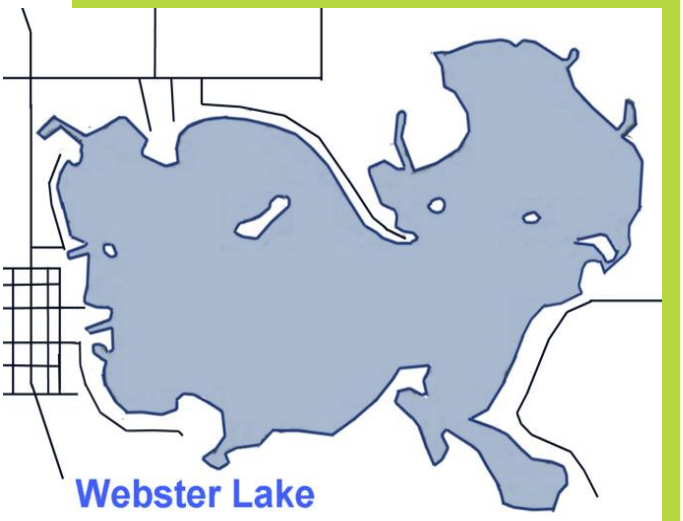
2018

Webster Lake Aquatic Vegetation Management Plan Update



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Acknowledgements

Clarke Aquatic Services would like to thank the Indiana Department of Natural Resources Division of Fish and Wildlife's LARE Program for providing the funding and guidance on this project. Clarke Aquatic Services passion is to make communities around the world more livable, safe and comfortable. Our goal is to help preserve and enhance lakes and ponds in an environmentally-friendly manner so you and your community can enjoy the recreational and aesthetic value of your waterway to the fullest. We would be remiss if we didn't include a special thank you to Mike Wyrick and the Webster Lake Conservation Association, along with Joey Leech (IDNR) and Rod Edgell of the LARE program.
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.

Clarke Aquatic Services (CAS) was contracted by the Webster Lake Conservation Association (WLCA) to complete the aquatic vegetation sampling and treatment, and to update the Webster Lake Aquatic Vegetation Management Plan (AVMP) in 2018. The primary invasive species within Webster Lake is Eurasian watermilfoil, with curly-leaf pondweed (*Potamogeton crispus*) and starry stonewort (*Nitellopsis obtusa*) occurring in previous surveys. Another common native species of submerged aquatic vegetation present in Webster Lake that has reached nuisance levels is Coontail (*Ceratophyllum demersum*). Due to the extensive shallow areas of the lake, a large portion of the lake can become heavily infested with dense growth of these nuisance species. Over 100 acres of Eurasian watermilfoil has been documented since 2014. During the 2018 season the lake set a record for the number of acres of Eurasian watermilfoil treated at 175.

WLCA was awarded a $26,600 grant from the Lake and River Enhancement (LARE) program for selective Eurasian watermilfoil (EWM) treatments, sampling, and plan update in 2018. An invasive survey was completed on May 17, 2018. The survey documented 175 acres of Eurasian watermilfoil which was in excess of the estimated 100 acres of EWM in 2017. LARE grant funding was insufficient to cover the additional acreage of treatment for 2018.

These areas were treated on May 23, 2018 with 2.0 ppm of 2,4-D liquid. A Tier 2 survey completed on August 8, 2018, found only 2 sites containing Eurasian watermilfoil. No Starry stonewort was collected or observed during the 2018 season. Starry stonewort has not been observed in the lake since 2016 due to the rapid response to its discovery.

Vegetation controls in 2018 met the LARE objectives and goals of this update by limiting nuisance plant issues in high use areas and maintaining overall plant coverage throughout the lake. A similar strategy for the 2019 season is recommended in this update. The WLCA recognizes an additional need for 16 acres of early season curly leaf pondweed treatment on the east end of Webster Lake as it impedes navigation and causes for plants to be fragmented and dispersed throughout the lake. An additional treatment for natives in the summer months will greatly improve navigation as well during July and August in the main body of the lake as the lake has historically shallow areas that impede use and navigation.

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 two primary nuisance species within Webster

Lake is the invasive species Eurasian watermilfoil and curly-leaf pondweed. Starry stonewort if left unmanaged will have significant impacts on lake use.

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 impact 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 10% occurrence in spring Tier 2 surveys
- 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, native plant coverage exceeded the objective at 94%, which met above and beyond the 80% outlined in the goals section. All objectives were met for 2018.

Table 1. Webster Lake Treatment History 1988-2018.

