2019 AIS Management Assessment and Summary Report: ACEI-21918 Little 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 Little Trade Lake. Curly-leaf pondweed (CLP) and Eurasian Watermilfoil (EWM) management was planned and implemented on Little Trade Lake in 2019. 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 Big and Little Trade Lakes are included in this project summary.

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

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 Big and Little Trade Lakes in 2019

PLANtrax®

Earned Value Table -- Calculation of Estimated Progress

Post % Complete to Historical Tab

Lake Education and Planning Services
2019 RTLIA-Big&LittleTrade-AIS

EV Table Date = 29-Feb-20 (Enter date as mm/dd/yy)

Cost Code	Task Description	Manager	Start Date	Finish Date	Task Budget		Percent Complete	Earned Value
			1-Apr-19	31-Mar-20	$ 6,300		75.9%	$ 4,780
1	2019 CLP/EWM Management Planning	DLB				x		
1.1	CLP/EWM management planning		1-Apr-19	30-Jun-19	1,500	x	100.0%	1,500
1.2	Preparation of WDNR permit		1-Apr-19	30-May-19	600	x	100.0%	600
1.4	Applicator support		1-May-19	30-Jun-19	300	x	100.0%	300
2	2019 Aquatic Plant Survey Support	DLB				x		
2.1	Pre-Post Treatment Surveys		1-May-19	30-Jun-19	300	x	90.0%	270
2.3	Fall Bed-mapping Support		1-Aug-19	31-Mar-20	300	x	90.0%	270
2.4	Summer EWM survey and physical removal		1-Jul-19	30-Sep-19	320	x	100.0%	320
3	2018 AIS Education Support	DLB				x		
3.1	AIS Workshop		1-Jun-19	30-Sep-19	240	x	100.0%	240
3.2	ZM Dock-Out Day		1-Sep-19	31-Oct-19	320	x	0.0%	
4	2018 Water Quality Monitoring Support	DLB				x		
4.1	Preparation of bottles, labslips, coolers		1-Apr-19	31-Oct-19	320	x	100.0%	320
5	2018 Project Management Support	DLB				x		
5.1	End of Year Summary Report		1-Oct-19	31-Mar-20	900	x	0.0%	
5.2	Meetings		1-Apr-19	31-Mar-20	600	x	80.0%	480
5.3	General Expenses		1-Apr-19	31-Mar-20	600	x	80.0%	480
	TOTALS				6,300			4,780
	Total Project Progress:	$4,780			/ $ 6,300	=	**75.9%**	

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 2020. The invoices included in the 2019 Reimbursement Request for this project reflect a 56.67% completion rate 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 – Little Trade Lake

Based on how the 3-yr ACEI grant was set up, EWM management was not originally planned in Little Trade Lake. However, because diquat was used in some treatment areas, it was expected that it would take out EWM as well as CLP. The initial 2019 treatment proposal included 9.65 acres of which 6.27 was exclusively CLP and the remaining 3.36 acres being both CLP and EWM. After a pre-treatment aquatic plant survey completed by Endangered Resource Sciences (ERS) the initial proposal was modified down to 5.84 acres total with 4.0 targeting just CLP and the remaining 1.84 targeting both CLP and EWM. The four acres of CLP were treated with 2.0ppm of Aquathol K (liquid endothall) and the 1.84 acres of CLP and EWM was treated with Tribune (diquat) at the maximum label rate. No 2,4-D based herbicide was used in Little Trade Lake in 2019.

