of a few other items have yet to be completed. These few services related to the 3-yr ACEI project will be completed and a new contract will be drawn up for 2020 LEAPS services. Consultant support for a ZM Dockout Day was not needed.

2019 CLP and EWM Management Planning – Long Trade Lake

Based on how the 3-yr ACEI grant was set up, EWM management was not planned in Long Trade Lake in 2019. Property owners were encouraged to complete physical removal of EWM in lieu of using herbicides to treat it. CLP management planning and implementation was completed in Long Trade Lake in 2019. The intent of the 3-yr ACEI project was to chemically treat much of the CLP in Long Trade Lake three years in a row.

Initially 6.8 acres of CLP in five beds were proposed for chemical treatment in 2019 (Figure 1). But after a pre-treatment survey of 116 points in the initial five beds completed by Endangered Resource Services (ERS) on May 6, 2019, the chemical treatment area was reduced to about half of what was initially proposed (Table 2). Figure 2 reflect the final 2019 CLP chemical treatment plan.

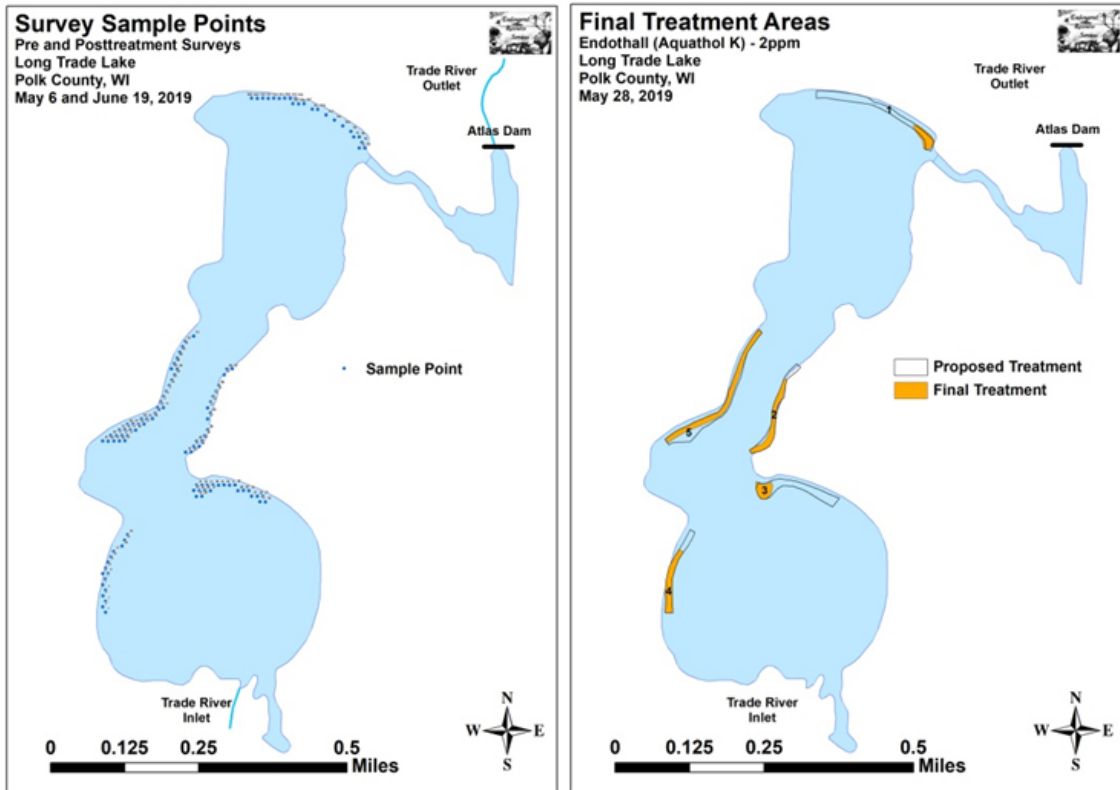


Figure 1: Survey sample points and final treatment areas (ERS, 2019)

Table 2: Changes in treatment acreage after pre-treatment survey results (ERS, 2019)

Treatment Area	Proposed Acreage	Final Acreage	Difference +/-
1	1.44	0.42	-1.02
2	1.06	0.78	-0.28
3	1.38	0.38	-1.00
4	0.95	0.73	-0.22
5	1.97	1.30	-0.67
Total Acres	6.80	3.61	-3.19