Year	Targeted Vegetation	Treated Acres	Chemical Approved	Total Cost	Per Acre Cost
1988	Eurasian watermilfoil, Pondweed, Naiad, eel grass, algae	*	Reward, Komeen, Aquathol K, Hydrothol, Sonar AS, CuSO4	$20,527.00	$200.00
1989	Eurasian watermilfoil, pondweeds, chara, algae	*	Reward, Komeen, Aquathol K, Hydrothol, Sonar, CuSO4, and Cidekick	$18,185.00	*
1990	Eurasian watermilfoil, pondweeds, chara, algae	*	Reward, Komeen, Aquathol, and CuSO4	$12,080.00	$200.00
1991	Eurasian watermilfoil, flatstem pw, curlyleaf pw, algae	*	Reward, Aquathol K, Komeen, and CuSO4	$18,000.00	$200.00
1992	Eurasian watermilfoil, mixed pondweeds, chara, and filamentous algae	*	Reward, Komeen, Aquathol K, Sonar, and CuSO4	$18,050.00	*
1993	Eurasian watermilfoil, coontail, pondweeds, and chara	65	Sonar, Aquathol K, Hydrothol, Reward, and CuSO4	$19,400.00	$300.00
1994	Eurasian watermilfoil, coontail, mixed pondweeds, chara, and filamentous algae	32.5	Reward, Komeen, Aquathol K, Hydrothol, and CuSO4	$10,125.00	$312.00
1995	Eurasian watermilfoil, mixed milfoil, coontail, pondweeds, elodea, and chara	*	Reward Komeen, Aquathol K, and CuSO4	$13,230.00	*
1996	Eurasian watermilfoil	60	2,4-D	*	*
1997	Eurasian watermilfoil	60	Reward	*	*
1998	Eurasian watermilfoil	60	Reward	*	*
1999	Eurasian watermilfoil, pondweeds, coontail, and chara	174	Sonar SRP, Nautique, Reward, and CuSO4	$75,367.00	$433.00
2000	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	48	Reward, Nautique, Navigate, Aquathol K, and Copper Sulfate	$19,585.00	$408.00
2001	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	65	Reward, Nautique, Navigate, Aquathol K, and Copper Sulfate	$23,695.00	$364.00
2002	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	653	Sonar SRP, Sonar PR, Sonar AS, Nautique, and Copper Sulfate	$73,390.00	$112.38
2003	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	28	Reward, Nautique, Navigate, Aquathol K, and Copper Sulfate	$6,601.00	$235.75
2004	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	35.75	Reward, Nautique, Navigate, Aquathol K, and Copper Sulfate	$11,575.00	$322.10
2005	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	64 EWM, 80 Shoreline	Reward and Nautique Shoreline & Renovate for EWM	$49,80 0.00**	$345.80
2006	Eurasian watermilfoil, curly-leaf pondweed, coontail,	121 CLP, 46 EWM,	Reward & Komeen Shoreline, Renovate EWM,	$51,175.00**	$247.22

	chara, and filamentous algae	40 shoreline	Aquathol early CLP		
2007	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	121 CLP, 40 EWM, 38 shoreline	Reward & Komeen Shoreline, Renovate EWM, Aquathol early CLP	$46,144.00**	$231.87
2008	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	121 CLP, 46.8 EWM, 38 shoreline	Reward & Komeen Shoreline, Renovate EWM, Aquathol early CLP	$47,406.00**	$230.35
2009	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	31.7 CLP, 38.7 EWM, 38 shoreline	Reward & Komeen Shoreline, Renovate EWM, Aquathol early CLP	$35,201.00**	$324.70
2010	Eurasian watermilfoil	653	SonarONE and Sonar AS	$125,000	$191.42
2011	Eurasian watermilfoil, curly-leaf pondweed, coontail, chara, and filamentous algae	0 (1.75 EWM on backwater)	Renovate Max G	$875.00	$500.00
2012	Eurasian watermilfoil in main lake, algae, coontail, Eurasian watermilfoil in channels only	45.3 EWM (15.3 web), 7.6 native	2,4-D, Reward, Komeen, Aquathol	$18,781.00	$355.00
2013	Eurasian watermilfoil in main lake, algae, coontail, milfoil in channels and select main lake areas	53.0 EWM, 26 native	2,4-D, Reward, Komeen, Aquathol	$24,685***	$312.46
2014	Eurasian watermilfoil in main lake, algae, coontail, milfoil in channels and select main lake areas	26.2 EWM, 69.5 native	2,4-D, Reward, Komeen, Aquathol	$34,530***	$355.25
2015	Eurasian watermilfoil in main lake, algae, starry stonewort, coontail, milfoil 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	Eurasian watermilfoil, Misc Species	175 EWM 60.5 natives	2,4-D Captain, Cygnet Plus, Reward	$45,470.45****	$190.08

***insufficient data, **approximately $20,000 funded by LARE, ***approximately $5,000 funded by LARE, ****80% of EWM treatment funded by LARE**

In 2018, an invasive survey was completed on May 17, 2018. The survey documented 175 acres of Eurasian watermilfoil. This was a significant increase from 2017. There were significant amounts of curlyleaf pondweed, but no Starry stonewort, which was previously found in the 2016 season. Treatment for Eurasian watermilfoil was completed on May 23, 2018 with 2.0 ppm, 2,4-D. The treatment is displayed by area in Table 2 and illustrated in Figure 1.

Table 2. Eurasian watermilfoil Treatment Summary, May 23, 2018.