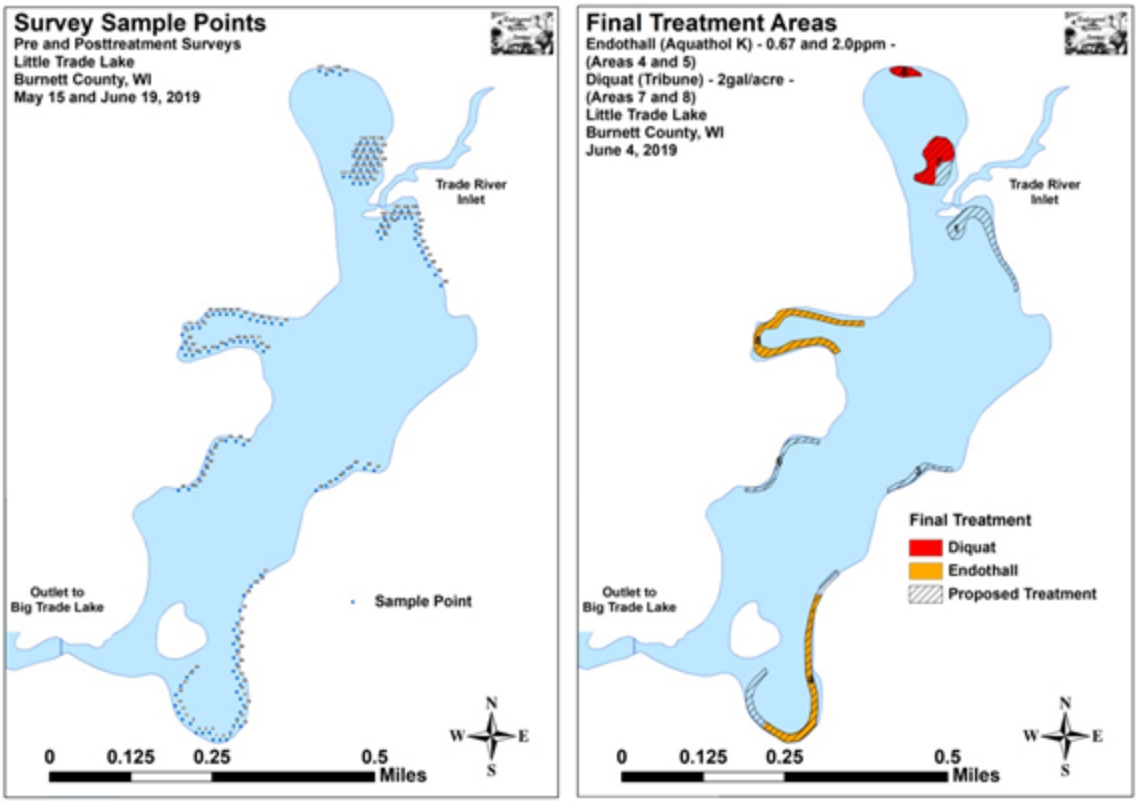
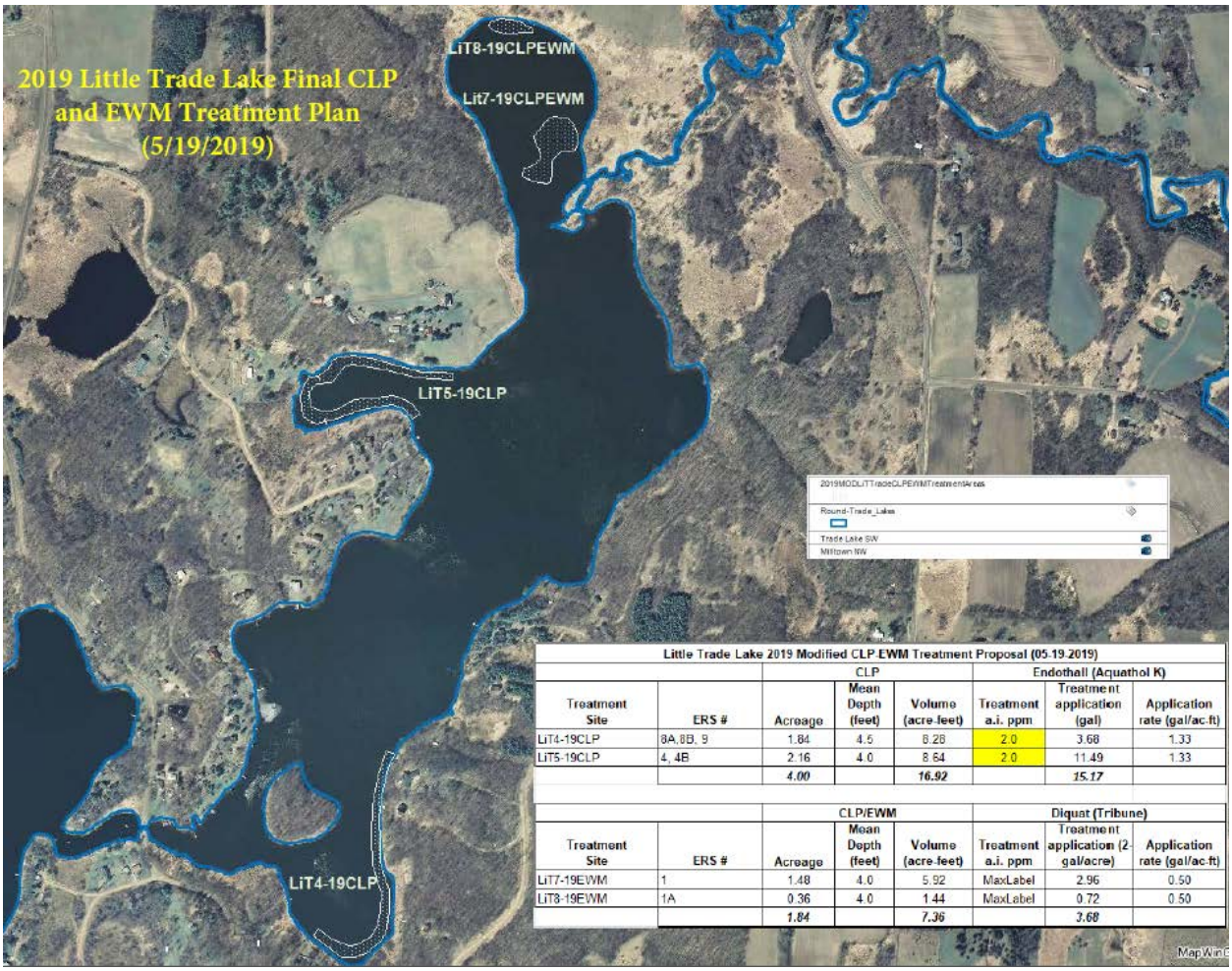


