



Webster Lake

2023 Aquatic Vegetation Management Plan

RERPORT FOR:

Webster lake Conservation
Association
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Thank you!

EXECUTIVE SUMMARY

Webster Lake is located in Kosciusko County with 653 surface acres and has a mean depth of 12 feet. The lake is known as the premier muskie lake in the state of Indiana. This is due to the intense stocking effort conducted by the Department of Natural Resources since 1978. In summer months Webster Lake is a very popular fishing, boating, swimming, and water-skiing resource, and a public beach is located on the western side of Webster Lake. Much of the open water is deep enough on Webster Lake to accommodate boats, but in recent years, dense beds of Eurasian watermilfoil (*Myriophyllum spicatum*) have interrupted the popular summer activity.

The primary invasive species within Webster Lake is Eurasian watermilfoil (EWM). Other invasive species present in the lake in past surveys have included curly-leaf pondweed (*Potamogeton crispus*) (CLP) and Starry stonewort (*Nitellopsis obtusa*). A common native species of submerged aquatic vegetation present in Webster Lake that can reach nuisance levels is Coontail (*Ceratophyllum demersum*). Because of extensive shallow areas within the lake, the lake can become heavily infested with dense growth of these nuisance species. In 2018, there was a spike in the growth of Eurasian watermilfoil with 175 acres treated. In 2019, a significant reduction in Eurasian watermilfoil was observed documenting only 88.49 acres. The 2020 season saw a slight increase of Eurasian watermilfoil of 136 acres. In 2021, 98.75 acres of Eurasian watermilfoil were treated. The 2022 season saw another decrease in EWM treated with only 62 acres treated. The EWM made another resurgence in 2023 in which 91.75 acres were treated.

WLCA was awarded a \$27,400 grant from the Lake and River Enhancement (LARE) program which included aggressive treatment funding for EWM. SOLitude Lake Management was contracted by the Webster Lake Conservation Association (WLCA) to complete aquatic vegetation sampling, herbicide treatments, and to update the Webster Lake Aquatic Vegetation Management Plan (AVMP) in 2023. An invasive survey was completed on May 10, 2023. The survey documented 91.75 acres of Eurasian watermilfoil. For the 2023 season, 91.75 acres of EWM were treated. Eurasian watermilfoil was detected at 17 sites during the Tier II survey. Native plant coverage increased in 2023 from 66.2% to 68%.

2023 vegetation controls met 2 of the 4 LARE objectives and goals of this update by limiting nuisance plant issues in high use areas and maintaining overall plant coverage throughout the lake.

- Keep Eurasian watermilfoil below 10% occurrence in summer Tier 2 surveys – 17% in 2023
- Keep curly-leaf pondweed below 10% occurrence in spring Tier 2 surveys - no spring survey in 2023
- Keep starry stonewort below 10% occurrence in summer Tier 2 surveys – 0% in 2023
- Maintain native plant coverage at 80% of sample sites in summer Tier 2 Survey – 74% in 2023

Problem Statement

Aquatic vegetation is an important component of lakes in Indiana. However, as a result of many factors, this vegetation can develop to a nuisance level. Nuisance aquatic vegetation, as used in this plan, describes plant growth that negatively impacts the present uses of the lake including fishing, boating, swimming, aesthetic, and lakefront property values. The primary invasive species within Webster Lake are Eurasian watermilfoil and curly-leaf pondweed. Residents at Webster Lake have communicated that coontail and duckweed have been at nuisance levels since 2019. While they are native species, they can cause negative impacts to recreation and enjoyment of Webster Lake.

A similar strategy for the 2024 season is recommended. No spring survey has been conducted the last few years. It is recommended that there is a move from a percentage of occurrence to acres treated in the spring. Looking back over the treatments of EWM and CLP over the last couple years, it came to approximately 300 acres. This would be close to what the littoral zone of the lake is, the area of the lake where sunlight can penetrate deep enough to sustain plant life. A new goal of keeping the treated acres of curly-leaf pondweed under 30 acres, or 10% of the littoral zone, is recommended.

Goals and Objectives

The vegetation management goals of the Webster Lake Aquatic Vegetation Management Plan are:

- Maintain a stable, diverse aquatic plant community that supports a good balance of predator and prey fish and wildlife species, good water quality, and is resistant to minor habitat disturbances and invasive species
- Direct efforts to preventing and controlling the negative impacts of aquatic invasive species
- Provide reasonable public recreational access while minimizing the negative impacts on plant and fish and wildlife resources

Specific management objectives had been developed for Webster Lake in past plans.

Below are the plant management objectives for Webster Lake:

- Keep Eurasian watermilfoil below 10% occurrence in summer Tier 2 surveys
- **Keep curly-leaf pondweed below 30 acres for the spring treatment – New goal for 2024**
- Keep starry stonewort below 10% occurrence in summer Tier 2 surveys
- Maintain native plant coverage at 80% of sample sites in summer Tier 2 Survey.

Plant Management History

The morphology of Webster Lake includes extensive shallow areas; accordingly, a large percentage of the lake can become infested with heavy growth of invasive and nuisance species that negatively impact boating, fishing, swimming, and property value. Whole lake fluridone treatments were completed in 1999, 2002, and 2010. After the 2010 Sonar treatment, Eurasian watermilfoil was greatly reduced, but native vegetation was also adversely impacted. In the years following the Sonar treatment, IDNR limited treatments due to a concern of fish cover lacking throughout the lake (Aquatic Control 2017). Traditional non-selective shoreline treatments were allowed, but offshore Eurasian watermilfoil treatments were limited. In 2011, Eurasian watermilfoil was not detected which resulted in a year without treatment. In 2012, 45 acres of Eurasian watermilfoil were treated with 2,4-D herbicide, 53 acres in 2013, 26 acres in 2014, and 26 acres in 2015 (Aquatic Control 2017). These treatments are outlined in Table 1.

Over 100 acres of Eurasian watermilfoil were documented in 2014 and 2015. Data from the 2015 Tier 2 survey depicted a large increase in overall plant coverage and native abundance, therefore IDNR lifted treatment restrictions in 2016. In addition to invasive Eurasian watermilfoil treatments, starry stonewort, an invasive macroalgae, was treated in a 4.5-acre area in 2015 and 2016. In the spring of 2016, invasive mapping revealed 155.4 acres of Eurasian watermilfoil. All Eurasian watermilfoil areas were treated with 2.0 ppm of 2, 4-D, which led to a decrease in abundance. The spring 2017 survey documented 59.4 acres of Eurasian watermilfoil and 71.4 acres of curly-leaf pondweed. Eurasian watermilfoil areas were treated with 2.0ppm 2, 4-D, and 16 acres of curly-leaf pondweed were treated with Aquathol K at 1.0ppm (Aquatic Control 2018). The summer of 2017 Tier 2 survey revealed that invasive frequency and overall native plant coverage met the management plan objective.

In 2018, 175 acres of Eurasian watermilfoil using 2,4-D, was treated and native plant coverage did not meet the objective at 71.1%, which was below the 80% outlined in the goals section. For 2019, a significant decline in EWM growth was expected in the spring. All objectives were met for 2019, except for native plant coverage which was recorded at 70.0%. Spring 2020 brought on an increase in Eurasian watermilfoil compared to 2019, at 136 acres. In 2021, 98.75 acres were treated with 3 PDU's of ProcellaCOR and 2.0 ppm 2,4-D, which yielded seasonal control of EWM. In 2022, 62 acres of EWM were treated as well as 50 acres of CLP. Three of the four objectives were met. Eurasian watermilfoil was not detected during the late summer Tier 2 survey. Native plant coverage decreased in 2022 from 76.7% to 66.2%. For the 2023 season, no LARE funds were used to treat the curlyleaf pondweed that was found in the lake. The Webster Lake Conservation Association funded the treatment of 33 acres of CLP treatment on May 9. During the spring survey, 91.75 acres of EWM was found in the lake; 69 acres was treated with 2, 4-D and 22.75 acres was treated with ProcellaCOR. After finding no EWM during the summer Tier II survey, EWM was found at 17% of the sites. A late summer shoreline treatment was not done on the lake compared to a treatment on 8/26 in 2022.