Area	Acres	2,4-D Conc. (ppm)
1	10.67	2.0
2	7.80	2.0

3	44.48	2.0
4	47.74	2.0
5	6.48	2.0
6	20.56	2.0
7	35.61	2.0
8	1.66	2.0

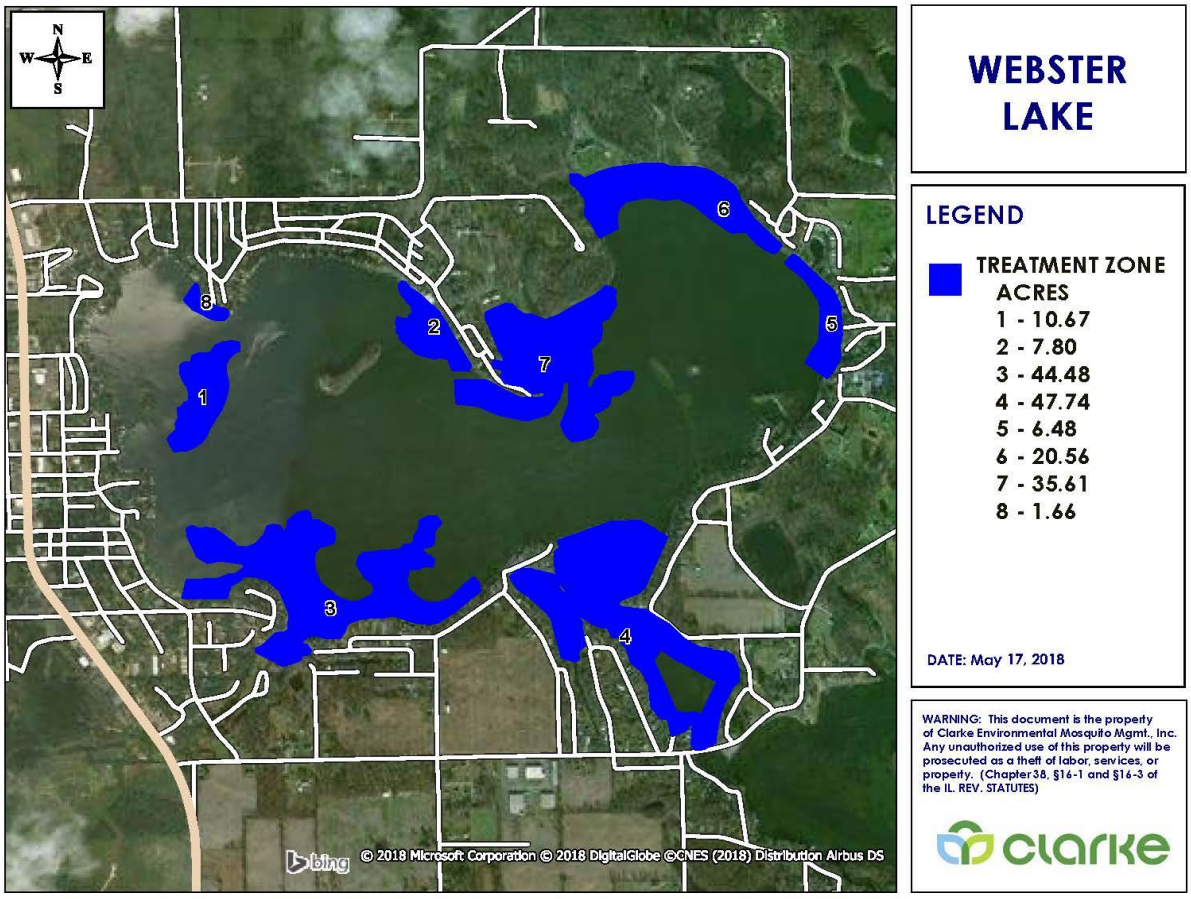

Figure 1. Webster Lake Treatment Areas May 23, 2018.

A 60.5 acre shoreline treatment (Figure 2) was completed using contact herbicides on June 13, 2018. These areas were treated primarily to target Coontail, Curly-leaf pondweed, and other native species. These plants had reached the surface and were inhibiting boat navigation and swimming.

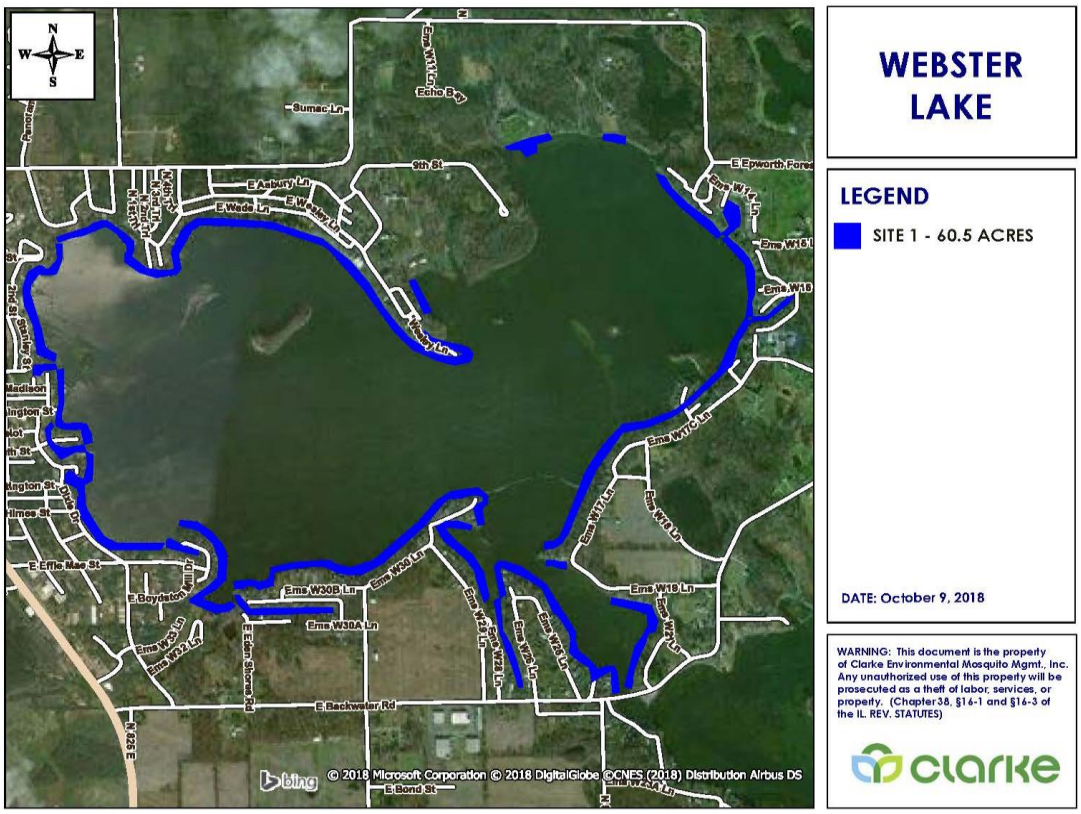

Figure 2. Webster Lake 2018 Shoreline Treatment Areas June 13, 2018.

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 2018, 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 points in the Webster Tier 2 survey are the same points that had been used in previous Tier 2 Surveys, a few of the waypoints when uploaded to the GPS for rake collection were out of the desired depth range. Those locations were changed to obtain the desired depths. 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. 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 8th, 2018. Secchi depth was 2.75 feet. Plants were present at 64 of the 90 sites and 6 species were collected, of which 5 were native (Figure 3). Eurasian watermilfoil was the only invasive species collected and found at 2.2% of sites (Figure 4). The results of the August 2018 Tier 2 survey for Webster Lake can be found in Table 3.

