An Aquatic Plant Survey and Management Plan Update for Little Cedar Lake—Washington County, WI November, 2018



Acknowledgements

Marine Biochemists wishes to recognize the following individuals and organizations whose work assisted with the completion of this the original 2014 Aquatic Plant Study and Plan, and whose work is cited in this 2018 update:

- The Wisconsin Department of Natural Resources for PI Protocol and Plan requirements , historical treatment records and 1991 Sensitive Area Assessment.
- The Southeast Wisconsin Regional Plan Commission (SEWRPC) for their earlier work in 2000 (Aquatic Plant Survey) and 2000 Aquatic Plant Management Plan that provides a historical reference of the aquatic plant community.
- Washington County Planning and Parks Department staff, including Paul Klein for their collection of plant data in the July/August 2012 survey used in this Report.

Finally, Marine Biochemists wishes to thank the membership of the Little Cedar Lake Protection and Rehabilitation District for the opportunity to continue to assist them with the management of the lake.

Published November, 2018 by Marine Biochemists

Introduction

Little Cedar Lake is a 260 acre drainage lake with its inlet and outlet consisting of Cedar Creek, a tributary of the Milwaukee River system. Located in the Towns of West Bend and Polk in Washington County, Wisconsin, Little Cedar Lake serves as an important recreational asset to both the lake residents and surrounding community. A Pubic Access is available at Ackermann's Grove Park, a part of the Washington County Park System.

A relatively deep lake with a maximum depth of 56 feet, Little Cedar has significant amounts of both deep and shallow water habitat, with slightly less than one-half of the lake having a depth of greater than 15 feet. Bottom sediments are highly variable, from fine organic silts and clay to sand and gravel. The fishery consists of Largemouth Bass, Panfish, Walleye and Northern Pike. In addition to fishing, other lake uses include power-boating, water-skiing, canoeing and swimming. It is also has important wildlife values, providing habitat for fish, waterfowl, amphibians, and furbearers.

Aquatic plant growth in the lake is fairly extensive, as a little more than 50% of the lake lies within the littoral zone- the area of the lake lies above the maximum depth of sunlight penetration, and in the case of Little Cedar, a depth of approximately 15-17 feet (Figure 1). While beneficial in terms of contributing to good water quality and providing habitat for fish and aquatic insects and as a source of food for waterfowl, conflicts with boating (navigation) and other recreational activities, such as swimming, have occurred.

The Little Cedar Lake Protection and Rehabilitation District is the organization primarily responsible for lake management activities, including aquatic plant management and lake related studies.

The most recent Aquatic Plant Survey, contained within this Report, was conducted in August, 2018. This is an Update to the surveys conducted by Washington County (WI) staff (July/August, 2012 and Marine Biochemists, a Lonza Business (October, 2012), that were contained with the original Little Cedar Lake Aquatic Plant Management Plan (2014). Both this update and the 2014 Plan cite "An Aquatic Plant Management Plan for Little Cedar Lake Washington County, WI" (2004) by the Southeast Wisconsin Regional Planning Commission, which was based upon plant data obtained in the year 2000.

Both surveys in 2012, along with the 2018 survey used the Point-Intercept method for collecting data on aquatic plants, while the aforementioned 2000 survey by SEWRPC used the modified Jesson & Lound transect-based technique. The results of these surveys serve as a basis for completing this Update to the Aquatic Plant Management Plan, a guide for future management activities and to provide information and education to the membership of the LCLPRD.

The following Section of the report describes the methodology used to access the aquatic plant population and presents the survey results.

2018 Aquatic Plant Survey Methodology and Results

The protocol for this aquatic plant survey follows the same as called for in the two (July/August and October) 2012 Surveys - sampling the vegetation at 614 pre-determined sites within the lake. These locations were spaced apart by approximately 35 meters in general north-south and east-west transects across Little Cedar Lake using waypoints (longitude and latitude coordinates) established by the Wisconsin Department of Natural Resources (see fig. #2).

During the surveys, crews navigated to waypoints using a Global Positioning System (GPS). At each point where water depth was at or below the maximum plant rooting depth (approximately 17 feet), plants were sampled using a rake head attached to either a Pole (P) or Rope (R). Water depth was recorded and the dominant bottom sediment type (muck, sand, rock) noted. Plants collected were identified to genus and/or species, individual plant species density (rake fullness for a single plant type) determined, along with total plant density (rake fullness for all plants). This data was then recorded for each site. An example of this "rake fullness" density determination is found on fig #3.

The aquatic plant survey indicated that the lake contains a diverse aquatic plant community. Figures #4 (2018) and #5 (2012 Surveys) graphs the relationship between water depth and the number of sites where aquatic vegetation was found. Figure 6 provides the location of sites with aquatic vegetation (native or non-native).

The locations where AIS (Eurasian Watermilfoil and/or Curly-leaf Pondweed) were found are shown on Figures #7 and #8. It is important to note that Figure #7 provides Pre and Post Treatment Data showing a significant reduction of Eurasian Watermilfoil following the treatment on August 14, 2012. Curly-leaf pondweed, being an early season plant, typically reaches a maximum biomass in late May/mid June, then dies back after the 4th of July, hence the reason for the low number of observations made later in the season.

Figures 9-16 are detailed maps showing the location of each of the eight top-ranked native species based upon 2018 abundance (# of sites present) listed in the Table below. Maps for the distribution of these same species during the 2012 surveys are provided as a reference. A discussion of the results of the survey begins after the presentation of the Distribution Maps on page 19.

Scientific Name	Common Name	Ranking-2018/ # Sites Present	Ranking-Oct. 2012/ # Sites Present	Ranking-July/Aug. 2012 # Sites Present
Vallisneria americana	Eelgrass	1/151	1/156	1/132
Chara, sp.	Muskgrass	2/96	3/53	4/63
Ceratophyllum demersum	Coontail	3/75	4/36	13/15
Najas flexilis	Slender naiad	4/56	14/8	6/39
Potamogeton zosteriformes	Flatstem pondweed	5/50	6/44	3/95
Stukenia pectinata	Sago pondweed	6/49	9/27	5/42
Potamogeton illoensis	Illinois pondweed	7/41	2/67	2/103
Elodea canadensis	Elodea	8/39	16 /2	10/24

Little Cedar Lake—Aquatic Plant Rankings by Abundance (# Sites Present)

Of the above, all but two of these top eight ranked native species (Sago and Illinois Pondweed) also were listed in the SEWRPC , 2000, survey "Top Eight".

Delineation of Deep (> 15 ft. contour, in red) vs. Shallow Waters



Little Cedar Lake, Washington County, WI

Lake Size: 260 acresArea >15 ft.: 122 acres<15 ft.: 138 acres</th>Approximate Location of 15 ft. Contour Shown in Red Above

Location of WI DNR Sampling Waypoints

Little Cedar Lake, Washington County, WI



Total # of Sampling Points: 614

Aquatic Plant Fullness Ratings

Fullness Rating	Coverage	Description
1	-	Only few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2	AND	There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover the tines.
3		The rake is completely covered and tines are not visible.

Depth of Plant Colonization-Little Cedar Lake, Washington County, WI

Marine Biochemists Survey, August, 2018



Depth of Plant Colonization-Little Cedar Lake, Washington County, WI



Washington County Parks & Planning Survey, July/August, 2012





Little Cedar Lake, Washington County, WI

Sites with Aquatic Vegetation (all species)

August, 2018

October, 2012

July/August, 2012





Little Cedar Lake, Washington County, WI

Sites with Eurasian Watermilfoil (Myriophyllum spicatum)

 August, 2013
 October, 2012
 July/August, 2012

Total # Sites Present: 124 (127 including Visuals) Total # Sites Present: 55

Total # Sites Present: 145



Little Cedar Lake, Washington County, WI Sites with Curlyleaf Pondweed (*Potamogeton crispus*)

August, 2018



Total # Sites Present: 11

July/August, 2012

Total # Sites Present: 2

Note: No Observations during October, 2012 Survey

Rake Fullness: $\blacklozenge = 3$ $\diamondsuit = 2$ $\blacklozenge = 1$ Marine Biochemists N173 W21440 Northwest Passage

173 W21440 Northwest Passag Jackson, WI 53037 (888) 558-5106 www.marinebiochemists.com

Location and Rake Fullness of

Eelgrass (Vallisneria americana) in Little Cedar Lake, Washington County, WI



Total # Sites Present: 151 (155 including Visuals)

Total # Sites Present: 156

Total # Sites Present: 132



Figure 10 Location and Rake Fullness of

Muskgrass (Chara sp.) in Little Cedar Lake, Washington County, WI

August, 2018 Abundance Rank (Native Species): 2 October, 2012 Abundance Rank (Native Species): 3 July/August, 2012 Abundance Rank (Native Species): 4



Total # Sites Present: 96 (97 including Visuals)

Total # Sites Present: 53

Total # Sites Present: 63



Figure 11 Location and Rake Fullness of

Coontail (Ceratophyllum demersum) in Little Cedar Lake, Washington County, WI

August, 2018October, 2012July/August, 2012Abundance Rank (Native Species): 3Abundance Rank (Native Species): 4Abundance Rank (Native Species): 13



Total # Sites Present: 75

Total # Sites Present: 36

Total # Sites Present: 15



Location and Rake Fullness of

Slender Naiad (Najas flexilis) in Little Cedar Lake, Washington County, WI

August, 2018October, 2012July/August, 2012Abundance Rank (Native Species): 4Abundance Rank (Native Species): 11Abundance Rank (Native Species): 6



Total # Sites Present: 56 (57 including Visuals)

Total # Sites Present: 8

Total # Sites Present: 39



Location and Rake Fullness of Flatstem Pondweed (*Potamogeton zosteriformes*) in Little Cedar Lake, Washington County, WI

August, 2018 Abundance Rank (Native Species): 5 October, 2012 Abundance Rank (Native Species): 6

July/August, 2012 Abundance Rank (Native Species): 3



Total # Sites Present: 50

Total # Sites Present: 44

Total # Sites Present: 95



Location and Rake Fullness of

Sago Pondweed (Stuckenia pectinata) in Little Cedar Lake, Washington County, WI

 August, 2018
 October, 2012
 July/August, 2012

 Abundance Rank (Native Species) 6
 Abundance Rank (Native Species) 7
 Abundance Rank (Native Species) 7

Total # Sites Present: 49 (53 including Visuals)

Total # Sites Present: 27

Total # Sites Present: 42



Location and Rake Fullness of

Illinois Pondweed (Potamogeton illoensis) in Little Cedar Lake, Washington County, WI