Year	Targeted Vegetation	Treated Acres	Chemical Approved	Total Cost	Per Acre Cost
1988	EWM, Pondweed spp., Naiad, eel grass, algae	*	Reward, Komeen, Aquathol K, Hydrothol, Sonar AS, CuSO4	\$20,527.00	\$200.00
1989	EWM, Pondweed spp., chara, algae	*	Reward, Komeen, Aquathol K, Hydrothol, Sonar AS, CuSO4, Cidekick	\$18,185.00	*
1990	EWM, Pondweed spp., Chara, algae	*	Reward, Komeen, Aquahol, CuSO4	\$12,080.00	\$200
1991	EWM, flatstem pw, CLP, algae	*	Reward, Aquathol K, Komeen, CuSO4	\$18,000.00	\$200
1992	EWM, Pondweed spp., chara, algae	*	Reward, Komeen, Aquathol K, Sonar, CuSO4	\$18,050.00	*
1993	EWM, coontail, Pondweed spp., chara	65	Sonar, Aquathol K, Hydrothol, Reward, CuSO4	\$19,400.00	\$300

Table 1. Webster Lake Treatment History 1988-2023

1994	EWM, coontail, Pondweed spp., chara, algae	32.5	Reward, Komeen, Aquathol K, Hydrothol, CuSO4	\$10,125.00	\$312
1995	EWM, mixed milfoil, coontail, Pondweed spp., elodea, chara	*	Reward, Komeen, Aquathol K, CuSO4	\$13,230.00	*
1996	EWM	60	2,4-D	*	*
1997	EWM	60	Reward	*	*
1998	EWM	60	Reward	*	*
1999	EWM, Pondweed spp., coontail, chara	174	Sonar SRP, Nautique, Reward, CuSO4	\$75,367.00	\$433
2000	EWM, CLP, coontail, chara, algae	48	Reward, Nautique, Navigate, Aquathol K, CuSO4	\$19,585.00	\$408
2001	EWM, CLP, coontail, chara, algae	65	Reward, Nautique, Navigate, Aquathol K, CuSO4	\$23,695.00	\$364
2002	EWM, CLP, coontail, chara, algae	653	Sonar SRP, Sonar PR, Sonar AS, Nautique, CuSO4	\$73,390.00	\$112.38
2003	EWM, CLP, coontail, chara, algae	28	Reward, Nautique, Navigate, Aquathol K, CuSO4	\$6,601.00	\$235.75
2004	EWM, CLP, coontail, chara, algae	35.75	Reward, Nautique, Navigate, Aquathol K, CuSO4	\$11,575.00	#322.10
2005	EWM, CLP, coontail, chara, algae	64 EWM, 80 Shoreline (SL)	Reward and Nautique for SL, Renovate for EWM	\$49,800.00**	\$345.80
2006	EWM, CLP, coontail, chara, algae	121 CLP, 46 EWM, 40 SL	Reward and Komeen SL, Renovate EWM, Aquathol early CLP	\$51,175.00**	\$247.22
2007	EWM, CLP, coontail, chara, algae	121 CLP, 40 EWM, 38 SL	Reward and Komeen SL, Renovate EWM, Aquathol early CLP	\$46,144.00**	\$231.87

2008	EWM, CLP, coontail, chara, and filamentous algae	121 CLP, 46.8 EWM, 38 SL	Reward & Komeen SL, Renovate EWM, Aquathol early CLP	\$47,406.00**	\$230.35
2009	EWM, CLP, coontail, chara, and filamentous algae	31.7 CLP, 38.7 EWM, 38 SL	Reward & Komeen SL, Renovate EWM, Aquathol early CLP	\$35,201.00**	\$324.70
2010	EWM	653	SonarONE and Sonar AS	\$125,000	\$191.42
2011	EWM, CLP, coontail, chara, and filamentous algae	0 (1.75 EWM on backwater)	Renovate Max G	\$875.00	\$500.00
2012	EWM in main lake, algae, coontail, EWM in channels only	45.3 EWM (15.3 web), 7.6 native	2,4-D, Reward, Komeen, Aquathol	\$18,781.00	\$355.00
2013	EWM in main lake, algae, coontail, EWM in channels and select main lake areas	53.0 EWM, 26 native	2,4-D, Reward, Komeen, Aquathol	\$24,685***	\$312.46
2014	EWM in main lake, algae, coontail, EWM in channels and select main lake areas	26.2 EWM, 69.5 native	2,4-D, Reward, Komeen, Aquathol	\$34,530***	\$355.25
2015	EWM in main lake, algae, starry stonewort, coontail, EWM in channels and select main lake areas	26.0 EWM, 4.0 SSW, 90.9 native	2,4-D, Reward, Clipper, Komeen, Aquathol	\$43,460***	\$371.77
2016	Eurasian watermilfoil, algae, coontail, starry stonewort, coontail, pondweed	60.8 native, 4.5 SSW, 158.8 EWM	2,4-D, Reward, Clipper	\$62,638****	\$285.24
2017	Eurasian watermilfoil, algae, coontail, coontail, pondweed	60.8 native, 138.6 EWM, 15 CLP	2,4-D, Reward, Clipper, Aquathol	\$63,050****	\$294.08
2018	EWM, Misc. Species	175 EWM 60.5 natives	2,4-D Captain, Cygnet Plus, Reward	\$45,470.45**** *	\$190.08
2019	EWM, Misc. Species	88.49EWM, 68.59 shore	2,4-D, Clipper, Tribune, Cygnet Plus, Captain	\$42,440.49**** *	\$270.18
2020	EWM	136 EWM 17.73 shore	2,4-D, Clipper, Copper sulfate, Tribune, Cygnet Plus	\$44,274.25**** *	\$325.54
2021	EWM	98.75 EWM 89 Shore	ProcellaCOR, 2,4 D, Clipper, Copper sulfate, Tribune, Cygnet Plus	\$30,608.00**** *	\$309.86

2022	EWM, curly-leaf pondweed	62 EWM 50 CLP 63 SL	ProcellaCOR, 2,4 D, , Tribune, Captain, Clipper, Copper sulfate Propeller, Cygnet Plus, Sunwet	\$34,613.75	\$500.00
2023	EWM, CLP, algae, coontail, various pondweed spp.	91.75 EWM, 31.5 early CLP, 68.6 SL and Channels	ProcellaCOR and 2,4-D for EWM, Diquat for CLP, Captain, Diquat, Flumioxazin, Cygnet Plus, Sunset for Shoreline and Channels	\$47,106.45* ****	\$256.00

*insufficient data, **approximately \$20,000 funded by LARE, ***approximately \$5,000 funded by LARE, ****80% of EWM treatment funded by LARE *****\$25,489.80 funded by LARE for treatments

In 2023, a survey for curly-leaf pondweed was completed on April 26, 2023. This survey yielded 33 acres of priority curly-leaf pondweed areas that were treated on May 9, 2023. A survey for Eurasian watermilfoil was started after the treatment on May 9 and completed on May 10. From this survey, 91.75 acres of milfoil was marked for treatment. The shoreline was also surveyed at this time. On May 23, the lake was treated for EWM. Liquid 2,4-D was used at 2.0 ppm on 69 acres and ProcellaCOR EC was used on 22.75 acres at 3 PDU/acre foot.

Table 2. Curly-leaf pondweed treatment summary May 9, 2023.

Acres Treated	Product	Rate	Total Product Used
33	Tribune Sunwet	1 gallon/acre 0.25 gallon/acre	33 gal. 8.25 gal.

Site	Acreage	Avg. Depth	Product	Rate
1	69	5	2,4-D	2.0 ppm
2	1.5	3	ProcellaCOR	3 PDU/af
3	11.0	5	ProcellaCOR	3 PDU/af
4	1.0	3	ProcellaCOR	3 PDU/af
5	3.75	3	ProcellaCOR	3 PDU/af
6	1.0	3	ProcellaCOR	3 PDU/af
7	1.0	5	ProcellaCOR	3 PDU/af
8	1.5	4	ProcellaCOR	3 PDU/af
9	1.0	4	ProcellaCOR	3 PDU/af
10	1.0	7	ProcellaCOR	3 PDU/af