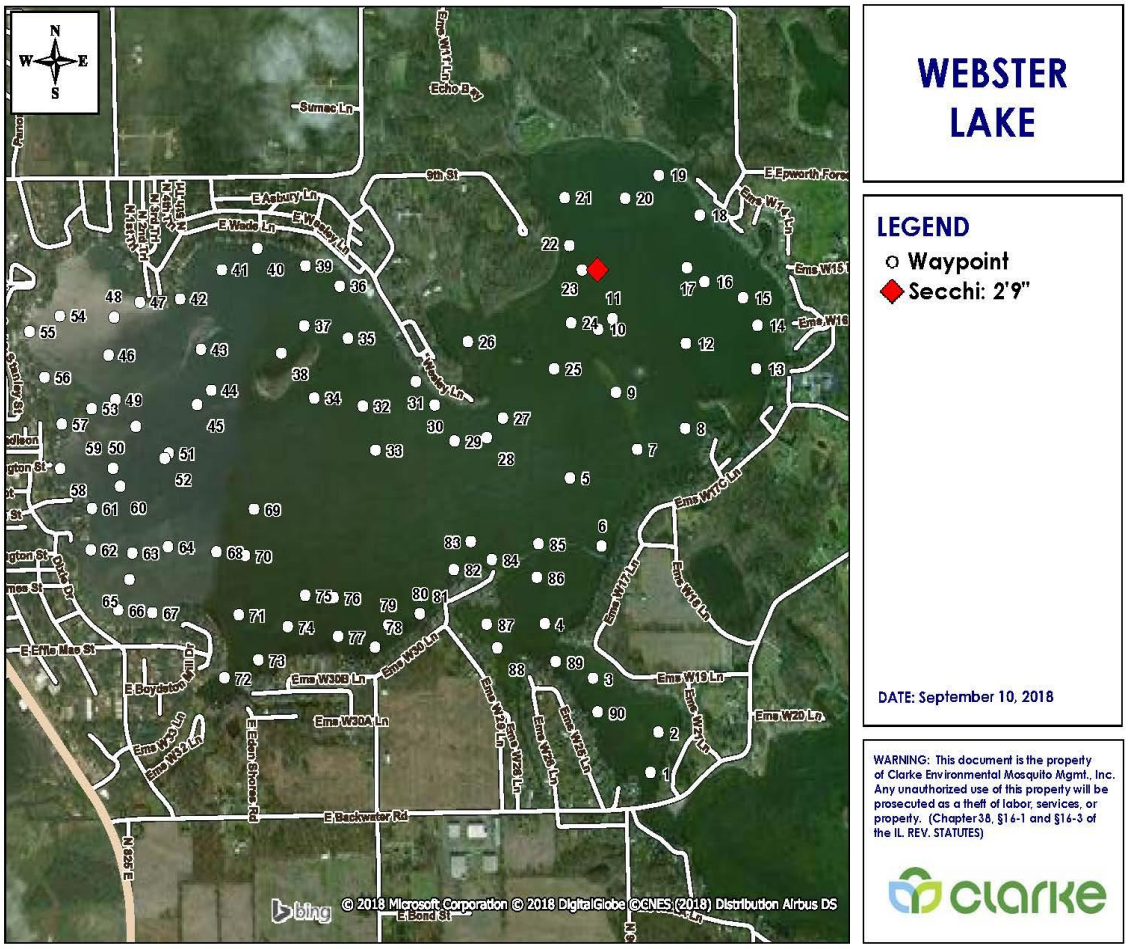

Figure 3. Webster Lake Tier 2 Sampling Locations August 8, 2018.