Figure 1: 2019 Little Trade Lake survey sample points and final treatment areas (ERS, 2019)

Table 2: 2019 Little Trade Lake spring CLP and EWM treatment summary (ERS, 2019)

Treatment Area	Proposed Acreage	Final Acreage	Difference +/-
1	1.54	0.00	-1.54
3	0.52	0.00	-0.52
4	2.59	1.84	-0.75
5	2.16	2.16	0.00
6	0.61	0.00	-0.61
7	1.87	1.48	-0.39
8	0.36	0.36	0.00
Total Acres	**9.65**	**5.84**	**-3.81**



Little Trade Lake 2019 Modified CLP EWM Treatment Proposal (05.19.2019)

		CLP			Endothall (Aquathol K)		
Treatment Site	ERS #	Acreage	Mean Depth (feet)	Volume (acre-feet)	Treatment a.i. ppm	Treatment application (gal)	Application rate (gal/ac-ft)
LiT4-19CLP	8A, 8B, 9	1.84	4.5	8.28	2.0	3.68	1.33
LiT5-19CLP	4, 4B	2.16	4.0	8.64	2.0	11.49	1.33
		4.00		*16.92*		*15.17*	

		CLP/EWM			Diquat (Tribune)		
Treatment Site	ERS #	Acreage	Mean Depth (feet)	Volume (acre-feet)	Treatment a.i. ppm	Treatment application (2 gal/acre)	Application rate (gal/ac-ft)
LiT7-19EWM	1	1.48	4.0	5.92	MaxLabel	2.96	0.50
LiT8-19EWM	1A	0.36	4.0	1.44	MaxLabel	0.72	0.50
		1.84		*7.36*		*3.68*	

Figure 2: 2019 Final Little Trade Lake CLP and EWM chemical treatment map and details

2019 CLP and EWM Management Implementation - Little 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 all herbicides to control CLP and EWM in Little Trade Lake was completed on June 4, 2019 by Northern Aquatic Services. Herbicide was applied between 2:00 and 4:00pm. Water temperature was 63°F and air temperature was 75°F. Wind speed was very light at 3-4 mph out of the S. At the time of treatment, CLP, EWM, coontail, white water lily, and filamentous algae was present.

2019 Aquatic Plant Survey Work – Little Trade Lake

In 2019, pre-treatment, post-treatment, and fall EWM bedmapping was completed by Endangered Resource Services (ERS). A point-intercept style of plant survey that included 40 points in 9.64 acres of the lake was completed on May 15, 2019. The number of points surveyed was well above the minimum of 4-10 points/acre required by WDNR protocol for pre/post treatment surveys (Figure 3). Originally, the

2019 proposed chemical treatment of CLP and EWM included 9.64 acres, but after the pre-treatment survey, the treatment area was reduced in size 6.84 acres. Three of the initially proposed beds were removed with those remaining being reduced but still greater than an acre in size except for a small bed in the extreme north end of the north bay.