Table 3. Eurasian watermilfoil treatment summary May 23, 2023

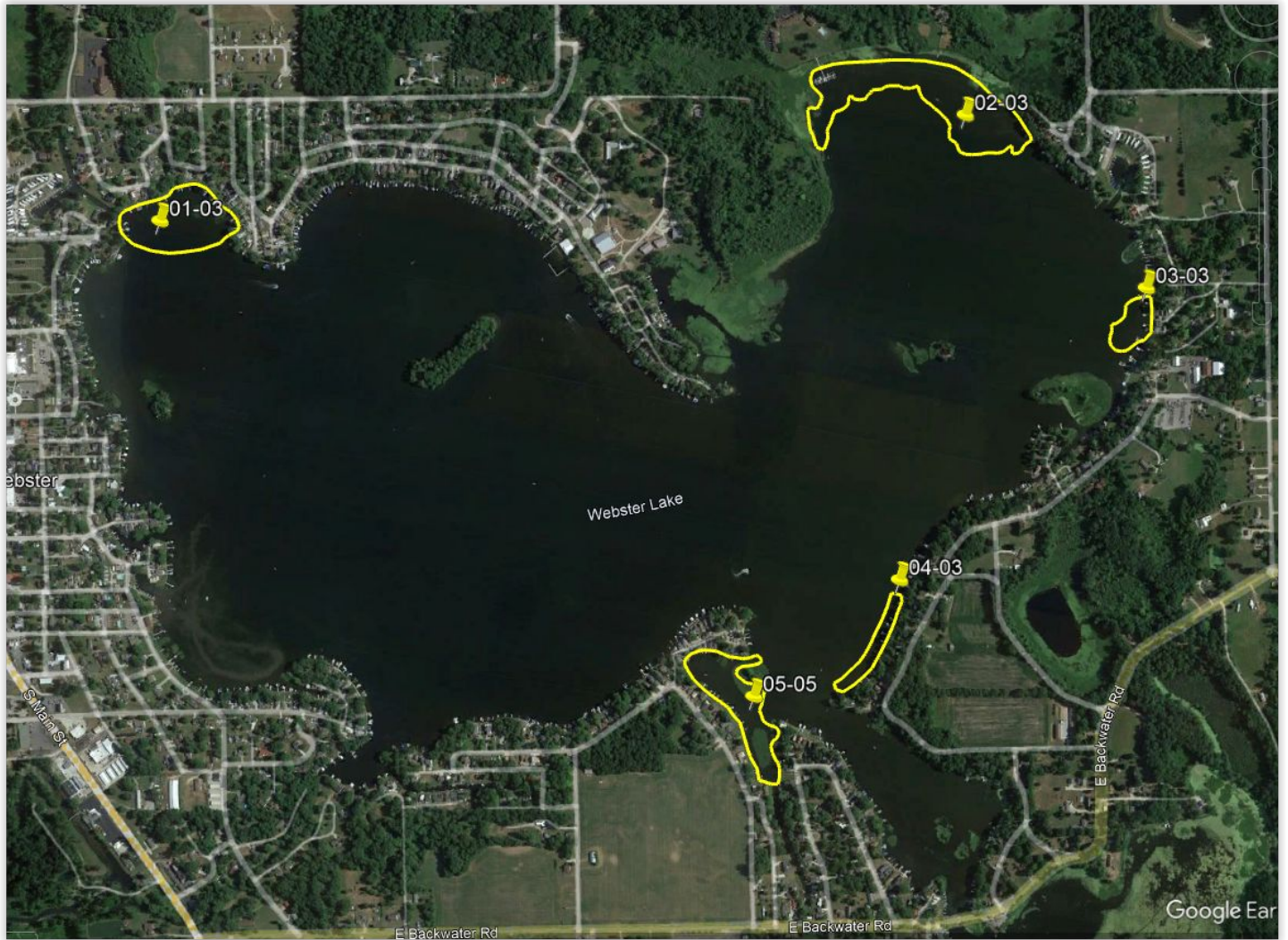


Figure 1. Curly-leaf pondweed treatment May 9, 2023. This treatment was fully funded by the Webster Lake Association.

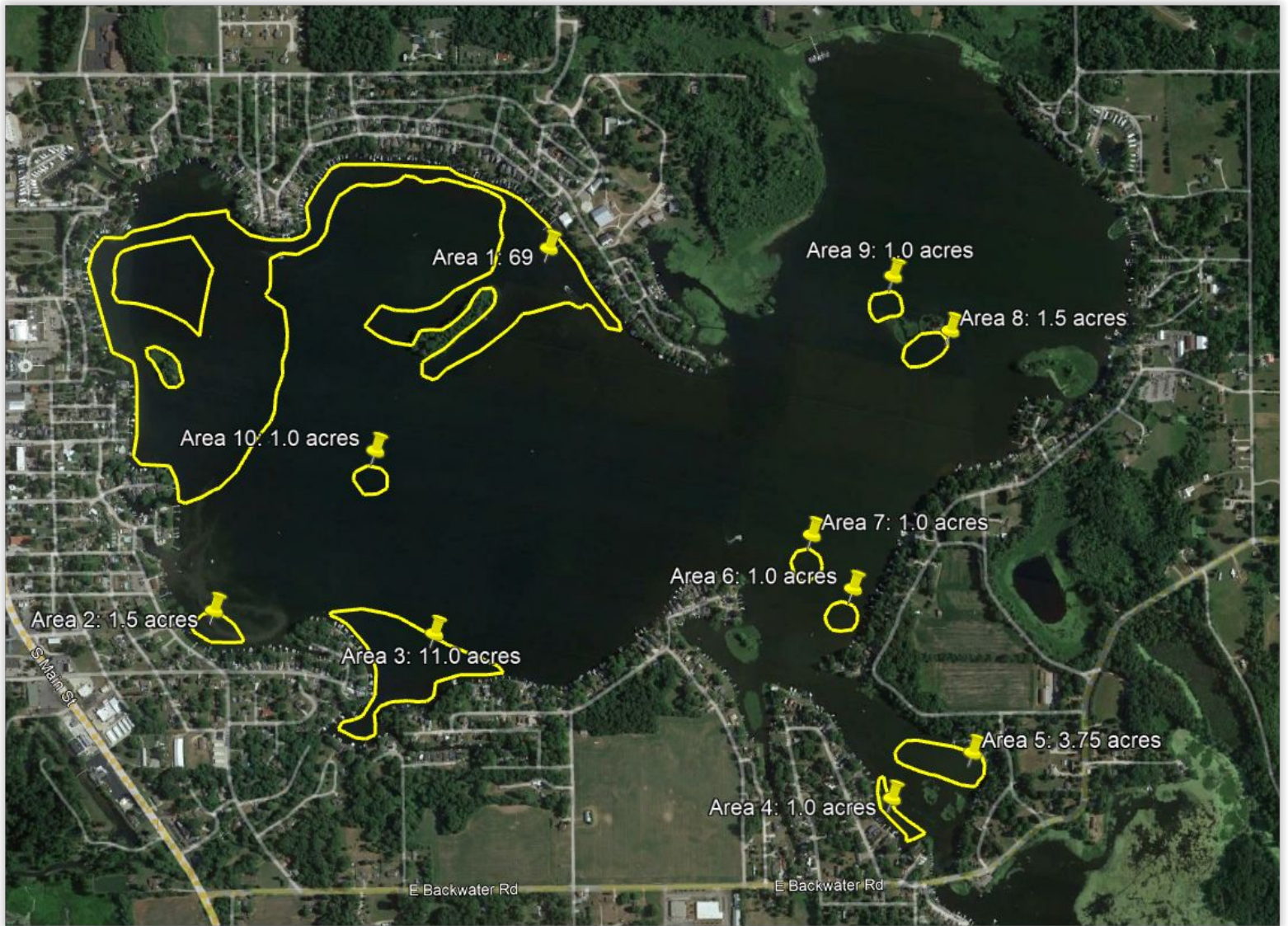


Figure 2. Eurasian watermilfoil LARE treatment May 23, 2023.

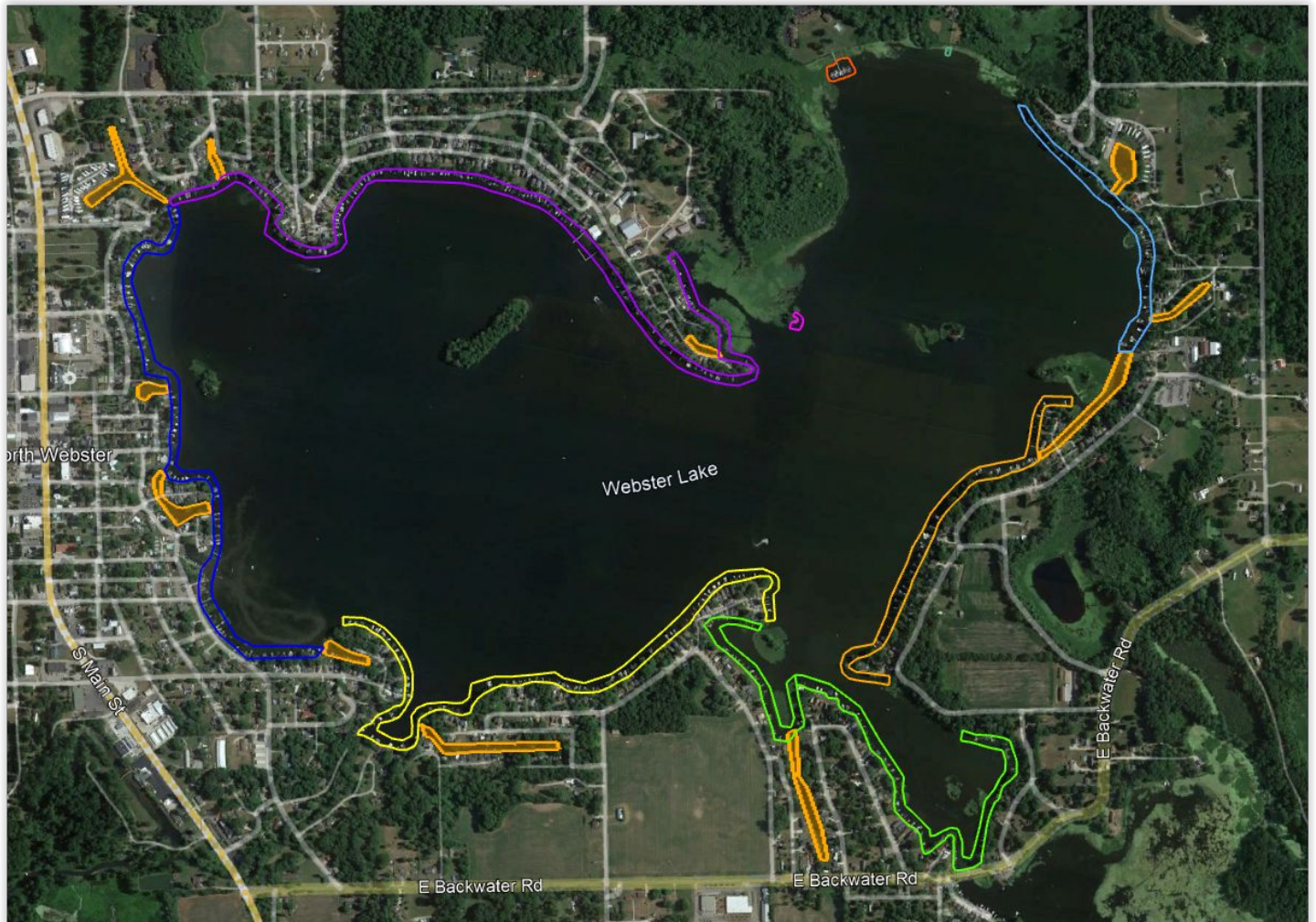


Figure 3. Shoreline and channel treatment May 23, 2023. Fully funded by the Webster Lake Association, about 50 acres of shoreline and 7.25 acres of channels were treated.