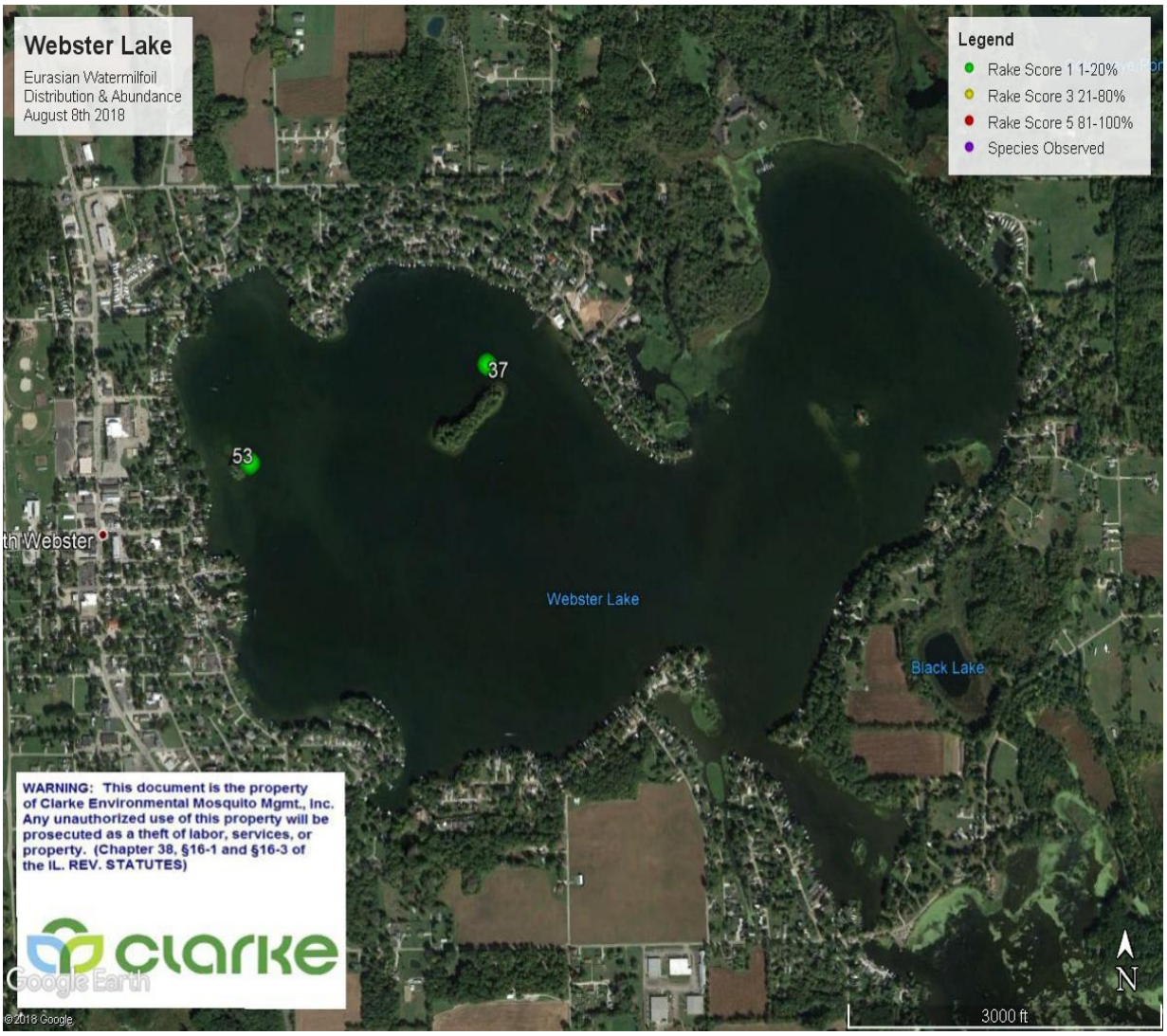

Figure 4. Webster Lake EWM Distribution August 8, 2018.

Table 3. Webster Lake 2018 Tier 2 Sampling Results

Occurrence and Abundance of Submersed Aquatic Plants in Webster Lake

County:	Kosciusko	Secchi (ft):	2.9 ft	Mean species/site:	0.97
Date:	8/8/2018	Sites with plants:	64	SE Mean species/site:	0.08
Littoral Depth (ft):	20.0	Sites with native plants:	64	Mean native species/site:	0.94
Littoral Sites:	90	Number of species:	6	SE Mean natives/site:	0.08
Total Sites:	90	Number of native species:	5	Species diversity:	0.53
		Maximum species/site:	3	Native species diversity:	0.50

All Depths	Frequency of	Rake score frequency per species				Plant
Species	Occurrence	0	1	3	5	Dominance
Coontail	61.1	38.9	41.1	13.3	6.7	22.9
Illinois pondweed	25.6	74.4	24.4	1.1	0.0	5.6
Chara sp.	5.6	94.4	4.4	1.1	0.0	1.6
Eurasian watermilfoil	2.2	97.8	2.2	0.0	0.0	0.4
Slender naiad	1.1	98.9	1.1	0.0	0.0	0.2
Narrow-leaved pondweed	1.1	98.9	1.1	0.0	0.0	0.2

Occurrence and Abundance of Submersed Aquatic Plants in Webster Lake

County:	Kosciusko	Secchi (ft):	2.9 ft	Mean species/site:	0.93
Date:	8/8/2018	Sites with plants:	20	SE Mean species/site:	0.16
Littoral Depth (ft):	20.0	Sites with native plants:	20	Mean native species/site:	0.90
Littoral Sites:	29	Number of species:	5	SE Mean natives/site:	0.14
Total Sites:	29	Number of native species:	4	Species diversity:	0.51
		Maximum species/site:	3	Native species diversity:	0.48

Depths: 0 to 5 ft	Frequency of	Rake score frequency per species				Plant
Species	Occurrence	0	1	3	5	Dominance
Coontail	62.1	37.9	58.6	3.4	0.0	13.8
Illinois pondweed	17.2	82.8	17.2	0.0	0.0	3.4
Chara sp.	6.9	93.1	3.4	3.4	0.0	2.8
Eurasian watermilfoil	3.4	96.6	3.4	0.0	0.0	0.7
Narrow-leaved pondweed	3.4	96.6	3.4	0.0	0.0	0.7

Occurrence and Abundance of Submersed Aquatic Plants in Webster Lake

County:	Kosciusko	Secchi (ft):	2.9 ft	Mean species/site:	1.18
Date:	8/8/2018	Sites with plants:	28	SE Mean species/site:	0.12
Littoral Depth (ft):	20.0	Sites with native plants:	28	Mean native species/site:	1.18
Littoral Sites:	34	Number of species:	3	SE Mean natives/site:	0.12
Total Sites:	34	Number of native species:	3	Species diversity:	0.51
		Maximum species/site:	2	Native species diversity:	0.51

Depths: 5 to 10 ft	Frequency of	Rake score frequency per species				Plant
Species	Occurrence	0	1	3	5	Dominance
Coontail	67.6	32.4	35.3	20.6	11.8	31.2
Illinois pondweed	47.1	52.9	44.1	2.9	0.0	10.6
Chara sp.	2.9	97.1	2.9	0.0	0.0	0.6

Occurrence and Abundance of Submersed Aquatic Plants in Webster Lake					
County:	Kosciusko	Secchi (ft):	2.9 ft	Mean species/site:	0.71
Date:	8/8/2018	Sites with plants:	10	SE Mean species/site:	0.17
Littoral Depth (ft):	20.0	Sites with native plants:	10	Mean native species/site:	0.65
Littoral Sites:	17	Number of species:	3	SE Mean natives/site:	0.15
Total Sites:	17	Number of native species:	2	Species diversity:	0.29
		Maximum species/site:	2	Native species diversity:	0.17