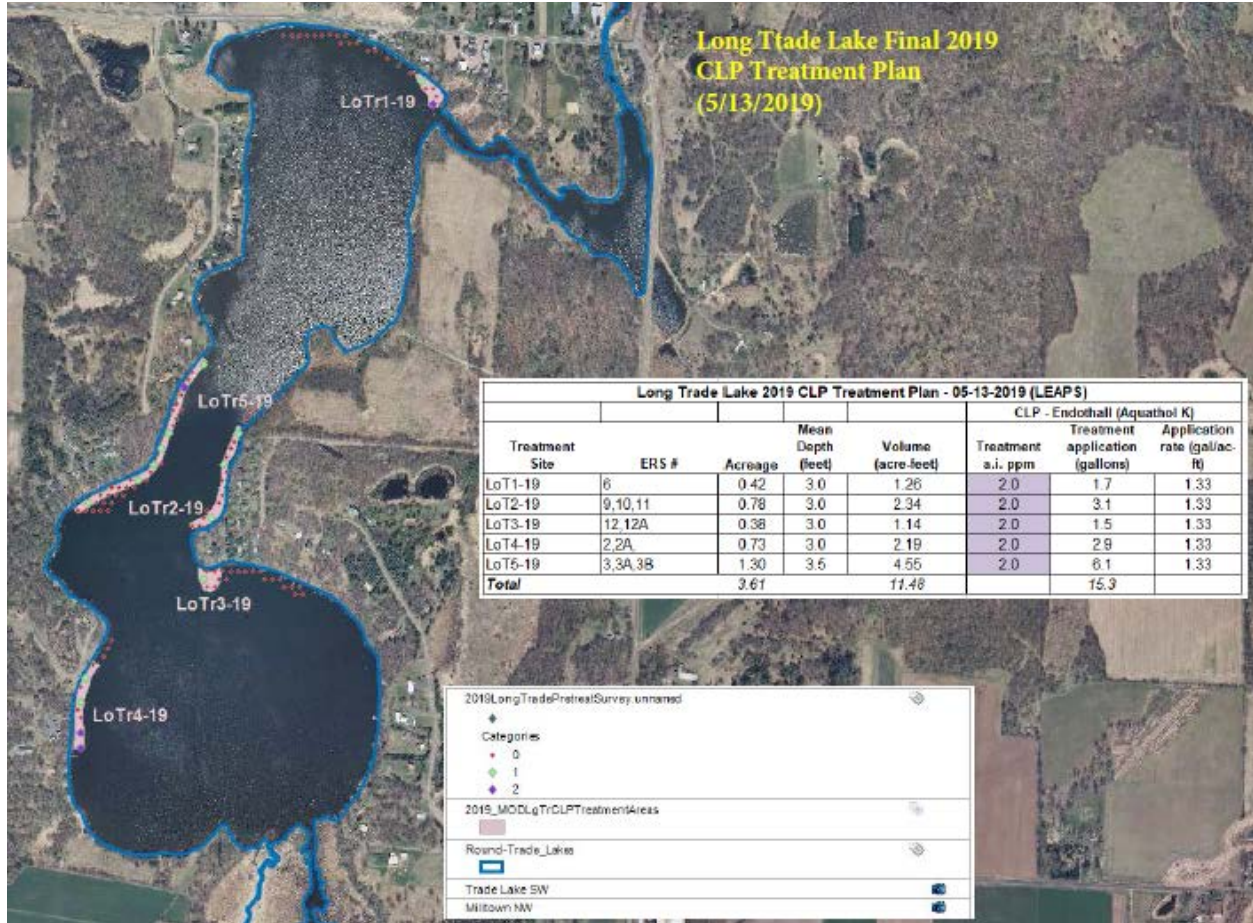


Figure 2: Final Long Trade Lake CLP chemical treatment map and details

2019 CLP Management Implementation - Long Trade Lake

The required WDNR herbicide application permit was completed by LEAPS, the RTLIA, and Northern Aquatic Services in April and all property owners adjacent to the proposed treatment areas contacted as required by the permit, and signs were posted at the properties on the day of application.

Application of herbicide to control CLP in Long Trade Lake was completed on May 28, 2019 by Northern Aquatic Services. Herbicide was applied starting at 10:00am and was completed by Noon. Water temperature was 57°F and air temperature was 49°F. Wind speed was very light at 0-2mph out of the N. Liquid endothall (Aquathol K) was applied at 2.0 ppm in all areas. At the time of treatment, CLP, EWM, coontail, white water lily and filamentous algae was present.