Aquatic Plant Community Characterization

Aquatic vegetation sampling is a must to create an effective aquatic vegetation management plan. Sampling provides useful and important data that allows lake managers to identify and locate areas of nuisance and/or beneficial native submersed vegetation throughout the waterbody. It also allows for annual monitoring to create a proactive plan if any changes occur in the plant community. Monitoring also evaluates the effectiveness of management and treatment techniques from season to season. In 2023, invasive species mapping surveys and Tier 2 surveys were completed on Webster Lake.

Methods

The Tier 2 survey fulfills the following objectives:

1. To document the distribution and abundance of submersed aquatic vegetation
2. To compare present distribution and abundance with past distribution and abundance within select areas and at a lake-wide scale

The Tier 2 survey in 2023 followed the Tier 2 survey protocol issued by the IDNR LARE program. Once a site was reached, the boat was slowed to a stop and the coordinates were recorded on a hand-held GPS unit and later downloaded into mapping software. These coordinates are existing from previous surveys. A depth measurement was taken by dropping a two-headed standard sampling rake that was attached to a rope marked off in 1-foot increments. An additional ten feet of rope was released, and the boat was reversed at minimum operating speed for a distance of ten feet. Once the rake is retrieved the individual species are placed on the rake and the abundance on the rake is scored with either a 0 (no plants retrieved), 1 (1-19% of rake teeth filled), 3 (20-99% of rake teeth filled), or 5 (100% of rake teeth filled) (IDNR 2018).

Tier 2 Sampling Results

A Tier 2 survey was completed on August 29, 2023. Secchi depth was recorded at 7 feet 11 inches, slightly down from last year's 8' 10" depth. Native plants were present at 62 of the 90 sites, an increase from 57 in 2022, however, only 5 native species were collected compared to 6 from last year, Richardson's pondweed was not found on this survey. The number of sites that had both Eurasian watermilfoil (17) and curly-leaf pondweed (6) are both increases from last year (Figure 4). The results of the August 2023 Tier 2 survey for Webster Lake can be found in Table 4.

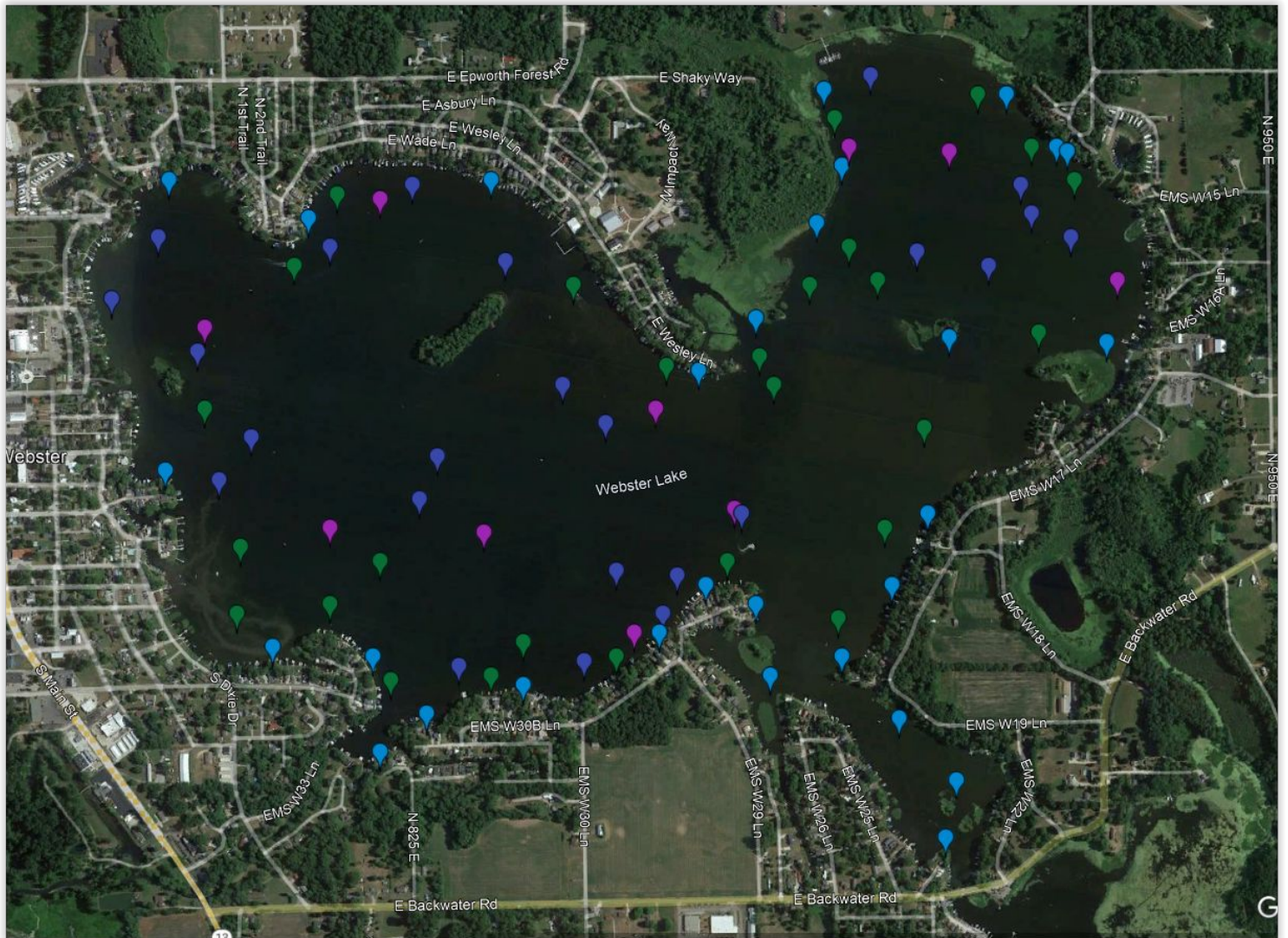


Figure 4. Webster Lake Tier II survey points. Light blue points are 0-5 ft., Green points are 6-10 ft., Dark Blue points are 11-15 ft., and purple points are 16-20.

Table 4. Webster Lake 2023 Tier II Sampling Results.

Occurrence and Abundance of Submersed Aquatic Plants in Lake Webster.

County:	Kosciusko	Secchi (ft):	7'11"	Mean species/site:	1.24
Date:	29/8/2023	Sites with plants:	66	SE Mean species/site:	0.11
Littoral Depth (ft):	17.0	Sites with native plants:	62	Mean native species/site:	0.96
Littoral Sites:	84	Number of species:	8	SE Mean natives/site:	0.08
Total Sites:	90	Number of native species:	5	Species diversity:	0.69
		Maximum species/site:	5	Native species diversity:	0.51

All Depths Species	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
		0	1	3	5	
Coontail	60.0	40.0	34.4	22.2	3.3	23.6
Illinois Pondweed	28.9	71.1	17.8	11.1	0.0	10.2
Sago pondweed	3.3	96.7	3.3	0.0	0.0	0.7
Largeleaf pondweed	1.1	98.9	1.1	0.0	0.0	0.2
Leafy Pondweed	2.2	97.8	1.1	1.1	0.0	0.9

Occurrence and Abundance of Submersed Aquatic Plants in Lake Webster.

County:	Kosciusko	Secchi (ft):	7'11"	Mean species/site:	1.83
Date:	29/8/2023	Sites with plants:	27.00	SE Mean species/site:	0.2
Littoral Depth (ft):	16.0	Sites with native plants:	25	Mean native species/site:	1.23
Littoral Sites:	30	Number of species:	8	SE Mean natives/site:	0.14
Total Sites:	30	Number of native species:	5	Species diversity:	0.77
		Maximum species/site:	5	Native species diversity:	0.62

Depths: 0 to 5 ft	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
Species		0	1	3	5	
Coontail	63.3	36.7	40.0	20.0	3.3	23.3
Illinois Pondweed	40.0	60.0	23.3	16.7	0.0	14.7
Leafy Pondweed	6.7	93.3	3.3	3.3	0.0	2.7
Sago pondweed	10.0	90.0	10.0	0.0	0.0	2.0
Largeleaf pondweed	3.3	96.7	3.3	0.0	0.0	0.7

Occurrence and Abundance of Submersed Aquatic Plants in Lake Webster.

County:	Kosciusko	Secchi (ft):	8'10"	Mean species/site:	0.96
Date:	29/8/2023	Sites with plants:	18	SE Mean species/site:	0.17
Littoral Depth (ft):	17.0	Sites with native plants:	17	Mean native species/site:	0.82
Littoral Sites:	28	Number of species:	4	SE Mean natives/site:	0.15
Total Sites:	28	Number of native species:	2	Species diversity:	0.59
		Maximum species/site:	3	Native species diversity:	0.45

Species	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
		0	1	3	5	
Coontail	53.6	46.4	32.1	17.9	3.6	20.7
Illinois Pondweed	28.6	71.4	17.9	10.7	0.0	10.0

Occurrence and Abundance of Submersed Aquatic Plants in Lake Webster.