Depths: 10 to 15 ft	Frequency of	Rake score frequency per species				Plant
Species	Occurrence	0	1	3	5	Dominance
Coontail	58.8	41.2	29.4	23.5	5.9	25.9
Eurasian watermilfoil	5.9	94.1	5.9	0.0	0.0	1.2
Illinois pondweed	5.9	94.1	5.9	0.0	0.0	1.2

Occurrence and Abundance of Submersed Aquatic Plants in Webster Lake					
County:	Kosciusko	Secchi (ft):	2.9 ft	Mean species/site:	0.80
Date:	8/8/2018	Sites with plants:	6	SE Mean species/site:	0.25
Littoral Depth (ft):	20.0	Sites with native plants:	6	Mean native species/site:	0.80
Littoral Sites:	10	Number of species:	4	SE Mean natives/site:	0.25
Total Sites:	10	Number of native species:	4	Species diversity:	0.66
		Maximum species/site:	2	Native species diversity:	0.66

Depths: 15 to 20 ft	Frequency of	Rake score frequency per species				Plant
Species	Occurrence	0	1	3	5	Dominance
Coontail	40.0	60.0	30.0	0.0	10.0	16.0
Chara sp.	20.0	80.0	20.0	0.0	0.0	4.0
Illinois pondweed	10.0	90.0	10.0	0.0	0.0	2.0
Slender naiad	10.0	90.0	10.0	0.0	0.0	2.0

Plant Sampling Discussion

A summer Tier 2 survey was completed on August 8, 2018 and found only 2 sites with Eurasian watermilfoil present. There was an increase in abundance of Coontail. Table 4 compares surveys completed on Webster Lake from 2004 through 2018 for all depths. For depths broken down into 5-foot increments can be found in the Appendix. Eurasian watermilfoil occurrence decreased in 2018 to 2.2% during the summer Tier 2 survey. Sites with plants decreased from 2017 to 2018 to 71.1%. The number of native species decreased from 8 to 5 between the 2017 and 2018 survey. The total number of species also decreased from 9 to 6 in the same period. Leafy pondweed which was found in previous years was not detected on Clarke's Tier 2 survey but IDNR recorded the species at an occurrence of 6.73% which is down from the 2017 season. Illinois pondweed however made a rebound from the 2017 season and was recorded at a 15.6% frequency of occurrence according to the IDNR 2018 Tier 2 survey and recorded at 25.6% by CAS. Coontail also had a high frequency of occurrence in the summer survey occurring 61.1% of the time. This is common compared to previous year's surveys but is trending less than in previous surveys. Curly-leaf pondweed was not documented in the summer survey. In 2018, all objectives of the plant management plan were met.

- Keep Eurasian watermilfoil below 10% occurrence in summer Tier 2 surveys – 2.2% in 2018
- Keep curly-leaf pondweed below 10% occurrence in spring Tier 2 surveys
- Keep starry stonewort below 10% occurrence in summer Tier 2 surveys – 0% in 2018

- Maintain native plant coverage at 80% of sample sites in summer Tier 2 Survey – 94% in 2018

Table 4. Webster Lake Tier 2 Data from 2004-2018.

Surveyor	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	IDNR	Clarke
Date	8/25/04	8/2/05	8/3/06	8/13/07	8/27/08	7/30/09	9/21/10	8/24/11	8/13/12	8/13/13	8/11/14	8/12/15	4/25/16	8/3/16	8/7/17	8/1/18	8/8/18
Total Sites	160	160	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Littoral Sites	159	160	88	87	90	88	65	65	80	86	80	84	89	89	90	90	90
Sites with Plants	125	146	74	68	78	77	29	41	46	48	56	71	67	72	75	69	64
% Sites With Plants	78.1%	91.3%	82.2%	75.6%	86.7%	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	74	68	78	76	29	41	43	35	53	68	46	72	74	69	64
Percent Littoral Coverage	79%	91%	84%	78%	87%	88%	45%	63%	58%	56%	70%	85%	75%	81%	83%	76.6%	71.0%
Maximum Plant Depth	12	14	18	18	20	17	8	9	12	15	15	18	19	19	20	19.5	20
Secchi (ft)	5	8	7	7	9	5	5	3.5	3	5	8.5	7.5	7	4	8.5	4	2.75
Number of Species	13	15	10	8	7	10	6	10	9	10	9	13	9	9	9	6	6
Number of Native Species	11	13	9	7	6	8	6	9	7	8	7	11	7	8	8	5	5
Species Diversity	0.85	0.80	0.55	0.40	0.60	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	0.55	0.37	0.59	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	1.10	0.92	1.27	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																	
Eurasian Watermilfoil	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
Curly-leaf Pondweed	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 stonewort	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
Coontail	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 Pondweed	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 Spp.	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
Slender 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 Waterweed	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 Pondweed	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 Pondweed	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
Common Bladderwort	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 Stargrass	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 Pondweed	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 Pondweed	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
Illinois Pondweed	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 Pondweed	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
Variable Watermilfoil	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
Spiny 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-leaved Pondweed	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 Pondweed	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
Northern Watermilfoil	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
Filamentous 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
Slenderleaf Pondweed	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

Plant Management Discussion and Action Plan

Due to the increase in EWM seen in the 2018 season, IDNR allowed for 175 acres of EWM to be treated in the lake and which greatly reduced the abundance of the plant throughout the summer season. Following the early summer shoreline treatments no additional treatments were made for nuisance native vegetation in the 2018 season. Due to the aggressive treatments in 2018, it is estimated to treat no more than 100 acres of EWM in 2019. It is also recommended to treat approximately 60.5 acres of shoreline for nuisance species that is limiting navigation and multiple recreational uses. It is recommended that the association plan on treating all areas of EWM with 2, 4-D for systemic control in April or early May. It is also recommended that an early season treatment targeting up to 16 acres of curly-leaf pondweed be treated. A late summer inspection by DNR for additional coontail treatment is requested by WLCA if it impedes navigation.