2019 Aquatic Plant Survey Work - Long Trade Lake

In 2019, pre-treatment, post-treatment, and fall EWM bedmapping was completed by Endangered Resource Services (ERS). A point-intercept style plant survey that included 116 points in 6.8 acres of the lake was completed on May 6, 2019. The number of points surveyed approximated to almost 17

pts/acre – well over the minimum of 4-10 points/acre required by WDNR protocol for pre/post treatment surveys (Figure 1).

During the pre-treatment survey, CLP was found at 24 of 116 points sampled (Figure 3). EWM was not found at any point during the pretreatment survey.

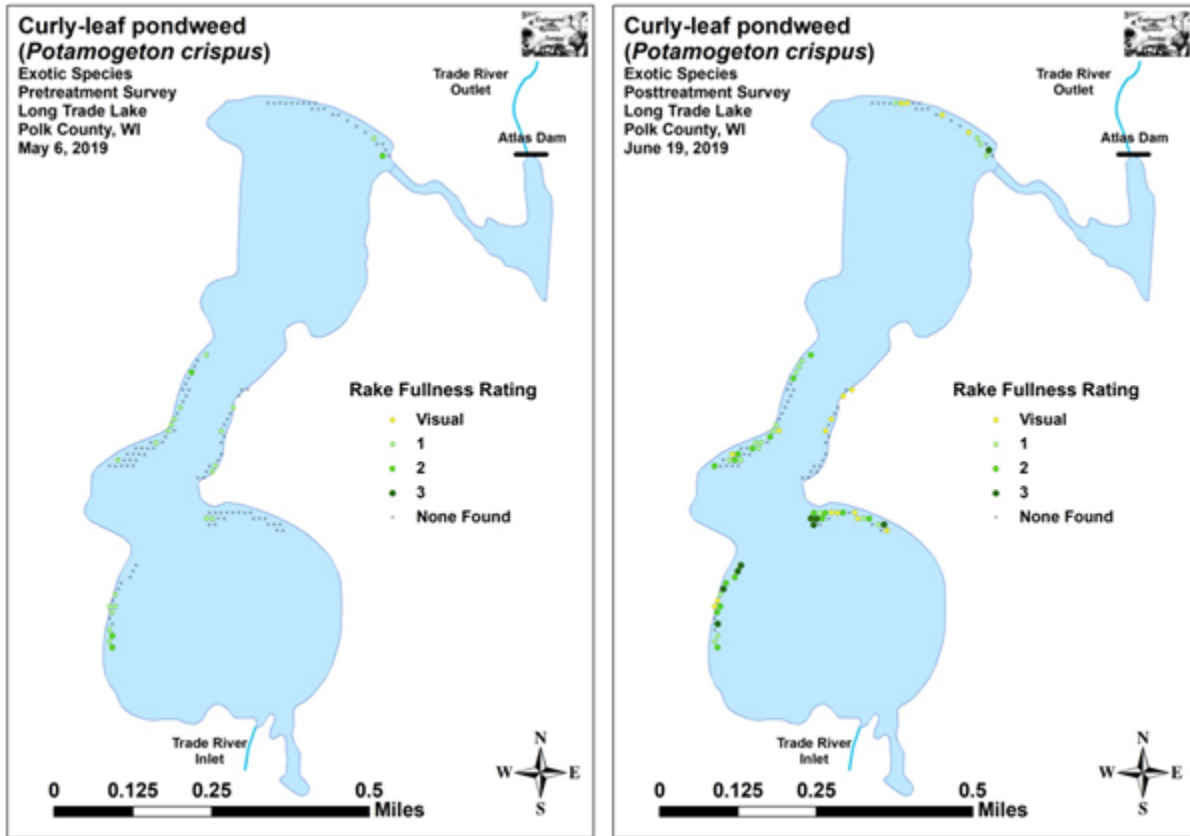


Figure 3: 2019 Pre/Post CLP density and distribution (ERS, 2019)

The post-treatment survey was completed by ERS on June 19, 2019. During the post-treatment survey, CLP was found at 46 points demonstrating a highly significant INCREASE in total CLP density and visual sightings; and a moderately significant increase in total distribution, rake fullness 2, and rake fullness 3 (Figure 4). Again no EWM was found at any point during the post-treatment survey.