August, 2018 October, 2012 July/August, 2012 Abundance Rank (Native Species): 2 Abundance Rank (Native Species): 7 Abundance Rank (Native Species): 2 Total # Sites Present: 41 Total # Sites Present: 67

Total # Sites Present: 103



Location and Rake Fullness of

Elodea (Elodea canadensis) in Little Cedar Lake, Washington County, WI

August, 2018October, 2012July/August, 2012Abundance Rank (Native Species): 8Abundance Rank (Native Species): 16Abundance Rank (Native Species): 10



Total # Sites Present: 39

Total # Sites Present: 2

Total # Sites Present: 24

Rake Fullness: $\diamondsuit = 3$ $\diamondsuit = 2$ $\diamondsuit = 1$

2018 Aquatic Plant Survey Methodology and Results cont'd

Parameter	Survey Month/Year			
	Aug., '18	Oct., '12	Jul/Aug, '12	
Total # Sites Visited	593	610	387	
Total # Sites w/vegetation	258	256	240	
Total # Sites Shallower than Max. Depth of Plants	317	322	320	
Frequency of Occurrence	81.39	79.5	75.00%	
Simpson Diversity Index	0.91	0.89	0.91	
Maximum Depth of Plants	17 ft.	14 ft.	17 ft.	
Avg. # Species/Site (Shallower than Max. Depth of Plants)	2.66	1.95	2.7	
Avg. # Species (vegetated sites only)	3.27	2.46	3.6	
Avg. # Native Species/Site (Shallower than max. Depth)	2.23	1.77	2.23	
Avg. # Native Species/Site (vegetated sites only)	2.87	2.33	3.29	
Species Richness	23	18	28	
Floristic Quality Index	27.06	20.5	27.4	

A comparison of Summary Statistics for each of the three surveys is located in the Table below.

Figures 17-19 provides a Floristic Quality Index (FQI), for each of the three surveys. A brief discussion of the importance and meaning of this Data, and a comparison between the three surveys follows.

Total # of Sites w/ Vegetation

The number of sites having vegetation in Little Cedar Lake changed very little between the three surveys. This indicates that water quality (clarity) has remained fairly consistent, allowing rooted aquatic plants to flourish. However, plant density (Rake Fullness) was significantly higher in July/August of 2012 (see distribution map for all plant species, figure 4, page 8) due to receding water levels during a significant period of drought.

Total # Sites Shallower Than Maximum Depth of Plants

The number of sites shallower than the maximum depth of plants for all three surveys were similar as well, indicating consistent growing conditions (nutrients and available sunlight)

Frequency of Occurrence

Frequency of Occurrence, presented as a percentage, is the number of sites shallower than the maximum depth that contained vegetation. The percentage for the August, 2018 survey was slightly higher than the 2012 surveys. Given adequate sunlight, this Frequency would be expected to increase over time as nutrients accumulate in shallows, allowing plants to become established in the "sandier" (inorganic) soils in certain areas of the lake.

Simpson Diversity Index

The Simpson Diversity Index (SDI) measures the diversity of a plant population, using the number of species surveyed and the number of species per site. The decimal scale ranges from 0 (low diversity) to 1 (high diversity). The SDI for the 2018 survey matches the previous high of 0.91 recorded in July/August, 2012. This indicates that a high level of diversity is found in Little Cedar Lake.

2018 Aquatic Plant Survey Methodology and Results cont'd

Maximum Depth of Plants

Maximum depth of plants was 17 feet in 2018, as compared to 17 feet and 14 feet for the July/August and October, 2012 surveys. Again, this indicates a fairly consistent pattern of good water clarity, and ample sunlight penetration for plant growth. While the Maximum Depth of Plants for exceptionally clear lakes may exceed 25-30 feet, Little Cedar has good clarity, on par with other urbanized lakes in our region.

Average # of Species Per Site (Shallower than maximum depth) and Average # of Species (vegetated sites only)

The values for the 2018 survey (2.66/3.27) are very similar to the July/August, 2012 survey (2.70/3.6). The October, 2012 survey values were much lower (1.95/2.45), with the difference attributable to the lower number of species being found at the end of the growing season.

Avg. # of Native Species/Site (shallower than max. depth) and Avg. # of Native Species/Site (vegetated sites only)

The values for 2018 (2.23/2.87) were very similar to the July/August, 2012 survey (2.23/3.29). Please note that the difference in the statistics for Vegetated Sites Only between 2018 and July/August, 2012 survey is primarily attributable a higher number of native species being recorded in 2012 (28 vs. 23). Part of this is due to recording methodology, as the July/August sampling crew recorded data for emergent species, such as Cattail and Bulrush according to Rake Fullness (1-3), while observations during subsequent surveys were recorded as Visual.

Species Richness

Species richness is simply the number of species observed in the lake during the surveys. The number for the July/ August, 2012 survey was much higher (28) versus the October survey (18). The drought and declining water levels, along with the lateness in the season (October survey) were all factors for that difference. The 2018 Value (23 species) fell in between previous recordings, however, as explained previously, was due to differences in the methods used for recording. For example, if the total number of species observed, *including Visuals* are factored, the total for 2018 (30) is higher than that recorded in July/August (28).

Floristic Quality of Index

The Floristic Quality Index (FQI) is a measure of a plant community's closeness to an undisturbed condition. Urban lakes, or those with a high level of boat traffic have lower FQI's, meaning fewer species or lacking specific native species that are often associated with undisturbed conditions. The FQI for the three surveys are as follows:

August, 2018: 27.06 October, 2012: 20.5 July/August, 2012: 27.4

FQI's for any particular lake are often compared to regional or state-wide averages in order to provide perspective. FQI values representing the highest value of the lowest quartile, mean and bottom of the highest quartile of all Wisconsin lakes are 16.9, 20.9, and 27.5. This places Little Cedar in the average to good category in terms of disturbance. For additional perspective, the lowest FQI measured 3.0 (most disturbed), and the highest, 44.6 (most undisturbed).

This concludes the presentation and discussion of plant data collected during the 2018 and 2012 surveys. An Update to the 2014 Aquatic Plant Management Plan begins on page 25.

Aquatic Plant Species Statistics August, 2018 & July/August, 2012 Plant Surveys Little Cedar Lake, Washington County, WI

		Freq. Occurrence w/in		Average Rake					
		Vegetated	d Areas %	Full	ness	# Sites P	resent	# Vis	suals
Species	Common Name	2018	2012	2018	2012	2018	2012	2018	2012
Myriophyllum spicatum	Eurasian watermilfoil	48.06	60.42	1.47	1.97	124	145	3	-
Potamogeton crispus	Curly-leaf Pondweed	4.26	0.83	1.00	1.00	11	2	-	-
Bidens beckii	Water marigold	-	0.42	-	1.00	-	1	-	-
Brasenia schreberi	Watershield	-	-	-	-	-	-	14	_
Ceratophyllum demersum	Coontail	29.07	6.25	1.33	1.47	75	15	-	-
Chara	Muskgrasses	37.21	26.25	1.70	1.71	96	63	1	-
Elodea canadensis	Commom waterweed	15.12	10.00	1.13	1.54	39	24	-	-
Heteranthera dubia	Water star-grass	8.91	12.08	1.35	1.76	23	29	4	-
Lemna minor	Small duckweed	-		-		-		6	-
Lythrum salicaria	Purple Loosestrife	-		-		-		8	
Lemna triscula	Forked duckweed	-	0.42	-	1.00	-	1	-	-
Myriophyllum heterophyllum	Various-leaved water-milfoil	2.71	-	1.57	-	7	-	1	-
Myriophyllum sibiricum	Northern water-milfoil	8.91	5.83	1.13	1.36	23	14	-	-
Myriophyllum verticillatum	Whorled water-milfoil	0.39	12.92	1.00	1.39	1	31	-	-
Najas flexilis	Slender naiad	22.09	16.25	1.32	1.33	57	39	1	-
Najas marina	Spiny Naiad	0.39	1.67	1.00	1.00	1	4	-	-
Nitella	Nitella	0.78	-	1.00	-	2	-	-	-
Nuphar variegata	Spatterdock	3.10	2.50	1.38	1.67	8	6	-	-
Nymphaea odorata	White water lily	8.14	15.42	1.67	2.03	21	37	20	-
Polygonum amphibium	Water smartweed	-	0.42	-	1.00	-	1	-	-
Potamogeton amplifolious	Large-leaf pondweed	12.02	6.25	1.10	1.67	31	15	7	-
Potagometon foliosus	Leafy pondweed	-	0.42	-	1.00	-	1	-	-
Potamogeton illinoensis	Illinois pondweed	15.89	42.92	1.02	1.30	41	103	1	-
Potamogeton natans	Floating-leaf pondweed	5.43	7.08	1.07	1.76	14	17	9	-
Potamogeton praelongus	White-stem pondweed	6.20	-	1.06	-	16	-	2	-
Potamogeton richardsonii	Clasping-leaf pondweed	-	5.00	-	1.08	-	12	1	-
Potamogeton zosteriformis	Flat-stem pondweed	19.38	39.58	1.28	1.64	50	95	-	-
Ranunculus aquatilis	White water crowfoot	0.78	7.08	1.0	1.24	2	17	-	-
Schoenoplectus acutus	Hardstem bulrush		4.58		2.00		11		-
Stuckenia pectinata	Sago pondweed	18.99	17.50	1.04	1.26	49	42	4	-
Utricularia vulgaris	Common bladderwort	0.78	1.67	2.00	1.00	2	4	1	-
Vallisneria americana	Wild celery	58.53	55.00	1.46	1.60	151	132	4	-
Wolfia columbiana	Watermeal	-	-	-	-	-	-	7	-

Floristic Quality Index (FQI)

August, 2018 Plant Survey - Little Cedar Lake, Washington County, WI

Species	Common Name	С	species present=1
Ceratophyllum demersum	Coontail	3	1
Chara	Muskgrasses	7	1
Elodea canadensis	Common waterweed	3	1
Heteranthera dubia	Water star-grass	6	1
Myriophyllum heterophyllum	Various-leaved water-milfoil	7	1
Myriophyllum sibiricum	Northern water-milfoil	6	1
Myriophyllum verticillatum	Whorled water-milfoil	8	1
Najas flexilis	Slender naiad	6	1
Nitella	Nitella	7	1
Nuphar variegata	Spatterdock	6	1
Nymphaea odorata	White water lily	6	1
Potamogeton amplifolius	Large-leaf pondweed	7	1
Potamogeton illinoensis	Illinois pondweed	6	1
Potamogeton natans	Floating-leaf pondweed	5	1
Potamogeton praelongus	White-stem pondweed	8	1
Potamogeton zosteriformis	Flat-stem pondweed	6	1
Ranunculus aquatilis	White water crowfoot	8	1
Stuckenia pectinata	Sago pondweed	3	1
Utricularia vulgaris	Common bladderwort	7	1
Vallisneria americana	Wild celery	6	1
N			20
mean C			20 6 05

CITATION: Nichols, SA. 1999. Floristic Quality Assessment of Wisconsin Lake Plant Communities with Example Applications. Journal of Lake and Reservoir Management, 15(2):133-141.