No starry stonewort was found in 2018 and has not been observed since 2016. It is important that if found, this should be reported to IDNR and controlled aggressively. There is potential for LARE maintenance funding for starry stonewort control treatments. A 4.5 acre area along the western shore had been treated with 200 ppb of flumioxazin in 2015 and 2016. It is recommended that WLCA request LARE funding for treatment of this area and any other potential new areas with similar treatment strategy in 2019.

It is our recommendation that WLCA applies to LARE for $4,720 for early season curly-leaf pondweed, $4,950 for the treatment of starry stonewort (both CLP and SSW treatments are at a 50% cost-share) $35,000 for the treatment of EWM, and $4,600 for an Aquatic Management Plan update (Table 5). A copy of this grant application is in the Appendix.

Table 5. Proposed WLCA plant management budget for 2019.

Plant Management Action Plan	Estimated Cost
Invasive Surveys (3), Tier 2 survey (August) and Plan Update (Nov)	$4,600
Up to 100 acres EWM treatment with 2.0 ppm 2,4-D (April)	$35,000
Up to 16 acres Early season curly-leaf pondweed with Aquathol K	$4,720
Two starry stonewort treatments with Clipper up to 4.5 acres	$4,950
Total	$49,270
Total LARE Grant Requested	$36,515

Public Involvement

A public meeting was held on September 10th, 2018 to discuss treatment protocol in 2019 and beyond regarding the use of 2,4-D, Diquat and Triclopyr products. Residents around the lake area were surveyed to gain insight to their history and needs. There were eleven attendees present at the meeting. A LARE Lake Use Survey was conducted and the results are below in Table 6. An additional survey was conducted in January 2019 using the updated LARE public use survey questionnaire. There were a total of 9 responses. Responses can be seen in Table 7.

Table 6. 2018 Public Survey Results.

2018 Webster Lake Public Meeting Survey Questions

1) Are you a lake property owner?	100% yes	0% no
2) How do you use the lake?	4 boating, fishing, and swimming	3 boating and swimming
3) How many years have you been using the lake?	30,22,30,21 ,38, 52, 49, 45,22	
4) Do you have aquatic plants been in nuisance quantities?	55% yes	33% no
5) Do aquatic plants interfere with your enjoyment of the lake?	55% yes	45% no
6) Does the level of plants change your property value?	77% yes	23% no
7) Are you in favor of continuing plant management?	100% yes	0% no
8) Are you aware that the LARE funds will only apply to invasive exotic species?	100% yes	0% no
Other problems or comments? Installed water circulators- no shoreline weed problem Coontail huge growth this year and topping out The aquatic plants at my shoreline are floating and/or algae Need to be able to treat native species especially curly-leaf and coontail		

Table 7. 2019 Webster Lake Public Use Survey

2019 Webster Lake Public Use Survey		
Are you a lake property owner?	100% Yes	0% No
Are you currently a member of your lake association?	100% Yes	0% N0

How many watercrafts do you currently have registered in Indiana?	1 – 1 2 – 6 3 or more - 2	
Do you have a current Indiana Fishing License?	66.7% Yes	33.3% N0
How many years have you been at the lake?	5 or less – 0 5-10 – 0 Over 10 years – 100%	
How do you use the lake?	Boating – 30% Swimming – 30% Fishing – 23% Irrigation – 13% Drinking water – 0% Other – 3%	
Do you have aquatic plants at your shoreline in nuisance quantities?	78% yes	22% No
Do you donate funding towards aquatic plant control?	100% Yes	0% No
Do aquatic plants interfere with your use or enjoyment of the lake?	89% Yes	11% No
Do you support efforts to control invasive plants on the lake?	100% Yes	0% No
Are you aware that LARE funds can only be used for controlling invasive plants, not native plants?	100% Yes	0% No
Mark any of these you think are problems on your lake:	 Too many aquatic plants Dredging needed Other Lack of speed enforcement Too many watercraft use the lake Fish population problem Not enough aquatic plants Poor water quality Too much fishing	 47% 35% 6% 6% 6% 0% 0% 0% 0%
Please add any additional comments: Not enough homeowners on lake recognize their responsibility to contribute to the management of the lake by the lake association. A good summer on Webster Lake Between the DNR and the Lake Association we are spending approximately $60,000 per year to keep the lake navigable and enjoyable for all users. Only 57% of property owners pay dues. Where could funds come from if we were allowed to treat nuisance native weeds i.e. duckweed & curlyleaf pond weed?		

Literature Cited

Aquatic Control Inc. 2008. Webster Lake Aquatic Vegetation Management Plan 2007 Update. Prepared for the Webster Lake Conservation Association. North Webster, IN.

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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

Tier 2 Data Sheets

Site #	Latitude	Longitude	Depth (Ft)	Illinois Pondweed	Coontail	Chara	Slender Naiad	Eurasian Watermilfoil	Narrow-leaved pondweed
1	41.317359	-85.67095	4.5		1				
2	41.318455	-85.67064	4		1				
3	41.31992	-85.67318	4.5		1				
4	41.321401	-85.67505	6		1				
5	41.325357	-85.67407	8		3				
6	41.323508	-85.67285	4						
7	41.326136	-85.67146	5	1	1				
8	41.326704	-85.6696	6.5	1	3				
9	41.327683	-85.67229	5						
10	41.3294	-85.67298	9		1				
11	41.329683	-85.67242	7						
12	41.329013	-85.66957	9.5	1					
13	41.328321	-85.66684	4.5	1					
14	41.3295	-85.66679	11						
15	41.330249	-85.66735	6						
16	41.330688	-85.66885	14		1				
17	41.331069	-85.66953	14.5		1				
18	41.332496	-85.66903	4						
19	41.333577	-85.67062	4.5		1				
20	41.33295	-85.67193	19						
21	41.332968	-85.67428	12						
22	41.331669	-85.6741	4						
23	41.331006	-85.67361	17						
24	41.329568	-85.67403	9		3				
25	41.328322	-85.67469	7		1				
26	41.329059	-85.67804	4.5		P				
27	41.326983	-85.67668	8	1	1				
28	41.326454	-85.67731	14	1	3				
29	41.326361	-85.67856	19						
30	41.32734	-85.67933	7	1	1				