During the pre-treatment survey, CLP was found at 56 of 140 points sampled (Figure 4). EWM was found at only 4 of 140 points during the pretreatment survey (Figure 4), prompting the reduction in the area of the lake chemically treated for EWM.

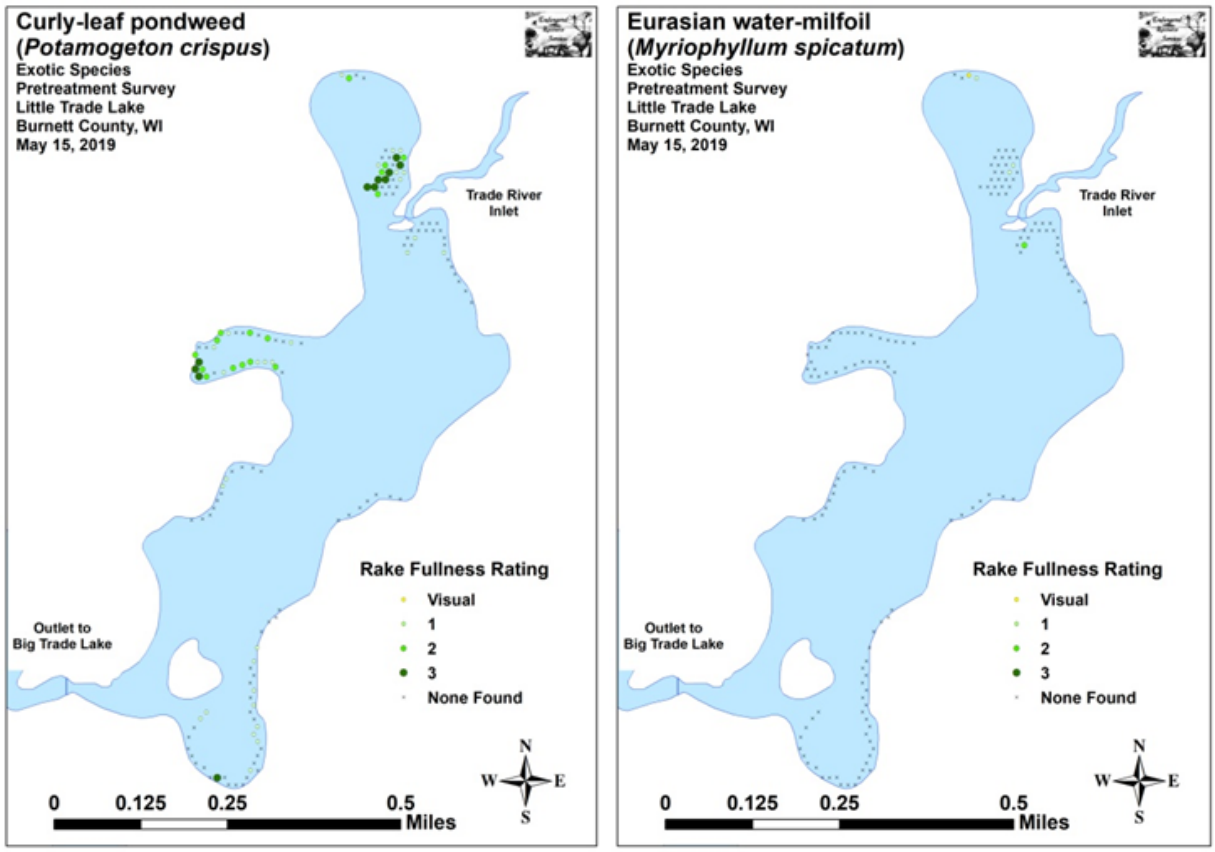


Figure 3: CLP and EWM found during the 2019 Little Trade Lake pre-treatment survey (ERS, 2019)

The post-treatment survey was completed by ERS on June 19, 2019. During the post-treatment survey, CLP was found at 30 points (Figure 5). The results indicated a moderately significant decline in mean rake density, a highly significant decline in total CLP distribution, and a moderately significant decline in rake fullness 3; but a highly significant increase in visual sightings (Figure 6). During the post-treatment survey, EWM was again found 4 out of 140 points (Figure 5). There were no significant changes in EWM from pre to post-treatment (Figure 6).