County:	Kosciusko	Secchi (ft):	7'11"	Mean species/site:	1.24
Date:	29/8/2023	Sites with plants:	17	SE Mean species/site:	0.15
Littoral Depth (ft):	17.0	Sites with native plants:	17	Mean native species/site:	1.05
Littoral Sites:	21	Number of species:	4	SE Mean natives/site:	0.15
Total Sites:	21	Number of native species:	2	Species diversity:	0.52
		Maximum species/site:	2	Native species diversity:	0.35

Species	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
		0	1	3	5	
Coontail	81.0	19.0	42.9	33.3	4.8	33.3
Illinois Pondweed	23.8	76.2	19.0	4.8	0.0	6.7

Occurrence and Abundance of Submersed Aquatic Plants in Lake Webster.

County:	Kosciusko	Secchi (ft):	7'11"	Mean species/site:	0.33
Date:	29/8/2023	Sites with plants:	3	SE Mean species/site:	0.19
Littoral Depth (ft):	17.0	Sites with native plants:	3	Mean native species/site:	0.33
Littoral Sites:	5	Number of species:	2	SE Mean natives/site:	0.19
Total Sites:	12	Number of native species:	2	Species diversity:	0.38
		Maximum species/site:	2	Native species diversity:	0.38

Species	Frequency of Occurrence	Rake score frequency per species				Plant Dominance
		0	1	3	5	
Coontail	25.0	75.0	8.3	16.7	0.0	11.7
Illinois Pondweed	8.3	91.7	0.0	8.3	0.0	5.0

Plant Sampling Discussion

A summer Tier 2 survey was completed on August 29, 2023. Coontail increased in abundance this year from 50.0% frequency of occurrence to 60% across all depths. Table 5 compares surveys completed on Webster Lake from 2019 through 2023 for all depths (2004-2018 can be found in the appendix). Depths broken down into 5-foot increments can also be found in the Appendix. Eurasian watermilfoil occurrence increased in 2023 from 0% to 18.89% during the summer Tier 2 survey. Curly-leaf pondweed also increased this year from 0% to 6.67%. The number of sites with plants present decreased this year from 74 in 2022 to 66 in 2023, but the number of sites with native plants increased from 57 to 62. The number of native species also decreased from 6 in 2022 to 5 in 2023. Starry stonewort (SSW) was not observed in the Tier II survey again this year. The last confirmed sample was found in 2016 when treatments were done. Unconfirmed fragments were found in 2019, but it has been four years since SSW was found in the main lake.

In 2023, two of the four objectives of the plant management plan were met, except native plant coverage at 68%. The second objective is in reference to spring Tier 2 survey only.

- Keep Eurasian watermilfoil below 10% occurrence in summer Tier 2 surveys – 18.89% in 2023
- Keep curly-leaf pondweed below 10% occurrence in spring Tier 2 surveys – No spring survey
- Keep starry stonewort below 10% occurrence in summer Tier 2 surveys – 0% in 2023
- Maintain native plant coverage at 80% of sample sites in summer Tier 2 Survey – 68% in 2023

Table 5. Historical Tier II Sampling Data 2019 - 2023.

Surveyor	IDNR	Clarke	IDNR	Clarke	IDNR	Clarke	Clarke	SOLitude
Date	8/1/19	8/14/19	8/4/20	8/18/20	8/5/21	8/31/21	8/17/22	8/29/23
Total Sites	90	90	90	90	90	90	90	90
Littoral Sites	90	90	70	90	45	86	86	84
Sites with Plants	64	63	70	83	45	67	57	66
% Sites With Plants	71.1%	70.0%	77.8%	92.2%	50%	77.9%	63.3%	73.3%
Sites with Native Plants	63	63	69	83	44	66	57	62
Percent Littoral Coverage	71.0%	70%	77.8%	92.2%	50%	73.3%	66.2%	93.3%
Maximum Plant Depth	18.0	20.0	19.0	15.0	17.0	17.1	19.1	17.0
Secchi (ft)	6.0	8.2	6.0	3.8	6.0	6.0	8.9	7.9
Number of Species	11	10	8	8	8	10	6	8
Number of Native Species	9	7	6	7	7	8	6	5
Species Diversity	0.65	0.62	0.59	0.63	0.75	0.72	0.66	0.69
Native Species Diversity	0.62	0.56	0.56	0.60	0.72	0.66	0.66	0.51
Mean Native Species/Site	1.03	1.06	1.16	1.48	0.69	1.28	0.93	0.96

All Depths	Relative Frequency							
Eurasian Watermilfoil	2.2	3.3	1.1	6.7	0.0	3.3	0.0	18.89
Curly-leaf pondweed	1.1	2.2	0.0	0.0	4.4	8.9	0.0	6.67
Starry Stonewort	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0
Coontail	60.0	66.7	72.2	82.2	30.0	58.9	50.0	60.0
Sago Pondweed	0.0	4.4	0.0	1.1	0.0	5.6	1.1	3.3
Chara Spp.	6.7	0.0	4.4	8.9	6.7	3.3	4.4	3.3
Slender Naiad	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0
Canada Waterweed	2.2	0.0	0.0	0.0	0.0	1.1	0.0	0.0
Flat-stemmed Pondweed	1.1	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Common Bladderwort	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Small Pondweed	0.0	3.3	0.0	1.1	0.0	8.9	0.0	0.0
Nitella	2.2	0.0	0.0	11.1	0.0	2.2	0.0	0.0
Illinois Pondweed	5.6	18.9	17.8	42.2	16.7	30.0	12.2	28.9
Leafy Pondweed	16.7	0.0	16.7	0.0	10.0	4.4	0.0	2.2
Large-leaved Pondweed	0.0	1.1	0.0	1.1	0.0	0.0	0.0	1.1
White-stemmed Pondweed	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Filamentous algae	41.1	0.0	35.6	0.0	46.7	80.0	62.2	61.1
Narrow leaved Pondweed	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0
Richardson's pondweed	0.0	0.0	0.0	0.0	0.0	2.2	18.9	0.0
Variable pondweed	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0

Plant Management Discussion and Action Plan

An increase in occurrence for EWM was seen in 2023 compared to the 2022 season in which IDNR allowed for 91.75 acres of EWM to be treated in the lake. In 2023, 100 acres of EWM were anticipated and 91.75 acres of EWM were treated. An early season maintenance treatment of 33 acres of curly-leaf pondweed was also completed. Additional treatments were made for nuisance native vegetation in the 2023 season along the shoreline. Due to the treatments in 2023, it is estimated to treat no more than 100 acres of EWM in 2024. It is also recommended to treat approximately 68 acres of shoreline and channels for nuisance species that are limiting navigation and multiple recreational uses. It is recommended that the association plan on treating 50 acres of EWM with 2,4-D at 2.0 ppm and 50 acres of EWM with ProcellaCOR at 3PDU’s in April or early May. It is also recommended that the association treat 50 acres of CLP with an early-season Diquat treatment to be completed before water temperatures reach 60 degrees. If late summer issues with Coontail impede navigation, additional treatment would be requested of the DNR at that time. A spring Tier 2 survey is recommended in 2024 to document the submersed aquatic vegetation community prior to invasive species treatments.

Two sites of starry stonewort were found in 2019, but zero sites in the last four years. It is important for this invasive species to be controlled in 2024 if found. There is potential for LARE maintenance funding for starry stonewort control. It is not recommended that WLCA request LARE funding for treatment of the two sites in 2024 due to the lack of presence in the last four seasons.

It is our recommendation that WLCA apply to LARE for \$54, 072 for the treatment of EWM, \$9,000 for early season curly-leaf pondweed, and \$5,750 for an Aquatic Management Plan update (Table 6). The reason for the increase in price is for the increase in acreage requested for ProcellaCOR. LARE funding has a maximum cap of \$35,000. A copy of this grant application is in the Appendix. Total LARE Grant requested is \$54,072.

Plant Management Action Plan	Estimated Cost
Invasive Surveys (3), Tier II Survey (Spring & Summer) and Plan Update (Nov)	\$5,750
Up to 50 acres of EWM treated (May) 2,4-D at 2.0 ppm	\$15,415
Up to 50 acres early season (April) CLP treatment with Diquat at 1.0 gal. per acre	\$9,000
Up to 50 acres of EWM treated ProcellaCOR EC at 3 PDUs/ac. ft.*	\$37,425
Total	\$67,590
Total LARE Grant Requested	\$54,072

Table 6. Proposed WLCA plant management budget for 2024.

*estimate based on 3 PDU’s per acre, rate may change due to the scale of the treatment.



Figure 5. Map of estimated CLP treatment areas for LARE 2024.