FQI

CITATION: University of Wisconsin-Madison, 2001. Wisconsin Floristic Quality Assessment (WFQA). Retrieved October 27, 2009 from: http://www.botany.wisc.edu/WFQA.asp

Marine Biochemists N173 W21440 Northwest Passage Jackson, WI 53037 (888) 558-5106 www.marinebiochemists.com 27.06

Floristic Quality Index (FQI)

October, 2012 Plant Survey - Little Cedar Lake, Washington County, WI

Species	Common Name	С	species present=1
Ceratophyllum demersum	Coontail	3	1
Chara	Muskgrasses	7	1
Elodea canadensis	Common waterweed	3	1
Heteranthera dubia	Water star-grass	6	1
Myriophyllum sibiricum	Northern water-milfoil	6	1
Najas flexilis	Slender naiad	6	1
Nymphaea odorata	White water lily	6	1
Potamogeton amplifolius	Large-leaf pondweed	7	1
Potamogeton foliosus	Leafy pondweed	6	1
Potamogeton illinoensis	Illinois pondweed	6	1
Potamogeton natans	Floating-leaf pondweed	5	1
Potamogeton richardsonii	Clasping-leaf pondweed	5	1
Potamogeton zosteriformis	Flat-stem pondweed	6	1
Schoenoplectus acutus	Hardstem bulrush	6	1
Stuckenia pectinata	Sago pondweed	3	1
Typha sp.	Cattail	1	1
Vallisneria americana	Wild celery	6	1

N= 16 (number of native species present) mean C = 5.125 FQI = 20.5

CITATION: Nichols, SA. 1999. Floristic Quality Assessment of Wisconsin Lake Plant Communities with Example Applications. Journal of Lake and Reservoir Management, 15(2):133-141.

CITATION: University of Wisconsin-Madison, 2001. Wisconsin Floristic Quality Assessment (WFQA). Retrieved October 27, 2009 from: http://www.botany.wisc.edu/WFQA.asp

Floristic Quality Index (FQI)

July/August, 2012 Plant Survey - Little Cedar Lake, Washington County, WI

Species	Common Name	С	species present=1
Bidens beckii	Water marigold	8	1
Ceratophyllum demersum	Coontail	3	1
Chara	Muskgrasses	7	1
Elodea canadensis	Common waterweed	3	1
Heteranthera dubia	Water star-grass	6	1
Lemna trisulca	Forked duckweed	6	1
Myriophyllum sibiricum	Northern water-milfoil	6	1
Myriophyllum verticillatum	Whorled water-milfoil	8	1
Najas flexilis	Slender naiad	6	1
Nuphar variegata	Spatterdock	6	1
Nymphaea odorata	White water lily	6	1
Polygonum amphibium	Water smartweed	5	1
Potamogeton amplifolius	Large-leaf pondweed	7	1
Potamogeton foliosus	Leafy pondweed	6	1
Potamogeton illinoensis	Illinois pondweed	6	1
Potamogeton natans	Floating-leaf pondweed	5	1
Potamogeton richardsonii	Clasping-leaf pondweed	5	1
Potamogeton zosteriformis	Flat-stem pondweed	6	1
Ranunculus aquatilis	White water crowfoot	8	1
Schoenoplectus acutus	Hardstem bulrush	6	1
Stuckenia pectinata	Sago pondweed	3	1
Typha angustifolium	Narrow-leaved cattail	1	1
Typha latifolia	Broad-leaved cattail	1	1
Utricularia vulgaris	Common bladderwort	7	1
Vallisneria americana	Wild celery	6	1

N= 25 (number of native species present)

mean C = 5.48

FQI=27.4

CITATION: Nichols, SA. 1999. Floristic Quality Assessment of Wisconsin Lake Plant Communities with Example Applications. Journal of Lake and Reservoir Management, 15(2):133-141.

CITATION: University of Wisconsin-Madison, 2001. Wisconsin Floristic Quality Assessment (WFQA). Retrieved October 27, 2009 from: http://www.botany.wisc.edu/WFQA.asp

An Update to the 2014 Little Cedar Lake Aquatic Plant Management Plan

Introduction

As indicated earlier, the primary intent of this most recent (2018) survey was to document the aquatic plant community of Little Cedar Lake and compare it to the 2012 findings. With minor exceptions, there have been few significant changes in the overall diversity of the native plant community in terms of Species Richness (number of species). As shown in the preceding data (Vegetation Maps), certain native species (Eelgrass, Illinois pondweed, Muskgrass, Coontail, Sago pondweed) rank high in abundance consistantly, whereas other species, while still present, may decline in one year, than become more dominant, in another.

A secondary purpose of this project was to take an opportunity to re-visit the Little Cedar Lake Management District Aquatic Plant Management Plan, completed in 2014 (following data collection in 2012). Aquatic Plant Control alternatives and recommendations were included in this Plan, some of which were adopted by the District or individual property owners and others, such as chemical treatment for control of Eurasian Watermilfoil, has been discontinued.

In the years since completion of the 2014 Plan, there have been some advances in technology, but in many respects, the basic options for aquatic plant management remain essentially the same. The recommended activities adopted in the 2014 Plan are listed below, with potential additions or changes highlighted.

Current Aquatic Plant Management Activities for Little Cedar Lake

A. Information and Education

The District is encouraged to disperse information to their residents regarding the importance of plants, the controls available, as well as the circumstances where control may be necessary. Information can be distributed by many forms of media, including:

- 1.) Electronic: Via e-mail, or the District website.
- 2) Newsletter
- 3) Availability of Literature at regular Meetings
- 4) Volunteer Opportunities such as participation in the Clean Boats, Clean Waters, for example.
- 5) Sponsorship of Annual Lake Workshops where area lake residents may learn about lakes, whether it be about fish, plants, water quality or wildlife from a variety of providers.
- B. Manual (Physical) Removal

Hand removal can be an effective tool in small, relatively shallow, near-shore areas. Residents should be encouraged to utilize this technique in and around piers and swim areas.

Residents should also be notified that a permit for this activity is required unless:

- Removal of plants is restricted to less than thirty feet of shoreline
- Plants targeted include Eurasian Watermilfoil or Curly-leaf Pondweed (aquatic invasive species)

Please note that areas within a DNR Designated Sensitive Area require a permit for Manual Removal, regardless of whether the plant species are native or non-native.

Current Aquatic Plant Management Activities for Little Cedar Lake, cont'd.

The use of Diver Assisted Suction Harvesting (or D.A.S.H.), is also available. This method uses a Scuba-equipped diver operating a suction device. While still labor-intensive, with removal of the plants done by hand (pulling/digging of plants), a suction device is used to carry the plants to the lake surface where they are collected.

D.A.S.H. has been used successfully for short-term removal of all species within a small area (such as a private swim or pier area), or on a larger scale for control of aquatic invasive species (A.I.S.). The success achieved in these A.I.S. control projects, relative to the effort and/or cost have varied quite widely. Greater success has been achieved where the infestation is quite small and the potential size of the infestation may be limited by physical characteristics of the lake such as water depth, or bottom type (inorganic sand or gravel). Competition from native plant species is another factor, particularly where bottom sediments are lower in nutrients than is favored by A.I.S. such as Eurasian Watermilfoil. Aquatic plant control using D.A.S.H. requires an approved WI DNR Chapter NR109 permit.

C. Mechanical Harvesting

Mechanical harvesting of native aquatic plants, or in beds containing a mixture of both native and non-native species is recommended, as needed to maintain recreational access.

These areas include:

- 1. Public Navigation: To and from the Ackermann's Grove Boat Launch and also the main lake and "Kettle".
- 2. Private Access : Allow for boats to navigate to/from their mooring location. This will generally require a large (wide) enough area for a boat to back away from the pier, turn, and exit towards deeper water.

The current Aquatic Plant Harvesting Plan is shown in pages 27-29 (Figures 21-22). This includes maps of the specific areas of the lake to be harvested, the location of aquatic plant disposal site, as well as specific harvesting instructions, such as depth to which plants may be cut and amount of plant material that must be left (distance from bottom).

While the navigational lane from Ackermann's Grove remains on the Harvesting Plan, removal of any plants in the vicinity of the Boat Launch (and Starry Stonewort infestation) should be accomplished by other means (DASH or hand pulling) in order to minimize the likelihood of the harvester transporting Starry Stonewort around the lake.

While the plant population may change, as well the needs of the residents, it is important that any proposed changes in harvesting receive WI DNR approval. Figure 23 (page 32) contains a map of Designated Sensitive Areas developed by DNR staff (1991). Figure 24 lists the management activities which may, or may not be conducted within these areas.

D. Aquatic Herbicides and/or Algaecides

Aquatic plant control activities utilizing herbicides/algaecides have been conducted in Little Cedar Lake previously. During the period of 2003-14, 2,4-D herbicide, either in the granular or liquid form was used for the selective control of Eurasian Watermilfoil (see Table on page 30). While the last treatment was conducted in 2014, the treatments proved rather effective and should remain a management option for control of Eurasian Watermilfoil.

Products utilized for aquatic plant control must be registered for use by the United States Environmental Protection Agency (USEPA) and the Wisconsin Department of Agriculture (WDATCP). Additionally, the application of these compounds is regulated under a permit system by the WI DNR. Further, the type of product that can be applied to a public body of water by individuals is limited to granular formulations to sites under 0.25 acre in size unless it is applied by an certified applicator (WDATCP). Finally, it is important to note that some compounds may be effective upon a limited number of species. Additional selectivity may be achieved, if desired, by other factors, including treatment timing (time of season).

Marine Biochemists N173 W21440 Northwest Passage Jackson, WI 53037 (888) 558-5106 www.marinebiochemists.com

Continued on page 30

DNR Approved Harvesting Plan Areas—Little Cedar Lake. Washington County, WI

North End

Note: Areas Highlighted in Blue are DNR-Designated Sensitive Areas.