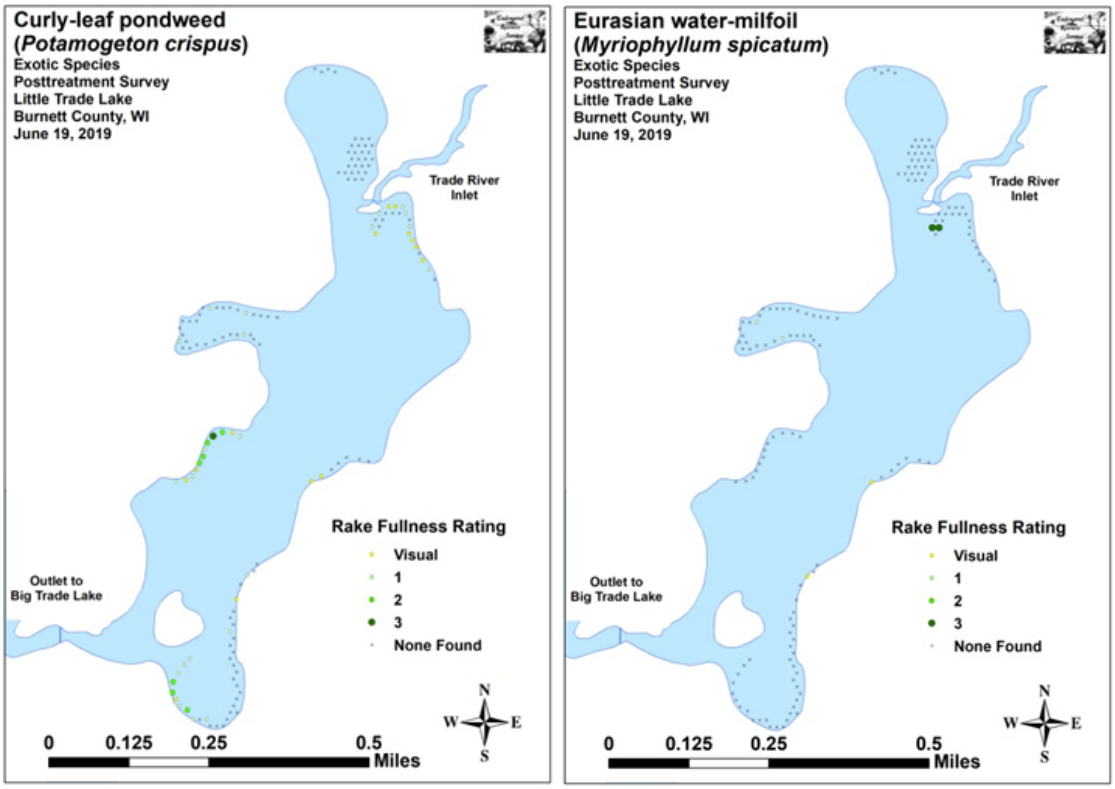
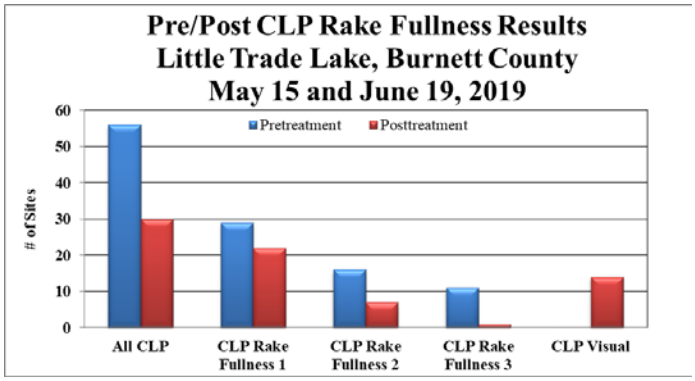


Figure 4: CLP and EWM found during the 2019 Little Trade Lake post-treatment survey (ERS, 2019)