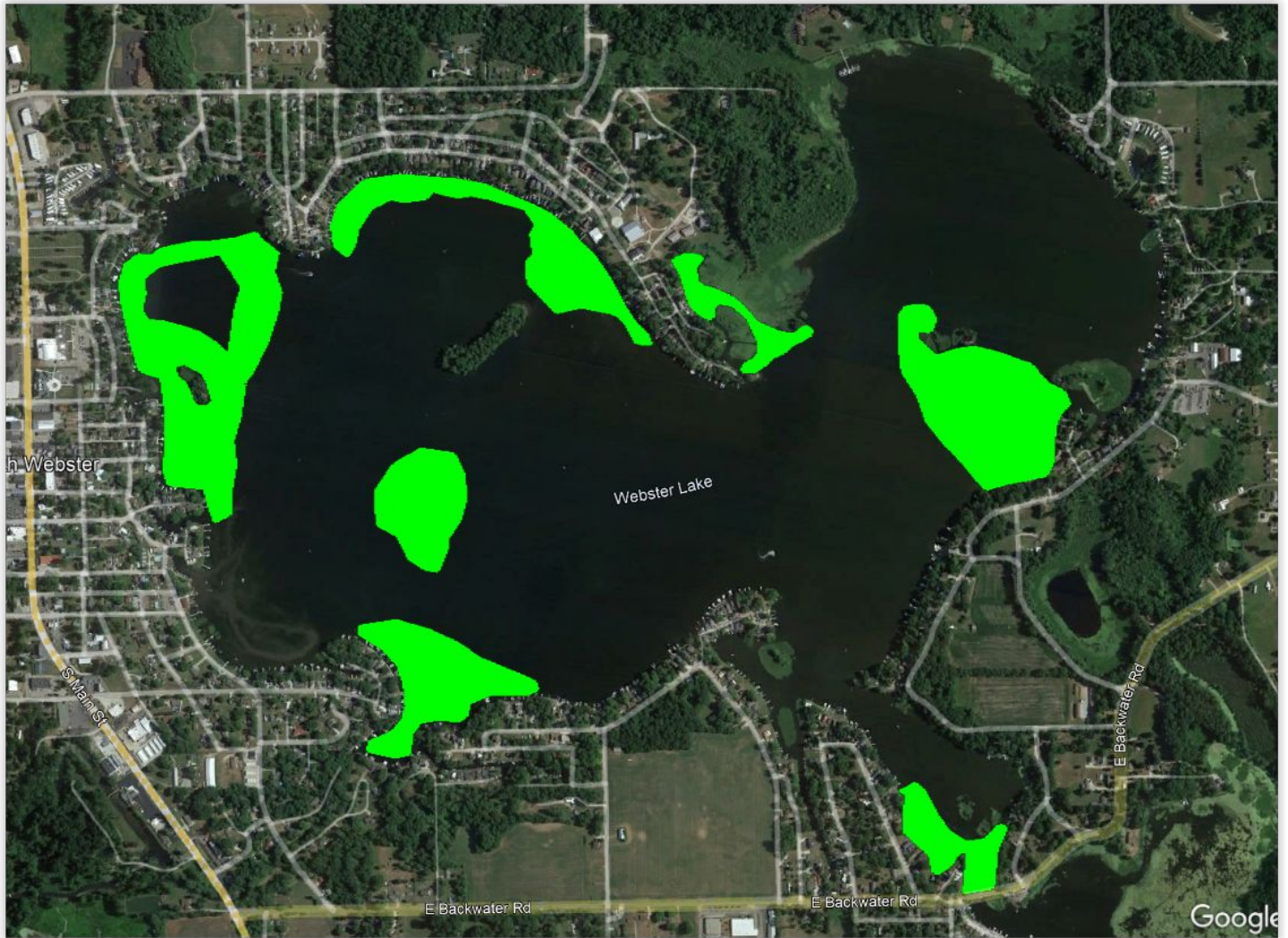


Figure 6. Map of estimated EWM treatment areas for LARE 2024.

Public Involvement

A public meeting was held for the WLCA on August 12, 2022. This meeting was created to gain public opinion and support. No residents attended the meeting outside of the WLCA board. To meet requirements of the LARE grant program, an electronic survey was sent out to residents around the lake area to gain insight to their history and needs. There were only 70 completed electronic questionnaires compared to 218 in 2022. The results from the survey are below in Table 7.

Table 7. 2023 Public Survey Results

2023 Webster Lake Public Use Survey		
Are you a lake property owner?	Yes - 70	No - 0
Are you currently a member of your lake association?	Yes - 61	No - 9
How many watercrafts do you currently have registered in Indiana?	0 - 5 1 - 29 2 - 25 3 or more - 11	
Do you have a current Indiana fishing license?	Yes - 37	No - 33
How many years have you been at the lake?	5 or less - 8 5 - 10 - 11 Over 10 - 51	
How do you use the lake?	Boating - 68 Swimming - 62 Fishing - 41 Irrigation - 10 Kayak/Canoe - 3 Other - 1	
Do you have aquatic plants at your shoreline in nuisance quantities?	Yes - 47	No - 23
Do you donate funding towards aquatic plant control?	Yes - 63	No - 7
Do aquatic plants interfere with your use or enjoyment of the lake?	Yes - 53	No - 17

Do you support efforts to control aquatic plants in the lake?	Yes - 67	No - 3
Are you aware that LARE funds can only be used for controlling invasive plants, not native plants?	Yes - 55	No - 15
Mark any of these you think are problems on your lake:	Too many aquatic plants Dredging Needed Lack of speed enforcement Too many watercraft Poor Water Quality Too much fishing/fish stocking Boating too close to docks Other	43 45 17 3 18 9 2 11

Please add any additional comments:

- The WLCA does a great job of managing the lake within the constraints it has. I would like to see a continued aggressive approach towards weed management and preference towards the needs of the homeowners on the lake versus the many traveling fisherman. Long term, there are many issues facing the lake that needs to be addressed such as dredging, weed management, and sewer for the east side of the lake. Strong leadership and support is needed in order to ensure long-term health of the lake for generations to come.
- Curly-leaf pondweed is becoming a problem. I understand needing weed cover for fish, but Curly-leaf pondweed is an invasive species and we seem to not be able to always treat it as that on Webster Lake. I had a real not patch of large-leaf pondweed (a native weed) in front of my home on Webster for the past few years but Curly-leaf pondweed started moving in and overtook the large-leaf pondweed this year.
- I am among many that feel the spotlight from the strip club ruins our peaceful lake night sky. Please Please find a way to protect the many lake owners' right to a peaceful night sky at our lake houses. Its such a shame and so intrusive. I hope you can help! I am happy to volunteer to research anything you might need. Thank you!
- We have been property owners and full time residents on Webster lake since 1969. We have such a mess of weeds that have floated on to our shoreline and they just keep accumulating. We have paid \$1000.00 to have just some of the weeds hauled away. We have never had this kind weed problem in all the years we have lived here.
- Keep up the good work, lake water looks much better. Thank you and my grandchildren thank you :) Would love to see the large spotlight that rotates around the lake nightly stopped. I believe Stimmelators Gentlemens Club are the owners. I also think it bothers some of the wildlife on the island near to us.
- The weeds are awful. When we try to swim in 20ft water you can still feel the weeds on your feet. This isn't very pleasant. If we had less weeds more people would enjoy the lake and thats what lake webster is all about. Please take this into consideration when deciding what action to make! Thank you!!
- LARE funds are being wasted in areas with no plant growth. Dredging of channels is necessary for good lake health, channels are pumping excessive algae generating nutrients into the lake in massive quantities.
- My answers are in general over the past few years, but I will say, the lake was the cleanest this year I've ever seen it. Still not great, but very good. I love it, and I hope we stay on the same trajectory.
- Investing in lake front property and not being able to jump off the pier without getting tangled in actively growing weeds is a HUGE concern. We are constantly fighting to keep our swim area weed free.

- We are so disappointed that we purchased a home on Webster Lake due to the weeds and muck. Please help us retain the property value as well as the quality of the lake.
- I'm having flashbacks of the lake aquatic devastation 10 years ago that made Lake Webster a swimming/ski lake for some on the board and devoid of all vegetation.
- I wanted to talk to someone about the application of chemicals on Webster lake. Could you please call me? Thanks Doug Himelick 217-390-5180
- Deep muck in Echo Bay causing boat engines to overheat and burn up impellers. Also unable to have boat lift set because of muck problem.
- Dredging has to be done. Many areas on the lake are way too shallow. Any help from the State would be greatly appreciated.
- Seems like not seeing perch, blue gill and sun as much as before. And get rid of the hideous night light from night shift.
- Need Sonar Treatment to help effective control the weeds in the lake for more than 3 months each year after treatment
- Very poor weed control this year. Too many bass tournaments. Definitely need dredging work done in several areas.
- Nuisance quantity of weeds typically early each summer. Dredging will likely be needed in southwest corner of lake
- I believe the association does a great job, within the financial and legal limits, of addressing aquatic weeds.
- To me the lake is doing pretty good Not all things can be controlled our lake assoc.board does a Great job !!
- Weed chop from boats combined with other weeds (such as duck weed) is the biggest problem in my lake channel
- Absolutely hate the spotlight from Stemmelators Night Club. Very disruptive to a peaceful night at the lake
- Dredging is needed in our area and other areas in the lake. Weed control is an annual challenge.
- We are unable to use the lake for certain water sports because we have too many weeds.
- My pier is on a channel with road runoff pipe feeding in. debris make it un navigable
- Need to charge for using lake if not a lake property owner, I.e. fishing tournaments
- The plants at our shoreline prevent us from being able to swim and utilize our area
- Need to work on the water quality and vegetation up stream to better the lake
- Algae blooms and weed chop floating in are the major source of problems.
- Too much and too often duckweed and feet slicing zebra mussels
- Alge never seen it this bad the last several years
- Would like access to city water and sewage.
- aquatic plants . It is really awful...
- Algae is becoming more of a problem
- Webster Bay needs dredging
- The lake needs work.