Harvesting of EWM in "Kettle" can begin in early Spring (late April-early May, then again in early Fall (before Sept. 30) to reduce EWM biomass Canopy of robust EWM growth must be present. Minimum 3 ft. of water depth required, with a minimum of 1 ft. of material left uncut on lake bottom.



**Harvesting of EWM in "Skim Area" highlighted in yellow can begin in early Spring (late April-early May, then again in early Fall (before Sept. 30) to reduce EWM biomass. Canopy of robust EWM growth must be present. Minimum 3 ft. of water depth required, with a minimum of 1 ft. of material left uncut on lake bottom.

Area	Acres	Length	Width	Depth of	Skim	Skim	Skim	Skim	Comments
		(ft.)	(ft.)	Cut (ft.)	Acres	Length (ft.)	Width (ft.)	Depth (ft.)	
1	0.76	1100	30	2	0.51	1100	20	1	Skim Lane East of Harvest Lane
2	0.9	1300	30	3					
3	0.8	700	50	2					
4	0.41	600	30	2	0.28	600	20	1	Skim Lane North of Harvest Lane
5	1.9	420	100-200 *	2					
6	0.2	300	30	2					
Yellow	**				2.3	500	200	1	Skim area between Areas 6 & 7
7	1.8	2600	30	2					
8	0.48	700	30	2					
9	0.41	600	30	2					
10	0.38	1100	15	1					
11	0.07	100	30	1					
12	1.37	2400	30	2					
13	0.34	500	30	2					Cut at buoy line for EWM; do not cut pondweeds by piers
14	0.34	500	30	2					
Total	10.16				3.09				

* 100 feet permitted for Area 5; 100 additional feet only if severe navigational impediment. ** See instructions for Early Spring & Early Fall Harvesting of EWM canopies.

Figure 21 (cont'd) DNR Approved Harvesting Plan Areas—Little Cedar Lake. Washington County, WI

Note: Areas Highlighted in Blue are DNR-Designated Sensitive Areas.

Plant control within Area 8 should be conducted by means other than Mechanical Harvester in order to avoid disturbance of the Starry Stonewort infestation by Boat Launch.



Area	Acres	Length	Width	Depth of	Skim	Skim	Skim	Skim	Comments
		(ft.)	(ft.)	Cut (ft.)	Acres	Length (ft.)	Width (ft.)	Depth (ft.)	
1	0.76	1100	30	2	0.51	1100	20	1	Skim Lane East of Harvest Lane
2	0.9	1300	30	3					
3	0.8	700	50	2					
4	0.41	600	30	2	0.28	600	20	1	Skim Lane North of Harvest Lane
5	1.9	420	100-200 *	2					
6	0.2	300	30	2					
Yellow					2.3	500	200	1	Skim area between Areas 6 & 7
7	1.8	2600	30	2					
8	0.48	700	30	2					
9	0.41	600	30	2					
10	0.38	1100	15	1					
11	0.07	100	30	1					
12	1.37	2400	30	2					
13	0.34	500	30	2					Cut at buoy line for EWM; do not cut pondweeds by piers
14	0.34	500	30	2					
Total	10.16				3.09				

* 100 feet permitted for Area 5; 100 additional feet only if severe navigational impediment

Figure 22 Little Cedar Lake—Washington County Aquatic Plant Harvesting Off-Loading & Disposal Sites

Overview of Off-Loading & Disposal Sites, Travel Route Detailed View of off-Loading Site



Current Aquatic Plant Management Activities for Little Cedar Lake, cont'd.

Year	Permit	Treated	2,4-D	2,4-D (Liq.)	2,4-D	2,4-D (Gran.)
	Acreage	Acreage	Liquid (gal)	Acres	Granular (#)	Acres
2003	45.48	31.44	110	18.44	1300	13.0
2004	45.48	8	-	-	800	8.0
2005	17.54	4.0	-	-	400	4.0
2006	29.94	3.25	-	-	325	3.25
2007	29.94	11.0	-	-	1100	11.00
2008	29.94	8.0	-	-	800	8.00
2009	* *	-	-	-	-	-
2010	18.0	0	-	-	-	-
2011	19.9	15.5	-	-	1600	-
2012	26.5	21.5	155	21.5	-	-
2013	56.7	12.9	57	5.9	700	7.00
2014	57.0	19.2	104.5	18.2	150	1.0

Herbicide Use in Little Cedar Lake 2003-2014*

*Source: Marine Biochemists Treatment Records ** No permit required due to lack of growth .

While the majority of the remaining discussion on chemical controls will focus on management of the principal exotic species in the lake, Eurasian Watermilfoil (EWM), it bears mentioning that Starry Stonewort (*Nitella obtusa*) was discovered in Little Cedar Lake in August, 2018, by Washington County A.I.S. staff. Starry Stonewort was not sampled during the Point-Intercept survey, therefore cannot be discussed in much detail at this time. The control technique(s) utilized will be based largely on the scale (size) of the infestation, with smaller infestations (0.25 acre) being manageable by physical removal. Potential treatment costs are identified, along with those for EWM, on page 37.

The decision on whether to chemically treat Eurasian Watermilfoil (EWM) in the future should begin with an assessment of how widespread, or statistically significant the EWM population is currently, relative to earlier surveys. The EWM distribution map shown earlier (Figure 7, page 9) provides a good representation. Statistically speaking EWM presence is nearly as great as it was during the July/August, 2012 survey, which preceded a treatment on August 14,. Results of this treatment can be seen via a reduction in the abundance/distribution of EWM in the October, 2012 Survey map. EWM data for the three surveys are as follows:

Survey	EWM # Sites	Freq. Occurrence %
July/August, 2012	145	16.8
October, 2012	55	8.7
August, 2018	124	14.7

Current Aquatic Plant Management Activities for Little Cedar Lake, cont'd.

As described in the 2014 Plan, treatments for control of EWM fall into two general categories:

- "Spot"-Type Treatments: While these "Spots" may be small (<0.5 acres) or relatively large (>10 acres), only "problem" areas of a lake receive treatment, with the primary objective being temporarily relieving the nuisance conditions. Except for some limited circumstances, the length of control obtained can be measured in weeks or months. In addition to temporary relief for recreational purposes, EWM may be controlled enough to allow for the expansion of the native plant community. This in turn, may delay the return of EWM to "nuisance" conditions.
- 2) Whole-Lake Treatments: These are aimed at reducing EWM populations thoughout the entire lake to the greatest ` extent possible, thus allowing for the re-establishment of native plant communities. These may, or may not be cost-effective depending upon the size of the lake and the relative size of the infestation. While long-term control (>1 year) can occur, this is dependent upon the product(s) and concentration(s) being used and the extent to which water enters and leaves the lake system (Residence Time).

"Spot Treatments"

As presented in the 2014 Plan, the District observed an expansion of Eurasian Watermilfoil during the late 1990's and early 2000's and began investigating the use of selective herbicides for controlling EWM. The first treatment of Little Cedar Lake under the District sponsorship occurred in 2003. That year, a permit covering (up to) approximately 46 acres was obtained from the WI DNR. Figure 25 (Map 10, SEWRPC Plan) shows the Distribution of Non-Native Aquatic Plants (Eurasian Watermilfoil and Curlyleaf Pondweed) according to the 2000 survey. Approximately 31.44 acres were treated in 2003.

Figures 26 and 27 are EWM distribution maps for the 2018 and 2012 surveys. While treatment of all these areas is not required, they, along with the 2000 SEWRPC Map provide a good indication of where EWM may be expected to develop. Should the District decide to pursue treatment, it is recommended that a permit for all areas be obtained, which can then be treated on an as-needed basis. As of 2018, the areas containing the densest EWM were Area #'s 4 and 5.

While prior treatments have not eliminated EWM, they have reduced the impact that it has had on the lake as evidenced by this Summary of the 2003-2013 treatment activities:

- 1) EWM treated nine of eleven years (no treatment in 2009 or 2010).
- 2) Treatment minimum of 3.25 acres (2006), maximum of 31.44 acres (2003).
- 3) Average of 12.8 acres (for nine years lake was treated), median of 11 acres and mode of 8.0 acres.
- 4) Beginning in 2006 a noticeable decline in EWM was noted (B. Suffern, field notes, 2006). The lack of treatment being required in 2009-10 was attributable in part due to earlier (successful) treatments, reduced water clarity, recovery/expansion of the native plant population, as well as the presence of Zebra Mussels. These can interfere with normal EWM growth by "weighting down" the stems, preventing them from reaching the water surface.

It has been suggested by many in this field that EWM treatments "early in the year" (May-June) is preferable to other times of the year. Our experience on Little Cedar Lake differs somewhat, in that treatments have been timed to control excessive growth prior to dense formation of surface canopies. While EWM typically begins its' growth in April or May, there are exceptions. Cool spring temperatures, poor water clarity, declining water levels in response to drought, as well as the presence of zebra mussels, can all have a major impact upon the normal growth cycle. EWM growth may be minimal in May or early June, than surge in the end of June or July, thus forming a nuisance for the remainder of the year.

continued on page 37

DNR Designated Sensitive Areas within Little Cedar Lake

Source: WI DNR Sensitive Area Assessment (1991), SEWRPC (2004)

Map 12

WISCONSIN DEPARTMENT OF NATURAL RESOURCES-DELINEATED SENSITIVE AREAS IN LITTLE CEDAR LAKE: 1991



39

Water Use Restrictions within DNR Designated Sensitive Areas—Little Cedar Lake—Washington County, WI

Source: August, 1991 Sensitive Area Assessment by WI DNR

MANAGEMENT RESTRICTIONS FOR SENSITIVE AREAS The Department of Natural Resources currently has regulatory authority over a wide variety of activities that take place in or near surface waters of the state. Placing restrictions on specific activities that would disturb the aquatic plant community in Little Cedar Lake will help to protect the fish, wildlife, and water guality of the lake. The use of aquatic herbicides is not allowed for the control of aquatic vegetation. Contact Person: Rob McLennan, Water Resources Manager, 263-8714 The use of aquatic herbicides for the control of aquatic plants and algae will be allowed only for Eurasian Water Milfoil. Contact Person: John Nelson, Fish Manager, 892-8756 Rob McLennan, Water Resource Manager, 263-8714 3. None of the following inlake activities allowed. a) Filling b) Pea Gravel/Sand Blankets c) Aquascreen d) Concrete, Timber, or Steel Seawalls Contact Person: Joanne Kline, Water Regulations and Zoning, 263-8673 Rock riprap will be allowed for shoreline protection in areas with erosion problems. Contact Person: Joanne Kline, Water Regulations and Zoning, 263-8673

 Individual piers will be allowed and proposals for marina piers will be evaluated on a case by case basis.