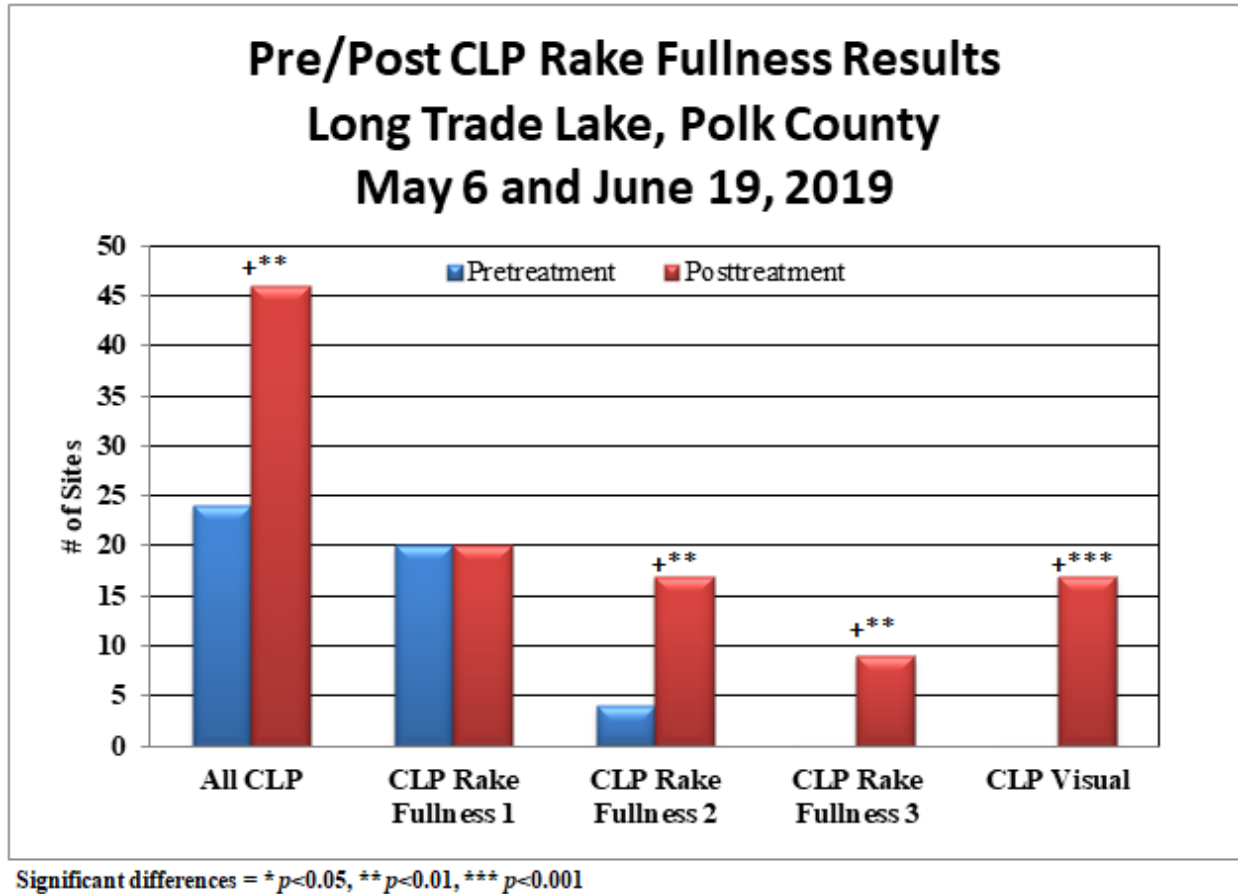


Figure 4: Pre/Post changes in CLP rake fullness (ERS, 2019)

Exactly why there was significantly more CLP post-treatment as compared to the pre-treatment survey can only be speculated but several reasonable assumptions can be made. First, the size of each individual treatment area was reduced to about half of what was initially proposed. The size of the treatment areas ranged from 0.38 to 1.3 acres. Even though these areas were much smaller, the concentration of herbicide applied was not changed, i.e. increased to accommodate for the smaller areas. If treated areas in 2020 are to be as small as they were in 2019 the amount of herbicide applied should be increased to perhaps 2.5 or even 3.0 ppm. Granular herbicide could be substituted as well, but the cost would increase substantially. Second, the cool water season was somewhat extended in 2019 as compared to 2018. The chemical treatments were completed on pretty much the same day of the same month in both 2018 and 2019. However, water and air temperatures were significantly different. In 2018 the water and air temperatures during treatment were up in the 70s. In 2019, water temperature was 57 degrees and the air temperature was 49 degrees when the treatment was completed. The cool water and air temperature lasted for several more weeks likely encouraging more CLP growth, and delaying native aquatic plant growth.