Literature Cited

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- Aquatic Control Inc. 2017. Webster Lake Aquatic Vegetation Management Plan 2016 Update. Prepared for the Webster Lake Conservation Association. North Webster, IN.
- IDNR 2018. Aquatic Vegetation Survey Protocol. IN Department of Natural Resources. Division of Fish & Wildlife, Indianapolis, IN

Appendix

2023 Tier II Data.

WPT	Lat	Long	Depth Check.	Rake Score.	EWM	CLP	Filamentous Algae	Chara	IL PW	Leafy Pondweed	Sago Pondweed	Large leaf
1	41.31750	-85.67150	2.5	1			P					
2	41.31870	-85.67120	4	0			P					
3	41.32000	-85.67280	4.5	3	1							
4	41.32130	-85.67440	4	1			P					
5	41.32210	-85.67450	6.5	0			P					
6	41.32280	-85.67300	4.5	3			P		1			
7	41.32400	-85.67320	6	3	1		P					
8	41.32430	-85.67200	3.5	3	1		P		1			
9	41.32610	-85.67210	7	1			P					
10	41.32800	-85.67140	5	5	3	1				1		1
11	41.32810	-85.66890	6.5	1			P		1			
12	41.32790	-85.66700	2.5	1	1							
13	41.32920	-85.66670	16.5	0			P					
14	41.33010	-85.66800	12	1			P					
15	41.32950	-85.67030	14.5	3		1	P					
16	41.32980	-85.67230	12	3			P		1			
17	41.33060	-85.66910	12.5	3								
18	41.33120	-85.66940	14	1		1	P					
19	41.33130	-85.66790	6.5	0			P					
20	41.33190	-85.66810	4	5	1		P			3		
21	41.33200	-85.66840	3	3	1		P		1			
22	41.33200	-85.66910	7	3	1	1	P					
23	41.33190	-85.67140	17.5	0			P					
24	41.33310	-85.66980	4.5	3		1	P					
25	41.33310	-85.67060	10	3			P		1			
26	41.33350	-85.67360	3.5	3	3		P	5				
27	41.33320	-85.67490	3.5	0			P					
28	41.33260	-85.67460	7.5	1			P					
29	41.33200	-85.67420	17.5	0			P					
30	41.33160	-85.67440	3	3	1		P					

31	41.33040	-85.67510	4.5	3	1	P						
32	41.32990	-85.67420	6.5	1		P						
33	41.32920	-85.67340	7.5	0		P						
34	41.32910	-85.67530	7	0		P						
35	41.32840	-85.67680	3.5	5		P						
36	41.32760	-85.67670	6.5	0		P						
37	41.32700	-85.67630	7	0		P						
38	41.32730	-85.67840	3.5	3						3		
39	41.32740	-85.67930	9	3		P				3		
40	41.32650	-85.67960	18.5	0								
41	41.32620	-85.68100	11.5	3		P				1		
42	41.32700	-85.68220	13.5	0								
43	41.32910	-85.68190	6	1		P						
44	41.32960	-85.68380	16.5	0								
45	41.33130	-85.68420	5	3								
46	41.33120	-85.68640	11	3	1							
47	41.33090	-85.68730	18.5	0								
48	41.33100	-85.68850	7.5	3								
49	41.33050	-85.68930	4	5	1	P				3		1
50	41.32990	-85.68870	11	3								
51	41.32950	-85.68970	7.5	0		P						
52	41.33130	-85.69320	3	1						1		
53	41.33010	-85.69350	15	5						3		
54	41.32880	-85.69480	13.5	3						1		
55	41.32820	-85.69220	19	3								
56	41.32770	-85.69240	10.5	5		P						
57	41.32650	-85.69220	6	1	1	P						
58	41.32590	-85.69090	10.5	3								
59	41.32500	-85.69180	11.5	3		P						
60	41.32520	-85.69330	4.5	5						3		

61	41.32360	-85.69120	7	0									
62	41.32220	-85.69130	7	3			P						
63	41.32150	-85.69030	2.5	1			P	1				1	
64	41.32240	-85.68870	10	5			P			1			
65	41.32400	-85.68870	18	0									
66	41.32330	-85.68730	7	3						1			
67	41.32130	-85.68750	5	1						1		1	
68	41.32080	-85.68700	9	3						1			
69	41.31930	-85.68730	4.5	3	1	1				1			
70	41.32010	-85.68600	4	5	1		P			3			
71	41.32110	-85.68510	15	3						1			
72	41.32090	-85.68420	7.5	3			P			3			
73	41.32070	-85.68330	4.5	3			P			3			
74	41.32160	-85.68330	7.5	3						3			
75	41.32120	-85.68160	13.5	3	1								
76	41.32130	-85.68070	7	0									
77	41.32180	-85.68020	17	5						3			
78	41.32180	-85.67950	2	3			P	1					
79	41.32220	-85.67940	14.5	0			P						
80	41.32300	-85.67900	11	1			P						
81	41.32310	-85.68070	17.5	0									
82	41.32390	-85.68440	17	1									
83	41.32460	-85.68620	14	1									
84	41.32550	-85.68570	14.5	1			P						
85	41.32280	-858.67820	3.5	5			P			1			
86	41.32330	-85.67760	7	1			P						
87	41.32430	-85.67720	14.5	0			P						
88	41.32440	-85.67740	16	0									
89	41.32240	-85.67680	4	0			P						
90	41.32090	-84.67640	3.5	1			P						

Tier II Historical Data 2004-2018

Surveyor	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	IDNR	Clarke
Date (m/y)	8/04	8/05	8/06	8/08	8/07	7/09	9/10	8/11	8/12	8/13	8/14	8/15	4/16	8/16	8/17	8/18	8/18
Total Sites	160	160	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Littoral Sites	159	160	90	90	87	88	65	65	80	86	80	84	89	89	90	90	90
Sites with Plants	125	146	78	78	68	77	29	41	46	48	56	71	67	72	75	69	64
% Sites With Plants	78.1 %	91.3 %	86.7%	86.7 %	75.6%	85.6 %	32.2%	45.6%	51.1%	53.3%	62.2%	78.9%	74.4%	80.0%	83.3%	76.6%	71.1%
Sites with Native Plants	113	144	78	78	68	76	29	41	43	35	53	68	46	72	74	69	64
Percent Littoral Coverage	79%	91%	87%	87%	78%	88%	45%	63%	58%	56%	70%	85%	75%	81%	83%	76.6%	71.0%
Maximum Plant Depth	12	14	20	20	18	17	8	9.0	12.0	15.0	15.0	18.0	19.0	19.0	20.0	19.5	20.0
Secchi (ft)	5	8	9	9	7	5	5	3.5	3.0	5.0	8.5	7.5	7.0	4.0	8.5	4.0	2.75
Number of Species	13	15	7	7	8	10	6	10	9	10	9	13	9	9	9	6	6
Number of Native Species	11	13	6	6	7	8	6	9	7	8	7	11	7	8	8	5	5
Species Diversity	0.85	0.80	0.60	0.60	0.40	0.68	0.71	0.77	0.79	0.78	0.79	0.69	0.68	0.51	0.56	0.44	0.53
Native Species Diversity	0.80	0.74	0.59	0.59	0.37	0.58	0.71	0.76	0.73	0.80	0.73	0.57	0.48	0.45	0.53	0.42	0.5
Mean Native Species/Site	1.21	1.49	1.27	1.27	0.92	1.31	0.40	0.72	0.71	0.50	0.99	1.11	0.63	1.08	1.16	0.99	0.94

Species Frequency of Occurrence - All Depths 2004-2018

Date (m/y)	8/04	8/05	8/06	8/08	8/07	7/09	9/10	8/11	8/12	8/13	8/14	8/15	4/16	8/16	8/17	8/18	8/18
EWM	12.5	6.3	1.1	2.2	1.1	21.1	0.0	0.0	7.8	34.4	40.0	30.0	47.8	6.7	3.3	2.2	2.2
CLP	21.3	20.0	0.0	0.0	0.0	3.3	0.0	1.1	3.3	2.2	1.1	0.0	6.7	0.0	0.0	0.0	0.0
Starry SW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Coon T	36.9	66.3	70.0	72.2	74.4	74.4	17.8	22.2	28.9	11.1	37.8	71.1	44.4	73.3	76.7	73.3	61.1
Sago PW	3.8	7.5	2.2	2.2	5.6	1.1	10.0	25.6	18.9	11.1	0.0	3.3	0.0	1.1	0.0	0.0	0.0
Chara .	11.3	13.8	10.0	7.8	10.0	4.4	6.7	5.6	3.3	13.3	18.9	4.4	7.8	5.6	4.4	2.2	5.6
SL Naiad	22.5	28.8	22.2	6.7	30.0	40.0	0.0	3.3	10.0	7.8	25.6	8.9	1.1	0.0	3.3	1.1	1.1
Canada WW	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	2.2	0.0	1.1	0.0	0.0
Flat-stemmed PW	29.4	9.4	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Horned PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bladder wort	0.0	0.6	0.0	1.1	0.0	0.0	0.0	1.1	0.0	0.0	1.1	0.0	0.0	1.1	0.0	0.0	0.0
Water SG	5.6	8.8	1.1	1.1	2.2	2.2	2.2	4.4	0.0	2.2	0.0	2.2	0.0	0.0	0.0	0.0	0.0
Unidentified PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small PW	7.5	3.1	1.1	0.0	0.0	4.4	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitella	1.3	0.6	1.1	0.0	0.0	0.0	2.2	5.6	0.0	0.0	0.0	3.3	1.1	2.2	2.2	0.0	0.0
IL PW	0.6	0.0	0.0	0.0	0.0	2.2	1.1	0.0	0.0	0.0	1.1	1.1	4.4	15.6	2.2	15.6	25.6
Leafy PW	0.0	0.0	1.1	0.0	4.4	2.2	0.0	2.2	6.7	2.2	12.2	5.6	0.0	1.1	11.1	6.7	0.0
V EWM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SP Naiad	1.9	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Large Leaf PW	0.0	3.1	1.1	0.0	0.0	0.0	0.0	2.2	2.2	0.0	0.0	8.9	2.2	0.0	14.4	0.0	0.0
White Stemmed PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0
N EWM	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Fil. algae	70.0	0.0	0.0	0.0	0.0	42.2	60.0	52.2	43.3	46.7	54.4	48.9	37.8	56.7	40.0	35.6	0.0
Narrow leaved PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Richards on's PW								0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variable PW								0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