Contact Person: Joanne Kline, Water Regulations and Zoning, 263-8673

MANAGEMENT RESTRICTIONS BY SENSITIVE AREA

Sensitive Area 1	Restrictions	1, 3-5
Sensitive Area 2	Restrictions	2-5
Sensitive Area 3	Restrictions	2-5
Sensitive Area 4	Restrictions	1, 3-5

MANAGEMENT RECOMMENDATIONS

Additional recommendations are also made to provide management guidance in areas which the department does not have regulatory control or can be better implemented at the local level.

 The department staff recommends that no mechanical harvesting take place in designated sensitive areas unless associated with a research program to increase the diversity of aquatic plants. Small hand cleared areas for swimming or navigation is acceptable.

Contact Person: Rob McLennan, Water Resources Manager, 263-8714

 Strictly enforce or encourage adoption of construction site erosion control ordinance.

3. Strictly enforce shoreland and wetland ordinance.

SEWRPC (2000) Distribution Map of Non-Native Plant Species

Little Cedar Lake—Washington County, WI

Map 10

DISTRIBUTION OF NONNATIVE AQUATIC PLANT SPECIES IN LITTLE CEDAR LAKE: 2000



DATE OF PHOTOGRAPHY: MARCH 2000

Figure 26 Little Cedar Lake—Washington County, WI Eurasian Watermilfoil Distribution—August, 2018



Area	Acres
1	3.5
2	7.5
3	4.0
4	11.5
5	11.5
6	4.7
7	3.5
8	3.0
9	3.5
Total	52.7

Distribution of Eurasian Watermilfoil in

Little Cedar Lake—Washington County, WI

June/July 2012*

Area	Acreage	Length (ft.)	Avg. Width (ft.)	Avg. Depth (ft.)
1	9.00	1400	275	5
2	3.90	1700	100	5
3	11.40	800	620	5
4	1.50	850	75	5
5	5.40	800	200	5
6	7.40	1700	200	5
7	1.50	1300	50	8
8	2.00	1700	50	5
9	2.80	700	175	5
10	5.75	1000	250	3
11	3.00	2600	50	3
12	7.30	800	400	3

Areas with Potential For Problematic ("Topped-Out") Beds** of Eurasian Watermilfoil

Total: 60.95 acres

**Note that this is a maximum estimate. Herbicide treatment is typically confined to continuous beds reaching surface (Rake Density = 2 or 3).



* Data collected by Washington County, Dept. of Parks and Planning

Current Aquatic Plant Management Activities for Little Cedar Lake, cont'd.

In the past, DNR policy allowed for treatment at pretty much any time of the season, as long as growth of EWM warranted it. However, recent changes in state-wide policy has all but prohibited treatment of EWM after July 1, with the exception for "direct navigational impairment".

Due to the severity of the EWM infestation in the northeast corner of the main lake (Area 5 on Figure 25, p 34), the District should consider an early-season treatment for EWM control using 2,4-D, as this portion may only be skimmed, rather than harvested.

This concludes the discussion on spot treatments, Potential costs are identified, along with other treatment options in the Table on page 37.

"Whole Lake Treatments"

The concept of treating an entire lake system for lake-wide control of aquatic invasive species (Eurasian watermilfoil and/or Curly-leaf pondweed) was developed over the last decade in an attempt to see to what an extent it could be controlled or eliminated. Dozens of these treatments have been completed over the years as part of an on-going research project. While excellent (multi-year) control has been obtained in some circumstances, in others, control lasted one season (or less).

In deep lakes that stratify (such as Little Cedar), treatment of only the epilimnion (portion of lake above the thermocline), rather than the entire lake-volume (for shallow lakes), is required. In early Spring, cooler water temperatures (less than 60 deg. F) allows for a slower herbicide breakdown, and thus, a relatively low concentration to be used. Treatments are conducted early in the plant growth cycle, when fresh green growth appears on EWM plant tips, or, in the case of Curly-leaf Pondweed, before turions (reproductive structures), are formed.

While not required, the DNR encourages lake organizations utilizing these techniques to collect plant data using Point-Intercept Methodology, along with monitoring herbicide residues over time. This adds significantly to overall treatment costs. Please note that the data collected in 2018 may be considered sufficient in the event that a whole-lake treatment is being considered in the near future.

Generally speaking, lakes that considered good candidates for this type of treatment include those that:

- 1) Have very little water inflow/outflow to affect the herbicide concentration, and thus, treatment results. Depending upon the product(s) being used, anywhere from 10-60 days of contact time may be required.
- 2) Lakes that are shallow and do not stratify, or lakes in which the depth to which stratification occurs can be predicted utilizing Temperature Profiles.
- 3) Lakes that have one-quarter to one-third or more of the lake surface being affected by Eurasian Watermilfoil, or a frequency of occurrence being greater than (approximately) 20%.
- 4) This technique may be used to treat large portions of lakes (such as the "Kettle" of Little Cedar) that are relatively isolated from the rest of the lake.

While Little Cedar may be considered a candidate for this type of treatment approach, the additional cost of a wholelake treatment may outweigh the benefits given the relatively small area (20-30 acres or less) of the lake being *significantly impacted* by EWM and the relatively positive results obtained by spot-type treatments. However, treatment of the entire north end "Kettle" may be cost-effective.

continued on following page

Current Aquatic Plant Management Activities for Little Cedar Lake, cont'd.

I. Whole Lake (Epilimnetic) Treatment	Treatment Cost	Post Treatment Sur-	Herbicide Residual	Estimated
for EWM Control		vey*	Monitoring*	Maximum
a. Liquid 2,4-D at 400 parts per billion (ppb)	\$ 21,500.00	\$ 6,000.00	\$ 3,000.00	\$ 30,500.00
 b. SonarOne (fluridone). Three treatments during season, total of 8 parts per billion. 	\$ 50,000.00	\$ 6,000.00	\$ 5,000.00	\$ 61,000.00
II. Entire Volume Treatment of Kettle for EWM Control with 2,4-D (400 ppb)	\$ 11,000.00			\$ 11,000.00
III. Spot Treatment				
A) EWM Control: Liquid 2,4-D at 2.0 ppm**				
(30 acres maximum at \$340.00/acre)	\$ 10,200.00	Not required	Not required	\$ 10,200.00
 B) Starry Stonewort Control: Maximum of one acre, 4x during season with Cutrine-Ultra (0.8 ppm) and Hydrothol 191 (0.17 ppm) 	\$ 4,000.00			

For the District's consideration, the following Table provides a listing of treatment options and costs:

* These are Optional costs and may, or may not be required as a Condition of DNR Permit ** Navigate Herbicide (2,4-D granular) may be substituted for treatment of small "spots", if required. Cost per acre will vary, depending upon rate used, maximum of \$850.00/acre (150# product/acre). Treatment of the northeast corner of the main lake (11.5 acres) in early spring at a concentration of 2.0-3.0 ppm would be in the cost range of \$4,000.00-\$5,500.00.

In addition, an annual fee of \$1,270.00 will be required for the DNR permit (>50 acre coverage). Finally, the DNR should be consulted for any special requirements, such as Residue Monitoring as part of any Starry Stonewort treatment that may be conducted.

E. Aquatic Plant Monitoring

The WI DNR currently requires updating of Aquatic Plant Surveys as a Condition of 5-Year Mechanical Harvesting Permits. Thus, it is recommended that the District plan accordingly.

The District may also wish to consider less informal, and less expensive "Visual" Surveys for monitoring the lake for EWM, particularly if treatment is under consideration. This will provide the District with a means of determining how much is present, and if it is sufficient to warrant treatment. Costs will not exceed \$1,500.00 per survey, with no more than one or two visits being required annually.

The Aquatic Plant Management Plan component of this Report concludes with a Summary of the recommended and activities within this Plan in Table form on the following page. The Appendix contains the original DNR Sensitive Area Assessment conducted in 1991, and a copy of the approved 2012 Mechanical Harvesting Permit, along with Field Notes from the WI DNR.

Summary of the Little Cedar Lake -Washington County Aquatic Plant Management Plan—Recommended Activities

Information and Education	Ongoing. This includes, but is not limited to familiarization with aquatic plants (identification of AIS), and Aquatic Plant Management Plan, and re- strictions upon certain management activities (see "Sensitive Area Designa- tions", Figures 19-20).
Physical Removal	As needed in pier/swim areas, by property owner. Thirty feet of shoreline may be maintained by manual means w/o WI DNR permit approval. Excep- tion: Non-native species. No permit required, no limit on amount of frontage that may be managed.
	Removal within DNR Designated Sensitive Area requires permit.
	Objective: High degree of control in swim areas.
	Diver Assisted Suction Harvesting (D.A.S.H.) either for control of all plant spe- cies in high-use riparian owners, or for control of Aquatic Invasive Species. WI DNR permit required
Mechanical Harvesting	Annual harvesting for native/mixed plant beds within designated areas (as needed). Need to harvesting regularly, (more than five times,May-Sept.), due in part to expansion of Eurasian Watermilfoil. Designation of Plant Disposal site required on permit application.
	Objective: Maintain private/public access to high use areas of lake.
Aquatic Plant Monitoring	Assess plant community prior to management activity (Spring) to determine type(s) and scope of plant control required. Reassess AIS in August to determine need for Fall treatment or Plan for following year.
	Full PI Survey required every five years.
Herbicide Treatments	Consideration of Spot-Type Treatments for control of Aquatic Invasive Spe- cies, where nuisance conditions exist. Whole-Lake Epilimnetic treatment, or treatment of the entire volume of the Kettle if cost-effective and warranted by growth.
	Objective: To minimize formation of plant beds dominated by AIS and impacts upon recreation and native plant community.
	Starry Stonewort Control: Consider treatment in the event currently planned activities (DASH or Hand Removal) are inadequate, or scale of infestation expands significantly.