31	41.327977	-85.68006	4		1				
32	41.327309	-85.68212	10.5						
33	41.326113	-85.68163	17		1				
34	41.327525	-85.68401	11		3				
35	41.32915	85.68270	7	3					
36	41.33057	85.68302	6	1	1				
37	41.32949	85.68440	10.5		1			1	
38	41.32875	85.68529	11						
39	41.33112	85.68435	11		1				
40	41.33159	85.68622	11						
41	41.33101	85.68760	10.5						
42	41.33022	85.68922	5	P	1				
43	41.32885	85.68841	13		3				
44	41.32774	85.68801	10	1					
45	41.32735	85.68856	11		5				
46	41.32869	85.69200	10	1	1				
47	41.33013	85.69078	4.5		1				
48	41.32972	85.69178	7						
49	41.32749	85.69173	7		1				
50	41.32676	85.69094	7		3				
51	41.32603	85.68966	19			1			
52	41.32589	85.68982	19.5			1	1		
53	41.32724	85.69266	4.5	1	1			1	
54	41.32976	85.69389	13.5		3				
55	41.32933	85.69507	5	1	1				1
56	41.32809	85.69449	5.5						
57	41.32682	85.69382	5		1	1			
58	41.32561	85.69388	5	1		3			
59	41.32562	85.69183	6	1		1			
60	41.32513	85.69155	19		1				
61	41.32453	85.69264	4						
62	41.32341	85.69269	5						
63	41.32332	85.69108	8		1				

64	41.32349	85.68969	14						
65	41.32260	85.69119	6	1	1				
66	41.32177	85.69163	4						
67	41.32170	85.69030	4						
68	41.32335	85.68781	8	1	5				
69	41.32451	85.68635	10		3				
70	41.32325	85.68670	8		3				
71	41.32164	85.68694	7		1				
72	41.31993	85.68750	4.5		1				
73	41.32042	85.68618	6.5	1	1				
74	41.32132	85.68504	14.5		1				
75	41.32217	85.68436	7	1	5				
76	41.32211	85.68326	7		5				
77	41.32106	85.68308	7.8	1	3				
78	41.32076	85.68165	5		1				
79	41.32137	85.68113	19.5						
80	41.32167	85.67991	7	1					
81	41.32216	85.67984	20	1	5				
82	41.32287	85.67859	8	1	5				
83	41.32363	85.67793	16		1				
84	41.32314	85.67711	5		1				
85	41.32357	85.67530	7						
86	41.32266	85.67536	6						
87	41.32139	85.67731	3.5		3				
88	41.32074	85.67690	3.5		1				
89	41.32037	85.67463	4.5		1				
90	41.31900	85.67300	5		1				

Tier Data Comparison for depths 0-5ft, 5-10ft, 10ft-15ft, 15-20ft 2004-2018																	
Surveyor	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	IDNR	Clarke
Date	8/25/04	8/2/05	8/3/06	8/13/07	8/27/08	7/30/09	9/21/10	8/24/11	8/13/12	8/13/13	8/11/14	8/12/15	4/25/16	8/3/16	8/7/17	8/1/18	8/8/18
Species Frequency of Occurrence - Depth 0 to 5 ft																	
Eurasian Watermilfoil	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
Curly-leaf Pondweed	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 Pondweed	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
Chara Spp.	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
Slender 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
Common 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
Canada Waterweed	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
Flat-stemmed Pondweed	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
Common Bladderwort	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 Stargrass	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 Pondweed	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 Pondweed	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
Illinois Pondweed	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 Pondweed	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
Spiny 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
Large-leaved Pondweed	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
Slenderleaf Pondweed	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
Northern	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

Watermilfoil																	
Filamentous 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
Species Frequency of Occurrence - Depth 5 to 10 ft																	
Eurasian Watermilfoil	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
Curly-leaf Pondweed	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 stonewort	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	86.7	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	0.0	83.3	74.1	67.6
Sago Pondweed	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 Spp.	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
Slender 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
Flat-stemmed Pondweed	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
Common Bladderwort	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 Stargrass	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 Pondweed	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
Illinois Pondweed	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 Pondweed	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
Large-leaved Pondweed	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
Northern Watermilfoil	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
Filamentous alage	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
Surveyor	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	IDNR	Clarke
Date	8/25/04	8/2/05	8/3/06	8/13/2007	8/27/08	7/30/09	9/21/10	8/24/11	8/13/12	8/13/13	8/11/14	8/12/15	4/25/16	8/3/16	8/7/17	8/1/18	8/8/18
Species Frequency of Occurrence - Depth 10 to 15 ft																	

Eurasian Watermilfoil	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
Curly-leaf Pondweed	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 Spp.	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
Slender 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
Flat-stemmed Pondweed	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 Stargrass	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 Pondweed	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 Pondweed	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
Large-leaved Pondweed	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
Illinois Pondweed	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
Filamentous 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
Species Frequency of Occurrence - Depth 15 to 20 ft																	
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 Pondweed	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
Large-leaved Pondweed	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
Illinois Pondweed	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
Slender 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 Spp.	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
Curly-leaf Pondweed	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
Filamentous alage	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*
Coontail	*Ceratophyllum demersum*
Illinois pondweed	*Potamogeton illinoensis*
Chara sp	*Chara sp.*
Eurasian watermilfoil	*MYRIOPHYLLUM SPICATUM*
Slender naiad	*Najas flexilis*
Narrow-leaved pondweed	*Potamogeton foliosus*

***The scientific and common names of NON-NATIVE species are shown in ALL CAPITAL LETTERS.