Native Aquatic Plant Survey Results

Coontail (23 sites – mean rake 1.39) and Common waterweed (4 sites – mean rake 1.25) were the only two native species present during the pretreatment survey. Post-treatment, coontail experienced a

significant increase ($p=0.04$) in distribution to 37 sites and a significant increase ($p=0.02$) in mean rake fullness to 1.78. Common waterweed, nearly unchanged post-treatment (2 sites with a mean rake fullness of 1.00), was only the sixth most common native species following highly significant increases in Small duckweed, Common watermeal, Large duckweed, and White water lily. No species experienced a significant decline post-treatment. This result is likely tied to the very late ice-out and slow warming of water temperatures which appears to have resulted in delayed germination and growth of both target and non-target species until after the herbicide application.

Total richness more than doubled from three species pre-treatment to seven species post-treatment. The Simpson's Diversity Index also increased sharply from a moderate pre-treatment value of 0.57 to a high post-treatment value of 0.83. The Floristic Quality Index (another measure of native plant community health) climbed from 4.2 pretreatment to 10.6 posttreatment.

Mean native species richness at points with native vegetation more than doubled from 1.08 species/point pre-treatment to 2.77 species/point post-treatment. Although this increase in localized richness was highly significant, it can largely be attributed to the rise in "duckweeds". Total mean rake fullness also experienced a highly significant increase from a low 1.32 pre-treatment to a moderate 1.94 post-treatment. Duckweeds, watermeal, and lilies are all plants that can do well under poor water quality conditions because it is easier for them to access the sunlight they need to grow. Submersed vegetation has a harder time under degraded water quality conditions. Long Trade Lake is considered highly eutrophic or nutrient rich.

Pre and post-treatment point-intercept survey statistics are included in Table 3.

Table 3 – Pre/Post surveys summary statistics Long Trade Lake, Polk County May 6 and June 19, 2019 (ERS, 2019)

Summary Statistics:	Pre	Post
Total number of points sampled	116	116
Total number of sites with vegetation	44	81
Total number of sites shallower than the maximum depth of plants	109	115
Freq. of occur. at sites shallower than max. depth of plants (in percent)	40.4	70.4
Simpson Diversity Index	0.57	0.83
Mean Coefficient of Conservatism	3.0	4.3
Floristic Quality Index	4.2	10.6
Maximum depth of plants (ft)	6.5	7.0
Mean depth of plants (ft)	3.7	3.5
Median depth of plants (ft)	4.0	3.5
Average number of all species per site (shallower than max depth)	0.47	2.16
Average number of all species per site (veg. sites only)	1.16	3.06
Average number of native species per site (shallower than max depth)	0.25	1.76
Average number of native species per site (sites with native veg. only)	1.08	2.77
Species richness	3	7
Mean rake fullness (veg. sites only)	1.32	1.94

Chemical treatment of CLP will continue in 2020 in nearly the same areas treated in 2018 and 2019 as a part of the new management plan recommendations. Chemical management of EWM will be completed again in 2020. Additional pre and post treatment aquatic plant survey data is available in the Final 2019 Plant Survey Summary Report generated by ERS and included as an appendix to this summary.

2019 Fall EWM Bed-mapping on Long Trade Lake

On October 7th, the entire visible littoral zone of Long Trade Lake was searched for EWM. The fall EWM bedmapping survey is a visual survey specifically looking for EWM and then marking individual plants and beds of EWM with GPS. A “bed” is determined to be any area where EWM is visually estimated to make up >50% of the area’s plants and is generally continuous with clearly defined borders. During the 2019 fall survey, it was disappointing to find EWM throughout much of the lake once again. EWM was not detected in either the pre or the post-treatment aquatic plant survey, and was almost undetectable in 2018 with just eight plants located and rake removed throughout the entire main body of the lake.

In 2019, a total of six beds covering 0.97 acre were mapped, and an additional 19 plants outside these beds were mapped (Figure 5). This represented a 0.95 acre increase from the fall 2018 survey, but was similar to the 11 small beds that totaled exactly 1.00 acre in 2017.