APPENDIX

Aquatic Plant Survey and Management Plan Update for Little Cedar Lake—Washington County, WI

November, 2018

Appendix A. 1991 DNR Sensitive Area Assessment Appendix B. 2014 Approved Mechanical Harvesting Permit and Field Notes

Appendix A

AQUATIC PLANT MANAGEMENT

SUMMARY OF SENSITIVE AREA ASSESSMENT

Lake: Little Cedar

County: Washington

Date of Assessment: August, 1991

RESOURCE VALUE

Little Cedar is a 246 acre lake with a shoreline of 4.3 miles located in the Towns of Polk and West Bend. Submergent plant species on Little Cedar include Chara, Coontail, Eel Grass, Eurasian Water Milfoil, Naiad, Water Star Grass, and a variety of pondweeds. The pondweeds include Sago, Flat-stem, Curly-leaf, Illinois, and Large-leaf. The pondweeds were observed in low densities with the exception of Illinois Pondweed which was observed in high densities at areas previously treated for Eurasian Water Milfoil.

Emergent plants include Bulrush, Cattail, and several unidentified Sedges. The floating leaved plants include White and Yellow Water Lilies, and Floating-leaf Pondweed. The emergent and floating leaved plants were confined to Sensitive Areas 1 and 4 (Figure 1).

Chemical treatment of aquatic plants in Little Cedar Lake is performed annually, during the summer, for Eurasian Water Milfoil and Curly-leaf pondweed.

The substrate in Little Cedar Lake is mostly muck, with the areas near shore being sandier. Some areas have boulders along the shoreline.

The fish population in Little Cedar Lake includes Bluegill, Largemouth Bass, and Northern Pike. Aquatic insects that are associated with aquatic plants are a very important food source in Little Cedar Lake. Sensitive Area 4 is excellent habitat for all three species, whereas Sensitive Area 1 is good Bluegill spawning habitat. All designated sensitive areas are good nursery and feeding habitats.

Wood Ducks, Mallards, and the Blue-winged Teal use Little Cedar Lake during the spring and fall for feeding, shelter, and migration. Great Blue Heron and Great Egert use Sensitive Areas 1 and 4 primarily for feeding and shelter.

Muskrat, Mink, Short-tail Weasel, and Raccoon use the lake for shelter, feeding, and rearing of their young year round.

The wetland areas located in Sensitive Areas 1 and 4 support a

wide variety of marsh mammals, birds, reptiles, and amphibians. These same areas act as nutrient and sediment traps for the lake. The emergent aquatic vegetation helps prevent shoreline erosion. Protection of the existing native aquatic plants is an important method of limiting the expansion of the exotic plant species Eurasian Water Milfoil and Curlyleaf Pondweed.

MANAGEMENT RESTRICTIONS FOR SENSITIVE AREAS

The Department of Natural Resources currently has regulatory authority over a wide variety of activities that take place in or near surface waters of the state. Placing restrictions on specific activities that would disturb the aquatic plant community in Little Cedar Lake will help to protect the fish, wildlife, and water quality of the lake.

 The use of aquatic herbicides is not allowed for the control of aquatic vegetation.

Contact Person: Rob McLennan, Water Resources Manager, 263-8714

 The use of aquatic herbicides for the control of aquatic plants and algae will be allowed only for Eurasian Water Milfoil.

Contact Person: John Nelson, Fish Manager, 892-8756 Rob McLennan, Water Resource Manager, 263-8714

3. None of the following inlake activities allowed.

- a) Filling
- b) Pea Gravel/Sand Blankets
- c) Aquascreen
- d) Concrete, Timber, or Steel Seawalls

Contact Person: Joanne Kline, Water Regulations and Zoning, 263-8673

 Rock riprap will be allowed for shoreline protection in areas with erosion problems.

Contact Person: Joanne Kline, Water Regulations and Zoning, 263-8673

Individual piers will be allowed and proposals for marina piers will be evaluated on a case by case basis.

Contact Person: Joanne Kline, Water Regulations and Zoning, 263-8673

MANAGEMENT RESTRICTIONS BY SENSITIVE AREA

Sensitive	Area	1	Restrictions	1, 3-5
Sensitive	Area	2	Restrictions	2-5
Sensitive	Area	3	Restrictions	2-5
Sensitive	Area	4	Restrictions	1, 3-5

MANAGEMENT RECOMMENDATIONS

Additional recommendations are also made to provide management guidance in areas which the department does not have regulatory control or can be better implemented at the local level.

1. The department staff recommends that no mechanical harvesting take place in designated sensitive areas unless associated with a research program to increase the diversity of aquatic plants. Small hand cleared areas for swimming or navigation is acceptable.

Contact Person: Rob McLennan, Water Resources Manager, 263-8714

2. Strictly enforce or encourage adoption of construction site erosion control ordinance.

3. Strictly enforce shoreland and wetland ordinance.

FIGURE 1

LITTLE CEDAR LAKE SENSITIVE AREAS



ĥ

AQUATIC PLANT MANAGEMENT

SENSITIVE AREA DESIGNATION

Lake Name Little Croat Lake

County WASH

Date 3/27/9/ Water Body Identification Code

Evaluators

201	NNIELINE	
Janed	NELSON	
rom	15446	-

The sensitive areas on this lake were designated to protect them from human perturbation either from water regulation and zoning projects or aquatic plant management activities. Sensitive areas are defined in NR107.05 (3) (i) (1) as:

... areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the area.

This evaluation will identify the sensitive areas on the lake and will recommend what and when management activities can be allowed without disturbing the ecological value of the area. In addition this evaluation will provide valuable information on future management strategies for the entire lake to ensure continued protection of existing fish and wildlife habitat and water quality.

SENSITIVE AREA

Page 2

I.	SITE DESCRIPTION	
La	e Name LITTLE CEDAL	
Α.	Location 1. Field Site Number / 2. Name of Adjacent Property Owners (Use back of form for addit space).	ional
	Site Description	
	 a. Total shoreline length <u>200</u> Ft. b. Distance from shore that is considered to be valuable <u>one</u>. c. Water Depth at site: Maximum <u>20</u> Ft., Average <u>3</u> Ft. d. Substrate Type. (Use back for additional information) 	Ft.
	<pre>% in zone A % in zone B % in zone C % in zone D Rubble Gravel %</pre>	
	Percent of area with mix: A, B, C, D, E, F, G, H	
on	ents	
_		

SENSITIVE AREA 1

e Name

Page 3

2. Biological

a. Maximum rooting depth 10 Ft.

b. Vegetation (Percent of area covered by individual species: $1^{\parallel} = 0-25$ %, 2 = 25-50%, 3 = 50-75%, 4 = 75-100%

Water depth (ft)

1	Plant Species 0	3	6-	9-	16+
1	Milfoil Operation	Ż.	-2	1.11.10.10.10.1	
2	Chara		3		
3	Cattail	74			
4	Bulrush	1	2		-
5	Sedges	1			
6	Lg leaf Pondweed	/	7		
7	Narrow 1f pondwd				
8	Curly lf pondwd	-			
9	Ylw lilv pad				
10	Wht lily pad	2	7		
11	P. Loosestrife	-			100
12	Filamentous algae				
13	Elodea				
11	FIRST AS IFFIRS / ALL -				
7	Labora Filo	1		-	
10				-	
17					
18					
19					
20					
21					
Com	ments (ie. Seasonal	conditions,	Currently	controlled,	etc.)

DEVELOPET SHOKELINE, IN ARANG CULLENILY OWNER GUE, ENEMICAL TREATMENT

c. Riparian vegetation

1.	Wetland (Type)
	a. Mapped wetlands present Yes/No
	b. Regulated by Corps, County, City, Village, DNR
2.	Agriculture (N/P
3.	Wooded (
4.	Developed (75%)
5.	Other (Small PACK/BOAT LANDING)

te Name Page 4 II. Resource Value A. Fish Species ABCD 1. Bluegill 4. Northern pike ABOD ABCD 5. Walleye 2. Lg mouth bass ABCD ABCD Crappie ABCD ABCD ABCD Fish Species В C А D 10% 20% 5% & Area used for Spawning A-M-J-J Period of use A-M-J-J> A-J-J-J A-M-J-J (April - July) Habitat needs for spawning Substrate Fran ensiscen; Wet FFION Vegetation Recent Tributary Other Srocify other: % Area used for Nursery 80 % 80% 80% A-M-J-J-A A-M-J-J-A A-M-J-J-A Period of use A-M-J-J-A (April - August) Habitat needs for nursery Substrate Vegetation Summer + BARDSENT Pelagic Structure Other Specify other: % Area used for Feeding 3000 80% Period of use 1-J-A A-m-J-1 Habitat needs for feeding Substrate Vegetation Pelagic Structure Other S cify other:

Lake Name _ (ittle (eday, S.end. (#1) Page 5 II. Resource Value (Con't) B. Wildlife Period of Use Essential Feature Species or Group Waterfowl wooddacts feeding X spring & fall ducks blowing --shelter X year round geese No drag rearing X other tran franze. . p. BSSID. duine ducks nesting X migrating X spring & fall feeding X Wading birds west Blue heyon shelter X year round rearing Great ecnet FSummer nesting migrating spring & fall feeding X Song birds year round Rod - where block block block shelter X rearing x a summer -Two e gwallows. nesting X on continue migrating mouch wren Duple martin spring & fall_ Shore birds feeding X year round sova vails shelter x rearing X a-summer. nesting X migrating feeding X Aquatic_furbearers spring & fall shelter X year round) muskrat rearing X mink nesting weeding STAIL WEASE! migrating feeding X Terrestrial furbearers spring & fall year round shelter X (raccoon) rearing nesting hand a migrating spring & fall feeding year round shelter rearing nesting migrating Waterford us would Do higher divine Comments kinted torthe cold minution

20 01 7 L 00 AT 10 ALL 10	La)	ce	N	am	e
---------------------------	-----	----	---	----	---

Page 6

Τ.,	Resource	Value	(Cont)	
~				

C. Water Quality

1. Sediment trap/retention Ses/No

- 2. Nutrient trap/retention (Yes/No
 - 3. Erosion Control Yes/No Some
- 4. Other

D. Ecological Value

- 1. Uniqueness to water body/region FILLAD with Michae However Ponowieds are present and should be allowed to srow to compete Wimilfoil, CHARA. GOOD TO KEEP OUT MILLADL, UNDEVELOPED SHOREWINE
- 2. Species diversity reservoir Good
- 3. Buffer against non-native species Nor Very GOOD TO Some Errowt Whileweles fily may help Keep miller Down

III. Management Recomendations

A. Aquatic Plant Management

- 1. Chemical Control
 - No treatment allowed

Treatment allowed with conditions FRAME LANE ONLY

Treatment allowed during specified time of year:

X Treatment limited to specified species:

Treatment limited to specified size limits

 X
 25 ft. private navigational channel

 Designated swim area of ______x
 ft.