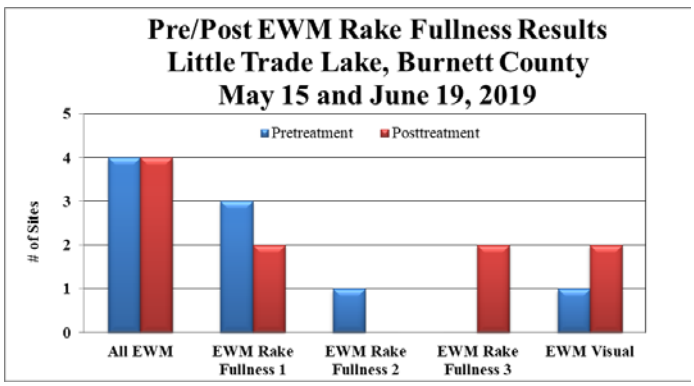


Figure 5: 2019 Little Trade Lake pre/post rake CLP and EWM rake fullness results (ERS, 2019)

2019 Native Aquatic Plant Survey Results – Little Trade Lake

The littoral zone within the beds extended to 9.0ft during the pre-treatment survey before dropping slightly to 8.0ft post-treatment. The frequency of plant occurrence was essentially unchanged at 95.0% pre-treatment and 95.7% post-treatment. Total richness doubled from five species pre-treatment to ten species post-treatment. Similarly, the Simpson's Diversity Index jumped from a moderate pre-treatment value of 0.59 to a moderately/high post-treatment value of 0.79. The Floristic Quality Index (another measure of native plant community health) also rose sharply from 6.9 pre-treatment to 13.4 post-treatment.

Mean native species richness at points with native vegetation increased sharply from 1.20 species/point pre-treatment to 2.10 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 experienced a significant decline from a moderate 1.89 pre-treatment to 1.74 post-treatment.

Coontail and Common waterweed were the most common native species in the pre-treatment survey. Post-treatment, Coontail remained the most common native species, and it was almost unchanged in both distribution and density. Although Common waterweed declined in both density and distribution to become the sixth most common native species, neither was significant.

Post-treatment, White water lily, Small duckweed, Large duckweed, and Common watermeal all experienced highly significant increases in distribution. White water lily also enjoyed a moderately significant increase in density from a mean rake of 1.00 pretreatment to 1.24 posttreatment. Filamentous algae also experienced a moderately significant increase in distribution and a significant increase in density. Duckweeds, white water lily, and common watermeal are plants that do well under degraded water quality conditions. Other than CLP, no other species experienced a significant decline post-treatment.

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

Table 3 – Pre/Post Surveys Summary Statistics Little Trade Lake, Burnett County May 15 and June 19, 2019

Summary Statistics:	Pre	Post
Total number of points sampled	140	140
Total number of sites with vegetation	133	134
Total number of sites shallower than the maximum depth of plants	140	140
Freq. of occur. at sites shallower than max. depth of plants (in percent)	95.0	95.7
Simpson Diversity Index	0.59	0.79
Mean Coefficient of Conservatism	4.0	4.8
Floristic Quality Index	6.9	13.4
Maximum depth of plants (ft)	9.0	8.0
Mean depth of plants (ft)	4.7	4.0
Median depth of plants (ft)	4.5	4.0
Average number of all species per site (shallower than max depth)	1.48	2.19
Average number of all species per site (veg. sites only)	1.56	2.29
Average number of native species per site (shallower than max depth)	1.05	1.95
Average number of native species per site (sites with native veg. only)	1.20	2.10
Species richness	5	10
Mean rake fullness (veg. sites only)	1.89	1.74

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 Little Trade Lake

On October 9th, 2019, 12 EWM beds were mapped totaling 1.59 acres or 1.26% of the lake's total surface area (Figure 7). Outside of these areas, 33 additional EWM plants were marked (Figure 7). This was an increase of 0.19 acre (+13.57%) from the seven beds covering 1.40 acres (1.11% of the lake's surface area) mapped in 2018. It was also higher than in 2017 when we found 14 small beds totaling 1.09 acres (0.87% coverage); and in 2016 when eight beds encompassed just 0.34 acre (0.27% coverage). Despite these year-over-year increases, the total was still well below the recent peak of 12 beds covering 4.23 acres (3.36% coverage) in the fall of 2015.

Historic Fall EWM Mapping Results

Table 4 reflects the changes in EWM each year based on fall bedmapping. Despite a rather large chemical treatment in 2018 that included both CLP and EWM that led to very little EWM chemically treated in 2019, fall totals have been up in both 2018 and 2019. While management of EWM over the last five years has kept it from reaching levels it has reached in the past, results could be better, specifically hoping for longer relief after treatment. This suggests that perhaps more aggressive management of EWM should occur, or that perhaps the areas of EWM that are treated should have the parameters under which they are treated modified. Using a higher concentration of herbicide, or perhaps trying a different herbicide like ProcellaCOR, might improve the longevity of the chemical treatments.