All Species Frequency of Occurrence - 0-5 ft

Date (m/y)	8/04	8/05	8/06	8/08	8/07	7/09	9/10	8/11	8/12	8/13	8/14	8/15	4/16	8/16	8/17	8/18	8/18
EWM	18.2	9.6	0.0	3.4	0.0	32.3	0.0	0.0	6.9	37.0	43.9	34.5	55.2	6.9	6.9	0.0	3.4
CLP	20.0	19.2	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0
Coontail	45.5	63.5	34.8	58.6	69.4	67.7	26.9	30.4	40.5	22.2	61.0	82.8	58.6	69.0	72.4	69.0	62.1
Sago PW	0.0	135.5	4.3	3.4	5.6	3.2	7.7	39.1	17.2	3.7	0.0	10.3	0.0	3.4	0.0	0.0	0.0
Starry SW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chara	18.2	23.1	30.4	17.2	22.2	12.9	19.2	21.7	6.9	18.5	26.8	10.3	20.7	13.8	10.3	6.9	6.9
SL Naiad	29.1	26.9	21.7	13.8	41.7	74.2	0.0	4.3	17.2	14.8	0.0	6.9	3.4	0.0	0.0	0.0	0.0
Com Naiad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0
Can. WW	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	6.4	6.9	0.0	3.4	0.0	0.0
FS PW	23.6	5.8	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bladder wort	0.0	1.9	0.0	3.4	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water SG	3.6	9.6	0.0	0.0	0.0	3.2	0.0	4.3	0.0	3.7	0.0	3.4	0.0	0.0	0.0	0.0	0.0
Unidentified PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small PW	1.8	1.9	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitella	1.8	1.9	4.3	0.0	0.0	0.0	7.7	8.7	0.0	0.0	0.0	10.3	3.4	6.9	6.9	0.0	0.0
IL PW	0.0	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	3.4	10.3	13.8	0.0	24.1	17.2
Leafy PW	0.0	0.0	4.3	0.0	0.0	0.0	0.0	4.3	6.9	3.7	7.3	6.9	0.0	0.0	6.9	10.3	0.0
SP Naiad	5.5	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LL PW	0.0	1.9	0.0	0.0	0.0	0.0	0.0	8.7	6.9	0.0	0.0	10.3	0.0	0.0	13.8	0.0	0.0
NL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4
N EWM	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0
Fil. Algae	65.5	0.0	0.0	0.0	0.0	58.1	92.3	73.9	75.9	77.8	73.2	69.0	51.7	75.9	55.2	51.7	0.0
Richardson's PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Variable PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slender PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Species Frequency of Occurrence - 5 - 10 ft.

Date (m/y)	8/04	8/05	8/06	8/08	8/07	7/09	9/10	8/11	8/12	8/13	8/14	8/15	4/16	8/16	8/17	8/18	8/18
EWM	12.2	0.0	2.7	2.3	2.6	20.0	0.0	0.0	9.5	45.5	58.1	36.7	66.7	13.3	3.3	7.4	0.0
CLP	26.8	13.6	0.0	0.0	0.0	5.0	0.0	2.1	7.1	4.5	3.2	0.0	11.1	0.0	0.0	0.0	0.0
Starry SW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0
Coontail	36.6	77.3	86.5	88.6	84.2	87.5	19.1	27.1	40.5	9.1	29.0	73.3	55.6	86.7	83.3	74.1	67.6
Sago PW	2.4	4.5	2.7	2.3	5.3	0.0	14.9	29.1	28.6	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chara	2.4	0.0	5.4	4.5	2.6	0.0	2.1	0.0	2.4	13.6	19.4	3.3	0.0	3.3	3.3	0.0	2.9
SL Naiad	14.6	34.1	24.3	4.5	28.9	32.5	0.0	4.2	9.5	4.5	45.2	3.3	0.0	0.0	6.7	0.0	0.0
FS PW	29.3	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bladder wort	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	3.3	0.0	3.3	0.0	0.0	0.0
Water SG	9.8	18.2	2.7	2.3	5.3	2.5	4.3	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small PW	7.3	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IL PW	2.4	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	3.2	0.0	3.7	20.0	3.3	14.8	47.1
Leafy PW	0.0	0.0	0.0	0.0	7.9	5.0	0.0	2.1	9.5	2.3	25.8	3.3	0.0	0.0	16.7	0.0	0.0
LL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	13.3	0.0	0.0
Var PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N EWM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
Fil. Algae	80.5	0.0	0.0	0.0	0.0	35.0	57.4	58.3	35.7	36.4	48.4	56.7	48.1	70.0	53.3	51.9	0.0
SL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Richards on's PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Species Frequency of Occurrence - 11-15 ft.

Date (m/y)	8/04	8/05	8/06	8/08	8/07	7/09	9/10	8/11	8/12	8/13	8/14	8/15	4/16	8/16	8/17	8/18	8/18
EWM	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	7.1	6.7	0.0	28.6	37.5	0.0	0.0	0	5.9
CLP	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Coontail	25.0	25.0	100.0	71.4	75.0	64.3	0.0	0.0	7.1	0.0	0.0	71.4	33.3	81.0	90.5	91.7	58.8
Chara	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	4.2	0.0	0.0	0	0.0
SL Naiad	25.0	0.0	22.2	0.0	8.3	0.0	0.0	0.0	0.0	6.7	12.5	19.0	0.0	0.0	4.8	0	0.0
FS PW	25.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Water SG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0	0.0
Small PW	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Leafy PW	0.0	0.0	5.6	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	9.5	0.0	4.8	14.3	12.5	0.0
LL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	19.0	0	0.0
IL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	4.8	12.5	5.9
Fil. Algae	25.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	14.3	26.7	25.0	23.8	25.0	23.8	9.5	12.5	0.0
Richards on's PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Var PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Species Frequency of Occurrence - 16-20 ft.

Date (m/y)	8/04	8/05	8/06	8/08	8/07	7/09	9/10	8/11	8/12	8/13	8/14	8/15	4/16	8/16	8/17	8/18	8/18
Coontail	0.0	0.0	41.7	40.0	25.0	40.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	30.0	40.0	40.0	40.0
Sago PW	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0
IL PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
SL Naiad	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0
Chara	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
CLP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
FS PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WS PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Leafy PW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fil. algae	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	30.0	20.0	0.0	0.0

List of Aquatic Plant Names

Common Name	Scientific Name	Common Name	Scientific Name
Coontail	<i>Ceratophyllum demersum</i>	Common Bladderwort	<i>Utricularia marcrohiza</i>
Illinois pondweed	<i>Potamogeton illinoensis</i>	Water Stargrass	<i>Heteranthera dubia</i>
EURASIAN WATERMILFOIL*	<i>MYRIOPHYLLUM SPICATUM*</i>	Unidentified pondweed	<i>Potamogeton sp.</i>
Small pondweed	<i>Potamogeton pusillus</i>	Nitella	<i>Nitella sp.</i>
Narrow-leaved pondweed	<i>Potamogeton sp.</i>	Leafy pondweed	<i>Potamogeton foliosus</i>
CURLY-LEAF PONDWEED*	<i>POTAMOGETON CRISPUS*</i>	SPINY NAIAD*	<i>NAJAS MARINA*</i>
Horned pondweed	<i>Zannichellia palustris</i>	Northern watermilfoil	<i>Myriophyllum sibiricum</i>
STARRY STONEWORT*	<i>NITELLOPSIS OBTUSA*</i>	Filamentous algae	<i>Algae</i>
Variable watermilfoil	<i>Myriophyllum heterophyllum</i>	White-stemmed pondweed	<i>Potamogeton praelongus</i>
Chara Spp.	<i>Chara sp.</i>	Richardson's pondweed	<i>Potamogeton richardsonii</i>
Slender naiad	<i>Najas flexilis</i>	Large-leaved pondweed	<i>Potamogeton amplifolius</i>
Common naiad	<i>Najas flexilis</i>	Sago pondweed	<i>Stuckenia pectinata</i>
Canada waterweed	<i>Elodea canadensis</i>	Variable pondweed	<i>Potamogeton gramineus</i>
Flat-stemmed pondweed	<i>Potamogeton zosteriformis</i>	Slender pondweed	<i>Potamogeton pusillus</i>

*Invasive species