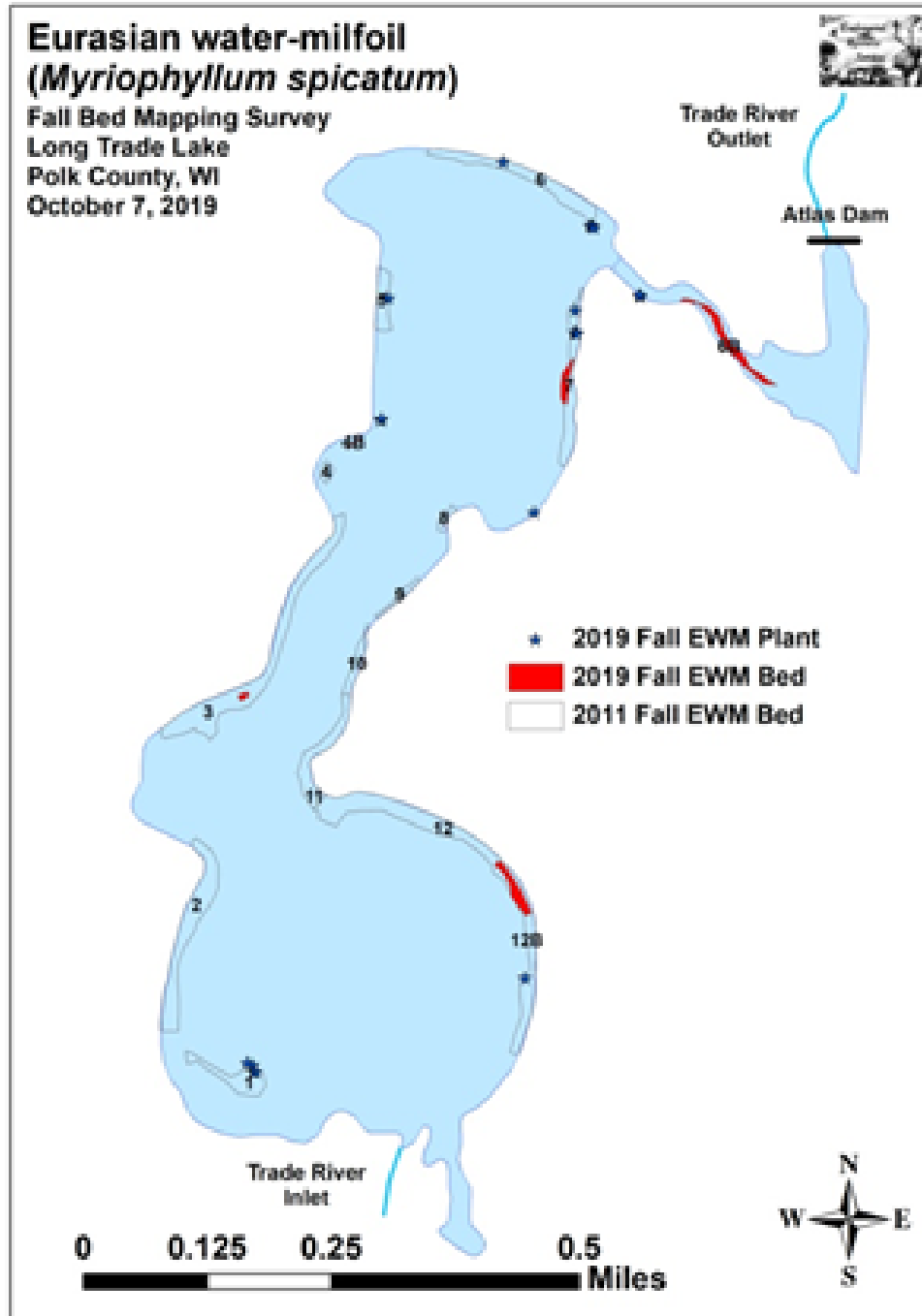


Figure 5: 2018 Long Trade Lake Fall EWM Bed Mapping Results

Long-term Control of EWM in Long Trade Lake

Table 4 reflects the changes in fall EWM since 2011 and identifies 2019 changes after treatment when compared to the previous year (2018). Since 2016, the amount of EWM mapped in the fall on Long Trade Lake has remained well below the average since 2011. At the end of the 2018 season that average was 3.39 acres. At the end of 2019 the average was down even further at 3.10 acres. Furthermore, after

12.97 acres of EWM were mapped in 2011 and management was implemented, it took only four years to go from zero or almost zero EWM in the lake back to 11.33 acres in 2015. Four years after the 2015 fall total, there is still <1.0 acres of EWM in Long Trade Lake. EWM management appears to be keeping the amount of EWM in the lake to very low levels, and has extended relief for multiple years.