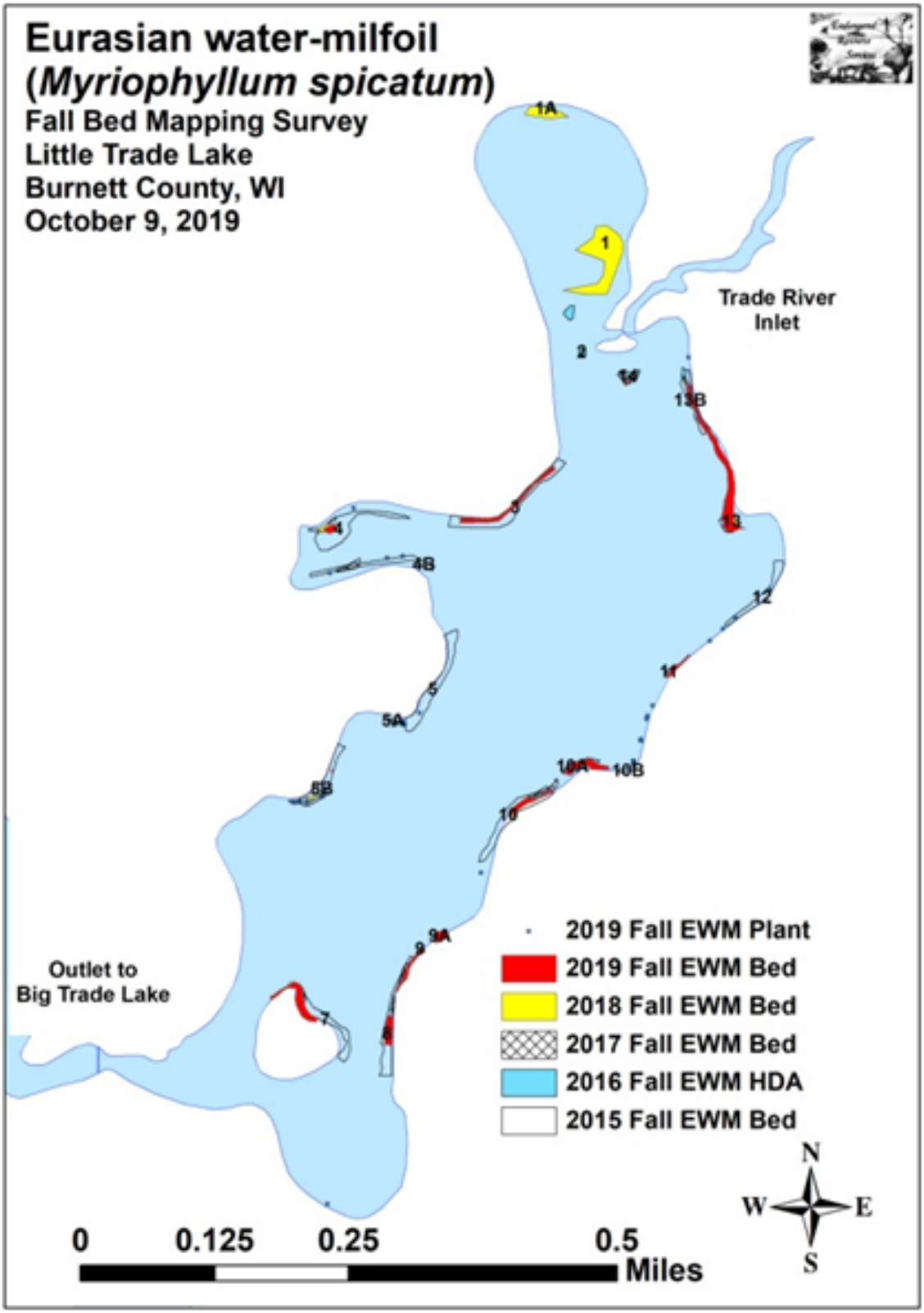


Figure 6: 2019 Fall EWM bedmapping results – Little Trade Lake (ERS, 2019)