 Other
 0

Treatment limited to research:

2. Mechanical Control

_____ No mechanical control allowed

Mechanical control allowed with conditions

Harvesting allowed during specified time of year:

Harvesting restricted to the identified areas (See Map)

State of Wisconsin DEPARTMENT OF NATURAL RESOURCES Waukesha Service Center 141 Barstow Street, Room 180 Waukesha WI 53188

Scott Walker, Governor Cathy Stepp, Secretary Telephone 608-266-2621 Toll Free 1-888-936-7463 TTY Access via relay - 711



July 8, 2014

Mr. Bob Ramsthal Little Cedar Lake Protection and Rehabilitation District 3936 Hwy NN West Bend, WI 53095

Re: 2014 Harvesting Permit

Dear Mr. Ramsthal:

The Department has received your application for a permit for harvesting aquatic plants by mechanical means in up to 13.25 acres of Little Cedar Lake, Washington County. We have found your application to be complete and are issuing you a five year permit with conditions that expires December 31st, 2018. It is recommended that a new plant survey be completed during the summer of 2018 in preparation for a new multiple permit application in 2019.

Attached is a copy of the harvesting permit with the conditions of the permit outlined. In addition, a copy of the findings of fact, conclusions of law and notice of appeal rights are included. A copy of the permit must be kept on the harvester at all times during operation. Please read your permit conditions carefully so that you are fully aware of what is expected.

Your next step will be to notify Department staff at least 4 days prior to the day in which you plan to begin harvesting. Please contact me if you have any questions at 262-574-2130 or heidi.bunk@wi.gov.

Sincerely,

id Bunk

Heidi Bunk Lakes Biologist

Cc: Travis Motl, Fisheries Biologist Dave Fezter, Midwest Aquatics Brian Suffern, Lonza/Marine Biochemists



STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Permit for Mechanical Harvesting of Aquatic Plants

The Little Cedar Lake Protection and Rehabilitation District is hereby granted under Section 23.24, Wisconsin Statutes and Administrative Code NR 109, a permit to conduct mechanical harvesting of aquatic plants in up to 13.25 acres of Little Cedar Lake in the Towns of Polk and West Bend, Washington County, Township 10 North, Range 19 East, Section 3 and Township 11 North, Range 19 East, Section 33 subject to the following conditions. This permit is issued for a 5-year term and will expire on December 31, 2018.

PERMIT CONDITIONS

- The Little Cedar Lake Protection and Rehabilitation District shall notify Lakes Biologist, Heidi Bunk at 262-574-2130 or <u>heidi.bunk@wi.gov</u>, 4 working days prior to the anticipated start of the harvesting operation. Department staff may schedule and conduct an onsite supervision of harvesting.
- A copy of the permit and accompanying maps shall be maintained onboard the harvester(s) at all times during harvesting operations.
- All aquatic plant cuttings must be removed immediately from the water. Disposal of the harvested aquatic
 plants must be located in the areas specified in the permit application (Ackerman Grove Park and Stoffel
 Farm, West Bend, WI) and must be in accordance with any applicable county and local regulations.
- The quantity and species of plants to be mechanically harvested must be in accordance with the permit
 application. Figures 24 and 25 denote fifteen areas to be harvested. Table 1 lists the allowable dimensions of
 harvesting in all fifteen areas.
- 5. The mechanical harvester may only be operated in three feet or greater water depth.
- A minimum of 1 foot of uncut plant material must be left growing on the bottom of the lake to stabilize sediment.
- The maximum depth of cut in Areas 10 and 11 is 1 foot. The maximum depth of cut in Area 2 is 3 feet. The maximum depth of cut in all other areas is 2 feet.
- Three areas are listed on Table 1 for "skim" harvesting. The depth of cut in these areas is 1 foot. The primary
 purpose of the "skim" harvesting is to remove floating vegetation.
- Area 13 may be cut by the buoy line to allow for harvesting of Eurasian water milfoil. The area of native pondweeds between the buoy line and the piers may not be cut.
- 10. Any fish or turtles accidentally harvested with the plant material shall be returned to the lake to the extent possible to protect the young of the year fish and panfish populations.
- Harvesting shall not be permitted within chemically treated areas until at least two weeks after an aquatic plant chemical application.

- All equipment transferred into Little Cedar Lake must be sterilized before launching and must abide by all provisions of NR 40. The harvester and trailer must be both completely pressure washed and all plant fragments removed. Hot water (at least 140 degrees Fahrenheit) or chlorine bleach can be used to achieve sterilization.
- 13. All mechanical harvesting records must be maintained and made available to the Department upon request. A report summarizing harvesting activities shall be given to the Department by November 1st, 2014. The report must include a map showing the area harvested, the number of acres harvested, the total cubic yards of plant material removed from each area of the lake harvested and the number of times harvesting took place.

FINDINGS OF FACT (Facts which were considered in making this decision.)

- The Little Cedar Lake Protection and Rehabilitation District has filed an application for a permit to conduct a
 mechanical harvesting operation in the Towns of Polk and West Bend, Washington County, Township 10
 North, Range 19 East, Section 3 and Township 11 North, Range 19 East, Section 33. The specific areas to be
 harvested are shown on the map(s) submitted with the permit application and incorporated into this permit.
- The Department has determined the proposed mechanical harvesting will provide aquatic plant nuisance relief in the designated areas. The mechanical harvesting will allow for increased navigation and recreational opportunities.
- The total harvesting area is 13.25 acres in the areas shown on the permit application maps as approved in the conditions above.
- The Department has determined that a portion of the proposed harvesting operation is in Departmentdesignated sensitive areas.

CONCLUSIONS OF LAW (These are the legal reasons why the Department can make these decisions)

The Department has authority under the above indicated Statutes and Administrative Codes, to issue a permit for mechanical harvesting of aquatic plants.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin Statutes and Wisconsin Administrative Code establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to Ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to serve a petition within the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to Section 227.42, Wisconsin Statutes, you have 30 days after the decision is mailed or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review. This notice is provided pursuant to Section 227.48(2), Wisconsin Statutes.

Dated at Waukesha, WI July 8th, 2014

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES For the Secretary

By ReichBurnt

Heidi Bunk Lakes Biologist

State of Wisconsin Department of Natural Resources PO Box 7921, Madison WI 53707-7921

Mechanical / Manual Aquatic Plant Control Application Form 3200-113 (R 3/04)

Page 1 of 4

Notice: Information requested on this form is required to permit mechanical and/or manual aquatic plant control application, per s. 23.24, Wis. Stats. The Department will not issue a permit unless you complete and submit this application. Personally identifiable information collected will be used for program administration and will be available to requesters under Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

FOR D	NR USE ONLY
Date Received	D Number 58-2014-47-23W
Fee Received	County Code
Exp. Date 12018	WBIC SIDO

Section I: Applicant Data								
Permit Applicant Name					Applicant is		_	
Little Cedar Lake PRD					Private ind	lividual	Contract	lor
Applicant Mailing Address					X Lake Orra	nization (Specif	Little Ceda	r Lake PRD
3936 Cty Hwy NN					Eans organ	mzation (opeca	<i>m</i>	
City West Bend		State WI	ZIP Code 53095		Lake Property Add	dress, City, Sta	te, ZIP (if differe	ent)
Telephone Number	E-Mail Ad	dress			Telephone Numbe	ər	E-Mail Address	5
262-335-7411	bob@s	erigraph	n.com		Same		Same	
Individuals and organizations (e.g removal. Attach additional sheets	., Lake Di if necess	istrict, La ary.	ke Association	, Prope	arty Owners Associa	ation, County E	epartment of R	tecreation), sponsoring
A. See attached sheet			^	ddress		Phone		E-mail Address
в				5				
C								
D.	¢							
Has a Lake Management plan be	en provide	d to the	DNR? If Yes	s, date 4	approved of most c	urrent copy	Location of Ap	plicant file copy
Does the proposed plant removal	ogree will	h the one	Caela bours					
If NO, explain. Atlach additional sh	eets if ne	cessary.	loved plant	X	Yes No			
Is this area within or adjacent to a	Sensitive	Area de	signated by the	e Wisco	onsin Department o	f Natural Reso	urces?	
Yes No X	Don't Kno	w I	f yes, list sites					
Section II: Location of Aquati	c Plant F	Removal	and Dispos	al				
Waterbody of proposed plant remo	oval Lake	e Surface	Area (acres)	Coun	ty			
Little Cedar Lake	246	3		Was	hington	Town	Nange K	1E Section 33
Name of Firm (if sub-contracted)					Telephone Number	r		
Midwest Aquatics	1.				262-385-5874			
Street Address					City, State and ZIP			
NTUSW14564 Wilson Dr					Germantown w	1 53022		
Name of 1st Plant Disposal Site (if Ackermans Grove Park	applicabl	ө)			414 % S	Section Townsh	hip Range E/	WCounty
Noncentralia Glove Faik	f an all a sh	(-)			NU	2 10	NY	Wash. Aster
Big Cedar Lake property on	Hwy 33	and Hw	vy 144		SW		N 19	washinston
Area(s) Proposed for Plant Remov	al (Note c	letails in	permit cover le	otter for	final permitted size	as). Please see	e attached samp	ple drawing for guidance
1. Length from shore ft.	x Shorelin	ne or area	width	ft.	/ 43,560 ft. =	Estimated	Acreage	Avg. Depthft.
 Length from shore ft. 	x Shorelin	ne or area	width	ft.	/ 43,560 ft. =	Estimated	Acreage	Avg. DepthfL
3. Length from shore ft.	x Shorelir	ne or area	width	ft.	/ 43,560 ft. =	Estimated	Acreage	Avg. Depthft.
 Offshore Control Site Length 	ft. x	Shoreline	e or area width		ft. / 43,560 ft. =	Estim	ated Acreage	Avg. Depthfl.
5. Offshore Control Site Length	ft. x	Shoreline	e or area width		fl. / 43,560 ft. =	Estim	ated Acreage	Avg. Depthft.
TOTAL ESTIMATED ACREAGE			- (SEE	AT	TACHED)			

Section II	: Location of Aqua	tic Plant Removal (cont)		
What type	of aquatic plants below	w the Ordinary High Water I	Mark are	proposed to be remov	ed? (check all that apply)
\times	Emergent (above water level)	Submergent (below water level)	\times	Floating Leaf (at the surface i.e. lill	y pads)
Section II	I: Map & Property C	Dwnership			
Attach a co the bottom	opy of a lake map th of this page. On th	at includes the property(e map, identify the follow) to be h ing requi	arvested. If no print red information.	ed map is available, provide a sketch of the site at
 Area a 	nd dimensions of ea	ich proposed plant remov	al area.		
 Location particip the spatial 	on of all riparian neig ants and non-partic ace below:	hbors (property owners r ipants. Consecutively nu	iparian to mber ea	and adjacent to the ch riparian neighbor	e proposed removal area) including project (both project participants and non-participants). In
Name propert	all riparian owners, i ties on the map. Att	ncluding project participa ach additional sheets if n	nts & nor ecessary	n-participants. The	number should correspond with the numbered
 Check 	Yes box to indicate	project participants and N	lo box fo	r non-participants.	
No.	Name of F	Riparian Neighbor		Project Participant	Control dimensions (calculated acreage)
1				Yes No	•
2.				Yes No	
3.				Yes No	
4.				Yes No	19
5.				Yes No	
3.		24.7			
Check	here if separate sheets	s are attached identifying ad	litional ne	ighbor riparian owners	Indicate project participants and/or non-participants.
Check	here if printed map atta	ached. If no printed map, us	e this spa	ce to sketch the site ar	nd provide required information.
Мар					
100 A.S.					
C)					

. .