Table 4: Fall EWM Bed-mapping Summary – Long Trade Lake

Bed Number	2019 Area in Acres	2018 Area in Acres	2017 Area in Acres	2016 Area in Acres	2015 Area in Acres	2014 Area in Acres	2013 Area in Acres	2012 Area in Acres	2011 Area in Acres	2019 Change in Acreage	Range; and Mean Rake Fullness	2019 Field Notes
1	0	0	0.02	0	0.36	0	0	0.45	0.70	0	<<<1	4 EWM plants
2 and 2A	0	0	0.05	0	0.54	0	0	0	1.89	0	0	No EWM found
3, 3A, and 3B	0.04	0	0.26	0	2.24	0	0	0.02	2.69	0.04	<1-2; 1	Approx. 50 plants
4	0	0	0	0	0	0	0	0	0.13	0	0	No EWM found
4B	0.02	0	0.01	0	0.12	0	0	0.03	0	0.02	<<<1; 1	Sliver of cont. EWM
5	0	0	0	0	0	0	0	0	0.51	0	<<<1	1 EWM plant
6	0	0	0.23	0	1.52	0	0	0.13	1.23	0	<<<1	4 EWM plants
6B	0.44	0.02	0.29	0	2.18	0.22	0	0.76	0	0.42	<1-2; 1	100s of plants
Mill Pond	0	0	0	0	0	0	0	0	0	0	0	No rooted EWM
7	0.16	0	0	0	0.73	0	0	0.21	1.03	0.16	<1-3; 1	Merging towers
8	0	0	0	0	0.01	0	0	0	0.11	0	0	No EWM found
9	0	0	0.01	0	0	0	0	0	0.16	0	0	No EWM found
10	0	0	0.02	0	0	0	0	0	0.29	0	0	No EWM found
11	0	0	<0.01	0	0.48	0	0	0	0.88	0	0	No EWM found
12 and 12A	0.31	0	0.09	0	3.05	0	0	0	3.35	0.31	<1-3; 1	Merging towers
13	0	0	0.02	0	0.09	0	0	0	0	0	0	No EWM found
Total Acres	0.97	0.02	1.00	0.00	11.33	0.22	0.00	1.60	12.97	0.95		

2019 AIS Education

The 2019 AIS education projects include watercraft inspection (Clean Boats, Clean Waters), AIS monitoring and removal, ZM Dockout Day, an AIS Training Workshop, and Newsletter articles. The time and people indicated in this report have been documented in the grant reimbursement process.

2019 Clean Boats, Clean Waters

Records indicate that a total of 86.25 hours of paid and volunteer watercraft inspection were completed on the Long Trade Lake Public Atlas Park Boat Landing in 2019. Monitoring began on May 5 and continued through August 25 in 2019. A total of 73 boats were inspected and 142 people were contacted in 2019 according to records in the WDNR CBCW database.

2019 AIS Monitoring

AIS including CLP, EWM, Purple Loosestrife, and Zebra Mussels were monitored for in May, June, July, August, September, and October in 2019. At least 22 different volunteers spent at least 140 hours on Long Trade Lake looking for AIS and removing most of what they found.

2019 AIS Identification and Removal Workshop

On July 20, 2019 23 people participated in an AIS Workshop provided during the annual Picnic. A representative from LEAPS spent an hour at the picnic with AIS samples available for inspection. Proper identification and removal techniques were discussed during the event.

2019 ZM Dockout Day

ZM Dockout Day inspections were held on between 10/03 and 10/27/2019 on Long Trade Lake. At least 11 different properties reported that they had surveyed their docks upon removal. One individual inspected docks and boat lifts at 11 other properties as they helped property owners remove the equipment.

2019 Newsletters

Three newsletters were sent out in 2019, one in January, one in May, and one in August. A fourth was just sent out in January 2020. These newsletters provide an update for AIS management actions, CBCW, and AIS monitoring for all who receive it.

Round Trade Lake Improvement Association Meetings

The RTLIA holds at least four meetings each year: May, June, August, and September. The September meeting serves as the official annual meeting of the organization. Property owners on Long Trade Lake also hold one event each year that serves as a local informational meeting. These meetings were all completed in 2019.