Table 4: Fall EWM bedmapping summary – Little Trade Lake

Bed Number	2019 Fall Bed Acreage	2018 Fall Bed Acreage	2017 Fall Bed Acreage	2016 Fall Bed/ HDA Acreage	2015 Fall Bed Acreage	2014 Fall Bed Acreage	2013 Fall Bed/ HDA Acreage	2012 Fall Bed Acreage	2019 Change in Acreage	Estimated 2019 Mean Rake Fullness	2019 Field Notes
1	0	0.93	0	0.06	0	3.84	4.61	2.16	-0.93	-	No EWM seen
1A	0	0.18	0.04	0	0	0	0	0	-0.18	-	No EWM seen
2	0	0	0	0.02	0	Merged	Merged	Merged	0	-	No EWM seen
3	0.22	0	0	0	0.65	0.23	0.03	0	0.22	<<1-3; 1	Regular cont. towers
4	0.04	0.06	0.07	0	0.58	0	0	0	-0.02	1-3; 2	Large merging towers
4B	0	0	0.07	0	0.26	0	0	0	0	<<<<1	3 total EWM plants
5 and 5A	0	0	0.01	0	0.52	0	0	0	0	<<<<1	9 total EWM plants
5B	<0.01	0.02	0.07	0	0.33	0	0	0	-0.02	<1-3; 3	Microbed w/ satellites
6	0	0	0	0	0	0	0	0	0	-	No EWM seen
7	0.22	0.06	0.04	0.02	0.31	0	0	0	0.16	<<<1-3; 1	Scattered but, expand.
8A and 8B	0.19	0	0.10	0	0.42	0	0	0	0.19	1-3; 2	Regular/expanding
9 and 9A	0.07	0	0.01	0	0	0	0	0	0.07	1-3; 3	Small dense microbed
10	0.11	0.05	0.05	0	0.51	0	0	0	0.06	<<1-2; 1	Mixed with NWM
10A	0.15	0	0.10	0.11	0	0	0	0	0.15	<<1-3; 1	Mixed with NWM
10B	0	0	0	0	0.05	0	0	0	0	<<<<1	7 total EWM plants
11	0.05	0	0	0.01	0	0	0	0	0.05	<1-1; 1	Narrow ribbon
12	0	0	0	0	0.26	0	0	0	0	<<<<1	4 total EWM plants
12B	0	0	0	0	0	0	0	0.02	0	-	No EWM seen
12C	0	0	0	0	0	0	<0.01	0.08	0	-	No EWM seen
13	0.53	0.10	0.27	0.05	0.08	0.14	<0.01	0	0.43	<1-3; 2	Solid mat on point
13B	Merged	0	0.16	0.02	0.26	0	0	0	0	-	Merged w/ Bed 13
14	0.01	0	0.10	0.05	0	0.10	<0.01	0.31	0.01	1-3; 2	Solid mat on point
Total	**1.59**	**1.40**	**1.09**	**0.34**	**4.23**	**4.32**	**4.65**	**2.57**	**+0.19**		

2019 AIS Education

The 2019 AIS education project includes AIS monitoring, ZM Dockout Day, and Newsletter articles.

2019 Clean Boats, Clean Waters

There is no public access on Little Trade Lake. Access is gained through a channel and under a bridge that separates Big and Little Trade lakes.

2019 ZM Dockout Day

ZM Dockout Day inspections were held on between 10/03 and 10/27/2019 with at least three property owners documented as taking part.

2019 AIS Monitoring

AIS monitoring was completed in each month May-October by volunteers and resource professionals. At least five different volunteers put in a total of 29.5 hours of monitoring for AIS.

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

Little Trade Lake - Deep Hole was sampled 10 different days during the 2019 season. The average summer (July-Aug) secchi disk reading for Little Trade Lake - Deep Hole was 3.73 feet based on three readings. 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.

Chemistry data was collected on Little Trade Lake - Deep Hole. The average summer Chlorophyll was 36.7 µg/l (compared to a Northwest Georegion summer average of 13.2 µg/l). The summer Total Phosphorus average was 100.2 µg/l. Both of these averages are higher, i.e. worse than they were in 2018. 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 Little Trade Lake - Deep Hole was 62. The TSI suggests that Little Trade Lake - Deep Hole was eutrophic. This TSI usually suggests decreased clarity, fewer algal species, oxygen-depleted bottom waters during the summer, plant overgrowth evident, warm-water fisheries (pike, perch, bass, etc.) only.

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

Final Notes

2019 was the second year of a three year grant funded project that covers both Little and Big Trade lakes. Two additional grants were received for Round Lake and Long Trade 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.