Mechanical / Manual Aquatic Plant Control Application Form 3200-113 (R 3/04) Page 3 of 4

۰.

Section IV: Methods				
What mechanical or manual methods to	o remove plants are propose	d? (check all that	apply)	
Mechanical harvesting Ra	king Other			
Hand Pulling Cu	dting			
Please explain why you selected the pro	posed method(s).			
Native plants that cant be chemi	ically treated			
Native plants that can be onem	dully fromod			
Note: Other control methods (i.e. botton	n barriers, weed rollers, herbid	cides) also need D	NR permits. Contact this o	ffice for more details.
Section V: Fees				
Fees are not refundable and are calcul	ated as follows:			
Check box for type of project:			422.02	
1. single riparian area, one proper	ty owner, less than one acre .			and the second state and
 Imultiple riparian areas, offshore if proposed removal is greater to) control areas, multiple riparia han 10 acres fee caps at \$300	in properties, one 0.00	acre or greater \$30.00/acre	; (round up to the nearest whole acre)
	acre	s x \$30.00 per ac	e = \$	000.00
	Total non-refundable fee end	closed (max \$300.	00)	\$300.00
Section VI: Reasons for Aquatic P	lant Removal			
Purpose of Aquatic Plant Removal		Nuisance C	aused By	
Maintain navigational channel for	common use	Emerg	ent water plants	
Maintain private access for boatin	ng	X Subme	rgent water plants	
Maintain private access for fishing		Floatin	g water plants	
		Other		
M Improve swimming				
Other		-		
Name of plants, if known				
Section VII: Alternatives Consider	red			
	A. Previously Done?	B. Presently	Proposed?	
1. Chemical	Yes No	X Yes	No	
2. Sediment screens	Yes No	Yes	No	
3. Dredging	Yes No	Yes	X No	
4. Drawdown	Yes X No	Yes	No No	
5. Nutrient controls in watershed	Yes No	Yes	No No	
6. Nutrient controls on property	Yes No	Yes	X No	
7. Other	Yes X No	Yes	No	
NOTE: Consider feasibility of altern but also being you evaluate	atives for each control site. 1	This information no ant management.	t only helps the department	t make a decision on this application
Describe the level of success for alterna	tive methods previously used:			
	Works for EWI, but no	t for native so	cies	
1. Chemical	WORS IN LWE BUT IN	tion nauve op.	10100	
2. Sediment screens				
3. Dredging			11.11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	
4. Drawdown				
5. Nutrient controls in watershed				
6. Nutrient controls on property				
7. Other				

Page 4 of 4

Section VIII: Applicants Responsibilities

- The applicant has prepared a detailed map, which shows the length, width and average depth of each area proposed for the 1. control of rooted vegetation.
- The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management 2 project involving removal. Supervision may include inspection of the proposed treatment area and/or equipment, before, during, or after removal. The applicant is required to notify the regional office 4 working days in advance of each anticipated date of plant removal with the date, time, location and size of plant removal unless the Department waives this requirement. The advance notification may be specified in your permit.
- The applicant agrees to inform all operators of harvesting equipment of the conditions and terms of this permit and to insure that all 3 operators understand and abide by those terms and conditions.
- The applicant agrees to comply with all terms and conditions of this permit, if used, as well as applicable Wisconsin Administrative 4. Rules. The required fee is attached.

I hereby certify that the above information is true and correct and that copies of the application have been provided to the appropriate parties name in Section II and that the conditions of the permit will be adhered to. All portions of this permit, map and accompanying cover letter must be in possession of the applicant or their agent at time of plant removal. During plant removal activities, all provisions of applicable Wisconsin Administrative Rules must be complied with, as well as the specific conditions contained in the permit cover letter.

DNR Use Only

Applicant's Signature

Review Notes:

Natural Heritage Inventory Review

Section IX: Permit to Carry Out Mechanical or Manual Removal of Aquatic Plants

The foregoing application is a aquatic plants described in th represent an endorsement of Administrative Rules.	approved. Permission is hereby granted to the e application during the season. The appro- the permitted activity, but represents that the	he applicant to mechanically or manually remove val of an aquatic plant management permit may not e applicant has complied with Wisconsin	Season Year 20_12_
Application fee if received?	State of Wisconsin Department of Natural Resources For the By Aleid, Burd Regional Director or Designee 7/28/12	7/30/12	
	Date Signed	Date Mailed	

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For Judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to s. 227.42, Wis. Stats., you have 30 days after the decision is malled, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filling of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.

This notice is provided pursuant to s. 227.48(2), Wis. Stats.

Section VIII: Applicants Responsibilities

- The applicant has prepared a detailed map, which shows the length, width and average depth of each area proposed for the 1. control of rooted vegetation.
- The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management 2. project involving removal. Supervision may include inspection of the proposed treatment area and/or equipment, before, during, or after removal. The applicant is required to notify the regional office 4 working days in advance of each anticipated date of plant removal with the date, time, location and size of plant removal unless the Department waives this requirement. The advance notification may be specified in your permit.
- The applicant agrees to inform all operators of harvesting equipment of the conditions and terms of this permit and to insure that all 3. operators understand and abide by those terms and conditions.
- The applicant agrees to comply with all terms and conditions of this permit, if used, as well as applicable Wisconsin Administrative 4. Rules. The required fee is attached.

I hereby certify that the above information is true and correct and that copies of the application have been provided to the appropriate parties name in Section II and that the conditions of the permit will be adhered to. All portions of this permit, map and accompanying cover letter must be in possession of the applicant or their agent at time of plant removal. During plant removal activities, all provisions of applicable Wisconsin Administrative Rules must be complied with, as well as the specific conditions contained in the permit cover letter.

amot oplicant's Signature

Date Signed

DNR Use Only Review Notes: Natural Heritage Inventory Review

The foregoing application is a aquatic plants described in the represent an endorsement of Administrative Rules.	pproved. Permission is hereby granted to the applicant to mechanically or manually remove e application during the season. The approval of an aquatic plant management permit may not the permitted activity, but represents that the applicant has complied with Wisconsin	Season Year 20 <u>14 - 18</u>
Application fee if received?	State of Wisconsin Department of Natural Resources For the Secretary By Acids D Bunk Regional Director or Designee 7/08/14 (email) Date Signed	

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For Judicial review of a decision pursuant to ss. 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to s. 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. The filling of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.

This notice is provided pursuant to s. 227.48(2), Wis. Stats.

13.25 acres	Grand Total		acres	3.09			acres	10.16	Total:
					2	30	500	0.34	14
: pondweeds by piers	M; do not cut	line for EW	Cut at buoy I		2	30	200	0.34	13
					2	30	2400	1.37	12
					L.	30	100	0.07	11
					F	15	1100	0.38	10
					2	30	600	0.41	5
					2	30	700	0.48	00
					2	30	2600	1.8	1
Skim area between Areas 6 and 7	1	200	500	2.3		,			Yellow
					2	30	300	0.2	9
					2	100 to 200 *	420	1.9	5
Skim Lane North of Harvest Lane	1.	20	600	0.28	2	30	600	0.41	4
					2	50	700	0.8	ŝ
					ŝ	30	1300	0.9	2
skim Lane East of Harvest Lane	1.	20	1100	0.51	2	30	1100	0.76	1
9	Depth (ft)	Width (ft)	(tt)	Acreage	Cut (ft)	Width (ft)	Lenth(ft)	Acreage	Area
	Skim	Skim	Skim Length	Skim	Depth of		, ,		

* 100 feet permitted for Area 5; 100 additional feet only if severe navigational impediment

Little Cedar Lake Harvesting Plan 2014 Table 1. Allowable Dimensions for Harvesting on Figures 24 and 25

DNR Approved Harvesting Plan Areas-Little Cedar Lake. Washington County, WI



North End

Notes: 1) Areas Highlighted in Blue are DNR Designated Sensitive Areas. 2) DNR may limit mechanical harvesting to depths greater than 3 feet in order to avoid disturbance to lake bottom and/or uprooting of plants.
3) DNR may also limit depth to which harvesting occur, for example, to within 2 feet of lake bottom in shallow (3-4 feet) of water. These Restrictions will be listed on DNR permit.

DNR Approved Harvesting Plan Areas-Little Cedar Lake. Washington County, WI

Area	Acreage	Length (ft.)	Avg. Width (ft.)
1	0.76	1100	30
2	0.90	1300	30
3	0.8	700	50
4	0.41	600	30
5	1.90	420	200
6	0.20	300	30
7	1.8	2600	30
8	0.48	700	30
9	0.41	600	30
10	0.38	1100	15
11	0.20	100	100
12	1.37	2400	30
13	0.34	500	30
14	0.34	500	30

Total: 9.22 acres

Notes: 1) Areas Highlighted in Blue are DNR Designated Sensitive Areas. 2) DNR may limit mechanical harvesting to depths greater than 3 feet in order to avoid disturbance to lake bottom and/or uprooting of plants. 3) DNR may also limit depth to which harvesting occur, for example, to within 2 feet of lake bottom in shallow (3-4 feet) of water. These Restrictions will be listed on DNR permit.

South End

REFERENCES

Southeast Wisconsin Regional Planning Commission, 2004. An Aquatic Plant Management Plan for Little Cedar Lake, Washington County, Wisconsin. 103 pp.

Wisconsin Department of Natural Resources, August, 1991. Aquatic Plant Management Summary of Sensitive Area Assessment. 10 pp.