2019 Water Quality Sampling

Long Trade Lake - Deep Hole-South Basin was sampled 16 different days during the 2019 season. Parameters sampled included: water clarity, temperature, dissolved oxygen, total phosphorus, and chlorophyll. The average summer (July-Aug) secchi disk reading for Long Trade Lake - Deep Hole-South Basin was 2.7 feet. This was more than a half foot greater than the summer average in 2018. The average for the Northwest Georegion was 8.6 feet. Typically the summer (July-Aug) water was reported as murky and green. This suggests that the secchi depth may be mostly impacted by algae. Algal blooms are generally considered to decrease the aesthetic appeal of a lake because people prefer clearer water to swim in and look at. Algae are always present in a balanced lake ecosystem. They are the photosynthetic basis of the food web. Algae are eaten by zooplankton, which are in turn eaten by fish. You will know algae are causing reduced Secchi depth if the water generally appears green when you assess the color against the white background of the secchi disc.

Chemistry data was collected on Long Trade Lake - Deep Hole-South Basin. The average summer Chlorophyll was 46.6 µg/l (compared to a Northwest Georegion summer average of 13.2 µg/l). The summer Total Phosphorus average was 131.5 µg/l. The 2019 chlorophyll concentration was down by nearly a third from 2018, however, total phosphorus was nearly the same in both 2018 and 2019. Lakes that have more than 20 µg/l and impoundments that have more than 30 µg/l of total phosphorus may experience noticeable algae blooms. The overall Trophic State Index (based on chlorophyll) for Long Trade Lake - Deep Hole-South Basin was 64. The TSI suggests that Long Trade Lake - Deep Hole-South Basin was eutrophic. This TSI usually suggests blue-green algae become dominant and algal scums are possible, extensive plant overgrowth is also possible if the plants are not light-limited by the algae.

The data that is recorded in the SWIMS database and made available for public viewing through the CLMN program is not accurate for 2018 and still needs to be updated.

This project added total phosphorus and chlorophyll a water sample collection in September and October for Long Trade Lake. These sampling dates were completed and results are in the SWIMS Database.

2019 Native Plant Establishment

On October 25, 2019 LEAPS placed approximately 50 “sacks” of northern water milfoil turions in Long Trade Lake just west of the inlet on the south end of the lake. This location is different than what has been done before. In the past, NWM balls were placed along the Polk County Shoreline on the east side of the lake near the outlet. A sack is defined as 4-8 northern water milfoil winter turions (overwintering buds) tied up into a small piece of cheese cloth and then weighted down with several small rocks. These sacks are then distributed into the lake in the late fall with the expectation that some or all will begin new growth in the spring of 2020.

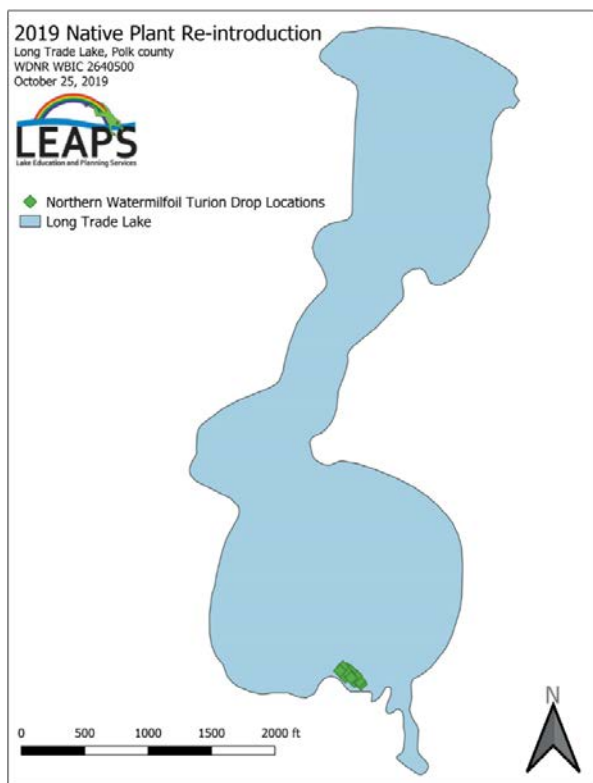




Figure 6: Reintroduction of northern water milfoil into Long Trade Lake: 2019 placement (top); actual “balls” (bottom left)

Final Notes

2019 was the second year of a three year grant funded project for Long Trade Lake. Two additional grants were received for Big/Little Trade lakes and Round Lake. Expenses claimed in this reimbursement are the large costs associated with actual chemical control work and consultant support. Not all expenses and activities are included in this reimbursement request as there will be additional requests to follow.